The prevalence of and risk factors for neck pain in first year Faculty of Health Sciences students at the Durban University of Technology.

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I, Giselle Lara Gevers, declare that this dissertation is representative of my own work in both conception and execution, except where indicated via references

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DEDICATION

To my parents, words fall short in describing my love and gratitude for you. Your love, unwavering support, provision and sacrifice have afforded me so many personal and professional opportunities.

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“Alice: *This is impossible.*

The Mad Hatter: *Only if you believe it is.**”***

- Lewis Carroll, Alice in Wonderland.

ABSTRACT

INTRODUCTION: Neck pain is considered to be one of the most disabling conditions, with a universal prevalence among youth, adult and elderly populations. However, despite its disabling nature and its high prevalence there is still much uncertainty surrounding the aetiology of the pain and the extent to which the condition is influenced by the intrinsic and extrinsic characteristics of an individual. While there is growing evidence to support the notion that marked bio-psychosocial associations exist with neck pain, this literature is heavily weighted toward an adult and a developed nation context leaving developing nations and the student population largely under-researched in comparison. Moreover, while a high prevalence of neck pain and its associated risk factors exist in the student population among health sciences and non-health sciences programmes, across many levels of study, the literature is ambivalent about which faculty and level of study is more at risk, if any. The first year of university stands out among the rest in that the students undergo a significant transition and are required to adapt to a new environment and style of learning compared to what they have been used to. Furthermore, students have been observed to exit first year with higher levels of distress than were present in the beginning of the year, suggesting that this unique environment may influence the psychosocial well-being of students. The extent and strength of this relationship is yet to be determined in a South African tertiary educational context and this is even more true of the first year student population at the Durban University of Technology. Research on the unique bio-psychosocial factors of these students would provide a more holistic understanding of the extent to which these factors exist and the role they play in the general well-being of the students and in the development of neck pain.

AIMS AND OBJECTIVES: This study aimed, firstly, to determine the prevalence and psychosocial risk factors of neck pain in registered first year Faculty of Health Sciences students at the Durban University of Technology and, secondly, to determine the association between neck pain presentation, demographic characteristics, socio-demographic and psychosocial risk factors. The outcomes of

this study could possibly have a threefold benefit (for the student, the institution, and the chiropractic profession at large).

RESEARCH DESIGN: A quantitative, descriptive, cross-sectional survey design was adopted in this research. This design was chosen as it was believed to be the best suited to achieving the aims and objectives of the study.

RESEARCH METHODOLOGY: Neck pain questionnaires were administered to the first year Faculty of Health Sciences students at the Durban University of Technology towards the end of the academic year in order to determine the prevalence of neck pain and its associated demographic, socio-demographic, and psychosocial risk factors. There was a final sample size of 135 participants achieving a response rate of 54.7% for the study. Data was captured by the researcher and sent to a statistician for statistical analysis.

RESULTS: A high prevalence of neck pain was found among the students (72%) with symptoms of depression (59.8%), anxiety (68.1%), and stress (53.6%) also being highly prevalent among this group. However, when neck pain was quantified by its characteristics the related impact was comparatively low. There was a common theme observed in the results highlighting the association between stress and neck pain, with stress furthermore being determined as an independent risk factor for neck pain (p = 0.023) with an odds ratio of 1.1. This result was not surprising, however, considering the stressors which emerged in the results highlighting factors such as transport protests, student protests, upcoming tests and financial aid as stress causing factors among the participants. The results provided valuable insight which enabled recommendations to be made about the direction of future research as well as recommendations for the Institution and the Chiropractic profession in the approach and management of students enrolled in tertiary education and with neck pain.

Key concepts: neck pain, demographics, socio-demographics, psychosocial, students, first year, bio-psychosocial, Faculty of Health, depression, anxiety, stress

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GLOSSARY

Prevalence: The existence of a disease or condition usually measured in a specific population and over a number of different time frames.

Lifetime Prevalence: Having experienced a condition in one's lifetime.

One Week Prevalence: Having experienced a condition over the past week.

Condition/Disease: An impairment of normal function which often manifests in a range of symptoms and/or signs.

Cervical Spine: The first of the three segments of the spinal/vertebral column.

Pain: "An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (Merskey 1991).

Demographic: Inherent characteristics of an individual (specifically age, gender, and ethnicity in this study).

Socio-demographic: Extrinsic characteristics regarding the social environment of an individual which may be determined/influenced by one's demographics (with specific focus on socioeconomic status and general health and lifestyle for this study).

Psychosocial: Extrinsic and interrelated psychological and social characteristics (with specific focus on depression, anxiety, stress, and coping for this study).

Bio-Psychosocial Model: A health model that recognises biological, psychological and social characteristics in the cause, progression and treatment of a condition or disease.

Biomedical Model: A health model which only focuses on biological factors when considering the cause, progression and treatment of a disease.

Major Depressive Disorder: A psychological condition (known simply as depression) which is characterised by low moods lasting at least two weeks and present in most contexts.

Unipolar Depression: Depression without episodes of mania.

LIST OF ABBREVIATIONS

BNP	Bothersome neck pain
CI	Confidence intervals
DASS	Depression Anxiety and Stress Scale
DALYs	Disability-adjusted life-years
DUT	Durban University of Technology
FHS	Faculty of Health Science
HALE	Healthy Life Expectancy
IASP	International Association for the Study of Pain
IREC	Institutional Research Ethics Committee
MDD	Major depressive disorder
NBQ	Neck Bournemouth Questionnaire
NPQ	Neck Pain Questionnaire
NRS	Numerical Rating Scale
NSFAS	National Student Financial Aid Scheme
VAS	Visual Analogue Scale
VRS	Verbal Rating Scale
WHO	World Health Organisation
YLD	Years lived with disability
YLL	Years of life lost due to premature mortality

CHAPTER 1 : INTRODUCTION

1.1 INTRODUCTION

This is an introductory chapter which contextualises the study by providing background to the study as well as the significance, delimitations, limitations and assumptions of the study which define the scope of the topic. Here the aims and objectives are also presented along with a chronological synopsis of the chapters which follow.

1.2 BACKGROUND TO THE RESEARCH

Neck pain is a highly prevalent condition with an average annual prevalence of between 30% and 50% in the general population of the United States of America; and Asian, Scandinavian, and European countries across the globe (Hogg-Johnson *et al.* 2008). International research on the prevalence, epidemiology and impact of neck pain (particularly in developed nations) has taken the lead over the past decades and as a result has contributed to the abundance in the literature regarding these topics (Cohen 2015; Côté *et al.* 2004; Croft *et al.* 2001; Fejer, Kyvik and Hartvigsen 2006; Haldeman *et al.* 2008; Hogg-Johnson *et al.* 2008; Hoy *et al.* 2010; Mäkela *et al.* 1991; Murray *et al.* 2013a; Vijay and Ide 2016). In contrast, research of this nature is not as extensive in developing nations and there is still a long way to go in order to close this gap (Fejer, Kyvik and Hartvigsen 2006; Hoy *et al.* 2014). To contextualise the current study, and considering the growing body of neck pain research in the developing world, neck pain prevalence has been noted in an African context (Tsang *et al.* 2008; Ayanniyi, Mbada and Iroko 2010; El-Sayed *et al.* 2010; Murray *et al.* 2013b), a South African context (Tsang *et al.* 2008) and in Durban (Ndlovu 2006; Venketsamy 2007; Slabbert 2010; Muchna 2011; McDonald 2014), with a multi-ethnic prevalence of 36.8% to 50% being reported in the greater Durban area (Ndlovu 2006; Slabbert 2010; Muchna 2011). Although neck pain prevalence has been established worldwide, the condition is rooted in a complex aetiology and has resulted in contention among researchers on this topic (Ariëns *et al.* 2001; Côté *et al.* 2004; Fejer, Kyvik and Hartvigsen 2006; Hogg-Johnson *et al.* 2008; Tsang *et*

al. 2008; Guzman *et al.* 2009; Misailidou *et al.* 2010; Palmlöf *et al.* 2012; Hoy *et al.* 2014). Neck pain has been mainly understood as either organic, psychosocial, or traumatic in origin. This contention among these authors and the sparsity of aetiological neck pain literature has highlighted a need for further research to be conducted to provide deeper insight into the demographic, socio-demographic and psychosocial influences on the condition, particularly in underserved communities (Ariëns *et al.* 2001; Côté *et al.* 2004; Fejer, Kyvik and Hartvigsen 2006; Hogg-Johnson *et al.* 2008; Tsang *et al.* 2008; Guzman *et al.* 2009; Misailidou *et al.* 2010; Palmlöf *et al.* 2012; Hoy *et al.* 2014).

Moreover, the high prevalence and vast reach of this condition across the globe should be understood in relation to its impact. This can be viewed in a two-pronged approach: the impact it has on society as a whole, and the impact it has on the individual experiencing it. Considering the first prong, neck pain has been established as one of the most disabling conditions in the world, which has also increased the burden on the economy (Côté, Cassidy and Carroll 1998; Venketsamy 2007; Hogg-Johnson *et al.* 2008; Tsang *et al.* 2008; Hanvold, Veiersted and Wærsted 2010; Cohen 2015). Considering the second prong, given its noted prevalence among students enrolled in tertiary institutions around the world; across a number of different faculties (Venketsamy 2007; Ayanniyi, Mbada and Iroko 2010; El Ansari and Stock 2011; Ibrahim and Abdelreheem 2015), the impact of neck pain is believed to be of particular importance as it can result not only in an inability to perform adequately in their studies, but also an impedance on the student's lifestyle and ability to deal with personal and/or work related activities that often underpin the students' ability to remain within higher education (Angell, Heffernan and Megicks 2008; Dann 2008; Stodnick and Rogers 2008; Ssegawa and Rwelamila 2009; Ayanniyi, Mbada and Iroko 2010).

Neck pain and heightened levels of distress have been noted among students in various years of study with a particular mention of these conditions being prevalent in first-year students across faculties, nationally and internationally (Venketsamy 2007; Ayanniyi, Mbada and Iroko 2010; El Ansari and Stock 2011; Ibrahim and Abdelreheem 2015). The experience of first year is unique in that a student has to transition from secondary education to tertiary education and it has been

hypothesised that this adjustment is a cause of stress among certain first-year students (Thawabieh and Qaisy 2012). Additionally, an interesting observation was made by Wolf *et al.* (1991) who measured levels of distress among students throughout their first year. When comparing results, they noted that students had higher ratings of distress at the end of the year compared to the beginning of the year when they entered first year. This suggests that there are unique factors at play which may influence the psychosocial well-being of the first-year students throughout their experience of first year (Wolf *et al.* 1991; Thawabieh and Qaisy 2012). This being said, a paucity in the literature exists regarding the prevalence of neck pain and its associated risk factors in South African students enrolled in tertiary institutions and it would seem that there too is a lack of literature regarding its prevalence and associated risk factors in first year Faculty of Health Science (FHS) students of the Durban University of Technology.

In light of the above, this study aims to determine the prevalence of neck pain in the first year the FHS students at the Durban University of Technology (DUT) while attempting to highlight associated risk factors within their respective demographic, socio-demographic and psychosocial contexts.

1.3 AIMS AND OBJECTIVES OF THE STUDY

1.3.1 Aims

Given the lack of literature pertaining to neck pain within the student community of developing nations; the study aimed to explore the socio-demographic and psychosocial factors unique to the first year FHS students at the DUT in relation to the prevalence of neck pain among these students. In so doing, the study aimed to contribute to and thus expand the literature on neck pain and its possible risk factors while allowing certain comparisons to be made between developed and developing nations.

1.3.2 Objectives

The first objective of the study was to determine the prevalence of neck pain in the registered first year FHS students at DUT.

The second objective of the study was to determine the characteristics (pain type, duration and intensity etc.) of the neck pain.

To determine the psychosocial risk factors of registered first year FHS students suffering with neck pain at DUT.

The fourth objective of the study was to determine the association between demographic characteristics, socio-demographic and psychosocial risk factors in the first year FHS student population in relation to the neck pain that they present with.

1.4 SIGNIFICANCE OF THE STUDY

The literature has highlighted the need for further research within the field of neck pain and the ambiguity surrounding the extent to which the bio-psychosocial constitution of an individual contributes or predisposes to the presentation and prevalence of neck pain. While it appears that a link has been established between these factors and neck pain in both the adult and developed population, there is still a need for further research to establish this same link in younger and developing populations. With this in mind, the outcomes of the study were expected to create holistic awareness and enhance the understanding of the socio-demographic and psychosocial contexts that were unique to the registered first year FHS students at the DUT. The questionnaire addressed areas such as: level of support, financial security, lifestyle, transition and adjustment to tertiary education, studying habits, psychological (depression, anxiety and stress) symptoms, and general health and well-being. In better understanding the aforementioned factors present in the students' context, the answers to the questionnaire highlighted potential risk factors in association to neck pain prevalence in this population and gave an idea of the general well-being of the first year students. While these insights contribute to a sparse, but growing, body of literature on neck pain in this setting, they too might enable DUT management to address these possible problematic areas identified and as a result, the students could improve and develop personally within the programmes for which they were registered.

A secondary benefit is that of potential professional growth. The literature brought the causation of neck pain into question and while the study cannot determine the directionality of neck pain and its risk factors, it can provide insight for health

practitioners to better understand the possible risk factors that students are subjected to and draw associations between these risk factors and the development of neck pain, which is a step in the direction of a better understanding of the causation of neck pain. This could allow practitioners to address the neck pain in a more effective (and holistic) way. The literature highlighted a trend of students neglecting to seek management for their pain and in response the questionnaire addressed the likelihood of the students to seek management for their symptoms and to utilise support services. This information was useful for both health care professionals and DUT to gauge the level of awareness and utilisation of the respective profession and support structures.

1.5 Delimitations, Limitations and Assumptions

An important part of any research project is identifying the delimitations, limitations and the assumptions of the study. In this way that the scope of the study is defined and potential weaknesses of the study are addressed. Delimitations are controllable limits set by the researcher in order to define the direction of the study and are usually based on practical factors such as budget and time constraints; in contrast, the limitations of the study are areas of weakness over which the researcher has no control. Assumptions, on the other hand, are factors that are difficult to prove but which are believed to be true by both the researcher and those reading the dissertation (Cunningham, Weathington and Pittenger 2013; Simon and Goes 2013; Creswell 2014).

The study was conducted by the researcher in the form of a partial dissertation and as a requirement for obtaining an academic degree. As a result, factors such as time and budget constraints are noted in their influence of the direction and depth of the study.

1.5.1 Delimitations

The following factors were considered delimitations of the study:

- Participants were limited to first year FHS students, enrolled at the DUT Durban campuses. This limit was set by the researcher in order to remain within the budget and time constraints imposed upon the study, by being able

to access the population with relative ease being based at the DUT and being a FHS student.

- The researcher limited the study to one independent variable (neck pain), as opposed to including several musculoskeletal conditions, in order to refine the research question.
- The researcher chose to utilise a quantitative, descriptive cross-sectional survey design for the study as opposed to other designs because it was believed to be best suited to achieving the aims and objectives for the study. Furthermore, the researcher chose a two-stage cluster sample strategy.

1.5.2 Limitations

The following factors were considered limitations of the study:

- The nature of using a quantitative, descriptive, cross-sectional approach is that the statistical models utilised in the study were only able to determine a correlation of selected risk factors with neck pain and not causation. Therefore, risk factors identified in the study are considered to be associated with neck pain but cannot be interpreted as having caused the neck pain.
- The data collection period coincided with the 2016 student protests which affected: the environment in which the data was collected, the response rate, and the participant drop-out rate (due to poorly answered questionnaires). All of these factors affected the final sample size of the study. Unfortunately, due to the timing of the academic year, budget, and time constraints the researcher had to continue with data collection under these unfavourable circumstances. Therefore, it is important that the results of the study are considered in relation to these factors.
- In order to avoid fatigue bias, the questionnaire structure was closed ended and was kept as short as possible. This approach, while also chosen based on time and budget constraints, can be problematic in that it limits the participants answers and as a result, the interpretation of certain variables.

1.5.3 Assumptions

It has been assumed that the responses of the participants were honest, as it is impossible to prove or control this when conducting a study of this nature. Considering this assumption, every effort was made by the researcher during data collection to assure the participants that their responses would be kept anonymous and confidential in the hope that this would create an environment in which they felt comfortable to respond truthfully to the questionnaire content. Moreover, participation was on a voluntary basis and the participants were informed that they could withdraw from the study at any point without negative ramifications as a result of their withdrawal.

1.6 OUTLINE OF THE CHAPTERS

1.6.1 Chapter One

This chapter introduced and contextualised the topic by providing a brief background of the research surrounding the topic. This chapter also outlined the aims, objectives, significance, delimitations, limitations, and assumptions of the study.

1.6.2 Chapter Two

This chapter reviews the current international and national literature on neck pain and its associated risk factors – with particular focus on selected demographic, socio-demographic and psychosocial factors. In order to keep the review current, research which was mostly published in the past five to ten years was the focus of the review. However, it was sometimes necessary to include older research in order to place a topic in an holistic context. The reviewing of the literature allowed the research gap to be defined and in so doing highlighted the projected value of the study.

1.6.3 Chapter Three

The methodology of the study is documented in this chapter. It states the research paradigm and design as well as the inclusion and exclusion criteria of the study. The sample strategy; sample size and the data analysis method are explained. This

chapter also outlines the instruments used in the development of the questionnaire, the development of the questionnaire, the process of content and face validation of the questionnaire, the study procedure and the ethical considerations of the study.

1.6.4 Chapter Four

The results of the study are presented in this chapter. The results are presented in the order of each objective and the data represented in diverse ways (text, tables, charts, graphs etc.) for optimal visualisation. Here too, the significant associations and correlations of the measured variables are presented.

1.6.5 Chapter Five

In this chapter, an exploration and interpretation of the results of the study (chapter four) is provided in the form of a detailed discussion. The discussion follows a progressive flow corresponding to the objectives while highlighting noteworthy and statistically significant associations. The results of the study are discussed in juxtaposition to the corresponding relevant literature which was reviewed in Chapter 2.

1.6.6 Chapter Six

This chapter concludes the study and summarises the significant findings. It evaluates the study by reviewing each objective and in so doing demonstrates the contribution to the body of knowledge and the gap in the literature. This chapter also revisited the delimitations and limitations of the study (presented in this chapter) elaborating on their implication in the context of the results. A reflection of the study process was provided as well as recommendations for the direction of future research, DUT, and the chiropractic profession.

CHAPTER 2 : LITERATURE REVIEW

2.1 INTRODUCTION

This chapter aims to provide a brief overview of the anatomy of the cervical spine in order to define the structures of the neck region. Furthermore, it aims to contextualise the current research study by reviewing the available literature on neck pain and its possible risk factors in an international, national and local setting, and in so doing highlights the research gap underpinning the current study. The literature has been sourced from anatomy text books and the following databases: DUT Summon Search, ScienceDirect, EBSCOhost, and Google Scholar.

2.2 ANATOMY OF THE CERVICAL REGION (THE NECK)

The cervical region (located between the base of the skull and the upper boundary of the thorax) is comprised of many anatomical structures that are interconnected and essential to its functions (Berkovitz and Moxham 2002; Moore, Dalley and Agur 2013). This region can be divided into four components. The first is the vertebral component which houses the vertebrae of C1 to C7 and their associated structures (joints, musculature, ligaments, a network of cervical nerves, and the spinal cord). Secondly, the visceral component which houses structures of various bodily systems such as the upper respiratory tract, the upper digestive tract, the thyroid gland, and parathyroid glands. The last two vascular components are located on either side of the neck and house a network of cervical arteries and veins, as well as the tenth cranial nerve – the vagus nerve. Each of these components and their constituents are designed to carry out specific bodily functions (Drake, Vogl and Mitchell 2009). For the purpose of categorising components according to specific biological systems, the cervical nerves and spinal cord have been discussed along with the neural structures found in the vascular component as opposed to in the vertebral component.

2.2.1 The Vertebral Component

The cervical vertebrae, the joints of the cervical spine, as well as the related

musculature and ligaments are discussed under this component (Drake, Vogl and Mitchell 2009).

2.2.1.1 Vertebrae of the Cervical Spine

The bones of the vertebral column are known as vertebrae. The cervical spine is located between the base of the skull and the first thoracic vertebra and is the first section of the vertebral column. Of the 33 bones of the vertebral column, the cervical spine houses seven of these (C1 – C7). These seven bones have traditionally been classified, according to their design and function, as typical and atypical vertebrae. The first cervical vertebra (C1), the second cervical vertebra (C2) and the seventh cervical vertebra (C7) are known as atypical vertebrae and are named the atlas, the axis and vertebra prominens, respectively. The middle four vertebrae (C3 – C6) are known as the typical vertebrae (Berkovitz and Moxham 2002). The cervical vertebrae form part of the axial skeleton and, combined with the manubrium, clavicles and hyoid bode (located anteriorly, at the level of C3), define the neck. Furthermore, the cervical vertebrae function to support the head while encasing and protecting the spinal cord and meninges (Moore, Dalley and Agur 2013).

2.2.1.2 Joints of the Cervical Spine

There are two types of joints in the cervical spine: cartilaginous and synovial joints. The first type (secondary cartilaginous joints) are found between the vertebral bodies of all cervical vertebrae except for the atlas (C1). They are known as intervertebral (fibrocartilaginous) discs which function to strengthen and stabilise the spinal column by absorbing shock encountered by the cervical spine. The latter (synovial joints) are found in three locations in the cervical spine: 1) the articular facet joints located between the vertebral arches, bilaterally, 2) the atlanto-occipital joint which is located between the condyles of the occiput and the superior articular facets of the first cervical vertebra, and 3) the atlanto-axial joint located between C1 (the atlas) and C2 (the axis). The atlanto-occipital and atlanto-axial joints are unique articulations in that they can only be found in the cervical spine (Berkovitz and Moxham 2002).

Another exclusive feature of the cervical spine are the uncovertebral joints otherwise known as "Luschka joints", and named after the German anatomist Hubert von

Luschka. These joints are also unique in that they are half joints which only start developing around the age of nine and reach full development around the age of 21 (Penning 1988; Tubbs *et al.* 2011).

2.2.1.3 Muscles of the Cervical Spine

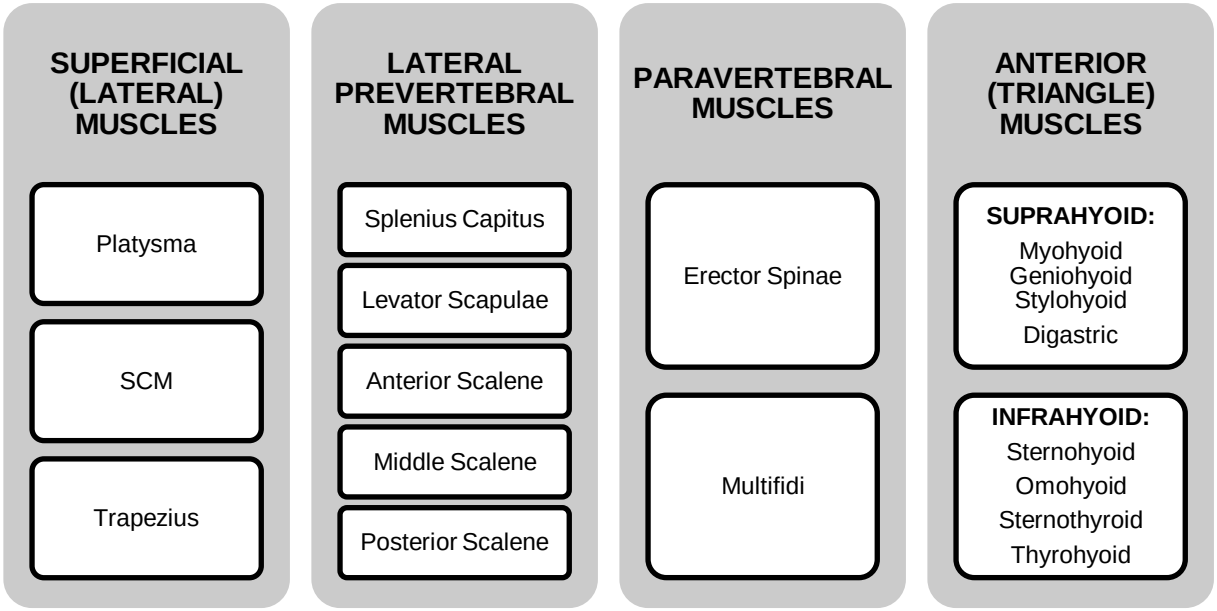
There are many layers to the intricate musculature of the cervical spine. Consequently, there are many ways in which these muscles can be categorised: according to location (Table 2.1), region (Table 2.2), action (Table 2.3), and clinical significance (Table 2.4) to name a few (Abrahams, Boon and Spratt 2008; Drake, Vogl and Mitchell 2009; Moore, Dalley and Agur 2013). For this section of the review only the muscles of clinical importance to this study will be discussed in further detail.

Table 2.1: Cervical musculature classified by location (superficial to deep)

POSTERIOR ASPECT	ANTERIOR & LATERAL ASPECT
Occipitalis	Platysma
Trapezius (upper fibers)	Sternocleidomastoid
Splenius Capitus	Trapezius
Splenius Cervicis	Omohyoid
Levator Scapulae	Sternohyoid
Rhomboid Minor	Sternothyroid
Spinalis Capitis	Thyrohyoid
Semispinalis Capitis	Middle Scalene
Longissimus Capitis	Posterior Scalene
Rectus Capitis Posterior Minor	Anterior Scalene
Rectus Capitis Posterior Major	Scalenus Minimus
Obliquus Capitis Inferior	Levator Scapulae
Obliquus Capitis Superior	Rectus Capitis Lateralis
Interspinalis	Rectus Capitis Anterior
	Longus Capitus
	Longus Cervicis

Adapted from Vizniak (2008)

Table 2.2: Cervical musculature classified by cervical region



SCM: Sternocleidomastoid.
Adapted from Moore, Dalley and Agur (2013)

Table 2.3: Cervical musculature classified by cervical action

FLEXION	EXTENSION	LATERAL FLEXION	ROTATION
SCM	Trapezius	Scalenes	SCM
Longus Coli	Suboccipitals	Splenius Capitus	Splenius
Longus Capitus	Longissimus Capitus	Splenius Cervicis	Suboccipitals
Rectus Capitus Anterior	Splenius Capitus	Longissimus Capitus	Rotatores
	Splenius Cervicis	Levator Scapulae	Longus Capitus
		Rectus Capitus Lateralis	Longus Coli

SCM: Sternocleidomastoid.
Adapted from Vizniak (2008)

Table 2.4: Cervical musculature classified by clinical significance

MUSCLE	PAIN CAUSING TRIGGER POINTS	NECK PAIN LOCATON	COMMON AGGRAVATORS
POSTERIOR NECK PAIN			
TRAPEZIUS	TP1 & TP2	Posterolateral neck, mastoid process, angle of jaw, occiput	Falling from a height, falling down stairs, whiplash, leg length discrepancy, postural stress that places shoulders in prolonged flexion / heightened position, prolonged pressure from back pack straps / clothing
CERVICAL MULTIFIDI	TP3 (deep)	Suboccipital & Posterior neck	Acute trauma, whiplash, chronic stress, postural stress, poor pillow which leads to sleeping with head in extension position
LEVATOR SCAPULAE	TP1 & TP2	Angle of the neck	Occupational stress that places neck in prolonged rotation, recreational stress from neck extension to look at a screen e.g. laptop, psychological stress that leads to tense posture, overexercise
SPLENIUS CERVICIS	Lower TP	From angle of the neck to the base of the neck	Acute trauma, postural stress which causes prolonged neck rotation or extension, sleeping with neck in a bent position, breeze on the neck
INFRASPINATUS	TP 1, TP2 & TP3	Suboccipital & upper posterior neck	Acute or chronic stress of the muscle due to excessive backwards shoulder movements
ANTERIOR NECK PAIN			
SCM	Sternal division (inner and upper margin)	pharynx - "sore throat" sensation & base of the skull	Postural stress which places neck in prolonged flexion, extension or rotation, sleeping supine and on two pillows, whiplash, leg length discrepancy, secondary activation
DIGASTRIC	TP in posterior belly	Upper portion of SCM & sometimes throat and occiput	Clenching / grinding teeth, postural stress which causes prolnged flexion & extension, whiplash
MEDIAL PTERYGOID	TP1	Pharynx	Postural stress which results in anterior head carriage, secondary activation, gringing teeth, anxiety, emotional stress

TP: trigger point, SCM: Sternocleidomastoid muscle.
Adapted from Simons, Travell and Simons (1999)

As described in Table 2.4 above, there are a number of muscles that have been implicated in neck pain. The trapezius, multifidi, levator scapulae, splenius cervicis and infraspinatus muscles have been known to refer pain to the posterior and lateral aspect of the neck. The sternocleidomastoid, digastric, and medial pterygoid muscles have been linked to throat and anterior neck pain. The aetiology of trigger points responsible for neck pain is largely linked to postural stress, emotional stress, and trauma such as whiplash (Simons, Travell and Simons 1999).

2.2.2 The Visceral Component

This is a multi-layered component which controls aspects of hormone function (the thyroid and parathyroid glands), respiratory function (the larynx and trachea), and digestive function (the pharynx and oesophagus). These structures are presented from most superficial to least superficial (Moore, Dalley and Agur 2013).

2.2.2.1 The Thyroid Gland

The thyroid gland (which extends from the fifth cervical vertebra to the first thoracic vertebra) is comprised of two lobes and it functions to release metabolic hormones (thyroid hormone and calcitonin) which control many essential bodily functions (Moore, Dalley and Agur 2013).

2.2.2.2 The Parathyroid Gland

The parathyroid glands (four glands found posterior to the thyroid gland) produce a hormone known as parathormone which aids in the metabolism of calcium and phosphorus found in the circulatory system of the kidneys, intestine and skeleton (Moore, Dalley and Agur 2013).

2.2.2.3 The Larynx (the Voice Box)

The larynx (which extends from the third cervical vertebra to the sixth cervical vertebra) functions to receive and direct air to the respiratory organs, prohibit substances other than air from entering the respiratory tract and convert air waves into sound waves for sound production (Moore, Dalley and Agur 2013).

2.2.2.4 The Trachea (the Windpipe)

The trachea (located at the level of the C6 vertebra) is an extension of the larynx which serves as a pathway to facilitate the transfer of air into and out of the lungs through the main bronchi which are located in the thorax (Moore, Dalley and Agur 2013).

2.2.2.5 The Pharynx (the Throat)

The pharynx (which extends from the base of the skull to the sixth cervical vertebrae) has a dual function in that it transports ingested substances from the oral cavity to the oesophagus and acts as an air filter which moistens and warms the air before it enters the trachea (Drake, Vogl and Mitchell 2009; Moore, Dalley and Agur 2013).

2.2.2.6 The Oesophagus

The oesophagus (located at the level of the sixth cervical vertebra) is a tubular muscle which joins the pharynx and the stomach. It has three portions to it and the first portion (the cervical oesophagus) is found in the cervical region (Moore, Dalley and Agur 2013).

2.2.3 The Vascular Component: Blood Vessels

The cervical arteries and veins are discussed under this component.

2.2.3.1 Arteries

The main arteries in the cervical region are known as the carotid arteries. The common carotid splits into two sections forming the internal carotid and the external carotid which are bilaterally located in the cervical region and are responsible for most of its blood supply. The internal carotid has no branches whereas the external carotid gives rise to eight branches which supply smaller structures in the head and neck region (Berkovitz and Moxham 2002).

2.2.3.2 Veins

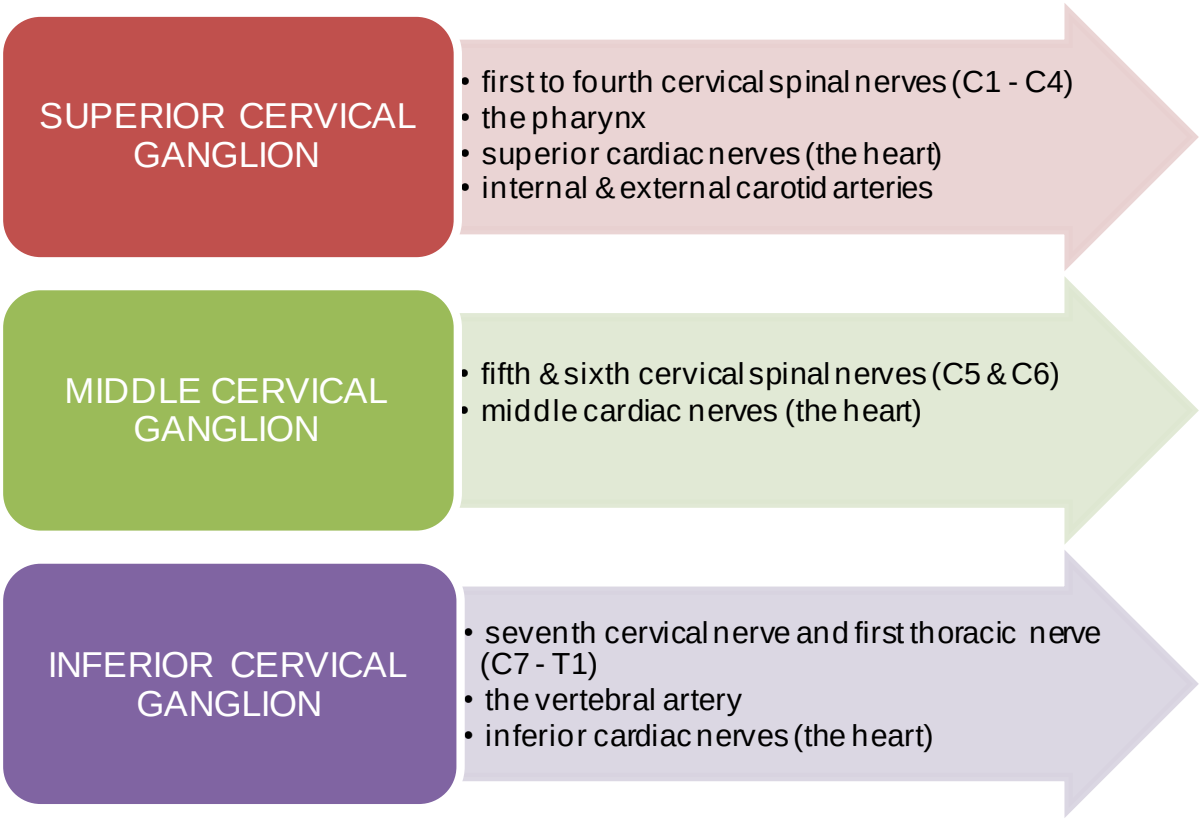
The main veins of the cervical region are the internal and external jugular veins. The majority of the blood from the cervical region empties through these jugular veins into the subclavian vein at the junction where they join to form the brachiocephalic vein. Each of the jugular veins network smaller branches which are responsible for supplying smaller structures in the cervical region (Berkovitz and Moxham 2002).

2.2.4 The Vascular Component: The Cervical Nerves & Spinal Cord

The anterior triangle, posterior triangle and the root of the neck house many

important neural structures, each of which has unique functions to assure optimal functioning of cervical region and other regions. Located in the anterior triangle are the following cranial nerves: facial, glossopharyngeal, vagus, accessory and the hypoglossal nerve. The transverse cervical nerve and ansa cervicalis constitute the peripheral nerves of the anterior triangle. The accessory nerve is also located in the posterior triangle of the neck along with the cervical plexus and the brachial plexus. The root of the neck houses the phrenic, vagus and recurrent laryngeal nerves as well as portions of the sympathetic nervous system (Drake, Vogl and Mitchell 2009; Moore, Dalley and Agur 2013). Of particular importance to the innervation of the cervical region are the cervical nerve roots. These nerve roots can be found (bilaterally) at each level of the cervical vertebral column which encases and protects the spinal cord. The cervical nerve roots arise from three cervical ganglia which demarcate the extent of the sympathetic trunk (Drake, Vogl and Mitchell 2009). The ganglia and their innervations are described in Figure 2.1.

Figure 2.1: The cervical ganglion and their distribution



C1 - C7: cervical vertebrae, T1: thoracic vertebra.
Adapted from Drake, Vogl and Mitchell (2009)

2.2.5 Bio-mechanics of the Cervical Spine

2.2.5.1 Cervical Lordosis

There are two types of curvatures of the spine: the primary curvatures (accommodation curves) and the secondary curvatures (compensation curves). The primary curvatures form in the foetus during late stage development as it takes on a kyphotic curve which is convex posteriorly; this curve can be found in the thoracic and sacral segments of the spine. The secondary curvature takes on a lordotic curve which is concave posteriorly; this is the curve of the cervical and lumbar segments of the spine (Drake, Vogl and Mitchell 2009). The secondary curves are not apparent at birth but develop as the infant undergoes bio-mechanical changes and reaches developmental milestones. Of the secondary curves, the cervical curve appears first (around three months of age) as the infant learns to hold up its head, and the lumbar

curve should be apparent by the first year of life as the infant progresses from crawling to learning to sit and stand. These curves are called compensatory curves as the spine adapts its design as it compensates for the weight of the growing and increasingly mobile infant (McKinley and O'Loughlin 2006). Moreover, it is this unique design of the vertebral column which allows it a greater degree of freedom while favourably positioning it to carry the weight and impact of the mobile human body (McKinley and O'Loughlin 2006).

2.2.5.2 Cervical Spine Range of Motion

The cervical, thoracic and lumbar regions constitute the vertebral column and are each capable of producing the same four movements (flexion, extension, lateral flexion and rotation), however, the cervical region has the largest range of movement of these three regions and is known to be the most mobile segment of the spine. Furthermore, an individual is said to have full range of motion when they are capable of achieving 60° of flexion, 60° of extension, 45° of lateral flexion, and 80° of rotation (Vizniak 2008).

2.2.6 Clinical Significance of Anatomical Structures in Neck Pain

Table 2.5 provides the two common classifications for neck pain and outlines the ways in which certain processes can cause an alteration in the cervical anatomical structures. These alterations have been known to present as neck pain. Although more serious pathologies are presented below, it is noted that mechanical neck pain has been described as occurring more commonly than these more insidious causes (Walker and Colledge 2013).

Table 2.5: Pain causing processes and structures in the cervical spine

CLASSIFICATION	PROCESS	ANATOMICAL STRUCTURE	EXAMPLES
MECHANICAL	**Trauma**	Bone	Fracture / Spondylosis
		Muscle / Tendon / Ligament	Strain / Sprain / Whiplash
		Joint	Dislocation / Herniation
		Nerve	NRE
	Postural	Muscle	MFTP / Anterior Head Carriage
		Bone	Scoliosis
NON - MECHANICAL	**Degenerative**	Bone	OA
		Joint	DJD
	Malignancy	Bone	Metastases
		Soft Tissue	Myeloma / Intrathecal
	Inflammatory	Bone	TB, Osteomyelitis
		Joint	Polymyalgia Rheumatica
		Soft Tissue	Abcess / Pharyngitis
		Spinal Cord & Meninges	Meningitis
	Metabolic	Bone	Osterporosis / Osteomalacia / Padgets
	Autoimmune	Joint	RA
		Soft Tissue / Nerves	Graves Disease, MS
	Congenital	Bone	TOS (cervical rib)
		Soft Tissue/Joint	Marfan's Syndrome

NRE = Nerve Root Entrapment; OA = Osteoarthritis, DJD = Degenerative Joint Disease; Ca = Cancer; TB = Tuberculosis; RA = Rheumatoid Arthritis; MS = Multiple Sclerosis; MFTP = Myofascial Trigger Point; TOS = Thoracic Outlet Syndrome.
Adapted from: Misailidou *et al.* (2010) and Walker and Colledge (2013)

2.3 PROFILE OF NECK PAIN

2.3.1 Presentation of Neck Pain

The presentation of neck pain is multifaceted and as a result there are a number of ways in which it can be defined. According to the International Association for the Study of Pain (IASP) neck pain is defined as pain that is experienced at the back of the neck extending upwards from the spinous process of the first thoracic vertebrae to the superior nuchal line (Merskey and Bogduk 1994). As cited in an article written by Misailidou *et al.* (2010), in their text book, Bogduk and Mcguirk (2006) divided neck pain into upper and lower segments using the fourth cervical vertebrae as the landmark of division. Each segment had a unique pattern of referral with the upper segment referring to the head and the lower to the scapulae, shoulders, upper limbs and anterior chest wall. A third segment, the sub-occipital area, extends upwards from the second cervical vertebrae to the superior nuchal line and has been reported

to be responsible for the presentation of cervicogenic headaches. Lastly, The Bone and Joint Decade 2000-2010 Task Force provided an anatomical definition of neck pain as pain that is experienced in the region bordered by the superior nuchal line; the suprasternal notch, the superior aspects of the clavicles and the spine of the scapulae that may appear with or without pain referral (Guzman *et al.* 2009).

2.3.2 Epidemiology of Neck Pain

From an international perspective, neck pain is a well-documented condition which frequently plagues a vast range of individuals (Côté, Cassidy and Carroll 1998; Fejer, Kyvik and Hartvigsen 2006; Hogg-Johnson *et al.* 2008; Tsang *et al.* 2008; Hanvold, Veiersted and Wærsted 2010; Hoy *et al.* 2010; Hoy *et al.* 2014). Neck pain prevalence is generally measured in the following two ways: 1) Period prevalence (lifetime prevalence, 12 month prevalence, six month prevalence, one month prevalence, one week prevalence); and 2) Point prevalence (current prevalence). In this regard, Table 2.6 provides a summary of the prevalence of neck pain in the general population of the United States of America, Asia, Scandinavia, and Europe. These values were extracted from two large-scale systematic reviews (Fejer, Kyvik and Hartvigsen 2006; Hogg-Johnson *et al.* 2008).

Table 2.6: Neck pain prevalence of the general population in the USA, Asia, Scandinavia and Europe

TIME FRAME	POPULATION AGE GROUP*	PREVALENCE
Lifetime	Adult	14.2% - 71.0%
12 month	Child/Adolescent	15.8% - 71.5%
	Adult	12.1% - 75.1%
	Elderly	8.8% - 11.6%
6 month	Child/Adolescent	6.0% - 45.0%
	Adult	6.9% - 54.2%
1 month	Child/Adolescent	4.5% - 8.5%
	Adult	15.4% - 45.3%
1 week	Adult	1.4% - 36%
Point	Adult	5.9% - 22.2%
	Elderly	38.70%

*Adult ages ranged from 15 - 90 years, child ages ranged from 12 - 18 years and the ages of the elderly group was usually 65+ years.

Adapted from the systematic reviews of Fejer, Kyvik and Hartvigsen (2006) and Hogg-Johnson *et al.* (2008)

As can be seen in Table 2.6, the finding of the systematic reviews demonstrate that neck pain prevalence generally increases when measured over longer time frames and is generally more prevalent in adults than in children and the elderly (Fejer, Kyvik and Hartvigsen 2006; Hogg-Johnson *et al.* 2008). Comparatively, Hoy *et al.* (2010) reported a wider range of overall neck pain prevalence in the general population (0.4% to 86.8%) as well as a wider annual prevalence (4.8% to 79.5%) and point prevalence (0.4% to 41.5%) ranges, worldwide. However, Hoy *et al.* (2010) caution that it is difficult to compare prevalence values due to the vast range of methodologies utilised in epidemiological research, which decreases homogeneity among studies.

In contrast to the international literature, national or local neck pain research is not as extensive; and while its prevalence has been noted, it is often noted in conjunction to other chronic pain conditions (Côté, Cassidy and Carroll 1998; Venketsamy 2007; Tsang *et al.* 2008; Hoy *et al.* 2014). When contrasting neck pain prevalence in developed and developing countries, Tsang *et al.* (2008) noted a higher prevalence of headache and back/neck pain in developing countries compared to developed countries. This pattern is contested by Hoy *et al.* (2014) who reported the highest age-standardised neck pain prevalence to be among high income regions, however, this study looked at neck pain in isolation.

More specifically, in the context of this research study, neck pain has been documented (multi-ethnically) in local studies in South Africa in the greater Durban area (Ndlovu 2006; Venketsamy 2007; Slabbert 2010; Muchna 2011; McDonald 2014). McDonald (2014) conducted a retrospective cross-sectional study of demographic characteristics and trends observed in the Chiropractic Day Clinic at the DUT between 1994 and 2011. Of the presenting complaints documented in this study, neck pain was found to be the second most common condition treated in the clinic (second to lower back pain), and the highest prevalence of neck pain was noted in 2006 (33.8%). Furthermore, Venketsamy (2007) conducted a retrospective cross-sectional survey of cervical cases recorded in this same clinic for the period 1996 to 2005. This study noted a statistically significant increase in neck pain prevalence over this nine year period with the highest prevalence of neck pain being documented in 2004 (29.36%). Moreover, this study reported that the most common

age group affected by neck pain were participants aged 20 to 29 years who demonstrated a prevalence of 30.2%. Neck pain prevalence in this age group has been noted elsewhere in the literature. Ayanniyi, Mbada and Iroko (2010) reported a lifetime prevalence of 34.9% in Nigerian undergraduate students with a mean age of 23.39 years. Moreover, Khan and Chew (2013) conducted a cross-sectional survey at five Malaysian dental schools and found neck pain to be the most prevalent condition when compared to other work related musculoskeletal disorders. The authors also reported a neck pain prevalence of 82% in clinical students and 41% in non-clinical students.

While many epidemiological reviews conclude that neck pain is a prevalent condition across many age groups worldwide, it has been suggested that the direction of future research should go beyond investigating the prevalence of neck pain to include its influence on society at large. A further suggestion was that further research needs to be conducted in lower income areas where neck pain prevalence is on the rise (Fejer, Kyvik and Hartvigsen 2006; Hoy *et al.* 2014).

2.3.3 Aetiology of Neck Pain

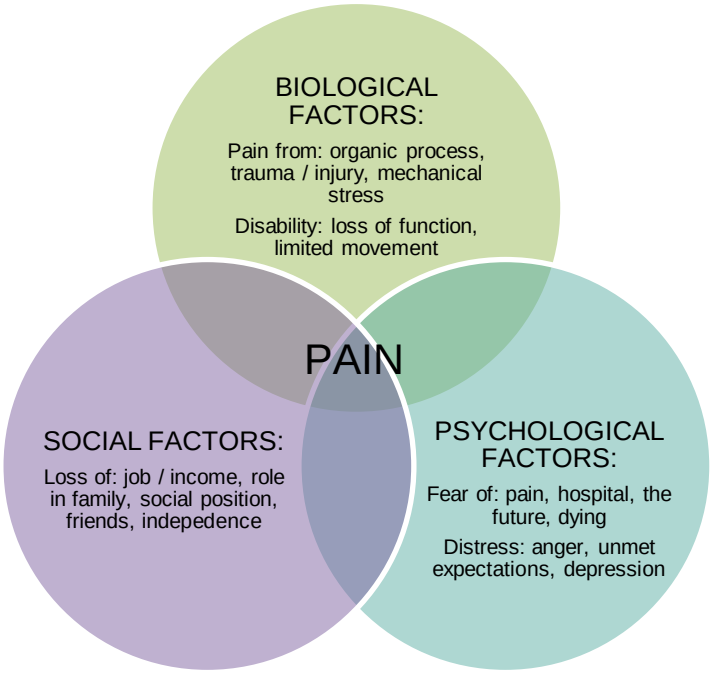
The aetiology of neck pain is multi-layered and is not fully understood. Furthermore, the extent to which neck pain is influenced by socio-demographic and psychosocial risk factors is yet to be determined as current literature on neck pain (of an epidemiological nature) is sparse (Ariëns *et al.* 2001; Côté *et al.* 2004; Tsang *et al.* 2008).

Guzman *et al.* (2009) reviewed scientific evidence of neck pain and its associated conditions over a six year period in order to determine a new conceptual model of neck pain. The authors concur that the aetiology of neck pain is often represented in one of three ways: 1) Neck pain is rooted in an isolated organic process; 2) Neck pain is principally non-pathological and is a result of social and psychological influences; and 3) The sub-division of neck pain based on causative factors such as “whiplash-associated disorders, occupational and sports-related neck pain and neck pain of unknown origin (non-specific neck pain)”. As cited by Misailidou *et al.* (2010) authors, Bogduk and McGuirk (2006) contend that the aetiology of mechanical neck pain is unknown and that the only known causes of neck pain are those linked to

pathological conditions. These various methods suggest and highlight diverse representations for neck pain.

2.3.4 The Clinical Characteristics of Pain (Neck Pain)

The IASP has defined pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage" (Merskey and Bogduk 1994). One can see from this definition that there are a number of components to pain; Figure 2.2 illustrates the bio-psychosocial interaction in the development and experience of pain (Walker and Colledge 2013). When considering these components of pain, these authors maintain that a complete psychological assessment is imperative if one is to address and manage pain appropriately.



Adapted from Walker and Colledge (2013)

Figure 2.2: Venn diagram of the components of pain

Moreover, it is important to understand pain in relation to its characteristics (its duration, intensity, frequency, periodicity, quality, and its resultant limitations) in order to understand the impact or burden the condition causes and to effectively diagnose and manage the condition (Schmidt and Willis 2007; Hogg-Johnson *et al.* 2008). When considering the overall impact of neck pain, Hogg-Johnson *et al.* (2008)

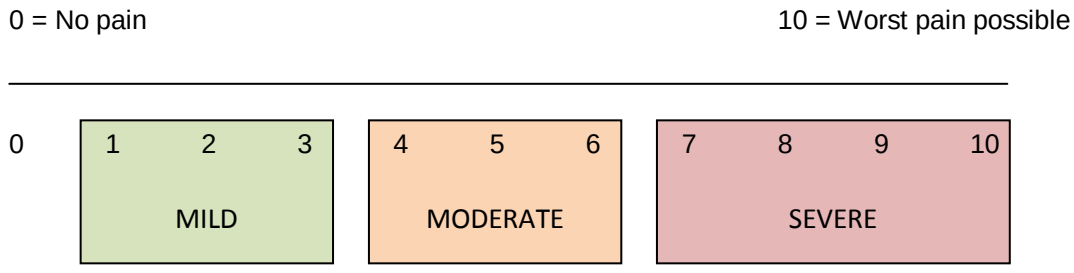
refer to a concept known as the “iceberg of burden”. This term is used for conditions that are high in prevalence but when quantified by clinical characteristics appear seemingly low in overall burden or functional limitation which results in a trend of decreased management sought.

2.3.4.1 Duration

Schmidt and Willis (2007) in their *Encyclopaedia of Pain* portray an evidence based historical progression in the understanding and definition of pain. In the section exploring acute and chronic pain, the authors discuss pain which is quantified by its expected length or prognosis by making reference to seminal authors on this topic. As cited by Schmidt and Willis (2007), acute pain was initially defined by Bonica in 1953 as, "a complex constellation of unpleasant sensory, perceptual and emotional experiences and certain associated autonomic, physiologic, emotional and behavioural responses" whereas, chronic pain was defined as, " pain that persists a month beyond the usual course of an acute disease or... (beyond the) time for an injury to heal, or that is associated with a chronic pathologic process." These definitions were intended to create an understanding of the severity of a disease/condition in order to select appropriate management approaches depending on the diagnosis, and to discern whether a condition that had progressed past its expected resolution may be a cause for concern warranting further investigation (Schmidt and Willis 2007). These definitions were criticised as they lacked a quantitative measure of time, which led to proposed time frames defining acute and chronic pain: as cited in Schmidt and Willis (2007), six months was the original (random) time frame proposed by Sternbach in 1974 to differentiate acute from chronic pain, which was later contested by Merskey in 1979 who proposed three months be the time frame to differentiate between the two. This was accepted and modern definitions maintain that acute pain is "pain that has been present for less than three months" and chronic pain is "pain that has been present for more than three months" (Merskey and Bogduk 1994). Furthermore, Walker and Colledge (2013) suggest that neck pain is most commonly short-lived and while individuals may experience repeated episode, most acute episodes do not progress to a chronic state.

2.3.4.2 Intensity

In clinical practise it has been noted that individuals generally indicate a higher pain severity than that observed by the health professional. Regardless of whether this is an accurate rating, it is still important to understand how that individual experiences the pain (Walker and Colledge 2013). A number of scales have been developed in order to try and gauge the level of severity of a condition such as neck pain, Williamson and Hoggart (2005) note three frequently used pain rating scales when measuring pain intensity: the Visual Analogue Scale (VAS), the Verbal Rating Scale (VRS), and the Numerical Rating Scale (NRS). The authors maintained that the VRS is the simplest to utilise, however, they criticised it as having the lowest sensitivity among the three scales. Moreover, the VAS provides challenges when being administered as it is the most likely to result in measurement errors due to the complex nature of the scale. While the results are open to doubt, it was reported that the NRS and VRS were seemingly the most popular among patients; the NRS because it is sensitive and the VRS because it is easy to understand. In this light, the VAS was the least popular tool as it is difficult to understand, which calls into question its accuracy in measuring the level of pain. It was concluded that the NRS is probably the most appropriate of the three scales in a research setting where the level of pain is needed to be determined and analysed. Figure 2.3 illustrates the NRS as well as providing qualitative interpretation of the quantitative intervals of the scale.



Adapted from McCaffery and Beebe (1989)

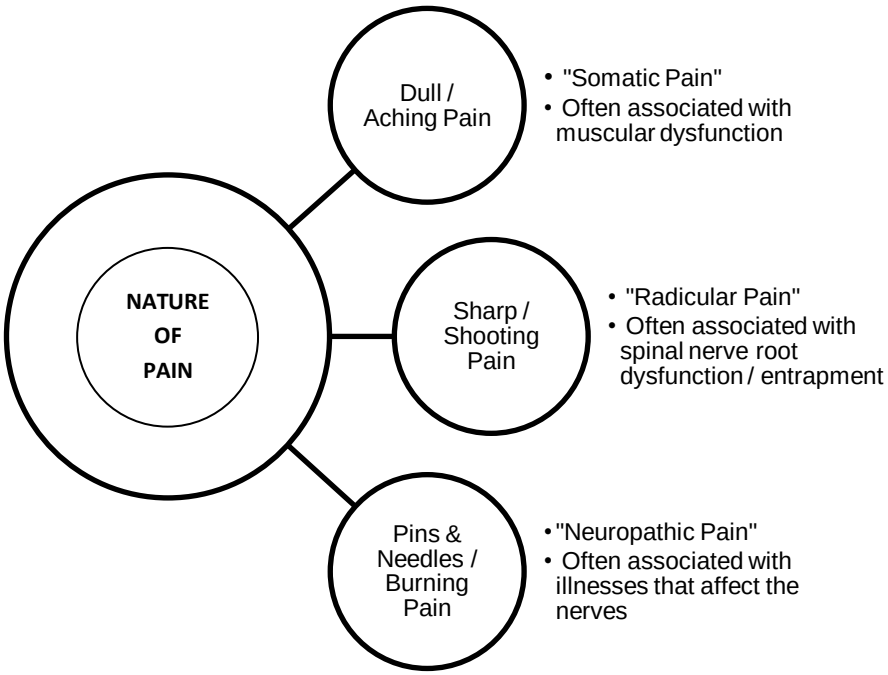
Figure 2.3: The NRS and an interpretation of the corresponding severity levels

2.3.4.3 Periodicity

Schmidt and Willis (2007) introduced the terms "constant" and "intermittent" pain with constant pain indicating a continuance of a pathological mechanism and intermittent pain being more likely to be characteristic of some form of trauma (be it direct or a result of micro-trauma over time).

2.3.4.4 Quality/Nature

Understanding the type of pain felt by an individual provides an indication of the cause of that pain (Schmidt and Willis 2007). Figure 2.4 provides a description of the different types of pain and their proposed root.



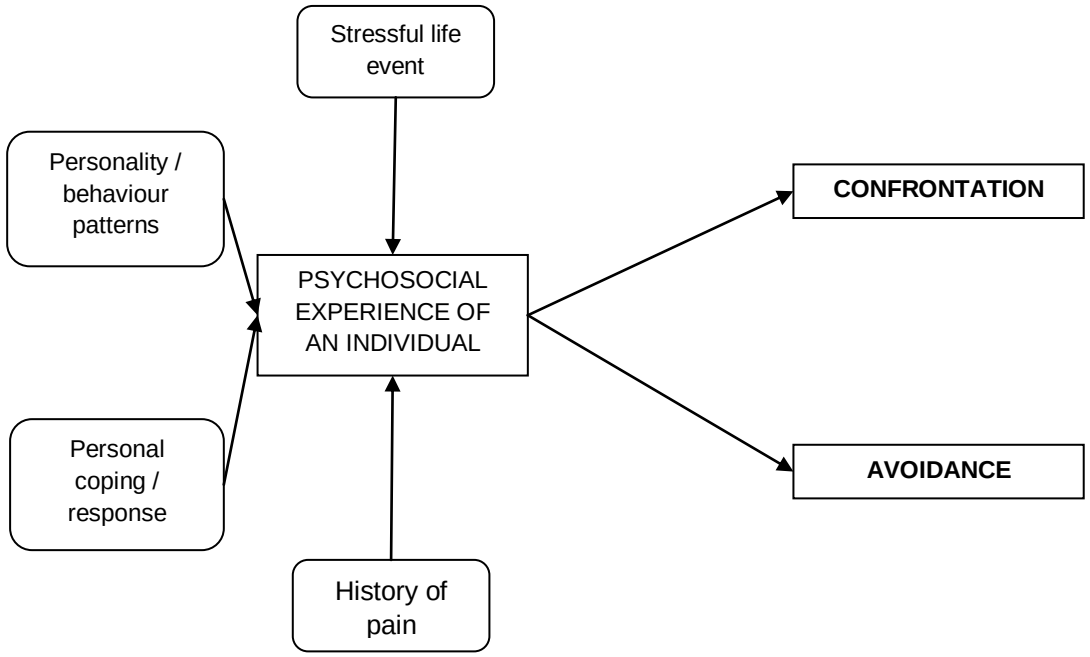
Adapted from Schmidt and Willis (2007)

Figure 2.4: The quality of pain and its associated conditions

2.3.4.5 Functional Limitations

It is important in diagnosing and managing pain to understand the level to which the pain impedes the daily and social activities of an individual. Furthermore, it is important to identify and distinguish between impedance due to biological limitation and impedance due to psychosocial limitation (i.e. the fear that certain activities may

worsen the pain); both of which can cause distress and disability (Schmidt and Willis 2007). The latter form of psychosocial impedance is a construct known as "fear-avoidance behaviour/belief" as proposed by Slade *et al.* (1983) in the fear-avoidance model of exaggerated pain perception. This model is based on the premise that pain results from a combination of a sensory and an emotional experience and that four "psychosocial factors" can determine how the pain experience is processed by an individual, which is largely dependent on their personality type – either "confrontational" or "avoidant" (Slade *et al.* 1983). Figure 2.5 illustrates this model.



Adapted from Slade *et al.* (1983)

Figure 2.5: The fear-avoidance model of exaggerated pain perception

2.3.5 The Impact of Neck Pain

Neck pain has been linked to disability and a subsequent negative impact on daily living in the public health domain (Fejer, Kyvik and Hartvigsen 2006; Côté *et al.* 2008; Miller *et al.* 2010). The majority of neck pain sufferers do not make a full recovery and there is a 50% to 85% chance that they will have a recurring episode within five years post the initial onset of their pain (Haldeman *et al.* 2008). Moreover, neck pain has been described as an economic burden and one of the principal

causes of disability worldwide (Côté, Cassidy and Carroll 1998; Venketsamy 2007; Hogg-Johnson *et al.* 2008; Tsang *et al.* 2008; Hanvold, Veiersted and Wærsted 2010; Cohen 2015).

In order to quantify the impact of diseases or conditions on a population, the following four factors are considered: healthy life expectancy (HALE), years of life lost (YLLs) due to premature mortality, years lived with disability (YLDs) and disability-adjusted life-years (DALYs) (Murray *et al.* 2013a; Murray *et al.* 2013b). The latter (YLDs and DALYs) have been used to measure the global impact of neck pain with neck pain being featured as the 25th and 21st most common cause of DALYs (out of 291 causes in 187 countries) in 1990 and 2010, respectively (Murray *et al.* 2013b). In the same decade, Murray *et al.* (2013a) reported neck pain as the fourth most common condition in relation to YLDs in 1990 and 2010, and the tenth (1990) and eleventh (2010) most common condition responsible for DALYs in the United States of America (US). Moreover, although an apparent improvement in overall health and life expectancy was also noted for this period, the authors highlighted that this did not necessarily translate to an improved quality of life among US citizens in these extended years of life.

In this regard, the controversial notion “quality of life” was introduced to the medical realm in the late 1960’s. Subsequently, and as a result of an increase in research, the understanding and use of the term has differed contextually and has been adopted by medical professionals in an attempt to better understand and define health and patient management (Pennacchini *et al.* 2011). The World Health Organisation (WHO) defines quality of health as “an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns” (WHOQOL Group 1995). In addition, this construct or state of well-being is underpinned by a multitude of factors such as physical well-being, social interactions, psychological health, and the surrounding environment (Ware 1987; WHOQOL Group 1995; Beaton and Schemitsch 2003). In a Canadian cross-sectional analysis, Rezai *et al.* (2009) state that there are several benefits to investigating the relationship between neck pain and health related quality of life. Such analyses provide valuable insight(s) into the influence of neck pain on one’s day-to-day living, the effect it has on the level of

general health, and its encumbrance on one's quality of life.

2.4 POSSIBLE RISK FACTORS FOR NECK PAIN

Risk factors can be categorised into intrinsic and extrinsic risk factors. Intrinsic risk factors are those which a person has no control over such as age, gender, and ethnicity, whereas extrinsic risk factors include variable factors such as socio-demographics (socioeconomic status – education, financial background, transportation; general level of health – smoking, history of head and/or neck injury) and the psychosocial (depression, anxiety and stress) environment of that person (Haldeman *et al.* 2008). With the growth of research in this field there is expanding evidence that the direction of research needs to extend beyond the physiological realm to incorporate and better understand the role that both social and psychological factors play in the development of neck pain (Hogg-Johnson *et al.* 2008; Palmlöf *et al.* 2012). This section will provide a brief overview of the possible risk factors for neck pain guided by the literature. Only the risk factors of direct significance to this study will be discussed in greater detail, such as: demographics (age, gender, ethnicity), socio-demographics (socioeconomic status – education, financial background, transportation; general level of health – smoking, history of head and/or neck injury), and psychosocial factors (depression, anxiety and stress).

2.4.1 Overview of Possible Risk Factors

Figure 2.6 illustrates an overview of various factors within the demographic, socio-demographic and psychosocial context, that have been identified in the literature as having varying associations with neck pain (Ndlovu 2006; Hogg-Johnson *et al.* 2008; Ayanniyi, Mbada and Iroko 2010; Hoy *et al.* 2010; Slabbert 2010; Muchna 2011; Shahidi, Curran-Everett and Maluf 2015; Elbinoune *et al.* 2016).

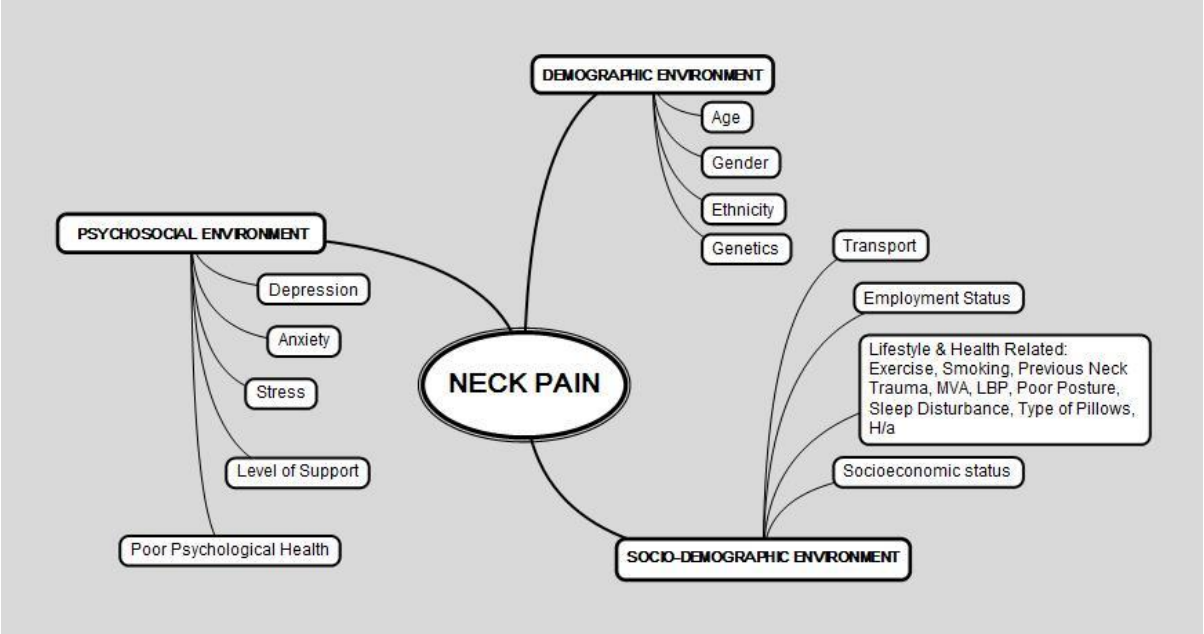


Figure 2.6: Mind map visualising the overview of possible risk factors for neck pain based on current literature

2.4.2 Selected Risk Factors

The following discussion around the possible demographic, socio-demographic and psychosocial risk factors has been drawn from the literature. Only factors commonly associated with neck pain and of particular importance to this study are discussed below.

2.4.2.1 Demographic Risk Factors

As mentioned earlier, the following demographic characteristics (age, gender and ethnicity) are considered intrinsic factors and have been selected for discussion.

2.4.2.1.1 Age

Neck pain has been well documented to affect the preadolescent; adolescent; student and adult population (Côté, Cassidy and Carroll 1998; Venketsamy 2007; Tsang *et al.* 2008; Hellstenius 2009; Hanvold, Veiersted and Wærsted 2010; Cohen 2015), with Hanvold, Veiersted and Wærsted (2010) noting a paucity in literature associated with neck pain in young adults. Moreover, it has been noted that the prevalence of neck pain appears to be directly proportional to age and that it is most prevalent between the third and fifth decades of life (Ndlovu 2006; Hogg-Johnson *et al.* 2008; Slabbert 2010; Muchna 2011; Peterson, Bolton and Humphreys 2012).

While Skillgate *et al.* (2012) agree that the prevalence of neck pain is most common before the fifth decade of life they contend that neck pain prevalence is not directly proportional to age but rather a higher risk in the younger age group. They also noted that while the younger age groups appear to be more at risk of developing neck pain, their ability to combat such neck pain is higher than in the older population. This prognostic pattern is also reflected in the best evidence synthesis conducted by Carroll *et al.* (2009) who extensively reviewed a total of 226 articles on neck pain yielding 70 permissible articles for their synthesis. The authors reported that the best prognosis was found in younger neck pain sufferers.

2.4.2.1.2 Sex and Gender

It is important to differentiate between sex and gender when it comes to broadening our understanding of health. Sex is defined on a biological basis based on the genetic differences between male and female whereas with gender, the features of men and women are deeply rooted in and based on societal constructs. In this way, there are many societal perceptions of “masculinity” and “femininity” that may influence how an individual may respond to pain and health care (Magar 2015). Furthermore, Ahlsen *et al.* (2014) conducted qualitative interviews on ten men and six women with chronic neck pain to explore how gender influenced the experiences of men and women undergoing rehabilitation for chronic pain. The results of this study alluded to the importance of understanding the influence that gender may have on an individual’s experience of chronic pain and their likelihood of seeking medical care.

The literature is unclear when reporting the prevalence of neck pain in males and females in the general population (Carroll *et al.* 2009). However, there is a tendency for international literature to report a higher prevalence of neck pain in females than in males (Guez *et al.* 2002; Côté *et al.* 2004; Fejer, Kyvik and Hartvigsen 2006; Hogg-Johnson *et al.* 2008; Hanvold, Veiersted and Wærsted 2010; Van Eerd *et al.* 2010). A Swedish population-based cohort study (n = 23 794) measuring bothersome neck pain (BNP) in Stockholm County echoed this tendency. This study initially measured a baseline of BNP in the period 2002 to 2003 through a detailed postal based questionnaire. A follow-up measurement of BNP was administered in

2007 through a postal and online based questionnaire which had a 76.0% retention rate of the original participants. These results indicated that females more commonly developed and experienced BNP than males, and that females showed a decreased tendency to recover from this BNP thereby identifying this gender as both a negative prognostic factor and a risk factor for BNP (Skillgate *et al.* 2012). Hellstenius (2009) reported an equal incidence of neck pain and/or headaches in preadolescents with a higher female incidence as the students transitioned into adolescence. In a South African context, Igumbor *et al.* (2011) highlighted a higher tendency of chronic pain in females as a result of a study conducted to determine the prevalence and risk factors of chronic pain in a rural community in South Africa. Slabbert (2010) conducted epidemiological research on White individuals in shopping centres in the greater Durban area. This study indicated that the female gender is associated with a higher risk of neck pain, being 1.7 times more likely to have neck pain than the male gender, in a sample with a size of 405 individuals. This was determined through a logistic regression analysis. This risk factor was identified Muchna (2011) contended that neck pain was more prevalent and a greater risk in Indian males in the greater Durban area.

2.4.2.1.3 Ethnicity

Neck pain has been documented, multi-ethnically, in the greater Durban area with a prevalence of 50% (Ndlovu 2006); 45% (Slabbert 2010) and 36.8% (Muchna 2011) in the Black, White and Indian populations. When considering ethnicity as a risk factor for neck pain, Hoy *et al.* (2010) reported that there may be an association between these variables. However, Hogg-Johnson *et al.* (2008) noted that there was a lack of studies assessing this relationship in the literature included in their systematic review of the burden and determinants of neck pain in the general population.

2.4.2.2 Social Risk Factors

The following socio-demographic characteristics (socioeconomic status – education, financial background, transportation; general level of health – smoking, history of head and/or neck injury) are considered extrinsic factors and have been selected for discussion.

2.4.2.2.1 Socioeconomic Status

There is a direct relationship between socioeconomic status and well-being, with individuals who fall within a more affluent socioeconomic bracket reporting better levels of health (Marmot 2002; Aittomäki *et al.* 2010). This association appears to extend its reach to the prognostic risk of physiological and psychological stress, depressive moods, and resultant neck pain (Kosidou *et al.* 2011; Palmlöf *et al.* 2012).

2.4.2.2.1.1 Education

Neck pain has been documented to affect the student population reporting a ranging prevalence among students enrolled in tertiary institutions, globally, and with a general tendency to be more prevalent in the earlier years of studies and in clinical programmes (Côté *et al.* 2004; Leijon, Wahlström and Mulder 2009; Hanvold, Veiersted and Wærsted 2010; El Ansari and Stock 2011; Kanchanomai *et al.* 2011; Khan and Chew 2013; Shahidi, Curran-Everett and Maluf 2015; Vijay and Ide 2016). Moreover, neck pain can influence student performance as it can result not only in an inability to perform adequately in their studies, but also negatively impacting their lifestyle and ability to cope with personal and/or work related activities which often underpin the students' ability to remain within higher education (Angell, Heffernan and Megicks 2008; Dann 2008; Stodnick and Rogers 2008; Ssegawa and Rwelamila 2009).

A study conducted by Thawabieh and Qaisy (2012) reported increased stress levels among first-year students and they commented on the transitional change in environment from secondary to tertiary education as a possible cause of the stress among these students. They recommended that tertiary institutions make an effort to involve their students in activities and support services that will equip them with the necessary coping skills needed to progress through tertiary education. Wolf *et al.* (1991) make reference to unique factors being experienced in first year which may contribute to the decreased emotional well-being of students.

Heightened levels of distress coupled with decreased likeliness of seeking treatment was noted in undergraduate medical, psychology, law and mechanical engineering students in a university in Adelaide, Australia with recommendations being made for

future research to investigate distress levels in students of other universities (Leahy *et al.* 2010). Furthermore, these authors hypothesised that the decreased likeliness of seeking treatment might be due to support services being insufficient or outdated and therefore rejected by the student body. One also needs to consider the “iceberg of burden” (as per Hogg-Johnson *et al.* 2008) as another possible hypothesis in that a decreased use of health services could also be a result of the overall impact of the neck pain being low. El Ansari and Stock (2011) displayed similar findings in their research study on students at seven universities in England, Wales and Northern Ireland. Their results indicated a decreased tendency to make use of health services and that tertiary institutions need to be aware of the health needs of their students. In contrast, a study by Shan *et al.* (2014) among Chinese high school students found a significantly lower neck pain prevalence. Participants expressed that their support infrastructure was favourable, which implies that better levels of support are associated with a lower prevalence on neck pain.

2.4.2.2.1.2 Financial Background

Factors equating to financial stability have been assessed as a possible risk factor with varying theories about the level of associations they have with neck pain. Regarding employment status, Hogg-Johnson *et al.* (2008) reported that within their systematic review of the literature three studies found no association between neck pain and employment status, another found a higher prevalence among employed youth, while another two studies yielded associations among retired and employed adults. One local study found an association between neck pain and type of occupation (Slabbert 2010). Another local study found an association between lower income groups having a higher prevalence of neck pain (Ndlovu 2006).

2.4.2.2.1.3 Transportation

One of the elements of socioeconomic status is the type of transport one uses. Hogg-Johnson *et al.* (2008) reported that in their systematic review of the literature that one study showed no association between owning a vehicle and neck pain, whereas another found motorcycle usage to be a risk factor for neck pain. Ndlovu (2006) reported an association between neck pain and transportation.

2.4.2.2.1.4 General Level of Health

Associations have been noted, in both international and local literature, regarding neck pain prevalence and certain lifestyle factors such as the smoking of and exposure to tobacco, a history of poor health, and history of head and neck injury (Hogg-Johnson *et al.* 2008; Hoy *et al.* 2010; Slabbert 2010; Muchna 2011; Shan *et al.* 2014).

The association between smoking and neck pain is vague. In a systematic review regarding neck pain in the general population, Hogg-Johnson *et al.* (2008) reported that four studies found no association, three studies found an association in relation to exposure to tobacco smoke, and two studies showed an association with current smoking. Ndlovu (2006) recommended that the association between smoking and neck pain be further investigated in the greater Durban population.

Regarding health history, five studies were identified by Hogg-Johnson *et al.* (2008) as showing associations between previous neck trauma and neck pain prevalence. This association was supported by the findings of a local study conducted in the general population of the greater Durban area (Slabbert 2010).

2.4.2.3 Psychological Risk Factors

The following psychosocial characteristics (depression, anxiety and stress) are considered extrinsic factors and have been selected for discussion.

2.4.2.3.1 Depression

Depressive disorders have been recognised for their disabling effect on society, worldwide (Gore *et al.* 2011; Ferrari *et al.* 2013; Murray *et al.* 2013b; Ibrahim and Abdelreheem 2015). As with neck pain, the impact of depression can also be measured in relation to YLDs and DALYS; from a global perspective, major depressive disorder (MDD) was identified as the second most burdensome condition in relation to YLD in 1990 and 2010 (Ferrari *et al.* 2013). Similarly, and in this same study, in northern Africa, central sub-Saharan Africa, eastern sub-Saharan Africa and southern sub-Saharan Africa MDD was also identified as the second leading cause of YLD in 2010. Regarding DALYs for 2010, MDD was ranked the eleventh most common contributor to DALYS globally, whereas, northern Africa had a much

higher ranking with MDD identified as the third most common contributor to DALYs. The rest of Africa ranked lower than the global ranking for MDD in 2010 (Ferrari et al. 2013). Gore *et al.* (2011) conducted a systematic analysis on the global burden of disease in youth aged 10 to 24 years. Their analysis was based on the data generated by WHO in their study on the global burden of disease in 2004. Gore *et al*.'s study found that neuropsychiatric disorders were the leading determinant of YLDs in 10 to 24 year olds across low, middle and high income countries with unipolar major depression being ranked as the primary cause of DALYs (for both sexes combined) for this age group. A unipolar major depression prevalence of 20% was noted in high income countries and 12% in the eastern Mediterranean region and 7% in Africa (Gore *et al.* 2011).

A meta-analysis of 39 individual student populations in China revealed a depression prevalence range of 3.0% to 80.6% with an average prevalence of 23.8%, where depression was more prevalent in medical students than non-medical students (Lei *et al.* 2016). Ibrahim and Abdelreheem (2015) found a depression prevalence of 57.9% among medical students and 51.1% among pharmaceutical students in an Egyptian university. El Ansari and Stock (2011) reported a 28.1% prevalence of depression among a collective sample of university students from seven universities around the United Kingdom. Moreover, there are several studies that have used the Depression Anxiety and Stress Scale (DASS) to measure the severity of depression, anxiety and stress among varying populations (Lovibond and Lovibond 1995a; Crawford and Henry 2003; Bayram and Bilgel 2008; Szabó 2010; Crawford *et al.* 2011; Szabó 2011) (Table 2.7). Lovibond and Lovibond (1995a) and Szabó (2011) measured depression among first year psychology students with a mean age of 21.0 (n = 717) and 19.3 (n = 117) years, respectively, and both reported similar average scores for depression ($\overline{X}$ = 7.2 and 8.9) which translated to a normal severity level. Normal severity levels for depression ($\overline{X}$ = 4.0 and $\overline{X}$ = 2.2) were also found in the Australian general population of two age groups, 18 to 24 years (n = 102) and 25 to 90 years (n = 395) where DASS-21 was used (Crawford *et al.* 2011), and in an earlier study conducted by Szabó (2010) on two groups of adolescents – younger adolescents with a mean age of 12.8 years (n = 238) and older adolescents with a mean age of 14.5 (n = 246). However, Bayram and Bilgel (2008) reported mild levels of depression ($\overline{X}$ = 10.0) in Turkish university students (n = 1617) with a mean age of

20.7 years. This study also found higher levels of depression among first and second year students than in the years above.

Furthermore, an association between depression and neck pain has been noted both internationally (Côté *et al.* 2004; Carroll *et al.* 2009; Leijon, Wahlström and Mulder 2009; Shahidi, Curran-Everett and Maluf 2015), and nationally (Muchna 2011). In this regard, results of a cross-sectional study conducted by Elbinoune *et al.* (2016) yielded a depression prevalence of 55.7% in a Moroccan population with an average age of 51.8 years who had co-morbid chronic neck pain.

Table 2.7: DASS published studies (depression)

STUDIES USING DASS	n	$\bar{X}$ (±)	SEVERITY
Szabó (2011)	117	8.9 (8.0)	NORMAL
Crawford *et al.* (2011)	102	4.0 (4.6)	NORMAL
	395	2.2 (3.6)	NORMAL
Szabó (2010)	238	4.0 (4.5)	NORMAL
	246	4.2 (4.5)	NORMAL
Bayram and Bilgel (2008)	1617	10.0 (6.9)	MILD
Lovibond and Lovibond (1995a)	717	7.2 (6.5)	NORMAL

n = total number of participants; $\bar{X}$ = mean; ± = standard deviation

2.4.2.3.2 Anxiety

Levels of distress have been noted in the student population with Ibrahim and Abdelreheem (2015) reporting an anxiety prevalence of 43.9% and 29.3% among Egyptian medical and pharmaceutical students, respectively. Various studies (Lovibond and Lovibond 1995a; Crawford and Henry 2003; Bayram and Bilgel 2008; Szabó 2010; Crawford *et al.* 2011; Szabó 2011) have used DASS to measure the severity of anxiety in similar populations (Table 2.8). Lovibond and Lovibond (1995a) and Szabó (2011) reported similar average scores for anxiety (5.2 and 3.2) which translated to normal severity level. Normal severity levels for anxiety were also found in the Australian general population, of 18 to 24 years ($\bar{X}$ = 2.8) and 25 to 90 years ($\bar{X}$ = 1.5) where DASS-21 was used (Crawford *et al.* 2011). Szabó (2010) again found normal severity ratings in the two adolescent groups, younger adolescents ($\bar{X}$ = 3.2) and older adolescents ($\bar{X}$ = 3.4). However, Bayram and Bilgel (2008) reported mild levels of anxiety in the Turkish university students ($\bar{X}$ = 9.8).

In a more local context, Herman *et al.* (2009) reported the following statistics regarding the lifetime prevalence of anxiety disorders in household and hostel dwelling South African adults (18 years and above) with a total sample size of 4351:

- The highest prevalence (17.6%) was noted in the 35 to 49 years of age category.
- A prevalence of 14.7% was noted in adults aged 18 to 34 years, which was the lowest prevalence of all the age categories.
- The highest prevalence (21.5%) in the whole sample was noted in the Free State. Kwazulu-Natal had a prevalence of 12.9% which was the lowest prevalence among the nine provinces.
- South Africa as a whole had a prevalence rate of 15.8%.

Additionally, research has found an association between anxiety and neck pain exists. As mentioned previously, Elbinoune *et al.* (2016) conducted a cross-sectional study in a Moroccan population with an average age of 51.8 years who had co-morbid chronic neck pain and reported a prevalence of 68.4% of these neck pain patients.

Table 2.8: DASS published studies (anxiety)

STUDIES USING DASS	n	$\bar{X}$ (±)	SEVERITY
Szabó (2011)	117	7.4 (7.0)	NORMAL
Crawford *et al.* (2011)	102	2.8 (3.3)	NORMAL
	395	1.5 (2.6)	NORMAL
Szabó (2010)	238	3.2 (3.4)	NORMAL
	246	3.4 (4.0)	NORMAL
Bayram and Bilgel (2008)	1617	9.8 (5.9)	MILD
Lovibond and Lovibond (1995a)	717	5.2 (4.8)	NORMAL

n = total number of participants; $\bar{X}$ = mean; ± = standard deviation

2.4.2.3.3 Stress

Stress, a phenomenon which, although difficult to be simply defined, has been described as: “conditions where an environmental demand exceeds the natural regulatory capacity of an organism” (Koolhaas *et al.* 2011). A study conducted by Shah *et al.* (2010) investigating the level of perceived stress among Pakistani medical school students reported increased levels of stress among their sample, with

the primary sources of stress falling within the psychosocial and academic context of the students. Moderate stress levels have been reported among first to fourth year students at Tafila Technical University (Thawabieh and Qaisy 2012). The study aimed to determine the stress levels of undergraduates, along with identifying common stressors. The results indicated that the main stressors were a possible by-product of the unique social environment of the community where the interaction between male and female students could be described as traditionalist in nature. Benham (2010) contends that the number of episodes of stress experienced by an individual may be a better forecaster of disease than self-reported stress levels.

When considering the same DASS published studies mentioned above (Lovibond and Lovibond 1995a; Crawford and Henry 2003; Bayram and Bilgel 2008; Szabó 2010; Crawford *et al.* 2011; Szabó 2011), normal severity levels for stress were reported by Crawford *et al.* (2011), Szabó (2010) and Lovibond and Lovibond (1995a) with mean scores of 4.8 (18 to 24 year old Australian population), 3.8 (25 to 90 year old Australian population), 4.9 (younger adolescents), 5.1 (older adolescents), and 10.54 (first year psychology students). Szabó (2011) reported mild severity levels ($\bar{X}$ = 14.9) for stress among the first year psychology students, and Bayram and Bilgel (2008) also reported mild stress severity levels in the Turkish student population (see Table 2.9).

Table 2.9: DASS published studies (stress)

STUDIES USING DASS	n	$\bar{X}$ (±)	SEVERITY
Szabó (2011)	117	14.5 (9.2)	MILD
Crawford *et al.* (2011)	102	4.8 (4.7)	NORMAL
	395	3.8 (4.1)	NORMAL
Szabó (2010)	238	4.9 (4.2)	NORMAL
	246	5.1 (4.4)	NORMAL
Bayram and Bilgel (2008)	1617	14.9 (6.7)	MILD
Lovibond and Lovibond (1995a)	717	10.54 (6.9)	NORMAL

n = total number of participants; $\bar{X}$ = mean; ± = standard deviation

2.5 DIAGNOSIS AND MANAGEMENT OF NECK PAIN

The WHO has defined modern health as, “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity’’ (Larson 1996).

Traditionally, the biomedical model of health has been the dominant approach in medical fields, however, health care is evolving towards a more holistic approach to patient diagnosis and management, with the bio-psychosocial model of health gaining popularity in modern society (Henderson and Bass 2006; Andrews, Evans and McAlister 2013; Wade 2015). Picard, Sabiston and McNamara (2011) pointed to a need for health care disciplines to look beyond the biomedical, reductionist, model and towards a more inclusive model. Chiropractic places itself within the holistic health care paradigm (Coulter 1992). Therefore, the chiropractic profession is well positioned to address not only the physical manifestations of illness/disease, but is also able to address issues around health promotion and disease prevention (Jamison 2002; Smith and Carber 2002; Jamison 2007; Dagenais and Haldeman 2012; Ford 2013).

In the biomedical model, there is a recognisable disease progression and a trusted link between the signs and symptoms a patient presents with and the relevant pathological changes (Quinter *et al.* 2008; Andrews, Evans and McAlister 2013; Wade 2015). In this model, the focus of the clinician is on finding the cause of the disease process by reducing the human body to its individual parts (Quinter *et al.* 2008). Juxtaposed to this approach is that of the bio-psychosocial model, which is holistic in its design. This model recognises the separate elements of the human body (social, psychological, biological and spiritual factors) collectively in their contribution to the “whole” and the presenting complaint (Picard, Sabiston and McNamara 2011).

These models extend to the proposed origin of musculoskeletal pain (Henderson and Bass 2006). Classically, treatment of chronic musculoskeletal disorders has been rooted in a biomedical model which is founded on a “structural-pathology paradigm” where injury to an area or structure is considered to be the main cause of the presenting problem. However, this paradigm has shifted over the last 20 years with increased evidence of neuro-physiological changes and their association with chronic musculoskeletal disorders. This paradigm shift suggests an intricate interaction between the central and peripheral nervous systems as well as the psychosocial factors the individual is subjected to (Pelletier, Higgins and Bourbonnais 2015).

A common trend has emerged in the literature with regard to the general health management approach of individuals in a state of dis-ease where there are apparently low levels of utilisation of available health care services and support structures (Hogg-Johnson *et al.* 2008; Leahy *et al.* 2010; El Ansari and Stock 2011). Authors have hypothesised that this could be a result of the support services being outdated and insufficient, or the fact that certain conditions (such as neck pain) have a high prevalence rate, but the overall impact of the condition is low, with little disability.

2.6 CONCLUSION

In light of this review, neck pain has been highlighted as a common and prevalent condition both nationally and internationally. It has been shown to be non-discriminatory in that it affects both males and females across all age and ethnic groups, with a tendency to favour females over males and to display a positive relationship with age.

Its wide-ranging disabling nature coupled with its ambiguous aetiology incites the need for further research in this field. While many demographic, social and psychological factors have been identified as having an association with the prevalence of neck pain, the extent of this relationship is not yet fully understood. Furthermore, these factors have not been as extensively researched in developing countries as they have in developed countries which is particularly true of the South African student population where studies of this nature are seemingly sparse.

Thus, with the paucity of the literature in an educational context in developing nations, the aim of the current study is to investigate the prevalence of neck pain in registered first year Faculty of Health Sciences students at the DUT, and to better understand the demographic, socio-demographic and psychosocial background of these students in relation to their neck pain.

CHAPTER 3 : METHODOLOGY

3.1 INTRODUCTION

This chapter provides a detailed account of the methodology of the study. It describes the framework of the study by stating the paradigm and design and outlining the development and validation of the questionnaire, the procedures followed for the collection of the data, and the statistical analysis of the data.

3.2 PARADIGM

A paradigm explains the type of research that is being conducted. Researchers from different disciplines generally adopt paradigms most suited to their field of research and specific to the research question. While there are a number of research paradigms, a positivistic/objective paradigm is usually used in health sciences research where the epidemiology of a condition is being investigated (Roberts and Priest 2010). Therefore, this study falls within the positivistic paradigm of quantitative research.

3.3 DESIGN

The design of this study was a quantitative, descriptive, cross-sectional survey which utilised an investigator administered questionnaire to groups. Roberts and Priest (2010) describe a quantitative design as a pragmatic approach which intends to gain knowledge through the use of valid and reliable instruments. These instruments (such as questionnaires) enable the measurement and statistical analysis of quantitative data which provides the researcher with insight about the chosen sample and enables observations to be made about the population. Moreover, this type of research design was highlighted as an effective way of gaining insight into the general prevalence and impact of neck pain in a population, as well as its associative factors, and can be used as a foundation for further research (Hogg-Johnson *et al.* 2008). It has also been a common design used in other studies with similar aims and/or objectives to that of the current study (Ndlovu 2006; Ayanniyi, Mbada and Iroko 2010; Slabbert 2010; El Ansari and Stock 2011; Muchna 2011;

Khan and Chew 2013; McDonald 2014). Given the paucity in the literature of neck pain in the South African student population, it was considered to be an appropriate design for the study in order to establish a starting point for further research of this nature.

3.4 POPULATION

Having a clear understanding of the research population is an essential part of ensuring representation within the study, which underpins the validity of the observations and generalisations made. It is up to the researcher to select and define the population based on the desired outcomes of the study and accessibility (Roberts and Priest 2010). In this light, the chosen population for the study were 2016 first entry first-year students enrolled at the Durban campuses (Ritson and ML Sultan) of the FHS at DUT. The population was inclusive of participants who did and did not have neck pain due to the descriptive nature of the study, and considering its aim to determine neck pain prevalence and provide insight into possible risk factors associated with this condition respectively. The Registrar's office at DUT provided enrolment statistics (based on the inclusion and exclusion criteria below) which allowed a population size of 483 first entry first-year students within the FHS for 2016 (Table 3.1).

3.4.1 Inclusion Criteria

- FHS students at the DUT, who were registered for first year, for the first time.
- Students who were 18 years of age and older.
- Students from the following Durban campuses: Ritson, ML Sultan.
- Students from the following Faculty of Health Sciences programmes, based on the random selection process: 1. ND: Dental Technology; 2. B.HSc: Diagnostic Sonography; 3. ND: Somatology; 4. B.HSc: Nuclear Medicine; 5. B.HSc: Homoeopathy; 6. B.HSc: Medical Orthotics and Prosthetics; 7. B.HSc: Diagnostic Radiography; and 8. ND: Chiropractic.

3.4.2 Exclusion Criteria

Students who:

- Had re-registered for first year due to failing the previous year.
- Did not wish to participate in the study.
- Participated in the focus group discussion.
- Participated in the pilot study.
- Had previous higher education experience.

Table 3.1: First year enrolment statistics by programme of study in the Faculty of Health Sciences (provided by the Registrar's office) at the DUT

	FACULTY OF HEALTH SCIENCES UNDERGRADUATE PROGRAMMES	NO. OF FIRST ENTRY 1ST YEAR STUDENTS
1	B. CHILD AND YOUTH CARE	37
2	B.HSc: DIAGNOSTIC RADIOGRAPHY	48
3	B.HSc: DIAGNOSTIC SONOGRAPHY	7
4	B.HSc: EMERGENCY MEDICAL CARE	20
5	B.HSc: ENVIRONMENTAL HEALTH	27
6	B.HSc: HOMOEOPATHY	23
	B.HSc: HOMOEOPATHY (FOUNDATION)	4
7	B.HSc: MEDICAL ORTHOTICS AND PROSTHETICS	30
8	B.HSc: NUCLEAR MEDICINE	7
9	B.HSc: RADIOTHERAPY	10
10	NC: DENTAL ASSISTING	62
11	ND: BIOMEDICAL TECHNOLOGY	29
	ND: BIOMEDICAL TECHNOLOGY (FOUNDATION)	7
12	ND: CHIROPRACTIC	29
	ND: CHIROPRACTIC (FOUNDATION)	1
13	ND: CLINICAL TECHNOLOGY	32
	ND: CLINICAL TECHNOLOGY (FOUNDATION)	10
14	ND: DENTAL TECHNOLOGY	6
	ND: DENTAL TECHNOLOGY (FOUNDATION)	22
15	ND: RADIOGRAPHY: ULTRASOUND	2
16	ND: SOMATOLOGY	42
	ND: SOMATOLOGY (FOUNDATION)	28
	TOTAL	**483**

3.5 SAMPLING

This step of the study involved selecting participants from the population where the intention was for the researcher to use established methods of selection for the purpose of obtaining a group of participants who were characteristic of the population. This was important in order to translate the results of the study into general observations or assumptions about the population (Mouton 1996). There were a number of important components considered when selecting the sample for this study, such as sample strategy as well as the size of the sample. These components were selected in order to ensure a characteristic sample and are outlined and elaborated upon below.

3.5.1 Strategy

Random sampling has been identified as one of the best methods of selecting a representative sample as it allows equal opportunity for selection, however, it is also a costly method in terms of time and expense (Roberts and Priest 2010; Creswell 2014). Considering the external budget and time constraints imposed on the study it was unrealistic for the researcher to have a very large sample size. Therefore, in order to use this preferred method while keeping within the proposed budget and timeline of the study, the researcher chose to utilise a multistage cluster strategy incorporating two stages of random sampling, based on logistical criteria as guided by research textbooks (Roberts and Priest 2010; Creswell 2014) and the statistician, Associate Professor Matthews (2015, pers. comm. 10 September). To be representative, the number of participants approached needed to be approximately half of the population size and Associate Professor Matthews (2015, pers. comm. 10 September) estimated that about 50% to 70% of those participants invited would take part in the study. The two stages of the cluster sampling are outlined below.

3.5.1.1 Stage One

The first stage of the cluster sampling strategy involved the random selection of half (eight) of the 2016 FHS undergraduate programmes offered at DUT. For this selection, the "hat method" was chosen as the simple random sampling method. It was chosen as it is a method based on probability which allows each programme an

equal opportunity of being selected, which is important to ensure unbiased representation within the population (Mouton 1996). It was noted, by Associate Professor Matthews (2015, pers. comm. 26 September), that there were vast differences in the total number of registered first-year students per programme and that this could have compromised the representativeness of the sample if more of the smaller programmes were drawn from the hat as it would have negatively impacted the sample size. Thus, if the estimated sample size of the selected programmes was not approximately half of the population, a redraw would be needed. This was not the case as the first stage of the cluster sample yielded a programme selection of a total number of participants equivalent to approximately half of the population size.

In the application of the "hat method" the researcher wrote the names of all of the FHS undergraduate programmes on individual pieces of paper, folded each piece of paper and placed them into a hat. Foundation programmes were not classified as separate programmes but rather as part of their mainstream programme (i.e. B.HSc: Homoeopathy and B.HSc: Homoeopathy (Foundation) were classified as one programme). The hat was shaken to mix the programme options and from a total of sixteen programmes, eight were selected from the hat by the blind-folded researcher. A list of the programmes that were placed into the hat and selected from the hat is provided in Table 3.2.

Table 3.2: Faculty of Health Sciences programmes placed into the hat and selected from the hat

PROGRAMMES PLACED IN HAT		SAMPLE SELECTED FROM HAT	
1	B. CHILD AND YOUTH CARE	1	B.HSc: DIAGNOSTIC RADIOGRAPHY
2	B.HSc: DIAGNOSTIC RADIOGRAPHY	2	B.HSc: DIAGNOSTIC SONOGRAPHY
3	B.HSc: DIAGNOSTIC SONOGRAPHY	3	B.HSc: HOMOEOPATHY
4	B.HSc: EMERGENCY MEDICAL CARE	4	B.HSc: MEDICAL ORTHOTICS AND PROSTHETICS
5	B.HSc: ENVIRONMENTAL HEALTH	5	B.HSc: NUCLEAR MEDICINE
6	B.HSc: HOMOEOPATHY	6	ND: CHIROPRACTIC
7	B.HSc: MEDICAL ORTHOTICS AND PROSTHETICS	7	ND: DENTAL TECHNOLOGY
8	B.HSc: NUCLEAR MEDICINE	8	ND: SOMATOLOGY
9	B.HSc: RADIOTHERAPY		
10	NC: DENTAL ASSISTING		
11	ND: BIOMEDICAL TECHNOLOGY		
12	ND: CHIROPRACTIC		
13	ND: CLINICAL TECHNOLOGY		
14	ND: DENTAL TECHNOLOGY		
15	ND: RADIOGRAPHY: ULTRASOUND		
16	ND: SOMATOLOGY		

3.5.1.2 Stage Two

The second stage of the cluster sampling strategy was the selection of only first-year students from these programmes sampled. All of the first-year students registered for the selected programmes were then approached and invited to participate in the study during this stage.

The plan was to approach the students from this sample during (prearranged) lecture periods where the lecturer(s) expected the class attendance to be high. Prospective times were provided by the lecturer and were based on the most appropriate time for each lecturer so as not to interfere with the academic programme. However, the expected high attendance rates during these arranged periods were affected by the 2016 student protests. Although this was minimised by arranging multiple sampling visits for each programme to ensure that every student was afforded the opportunity to participate in the study, it meant that the data collection was stretched over a few weeks as opposed to the original plan of collecting all of the data within the same week.

3.5.2 Sample Size

The number of participants invited to participate in the study was expected to be approximately half of the population size, and it was anticipated that about 50% to 70% of the invited individuals would consent to participate in the study. Based on this logistical criteria provided by Associate Professor Matthews (2015, pers. comm. 26 September) and the information provided in Table 3.1, the estimated calculations were as follows: 247 (eight selected programmes) ÷ 483 (population size) × 100 = 51.1% (approximately half of the population size). Furthermore, 50% of 247 = 124, and 70% of 247 = 173. Therefore the number of individuals participating in the study was expected to be between 124 and 173.

3.6 INSTRUMENTS

The following instruments were chosen based on their established validity and reliability, their measurement properties, and their appropriateness to the fulfilment of each of the objectives.

3.6.1 The Neck Bournemouth Questionnaire

The Neck Bournemouth Questionnaire (NBQ) (Appendix A) was developed as a short comprehensive outcome measure that measured psychometric (pain and disability) properties of neck pain (Bolton and Humphreys 2002). This questionnaire is consistent with the WHO's proposal of the bio-psychosocial model of health and has been used widely due to it being a valid and reliable measure with demonstrated excellent internal consistency (Bolton and Humphreys 2002; Ferreira *et al.* 2010). This instrument was chosen and included (in its entirety) in the study questionnaire for its quantitative properties and its ability to provide a baseline score for the overall impact of neck pain, as well as measuring the following factors which aligned with the objectives of the study: pain intensity; functional limitation (activities of daily living; and social activities); anxiety; depression; fear-avoidance behaviour; and locus of control, all in relation to neck pain. The NBQ falls within the public domain which meant that permission was not required from the authors to be able to use it in the study (Appendix A1). While NBQ has traditionally been used in clinical settings with a dual application method (i.e. an initial measurement to get a baseline score

and a follow-up measurement after intervention to be able to assess the level of improvement) it was used in this study with a singular purpose, i.e. establishing a baseline score of the impact of neck pain among the participants over the past week. The instrument comprised seven questions with the response of each question being measured by an 11 point NRS where the lowest possible score was zero and the highest possible score was ten for each question. As the instrument did not provide a description of severity ratings for the corresponding scores on the NRS, Figure 2.3 presented in Chapter 2 was used to provide a categorical description of the crude scores of the NRS of the NBQ questions. The scoring of the NBQ is provided in Appendix A2. In the event of a missing score for a question in the NBQ, the participant would be excluded from the analysis as per the suggestion of the authors (Appendix A3).

3.6.2 The Socio-Demographic Questionnaire

The Socio-Demographic Questionnaire (Appendix B), developed by Napier, explored the demographic, socio-demographics, level of responsibility and quality of life of an individual in a South African context. It was pretested and validated in Napier's thesis (Napier 2006). Questions were adapted and used from this instrument as it spoke to the context of the research in that it asked questions relevant to a developing nation and more specifically, South Africa. Permission to use this questionnaire can be found in Appendix B1.

3.6.3 The Depression Anxiety and Stress Scale

The DASS assessed symptoms of self-reported depression, anxiety and stress in an individual (Lovibond and Lovibond 1995b). Crawford and Henry (2003) validated this scale for its intended measures in their study. This instrument was selected as it measured three common psychological risk factors in one scale as opposed to other instruments which only measured individual risk factors at one time, such as Beck's Depression Inventory and/or Anxiety Inventory. Furthermore, it tied in with the questions from the NBQ which measured anxiety and depression levels in relation to neck pain, and aligned well with the third and fourth objectives of this study which were to identify the psychosocial risk factors of the participants with neck pain, and to determine the association of these risk factors coupled with the demographic

characteristics, the socio-demographic risk factors, and neck pain. It was also selected for its quantitative properties which enabled certain associations and correlations to be made across the scales.

This instrument has two versions: the full version which comprises of 42 questions (DASS-42), and the abridged version which comprises 21 questions (DASS-21). For the purposes of the study and with time constraints and fatigue bias in mind, DASS-21 (Appendix C) was selected and administered as part of the Neck Pain Questionnaire (NPQ) in order to identify the possible psychological risk factors. The DASS-21 falls within the public domain which means that permission is not required from the authors to make use of the scale (Appendix C1). It is important to note that this scale is not a diagnostic tool and therefore did not provide a conclusive diagnosis for these indicators, it was instead used to highlight areas of possible concern where there may have been an increase in symptoms of depression, anxiety and stress in order to better understand the participant's psychological state over the past week.

The scale was designed in such a way that there were seven questions measuring depression levels, seven questions measuring anxiety levels, and seven questions measuring stress levels. Each question had a 4 point Likert scale of 0 – 3 which the participants used to rate each question. The participants were instructed to mark the numerical value to indicate which description best reflected how they felt about each question. An example of the rating scale is demonstrated in Table 3.3.

Table 3.3: DASS-21 Likert scale

0 =	Did not apply to me at all	~~0~~	1	2	3
1 =	Applied to me to some degree, or some of the time	0	~~1~~	2	3
2 =	Applied to me to a considerable degree, or a good part of the time	0	1	~~2~~	3
3 =	Applied to me very much, or most of the time	0	1	2	~~3~~

Based on this rating scale and the number of questions for each variable, the highest possible score for each psychological risk factor was 21 (7 questions × maximum score of 3 for each question) and the lowest possible score was zero (7 questions × minimum score of 0 for each question). The scores were summed for each risk factor

and then were multiplied by two to get the overall score due to the fact that DASS-21 was used. The DASS severity rating template for psychological risk factors (Table 3.4) was used to interpret the total scores for each risk factor and to categorise the ratings into groupings of severity ranging from normal to extremely severe. It must be noted that the labels of severity are not representative of severity labels of a diagnosed disorder such as depression, anxiety and stress as this is not a diagnostic test (i.e. an extremely severe severity rating for depression does not mean the participant has extremely severe clinical depression). The severity ratings are an indication of the level of risk a participant displays regarding symptoms of depression, anxiety, and stress (i.e. a participant with an extremely severe severity rating for depression is classified as high risk and more likely to need to seek professional help). If one score was missing, the overall score was calculated using an average of the remaining scores for each risk factor; however, if more than one score was missing per risk factor the participant's data for the relevant section was deemed invalid and disregarded for the overall percentages so as not to compromise the validity of the results. This method for missing DASS-21 data was decided based on the guidelines of the DASS-21 authors provided on the DASS website and documented in Appendix C2.

Table 3.4: DASS severity rating template for psychological risk factors

SEVERITY	DEPRESSION	ANXIETY	STRESS
NORMAL	0 - 9	0 - 7	0 - 14
MILD	10 - 13	8 - 9	15 - 18
MODERATE	14 - 20	10 - 14	19 - 25
SEVERE	21 - 27	15 - 19	26 - 33
EXTREMELY SEVERE	≥ 28	≥ 20	≥ 34

≥: greater than or equal to

3.6.4 Study Questionnaire Development

As the study questionnaire incorporated questions which were not part of the pre-established questionnaires above, it had to go through a process of its own validation. This validation process involved content validity and face validity of the study questionnaire in the form of a focus group and pilot study. This process and the

development of the study questionnaire is outlined below.

3.6.4.1 Content Validity of the Study Questionnaire: Focus Group

As the name suggests, content validity is a way of confirming whether the content of the questionnaire is valid, and measures what it claims to measure (Roberts and Priest 2010). In order to determine whether the study questionnaire was appropriate for measuring the objectives of the study, a focus group was conducted by the researcher, which also kept within the standards of published literature and other similar research studies (Ndlovu 2006; Slabbert 2010; Muchna 2011). The focus group was a meeting organised by the researcher where individuals (from certain fields) were chosen based on their respective expertise (as outlined below) and invited to participate. The aim of the focus group was to create an environment where the selected participants felt as comfortable as possible and were encouraged to discuss the content of the questionnaire at length while critically evaluating the significance of each question and with the aim of aligning the questionnaire content with the study aims and objectives.

The focus group comprised seven active participants and one passive participant. The passive participant's role was administrative in nature in order to create a smooth and uninterrupted flow of the focus group process. This participant did not comment on the content being discussed and did not contribute to the content validation process, so, it is for this reason that the classification of "passive participant" was assigned. Each of the following active participants were carefully selected, based on their expertise, as they provided appropriate insight into the various topics covered in the questionnaire and ensured that it remained relevant to the study and to the study design (i.e. they contributed to the content validation of the questionnaire). The participants were as follows:

- The researcher.
- Three first-year students from various faculties at DUT who were also neck pain sufferers. These participants provided first hand insight into the life of first-year students (suffering with neck pain) at DUT and they also provided a likeness to the participants of the study.
- A chiropractor and senior lecturer at DUT. This participant, who also had

experience with quantitative descriptive survey research, provided clinical experience as well as an understanding of the factors influencing neck pain. This participant was also able to comment on the appropriateness of the questionnaire for the study.

- A counselling psychologist from the DUT Student Counselling and Health Department. This participant was able to comment on the aptness of DASS for the study and provided insight into psychosocial aspects of student life incorporating stressors unique to the DUT students.
- A representative from the Academic Development Department at DUT. This participant had knowledge of the academic and socio-demographic environment of the DUT students.

Each participant was given the following documentation:

- A copy of the Focus Group Questionnaire (Appendix D)
- A Focus Group Questionnaire Evaluation Form (Appendix D1)
- Letter of Information and Informed Consent (Appendix D2)
- Code of Conduct (Appendix D3)
- Confidentiality Clause (Appendix D4)

The researcher welcomed the participants and explained the context of the research as well as the purpose of the focus group. The researcher emphasised that participation would be kept anonymous and confidential and the participants were encouraged to engage with one another and to ask questions if any clarification was needed throughout the focus group. Each participant was given a Letter of Information and Informed Consent (Appendix D2) and asked to read and sign the document indicating their willingness to participate. The Code of Conduct (Appendix D3) and Confidentiality Statement (Appendix D4) were explained and passed around for each participant to read and sign. Once all the documentation was signed, the participants were given a copy of the Focus Group Questionnaire (Appendix D) and a Focus Group Questionnaire Evaluation form (Appendix D1) and were given time to read through the questionnaire and jot down any thoughts and suggested changes to the questionnaire on the relevant section of the evaluation form. Once all the participants had finished perusing the questionnaire the researcher read out each question in each section in chronological order. Time was given after each question

to assess the question's relevance to the study and for participants to put forward suggested changes. The changes were then discussed as a group and the decision to implement a change to the questionnaire was based on a consensus of the focus group participants. Once all the questions had been read out and discussed, the researcher asked the group if there were any further comments and suggestions to be made. Once the discussion came to an end the researcher thanked each member for their participation in the focus group and for their invaluable contribution.

An audio recording was taken (with consent from each participant) for the duration of the focus group so as to have a record of the proceedings. The audio recording was then used along with the evaluation forms during the editing of the focus group questionnaire to ensure a thorough amendment was made. This ensured that no suggested amendment was overlooked or forgotten. The recording was kept, along with the other research documentation, in a locked cupboard for the duration of the study and for five years thereafter. The amendments of the Focus Group Questionnaire are detailed in Appendix D5.

Overall, it was believed that the focus group achieved its aim and was an important part of the study process in that it ensured a more enlightened inclusion or exclusion of questions of particular relevance or irrelevance to the study. Given the selection of participants, one can imagine the power dynamic in the room when contrasting the selected first year participants with the professional participants (the chiropractor, the Academic Development representative and the counselling psychologist). It was thought plausible by the researcher that the first year participants might have been reluctant to put forward an opinion especially if that opinion contended an opinion of one of the professionals. With this in mind, a conscious effort was made by the researcher to make every effort to reiterate that each participant and opinion was important, equal, and valued by the researcher. This extended to the layout of the room and the environment set by the researcher. The participants were seated in close proximity to each other and the researcher and each participant was given a name place and their own stationery to use. The first year participants were seated together to give these participants a sense of solidarity as opposed to being seated between the professional participants and perhaps feeling uncomfortable or isolated. It was observed that the first year participants were, at first and as expected, hesitant

to put forward their opinions, however, with gentle encouragement and reassurance from the researcher that their opinion was valued they soon warmed up and provided invaluable feedback.

3.6.4.2 Face Validation of Questionnaire: Pilot Study

Where content validity involves an assessment of the questions and measurement tools within the questionnaire, face validity is the process of gauging how the test will be accepted and understood by the participants (Roberts and Priest 2010). Pilot studies have been identified in published literature as an important part of the process of determining the viability of a study that is intended to be conducted on a greater scale (Thabane *et al.* 2010). Essentially, they are the trial run of the data collection process.

A pilot study was conducted as part of this study in order to determine the face validity of the study questionnaire and to determine its usability and problematic or ambiguous areas or questions that needed to be addressed. Piloting the questionnaire also gave an indication of the average time taken to complete the questionnaire. For measuring face validity, it was important to invite participants who shared similar characteristics to the intended sample (i.e. were from first year and from the FHS). The pilot study was conducted in a lecture venue, which mirrored the proposed setting of the final data collection. These considerations were important as it gave the researcher an indication of how the study questionnaire would be perceived by the sample (in the appropriate setting) and, as mentioned above, a trial run for final data collection.

The researcher approached the Heads of Department and lecturers from the 16 FHS undergraduate programmes at random to obtain permission to access their first-year students and to inquire about their whereabouts and suitable times to approach the students to invite them to participate in the pilot study. The first year FHS students were approached until the requirement of five participants was met and it was also aimed to select a range of students from the different FHS programmes. The context and value of the research and inclusion and exclusion criteria was explained to each prospective participant in the pilot study. Five first year FHS students, who met the inclusion criteria, were invited to participate in the pilot study, and all five consented

to participate. The researcher assured the students that their participation and results would be kept strictly confidential and anonymous. The participants of the pilot study were excluded from participating in the main study.

Each participant was given the following documentation:

- A copy of the Pilot Study Questionnaire (Appendix E).
- A Pilot Group Questionnaire Evaluation Form (Appendix E1).
- Letter of Information and Informed Consent (Appendix E2).
- Code of Conduct (Appendix E3).
- Confidentiality Clause (Appendix E4).

The researcher welcomed the participants to the pilot study and explained the context and value of the research as well as how their participation would contribute to the research process. The participants were reminded that their participation was voluntary, anonymous and confidential and were encouraged to complete the questionnaire with a critical approach and to ask questions along the way if clarification was needed. The participants were then each given a Letter of Information and Informed Consent (Appendix E2) and were asked to read and sign the documentation to indicate their willingness to participate. Once the documentation was signed the Code of Conduct (Appendix E3) and Confidentiality Clause (Appendix E4) were explained and passed around to be signed. Following this, each participant was given a copy of the pilot study questionnaire (Appendix E) and the pilot study evaluation form (Appendix E1). The participants were given time to read through the evaluation form first to get an indication of what was required of them, once they had done so they were instructed to proceed with filling in the pilot study questionnaire. The researcher kept a time record of how long each participant took to fill in the questionnaire and then an average time was worked out based on the individual times. The average time taken to complete the questionnaire was 25 minutes. Each participant placed their consent forms in a sealed box labelled “Informed Consent Forms”, their questionnaire in a sealed box labelled “Questionnaires” and their evaluation forms in a sealed box labelled “Pilot Study Evaluation Forms”. As they did so they were thanked for their participation and invaluable contribution and reminded about their confidentiality agreement and that, should their programmes be selected, they were not required to participate in the

main study. The researcher was present throughout the duration of the pilot study to attend to questions that arose. Notes were taken by the researcher documenting the types of questions asked by the participants during the pilot study as well as their non-verbal cues while completing the pilot study questionnaire.

After the completion of the pilot study the researcher went through each of the pilot study questionnaires contrasting each questionnaire with its respective pilot study evaluation form and highlighting areas of concern. Based on the notes taken, the pilot study evaluation forms, and the observations made by the researcher during the pilot study, it was determined that, overall, the pilot study participants felt that the pilot study questionnaire content was relevant, interesting, and appropriate to the first year experience of FHS students at DUT. It was also noted that some participants felt the pilot study questionnaire was too lengthy. Each suggestion was considered within the context of the research aims and objectives and changes were implemented where deemed appropriate by the researcher, the supervisor and the co-supervisor of the study. The changes that were implemented to the pilot study questionnaire are detailed in Appendix E5.

3.6.4.3 The Neck Pain Questionnaire

The final study questionnaire, the NPQ (Appendix F), was the product of the content validation (focus group) and face validity (pilot study), and as a result of this process was considered valid and reliable overall. It consisted of seven pages and was divided into four sections. Section A (questions 1 to 43) comprised demographic and socio-demographic questions; Section B (questions 1 to 27) comprised questions pertaining to the participants' study environment, study habits and posture; Section C (questions 1 to 38) comprised questions relating to the lifestyle, general well-being, neck pain prevalence, neck pain characteristics (including the NBQ) of the participants; and section D housed DASS which conducted a basic evaluation of the psychological well-being of the students (questions 1 to 21). The NPQ was structured in this way and the questions grouped accordingly to facilitate a smooth flow of answering and thought progression of the participants. Moreover, each page was numbered, each question was numbered and the question blocks were shaded grey to differentiate them from the answer blocks. The questionnaire was printed in

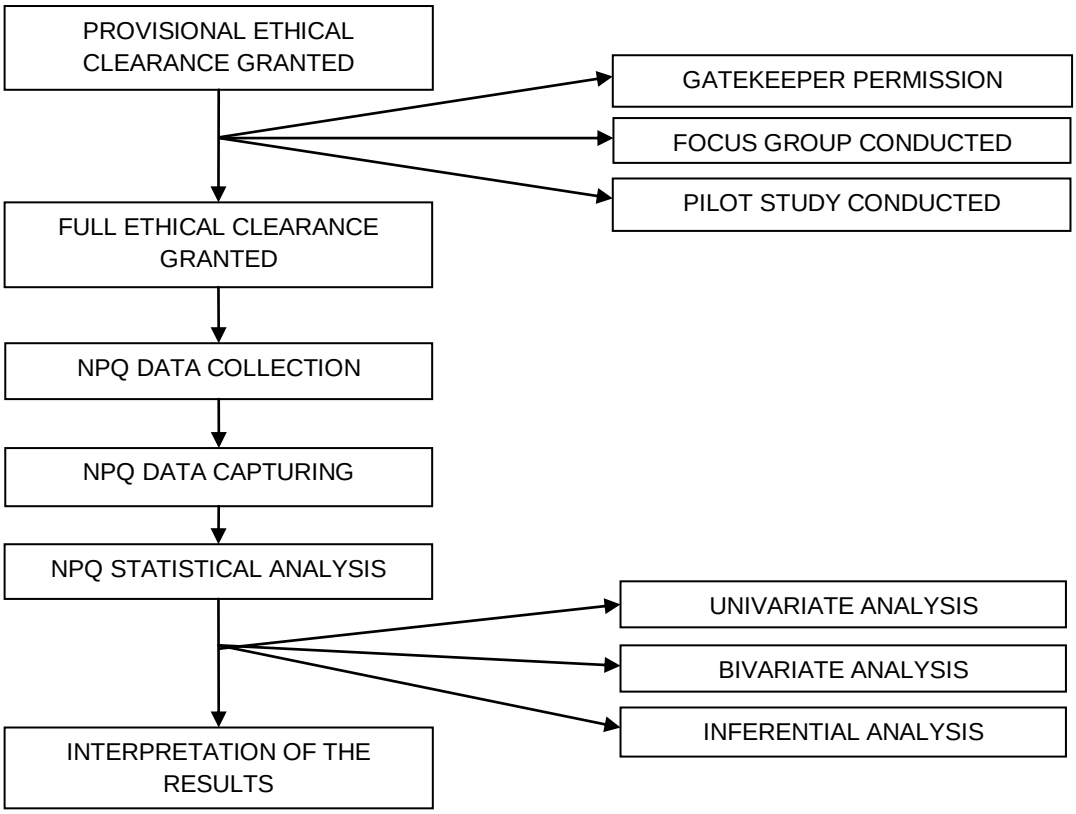
A4 size, portrait orientation, in a single sided format, in grey-scale and collated by stapling the pages together in the top left hand corner. No question stretched over two separate pages. The layout of the NPQ was carefully considered and structured in this way to ensure that every page was seen, the questions were easily matched with their respective answer blocks for ease of reading, and to ensure that all of the pages were kept together. The questions were mainly closed ended questions with answer blocks provided. However, questions which had the possibility of a wider range of answers (such as age- and time-based questions) were left open ended to save space, with the intention of categorising the answers retrospectively for analysis. All of the question responses provided for categorical data were presented in alphabetical order.

3.6.4.3.1 Measurement Frequency

As the design was descriptive and cross-sectional, the NPQ was distributed and administered only once per participant (i.e. there was no need for follow-up measurements to be taken).

3.7 PROCEDURE

The data collection procedure for the study is outlined in Figure 3.1 from the point of provisional ethical clearance being granted for the study to the interpretation of the results. Each step of the procedure is discussed under its respective heading.



DRC: Departmental Research Committee; RHDC: Research and Higher Degrees Committee; IREC: Institutional Research Ethics Committee

Figure 3.1: Flow diagram of study procedure

3.7.1 The Ethical Clearance Procedure

The study was granted provisional ethical clearance by the Institutional Research Ethics Committee (IREC) at DUT (Appendix G1) which stated that full ethical clearance would be granted upon the completion of the focus group and pilot study and once gatekeeper permission was obtained by the researcher. Following the completion of the focus group and pilot study, and the obtainment of gatekeeper permission (Appendix H), the study was granted full ethical clearance by IREC (Appendix G2) and was assigned the following ethical clearance number: IREC 027/16.

3.7.2 The Data Collection Procedure

The first-year students from the selected programmes were approached in prearranged lecture, test and exam times. The researcher was given the opportunity

to explain the aims and objectives of the study to the first year FHS students as well as explain the motivation of the study and how the desired outcome was hoped to have a number of benefits. The researcher explained that participation was on a volunteer basis and that participation and the results of the study would remain anonymous and confidential. The prospective participants were each given a Letter of Information and Informed Consent (Appendix F1). Those who chose to participate in the study were asked to sign the consent form and once signed, they were given the NPQ (Appendix F) to complete. The participants were instructed that upon completion of the questionnaire the participants were to place their consent forms in a sealed ballot box labelled “Informed Consent Forms” and their NPQ's in a sealed ballot box labelled “questionnaires” to ensure anonymity. As they did so they were thanked for their participation in, and contribution, to the study. The researcher was present throughout the data collection process to answer and clarify any queries that arose. This was believed to be an important part of the process as the way in which the study is explained can influence the way in which the questions are answered, so the researcher (having the most knowledge about the study) was able to ensure that a thorough explanation about the value and context of the study was provided as well as consistency of the explanations given among the participants from the different programmes (i.e. the researcher ensured that all of the participants within the study were provided with the same information and the same explanations).

3.7.2.1 The Data Collection Environment and Response Rate

As mentioned previously, the sample (n = 247) was approached during prearranged lecture times. This strategy was chosen as it was believed to be the most reliable way of ensuring all 247 students were given the opportunity to participate in the research, however, it was unforeseen that the data collection period would coincide with the 2016 student protests at DUT, as mentioned earlier. The student protests resulted in poor lecture attendance and DUT temporarily suspending the academic programme which posed a challenge to the recruitment of participants for the study. As a result, additional data collection periods were required and were arranged for during the year end test sessions and examination sessions which were the only opportunities left to access all of the students before the close of the academic year. It is important to note that the climate during data collection was one of instability and

uncertainty and as a result had a negative impact on the response rates, the questionnaire content, and the interpretation of the results.

3.7.3 Data Capturing and Analysis Procedure

Once the data collection was complete, the researcher assigned each answered NPQ a number which represented the participant number on the data sheet and the NPQ content was captured in an Excel spreadsheet and was coded, as guided by the NPQ coding template (Appendix F2), where the answers to each question in the NPQ were assigned a numerical value. For example, when capturing the gender of a participant, female = 1 and male = 2. The coding process of the NPQ was important for the statistical analysis of the data (Marston 2010). Once the data was captured the data set was quality checked by randomly selecting questionnaires from the sample and checking the answers against the data set. The spread sheet was then sent to a statistician for statistical analysis.

3.7.3.1 Data

3.7.3.1.1 Primary Data

The primary data was that which was obtained from the participants' results within the NPQ which was developed uniquely for the study (Appendix F). The NBQ comprised nominal and ordinal data which has been described here and discussed further under the statistical analysis procedure.

Nominal data was defined by responses that were not able to be measured by a scale and or given a numerical order value (Roberts and Priest 2010). The responses to categorical questions (i.e. ethnicity) were considered nominal data in the NPQ.

Ordinal data was defined as numeric or categorical data that had an inherent ranking system (or order) but where the difference between the raking levels were not necessarily of equal value (Roberts and Priest 2010). In the NPQ ordinal data was included in the form of a numerical scales (i.e. BNQ and DASS) and in the form of categorical raking systems (i.e. Likert scales with answers such as "never", "seldom", "sometimes", "often" and "very often"). Both of these data types were selected in the development of the NPQ as they were appropriate for and enabled quantitative

analysis to be conducted, as per the design.

3.7.3.1.2 Secondary Data

The secondary data was that which was extracted from, but not limited to, sources such as other questionnaires and measurement tools, journal articles, text books, the Internet, and dissertations. This data was used in the development of the NPQ and the write up of the dissertation.

3.7.3.1.3 Missing Data

There were some questions which certain participants neglected to answer. This was known as missing data and the missing values were coded as "99" in these instances so that they would be recognised as missing values in the IBM SPSS Statistics Software Package, as advised by Associate Professor Matthews (2016, pers. comm.18 November). It was hypothesised that the reason for the missing values was due to the climate during data collection where participants were rushing to complete the questionnaires. While missing values were reported in the frequency tables, they were excluded pair-wise for statistical analysis of the associations of variables. Results were interpreted and discussed bearing in mind the quantity of missing values per variable and the implied effect.

3.7.4 Statistical Analysis Procedure

In order to conduct the statistical analysis of the NPQ results, the data set was imported into the IBM SPSS Statistics Software Package (version 23.0.0) and analysed accordingly by the statistician. Marston (2010) highlighted the importance of specifying the type of data for the variables of each question in the data sheet (i.e. nominal or ordinal) in order for accurate statistical analysis of the data to be conducted in SPSS (i.e. if an ordinal variable was incorrectly labelled as nominal, SPSS would recognise it as categorical instead of a quantitative variable with an inherent order which would affect the results of the analysis).

3.7.4.1 Univariate Analysis

Univariate analysis was the starting point of statistical analysis. It enabled the

researcher to see the results of the data in relation to the bigger picture and also functioned as a quality check of the data set (Mouton 1996).

This descriptive analysis of the data made use of the following statistical techniques:

- Frequency tables were used to establish the distribution of two or more variables and to determine the descriptive nature of the sample.
- Percentages were mostly used to represent nominal/categorical ordinal data whereas mean values (a measure of central tendency), and standard deviation (a measure of average spread) were mostly used to represent numerical ordinal data of quantitative scales. Tables, histograms, bar diagrams, and pie charts were used to represent these results.

3.7.4.2 Bivariate Analysis

Bivariate analysis was the second step of statistical analysis. This form of analysis was applied in order to determine the associations between two or more variables, and the type of relationship being investigated determined the statistical technique which was chosen (Mouton 1996). Cross-tabulations were used for questions where an association was measured between two or more variables.

3.7.4.3 Inferential Statistics

In order to determine whether statistically significant associations exist between two or more variables, various statistical techniques have to be applied in the statistical analysis of the data. Statistical techniques are chosen depending on the type of data being analysed and certain assumptions about the data (Marston 2010; Bland 2015).

3.7.4.3.1 Determining the Distribution of Data

In order to know which statistical techniques to apply, one needs to determine the distribution of the data first. The distribution of the data can be determined by generating histograms and/or applying specific numerical tests of normality. Often the application of numerical tests of normality are favoured as they do not rely on the visual interpretation such as in the interpretation of a histogram. Once the normality is established it helps distinguish between the selection of parametric tests (used for normally distributed data) or non-parametric tests (used for data that is not normally

distributed) in the statistical analysis of the data (Marston 2010; Bland 2015). The Shapiro-Wilk Test of Normality, was used to determine the distribution of the data for this study. This test works on the premise that a *p* value of greater than 0.05 signifies normally distributed data, the converse is true of data with is not normally distributed. The DASS-21 depression ($p = 0.000$), anxiety ($p = 0.000$), and stress ($p = 0.007$) are some examples of significant variables in this test, indicating that the data was not normally distributed for these variables.

3.7.4.3.2 Selection of Statistical Techniques

Chi-square tests were used to determine whether the associations observed between two or more categorical variables in the cross-tabulations were in fact representative of the population (statistically significant). The Mann-Whitney U test (a non-parametric test) was used to determine the statistical significance between mean values of a dichotomous variable and a quantitative ordinal variable. The Mann-Whitney U test was chosen as opposed to the independent samples t-test due to the data of these measures not being normally distributed (Marston 2010).

Spearman's Rank-Order Correlation Coefficient was used to measure the degree of correlation between two or more quantitative ordinal variables. This test was chosen instead of Pearson's Product Moment Correlation Coefficient as the data of these quantitative variables did not display a normal distribution (Marston 2010).

A Binary Logistic Regression analysis was used to determine independent risk factors for neck pain. This type of analysis model was used as the dependent variable only had two possible outcomes (i.e. the participant either had neck pain or they did not have neck pain). In the context of this study, the independent variables were the selected risk factors. The coding of the dependent variable was important when setting the parameters of the model in that the dependent variable outcomes were coded with 0 and 1, with the outcome most important to the research problem being coded as 1 (i.e. 0 = participants without neck pain; 1 = participants with neck pain). Other important steps in the modelling are: specifying which of the independent variables are categorical, defining the confidence interval for the odds ratio, and defining the entry and exit parameters (Marston 2010). For this study, a 95% confidence interval was set and the entry and exit probabilities were set to 0.05 and

0.01 respectively.

3.7.4.3.3 Interpreting Statistical Significance

The interpretation of the results of the statistical analysis of the data is based on probability and the statistical significance is determined by the *p* value. In health sciences research, the following guidelines are given regarding the *p* value: $p < 0.01$ implies that there is strong evidence that a difference or association exists; $p = 0.01$ - 0.05 implies that a difference or association exists; $p < 0.05$ implies that the association is statistically significant, and $p > 0.1$ implies that there is minimal evidence of a difference or association (Marston 2010). Therefore, for this study, a *p* value of < 0.05 was considered to indicate the presence of a statistically significant association. Furthermore, neck pain was reported with a 95% confidence interval. Confidence intervals give the reader an indication of the range of a variable and the likelihood of the population mean falling within the upper and lower parameters for an observed association (i.e. the reader can be 95% sure that the significant association observed between neck pain and a variable is also true of the population as the population mean falls within the range set by the confidence limits) and are thus important in the interpretation of the results (Marston 2010).

3.8 ETHICAL CONSIDERATIONS

Participation was entirely on a voluntary basis and prospective participants were informed of this. A letter of informed consent was obtained from each participant prior to them filling out the questionnaire and this was collected in a ballot box labelled “Informed Consent Form”. The questionnaires were coded thus there was no form of identification (name, surname, ID number, student numbers or signatures) on the questionnaire. The questionnaires were collected in a ballot box labelled “Questionnaire”. The ballot box method ensured that participation was both confidential and anonymous and participants were assured of this. Gatekeeper permission was granted by the Director of Research and all data collected was secured in a locked cupboard for the duration of the study and thereafter for a period of five years, following which it will be destroyed by the researcher using a shredder. Only the researcher, the research supervisor, co-supervisor and the research statistician had access to the documentation and data collected.

3.9 CONCLUSION

This chapter delivered all aspects involving the methodology of the study. In Chapter 4 the results of the study will be presented.

CHAPTER 4 : RESULTS

4.1 INTRODUCTION

In this chapter the results of the study NPQ are presented. Of the 247 first-year students invited to participate in the study, a total of 148 consented to participate and were sampled. Of the 148 NPQs completed, 13 were inadmissible which rendered a final sample size of 135 (n = 135) from 247 invitations and a response rate of 54.7% which was 4.7% over the required minimum response rate of 50% (n = 124) to make the sample representative of the population, and thus viable to be able to make inferences regarding the statistical analysis of the results. The process of determining the final sample size is depicted in Figure 4.1.

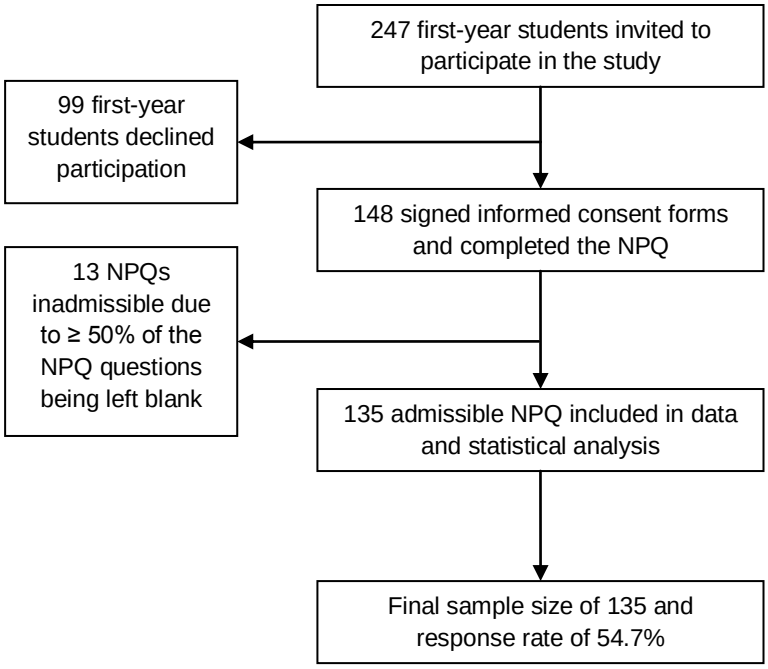


Figure 4.1: Flow diagram depicting the process of determining the final sample size and response rate

Brief demographic, social and psychological profiles are given to provide context to the environment and characteristics of the sample. Thereafter, the results are presented in the order of each objective of the study. The results for the prevalence

of neck pain will be presented first, followed by the characteristics of the neck pain, and the psychosocial profile of the participants. To conclude, the association between demographics, socio-demographics, and psychosocial factors will be presented relative to neck pain prevalence.

4.2 PARTICIPANT PROFILES

The demographic, socio-demographic and psychosocial profiles outlined below are summaries of the raw data. An account of all of the results for the profiles have been provided in the form of frequency tables under their respective headings, however, only the main points have been highlighted within the profiles. Certain important variables are discussed further and in more detail in the objectives that follow.

4.2.1 Demographic Profile

Mainly Black (62.2%), female (65.2%) participants between the ages of 18 to 20 (70.4%) participated in this study. The mean age of the participants was 19.7 ± 1.8 years (Table 4.1).

Table 4.1: Demographic characteristics of the participants

AGE	FREQUENCY (n)	PERCENTAGE
18	37	27.4%
19	37	27.4%
20	21	15.6%
21	15	11.1%
22	4	3.0%
23	4	3.0%
24	3	2.2%
26	1	0.7%
27	2	1.5%
Missing	11	8.1%
TOTAL	**135**	**100.0%**
AGE SUMMARISED	**FREQUENCY (n)**	**PERCENTAGE**
18 - 20	95	70.4%
21 - 27	29	21.5%
Summary statistics: $\bar{x}$ = 19.7 ± 1.8		

Table 4.1 continued

GENDER		FREQUENCY (n)	PERCENTAGE
Female		88	65.2%
Male		45	33.3%
Missing		2	1.5%
	TOTAL	**135**	**100.0%**
ETHNICITY		**FREQUENCY (n)**	**PERCENTAGE**
Asian		2	1.5%
Black		84	62.2%
Coloured		2	1.5%
Indian		38	28.1%
White		8	5.9%
Missing		1	0.7%
	TOTAL	**135**	**100.0%**

$\bar{x}$ = mean; ± = standard deviation

4.2.2 Socio-Demographic Profile

4.2.2.1 Education

The proportional representation of participants among the FHS programmes was as follows: Diagnostic Radiography (22.2%), Somatology (19.3%), Dental Technology (14.8%), Chiropractic (12.6%), Homoeopathy (12.6%), Medical Orthotics and Prosthetics (11.9%), Diagnostic Sonography (2.2%), and Nuclear Medicine (2.2%). As can be seen in Table 4.2, the participants were mostly isiZulu speakers (44.4%) and bilingual (58.5%). Despite 61.5% of the participants being non-English speakers, the majority (78.5%) stated that they did not experience any barriers to learning because the programme was presented in the English language.

Table 4.2: Descriptive statistics of language related questions

FIRST LANGUAGE		FREQUENCY (n)	PERCENTAGE
AFRIKAANS		2	1.5%
ENGLISH		52	38.5%
ISIXHOSA		14	10.4%
ISIZULU		60	44.4%
SESOTHO		3	2.2%
SETSWANA		1	0.7%
SISWATI		1	0.7%
TSONGA		1	0.7%
Missing		1	0.7%
	TOTAL	**135**	**100.0%**

Table 4.2 continued

NUMBER OF LANGUAGES SPOKEN		FREQUENCY (n)	PERCENTAGE
MONOLINGUAL		39	28.9%
BILINGUAL		79	58.5%
TRILINGUAL		3	2.2%
MULTILINGUAL		1	0.7%
Missing		13	9.6%
	TOTAL	**135**	**100.0%**
ENGLISH FIRST LANGUAGE		**FREQUENCY (n)**	**PERCENTAGE**
NO		**82**	**60.7%**
YES		52	**38.5%**
Missing		1	**0.7%**
	TOTAL	**135**	**100.0%**
BARRIERS TO LEARNING		**FREQUENCY (n)**	**PERCENTAGE**
NO		106	78.5%
YES		25	18.5%
Missing		4	3.0%
	TOTAL	**135**	**100.0%**

In terms of transitioning from high school to university; just over half of the participants (57.8%) felt that their high school had prepared them adequately for tertiary education with the remaining 40.7% reported that they did not feel adequately prepared for university. Furthermore, 96.3% of the participants had made friends with the minority of 2.2% not having made friends within their programme. Most of the participants (75.6%) stated that they had made friends easily with 10.4% having found it difficult making friends and 11.9% reporting that making friends was not a priority for them. Two point two percent of the participants did not answer this question. Eighty eight percent of participants reported an increase in stress levels associated with the 2016 student protests with the remaining 12% reporting no increase in stress. Of the participants who reported an increase in stress their severity levels were as follows: 29.4% reported a high increase, 26.9% a very high increase, 24.4% a moderate increase and 19.3% a mild increase. Just over half of the participants (55.6%) felt that they were coping with their academic load with the remaining 42.2% reporting that they were not coping with their academic load. The majority of participants (96.3%) reported an increase in stress levels right before an upcoming test with only 3.7% reporting no stress before a test. Of the participants who reported an increase in stress: 54.1% reported a very high increase, 37.6% a high increase, and 8.2% a mild increase. Table 4.3 shows that the majority of the participants (43.0%) spent 11 to 15 hours preparing for a test, starting their preparation a week or less prior to their test (66.7%) with the most common study

time being in the evening (39.3%). The majority of the study sessions lasted 30 minutes to two hours (73.3%) with most of the participants taking study breaks every 30 minutes (26.7%), every 45 minutes (14.8%), and every hour (20.7%). The most common medium of study notes were electronic and printed notes (50.4%) with 61.5% of the participants spending time writing out extra notes.

Table 4.3: The study routine of the participants

AVERAGE HOURS SPENT STUDYING FOR A TEST		**FREQUENCY (n)**	**PERCENTAGE**
0 HOURS		1	0.7%
1 - 5 HOURS		27	20.0%
5 - 10 HOURS		2	1.5%
11 - 15 HOURS		58	43.0%
16 - 20 HOURS		22	16.3%
21 - 25 HOURS		10	7.4%
26 - 30 HOURS		2	1.5%
> 30 HOURS		2	1.5%
Missing		11	8.1%
	TOTAL	**135**	**100.0%**
AMOUNT OF PREPARATION FOR TESTS / EXAMS		**FREQUENCY (n)**	**PERCENTAGE**
> 1 MONTH BEFORE		5	3.7%
A MONTH BEFORE		7	5.2%
2 - 3 WEEKS BEFORE		29	21.5%
1 WEEK BEFORE		34	25.2%
2 - 6 DAYS BEFORE		51	37.8%
THE NIGHT BEFORE		5	3.7%
Missing		4	3.0%
	TOTAL	**135**	**100.0%**
STUDY TIME		**FREQUENCY (n)**	**PERCENTAGE**
MORNING		22	16.3%
AFTERNOON		11	8.1%
EVENING		53	39.3%
RANDOM TIMES		35	25.9%
MORNING & AFTERNOON		1	0.7%
MORNING & EVENING		6	4.4%
MORNING & RANDOM TIMES		1	0.7%
MORNING, AFTERNOON & EVENING		1	0.7%
AFTERNOON & EVENING		2	1.5%
EVENING & RANDOM TIMES		1	0.7%
Missing		2	1.5%
	TOTAL	**135**	**100.0%**
LENGTH OF STUDY SESSIONS		**FREQUENCY (n)**	**PERCENTAGE**
30 MINUTES - 2 HOURS		99	73.3%
2 - 4 HOURS		22	16.3%
4 - 6 HOURS		2	1.5%
6 - 8 HOURS		2	1.5%
8 - 10 HOURS		1	0.7%
Missing		9	6.7%
	TOTAL	**135**	**100.0%**

Table 4.3 continued

FREQUENCY OF STUDY BREAKS		FREQUENCY (n)	PERCENTAGE
NO BREAKS		15	11.1%
EVERY 10 MINUTES		1	0.7%
EVERY 15 MINUTES		2	1.5%
EVERY 30 MINUTES		36	26.7%
EVERY 45 MINUTES		20	14.8%
EVERY HOUR		28	20.7%
EVERY 1.5 HOURS		11	8.1%
EVERY 2 HOURS		17	12.6%
AT RANDOM TIMES		2	1.5%
Missing		3	2.2%
	TOTAL	**135**	**100.0%**
MEDIUM OF STUDY NOTES		**FREQUENCY (n)**	**PERCENTAGE**
PRINTED		47	34.8%
ELECTRONIC		10	7.4%
PRINTED & ELECTRONIC		68	50.4%
PRINTED & AUDIO		1	0.7%
PRINTED, ELECTRONIC & AUDIO		9	6.7%
Missing		0	0.0%
	TOTAL	**135**	**100.0%**
TYPE OF STUDY NOTES USED		**FREQUENCY (n)**	**PERCENTAGE**
WRITES OUT OWN NOTES		83	61.5%
TYPES OWN NOTES		4	3.0%
WRITES & TYPES NOTES		9	6.7%
DOES'T TYPE / WRITE NOTES		39	28.9%
Missing		0	0.0%
	TOTAL	**135**	**100.0%**

> = greater than.

As can be seen in Table 4.4, the participants mostly studied at a desk (57.0%), in a seated position (81.5%), with their neck in bent forward in flexion (37.0%) and with their shoulders in a non-relaxed position (60.7%) which was defined as either one or a combination of the following: hunched up by ears, one higher than the other, rounded forward. The majority of the participants reported never (36.3%), seldom (22.2%), and sometimes (29.6%) having a breeze on their necks while studying and most of the participants (69.6%) also experienced one or more eye symptoms. The eye symptoms included one or a combination of the following: blurriness, dryness, flashing lights, itchiness, pain, strain, and fatigue. A large portion of the participants (72.6%) trembled or fidgeted while studying for one or a combination of the following reasons: hunger, nerves, cold, attention deficit disorder, attention deficit hyperactivity disorder, and hand using gestures when studying. The majority of the participants reported that they would sometimes (38.5%), never (28.1%) or seldom (23.7%) skip lectures to study for a test.

Table 4.4: Study environment of the participants

MOST COMMON STUDY PLACE		FREQUENCY (n)	PERCENTAGE
AT A DESK		77	57.0%
ON A BED		40	29.6%
ON A COUCH		4	3.0%
ON THE FLOOR		4	3.0%
AT A DESK / ON A BED		8	5.9%
AT A DESK / ON A COUCH		1	0.7%
AT A DESK / WALKS AROUND		1	0.7%
	TOTAL	**135**	**100.0%**
MOST COMMON STUDY POSITION		**FREQUENCY (n)**	**PERCENTAGE**
LYING ON BACK		4	3.0%
LYING ON SIDE		2	1.5%
LYING ON STOMACH		8	5.9%
SITTING		110	81.5%
STANDING		3	2.2%
ALL OF THE ABOVE		1	0.7%
LYING ON BACK / SITTING		1	0.7%
LYING ON STOMACH / SITTING		5	3.7%
SITTING / STANDING		1	0.7%
	TOTAL	**135**	**100.0%**
POSITION OF HEAD & NECK WHILE STUDYING		**FREQUENCY (n)**	**PERCENTAGE**
LATERAL FLEXION (LAT FLEX)		10	7.4%
NEUTRAL (NEUT)		33	24.4%
EXTENSION (EXT)		5	3.7%
FLEXION (FLEX)		50	37.0%
ROTATION (ROT)		4	3.0%
LAT FLEX / NEUT		2	1.5%
LAT FLEX / FLEX		9	6.7%
LAT FLEX / ROT		1	0.7%
NEUT / EXT		1	0.7%
NEUT / FLEX		6	4.4%
NEUT / ROT		1	0.7%
EXT / FLEX		1	0.7%
FLEX / ROT		4	3.0%
LAT FLEX / NEUT / EXT		2	1.5%
LAT FLEX / EXT / FLEX		1	0.7%
LAT FLEX / FLEX / ROT		1	0.7%
LAT FLEX / NEUT / FLEX / ROT		1	0.7%
LAT FLEX / NEUT / EXT / FLEX / ROT		2	1.5%
Missing		1	0.7%
	TOTAL	**135**	**100.0%**
POSITION OF SHOULDERS WHILE STUDYING		**FREQUENCY (n)**	**PERCENTAGE**
NON-RELAXED		82	60.7%
RELAXED		53	39.3%
	TOTAL	**135**	**100.0%**
EYE SYMPTOMS WHILE STUDYING		**FREQUENCY (n)**	**PERCENTAGE**
NO		41	30.4%
YES		94	69.6%
	TOTAL	**135**	**100.0%**

Table 4.4 continued

BREEZE ON NECK WHEN STUDYING		FREQUENCY (n)	PERCENTAGE
NEVER		49	36.3%
SELDOM		30	22.2%
SOMETIMES		40	29.6%
OFTEN		15	11.1%
VERY OFTEN		1	0.7%
	TOTAL	**135**	**100.0%**
TREMBLE / FIDGET WHILE STUDYING		**FREQUENCY (n)**	**PERCENTAGE**
NO		35	25.9%
YES		98	72.6%
Missing		2	1.5%
	TOTAL	**135**	
SKIPPED LECTURES TO STUDY FOR TESTS		**FREQUENCY (n)**	**PERCENTAGE**
NEVER		38	28.1%
SELDOM		32	23.7%
SOMETIMES		52	38.5%
OFTEN		8	5.9%
VERY OFTEN		4	3.0%
Missing		1	0.7%
	TOTAL	**135**	**100.0%**

4.2.2.2 Financial Background

As can be seen in Table 4.5, the majority of the participants did not have any dependents (85.9%) and were not the breadwinner of the family (97.0%). Of the 14.1% of the participants who did have dependants, the type of dependents were children, extended family members and parents. The unemployment rate was 84.4% among the participants with 98.5% of the participants relying one or more avenues of financial aid for their tertiary education, the bursars were as follows: bank loan, the National Student Financial Aid Scheme (NSFAS), parent(s), sibling(s), bursary, child dependency grant, child support grants, disability grants, scholarship, friend(s), grandparents, and extended family members. Collectively, the majority of the participants (83.7%) indicated that they experienced mild to very high increases in stress levels when it came to securing their financial aid with parents (25.2%), the NSFAS (20.9%) and bursaries (20.9%) being labelled the most common stressors with regards to securing financial aid. Similarly, the majority of the participants (59.3%) felt that their financial aid was insufficient for their needs with 37.0% of the participants reporting that they did not always have enough money to buy food.

Table 4.5: Financial background of the participants

DEPENDENTS		FREQUENCY (n)	PERCENTAGE
NO		116	85.9%
YES		19	14.1%
	TOTAL	**135**	**100.0%**
BREADWINNER		**FREQUENCY (n)**	**PERCENTAGE**
NO		131	97.0%
YES		2	1.5%
Missing		2	1.5%
	TOTAL	**135**	**100.0%**
EMPLOYED PART-TIME		**FREQUENCY (n)**	**PERCENTAGE**
NO		114	84.4%
YES		21	15.6%
	TOTAL	**135**	**100.0%**
DEPENDANT ON FINANCIAL AID		**FREQUENCY (n)**	**PERCENTAGE**
NO		2	1.5%
YES		133	98.5%
	TOTAL	**135**	**100.0%**
STRESS ASSOCIATED WITH SECURING FINANCIAL AID		**FREQUENCY (n)**	**PERCENTAGE**
NO INCREASE		22	16.3%
MILD INCREASE		18	13.3%
MODERATE INCREASE		26	19.3%
HIGH INCREASE		32	23.7%
VERY HIGH INCREASE		37	27.4%
	TOTAL	**135**	**100.0%**
FINANCIAL AID STRESSORS		**FREQUENCY (n)**	**PERCENTAGE**
BANK LOAN		9	7.8%
BURSURY		24	20.9%
CHILD SUPPORT GRANT		2	1.7%
DISABILITY GRANT		1	0.9%
EXTENDED FAMILY MEMBER		2	1.7%
FRIEND		1	0.9%
GRANDPARENT(S)		8	7.0%
NOT HAVING SECURED FINANCE		1	0.9%
NATIONAL STUDENT FINANCIAL AID SCHEME		24	20.9%
PARENT(S)		29	25.2%
SCHOLARSHIP		4	3.5%
SELF		4	3.5%
SIBLING(S)		4	3.5%
	TOTAL	**113**	**98.3%**
N/A		22	
	TOTAL	**135**	
IS FINANCIAL AID SUFFICIENT FOR NEEDS		**FREQUENCY (n)**	**PERCENTAGE**
NO		80	59.3%
YES		54	40.0%
Missing		1	0.7%
	TOTAL	**135**	**100.0%**
IS THERE ALWAYS ENOUGH MONEY TO BUY FOOD		**FREQUENCY (n)**	**PERCENTAGE**
NO		50	37.0%
YES		83	61.5%
Missing		2	1.5%
	TOTAL	**135**	**100.0%**

4.2.2.3 Residence and Transportation

The participants mostly resided in urban (40.7%) and sub-urban (31.9%) areas during term time with the minority residing in rural areas (14.1%) and informal settlements (5.9%). However, during the holidays the majority went home to sub-urban (38.5%), urban (26.7%), and rural (25.2%), with the minority going home to an informal settlement (6.7%). While the most common mode of transport individually was walking (28.1%), collectively the participants mostly relied on public transport (34.8%) and private transport (31.1%) to get to and from campus each day with the remaining 6% using a combination of public transport, private transport and/or walking. The majority of participants had a travel time of less than one hour (93.3%) with only 6.7% of the participants travelling for over an hour. When asked about the effect of the 2016 transport protests on their stress levels, 40.7% of the participants stated that they experienced no increase in stress levels, while collectively, the rest of the participants (59.3%) experienced an increase in stress. The 2016 transport protests were separate to the student protests and they occurred earlier in the academic year. The severity of this stress increase was as follows: mild (23.0%), moderate (14.1%), high (14.1%), and very high (8.1%). Just over half of the participants (51.1%) stated that they never skipped lectures due to transport problems with the other half of the participants skipping lectures seldom (16.3%), sometimes (23.7%), often (5.2%) and very often (1.5%). Two point two percent of the participants did not answer this question.

4.2.2.4 Lifestyle

Table 4.6 shows that most of the participants did not smoke cigarettes (90.4%), electronic cigarettes (96.3%), use social drugs (91.1%), or drink alcohol (66.7%).

Table 4.6: Substance usage of the participants

CURRENT SMOKER (TOBACCO)		FREQUENCY (n)	PERCENTAGE
NO		122	90.4%
YES		13	9.6%
	TOTAL	**135**	**100.0%**
CURRENT SMOKER (E-CIGARETTE)		**FREQUENCY (n)**	**PERCENTAGE**
NO		130	96.3%
YES		5	3.7%
	TOTAL	**135**	**100.0%**
SOCIAL DRUG USER		**FREQUENCY (n)**	**PERCENTAGE**
NO		124	91.9%
YES		11	8.1%
	TOTAL	**135**	**100.0%**
ALCOHOL INTAKE		**FREQUENCY (n)**	**PERCENTAGE**
NO		90	66.7%
YES		39	28.9%
Missing		6	4.4%
	TOTAL	**135**	**100.0%**

As seen in Table 4.7, the majority (97.8%) slept on a bed, used one pillow (72.6%) and most commonly on the stomach (30.4%), and on the right hand side (26.7%). While the majority regularly slept for less than six hours (49.6%) on an average night, an even higher percentage (85.9%) fell into this category the night before.

Table 4.7: Sleeping habits of the participants

SLEEPING SURFACE		FREQUENCY (n)	PERCENTAGE
BED		132	97.8%
FLOOR		3	2.2%
	TOTAL	**135**	**100.0%**
HOURS OF SLEEP ON AVERAGE WEEK NIGHT		**FREQUENCY (n)**	**PERCENTAGE**
≤ 6 HOURS		67	49.6%
> 6 HOURS		66	48.9%
Missing		2	1.5%
	TOTAL	**135**	**100.0%**
HOURS OF SLEEP BEFORE A TEST		**FREQUENCY (n)**	**PERCENTAGE**
≤ 6 HOURS		116	85.9%
> 6 HOURS		19	14.1%
	TOTAL	**135**	**100.0%**
NO. OF PILLOWS		**FREQUENCY (n)**	**PERCENTAGE**
0		10	7.4%
1		98	72.6%
2		23	17.0%
>2		4	3.0%

Table 4.7 continued

	TOTAL	**135**	**100.0%**
POSITION OF BODY WHEN SLEEPING		**FREQUENCY (n)**	**PERCENTAGE**
BACK		16	11.9%
LEFT SIDE		27	20.0%
RIGHT SIDE		36	26.7%
BOTH SIDES		5	3.7%
STOMACH		41	30.4%
BACK / LEFT SIDE		1	0.7%
BACK / RIGHT SIDE		1	0.7%
BACK / STOMACH		1	0.7%
LEFT SIDE / STOMACH		1	0.7%
RIGHT SIDE / STOMACH		1	0.7%
VARIABLE POSITIONS		4	3.0%
Missing		1	0.7%
	TOTAL	**135**	**100.0%**

≤ = smaller than or equal to; > = greater than.

Table 4.8 shows the exercise statistics among the participants. Of the participants, 70.4% reported engaging in exercise activities. There was a mean frequency of 2.0 ± 2.1 times per week and 0.8 ± 0.9 per day. The length of these exercise sessions were on average between 30 minutes and one hour (48.9%). The most common category of exercise was traditional cardiovascular type exercises (31.6%).

Table 4.8: Exercise statistics of the participants

DO YOU EXERCISE		**FREQUENCY (n)**	**PERCENTAGE**
NO		40	29.6%
YES		95	70.4%
	TOTAL	**135**	**100.0%**
DAYS OF EXERCISE / WEEK		**FREQUENCY (n)**	**PERCENTAGE**
0		46	34.1%
1		18	13.3%
2		28	20.7%
3		15	11.1%
4		7	5.2%
5		10	7.4%
6		5	3.7%
7		6	4.4%
	TOTAL	**135**	**100.0%**
Summary statistics: $\bar{x}$ = 2.0 ± 2.1			
EXERCISE SESSIONS / DAY		**FREQUENCY (n)**	**PERCENTAGE**
0		52	38.5%
1		60	44.4%
2		15	11.1%
3		3	2.2%
>3		3	2.2%
Missing		2	1.5%
	TOTAL	**135**	**100.0%**

Table 4.8 continued

Summary statistics: $\bar{x}$ = 0.8 ± 0.9			
AVERAGE LENGTH OF EXERCISE SESSIONS		**FREQUENCY (n)**	**PERCENTAGE**
< 30 MINUTES		35	38.9%
30 MINUTES - 1 HOUR		44	48.9%
> 1 HOUR		11	12.2%
	TOTAL	**90**	**100.0%**
N/A		45	
	TOTAL	**135**	
TYPE OF EXERCISE		**FREQUENCY (n)**	**PERCENTAGE**
BALL SPORTS (a)		7	7.4%
CARDIO (b)		30	31.6%
CARDIO X (c)		9	9.5%
CORE & FLEXIBILITY (d)		8	8.4%
STRENGTH (e)		7	7.4%
COMBINATION OF THE ABOVE		34	35.8%
	TOTAL	**95**	**100.0%**
N/A		40	
	TOTAL	**135**	

(a) = basketball, hockey, netball, soccer, and volleyball; (b) = long distance running, short distance running, swimming, and walking; (c) = boxing, cross-fit, cycling, dancing / Zumba, skateboarding, surfing; (d) = gymnastics, Pilates, and yoga; (e) = power lifting and weight training. $\bar{x}$ = mean; ± = standard deviation.

4.2.2.5 History General Injury and Chronic Illness

The majority (57.8%) of participants reported a history of no previous injury to any of the regions of the body. Of those who reported having sustained an injury, the majority had only been injured in one region of the body (54.9%). Of the vast range of injuries reported by the participants, the most commonly injured regions were the upper extremity (26.1%), the lower extremity (23.9%), and the head and/or neck region (17.4%). The prevalence of disability among the sample was very low with 1.5% reporting physical disability (all eyesight related) and 3.7% reporting a learning disability (fatigue, low concentration, vision problems, and slow comprehension and writing). Most of the participants (71.9%) did not have a history of chronic illness, however, of those that did, asthma (41.9%) was the most commonly reported chronic illness and depression (25.8%) was the second most common reported chronic illness. These statistics appear in Table 4.9.

Table 4.9: Injury and illness statistics for the participants

GENERAL INJURY PREVALENCE		FREQUENCY (n)	PERCENTAGE
NO		78	57.8%
YES		51	37.8%
Missing		6	4.4%
	TOTAL	**135**	**100.0%**
NUMBER OF REGIONS INJURED		**FREQUENCY (n)**	**PERCENTAGE**
ONE REGION		28	54.9%
TWO REGIONS		7	13.7%
THREE REGIONS		8	15.7%
FOUR REGIONS		1	2.0%
FIVE REGIONS		1	2.0%
SIX REGIONS		2	3.9%
SEVEN REGIONS		1	2.0%
OTHER, REGION NOT SPECIFIED		3	5.9%
	TOTAL	**51**	**100.0%**
N/A		78	
Missing		6	
	TOTAL	**135**	
SPECIFIED REGIONS OF INJURY		**FREQUENCY (n)**	**PERCENTAGE**
CHEST		5	5.4%
HEAD & NECK		16	17.4%
LOWER BACK		11	12.0%
LOWER EXTREMITY		22	23.9%
SPINAL CORD (NO PARALYSIS)		5	5.4%
UPPER BACK		6	6.5%
UPPER EXTREMITY		24	26.1%
OTHER, REGION NOT SPECIFIED		3	3.3%
	TOTAL	**92**	**100.0%**
PHYSICAL DISABILITY PREVALENCE		**FREQUENCY (n)**	**PERCENTAGE**
NO		133	98.5%
YES		2	1.5%
Missing		0	0.0%
	TOTAL	**135**	**100.0%**
LEARNING DISABILITIES PREVALENCE		**FREQUENCY (n)**	**PERCENTAGE**
NO		130	96.3%
YES		5	3.7%
Missing		0	0.0%
	TOTAL	**135**	**100.0%**
CHRONIC ILLNESS PREVALENCE		**FREQUENCY (n)**	**PERCENTAGE**
NO		97	71.9%
YES		31	23.0%
Missing		7	5.2%

Table 4.9 continued

	TOTAL	**135**	**100.0%**
TYPE OF CHRONIC ILLNESS		**FREQUENCY (n)**	**PERCENTAGE**
ANAEMIA		1	3.2%
ASTHMA		13	41.9%
DEPRESSION		8	25.8%
DIABETES MELLITUS		1	3.2%
HYPERTHYROIDISM		1	3.2%
HYPOTHYROIDISM		1	3.2%
MOOD DISORDER		1	3.2%
ANXIETY DISORDER; ASTHMA		1	3.2%
DEPRESSION; HYPERTENSION		1	3.2%
ANXIETY DISORDER; DEPRESSION; MOOD DISORDER		1	3.2%
ANXIETY DISORDER; DEPRESSION; PEPTIC ULCERS		1	3.2%
OTHER		1	3.2%
	TOTAL	**31**	**100.0%**
N/A		97	
Missing		7	
	TOTAL	**135**	

4.2.3 Psychosocial Profile

Just over half of the participants (54.8%) reported that the emotional support they received was sufficient for their needs, leaving a noteworthy 42.2% of the participants feeling that the emotional support they received was not sufficient for their needs. A total of 3.0% of the participants did not answer this question. In DASS-21, there was a high prevalence of depression symptoms (55.6%), anxiety symptoms (65.2%), and stress symptoms (48.1%) among the participants, with an absence of these symptoms in 43.7%, 34.8%, and 51.1% respectively. There were invalid results for depression (0.7%) and stress (0.7%). Table 4.10 provides an account of the psychosocial risk factor characteristics and provides summary statistics of the scores for DASS-21. The following mean scores were observed for depression (12.7 ± 10.6), anxiety (12.8 ± 9.6) and stress (14.3 ± 9.9) among the participants and these scores translated to average severity ratings of mild (depression), moderate (anxiety), and mild (stress) based on the Table 3.4 which was presented in Chapter 3.

Table 4.10: Severity distribution and summary statistics of DASS-21 scores for the participants

DEPRESSION CLASSIFICATION	FREQUENCY (n)	PERCENTAGE	SUMMARY STATISTICS OF SCORES
NORMAL	59	43.7%	
MILD	20	14.8%	
MODERATE	23	17.0%	Minimum = 0 Maximum = 40 $\bar{x}$ = 12.7 ± 10.6
SEVERE	17	12.6%	
EXTREMELY SEVERE	15	11.1%	
INVALID	1	0.7%	
TOTAL	**135**	**100.0%**	
ANXIETY CLASSIFICATION	**FREQUENCY (n)**	**PERCENTAGE**	**SUMMARY STATISTICS OF SCORES**
NORMAL	47	34.8%	
MILD	8	5.9%	
MODERATE	32	23.7%	Minimum = 0 Maximum = 36 $\bar{x}$ = 12.8 ± 9.6
SEVERE	9	6.7%	
EXTREMELY SEVERE	39	28.9%	
TOTAL	**135**	**100.0%**	
STRESS CLASSIFICATION	**FREQUENCY (n)**	**PERCENTAGE**	**SUMMARY STATISTICS OF SCORES**
NORMAL	69	51.1%	
MILD	23	17.0%	
MODERATE	23	17.0%	Minimum = 0 Maximum = 38 $\bar{x}$ = 14.3 ± 9.9
SEVERE	12	8.9%	
EXTREMELY SEVERE	7	5.2%	
INVALID	1	0.7%	
TOTAL	**135**	**100.0%**	

$\bar{x}$ = mean; ± = standard deviation

4.3 OBJECTIVES

The study had four objectives. The results of which have been outlined in chronological order below.

4.3.1 Objective One

The first objective of the study was to determine the prevalence of neck pain among the participants (registered first year FHS students at DUT).

4.3.1.1 Neck Pain Prevalence

Seventy two percent (97) of the participants reported that they had experienced neck pain in their lifetime, while the remaining 28% (38) had never experienced neck pain. Furthermore, based on the intensity ratings of the NBQ, it was determined that there was a neck pain prevalence of 64.4% (87) experienced over the past week, while 35.6% (48) had not experienced neck pain over the past week.

4.3.2 Objective Two

The second objective of the study was to determine the characteristics of the neck pain.

4.3.2.1 Duration of Neck Pain

Of those that reported neck pain, 63.9% reported their pain had lasted less than three months in duration, and 27.8% reported that their pain had lasted for more than six months (Table 4.11).

Table 4.11: Neck pain duration

NECK PAIN DURATION		FREQUENCY (n)	PERCENTAGE
< 3 MONTHS		62	63.9%
3 - 6 MONTHS		7	7.2%
> 6 MONTHS		27	27.8%
Missing		1	1.0%
	TOTAL	**97**	**100.0%**
N/A		38	
	TOTAL	**135**	

4.3.2.2 Intensity of Neck Pain

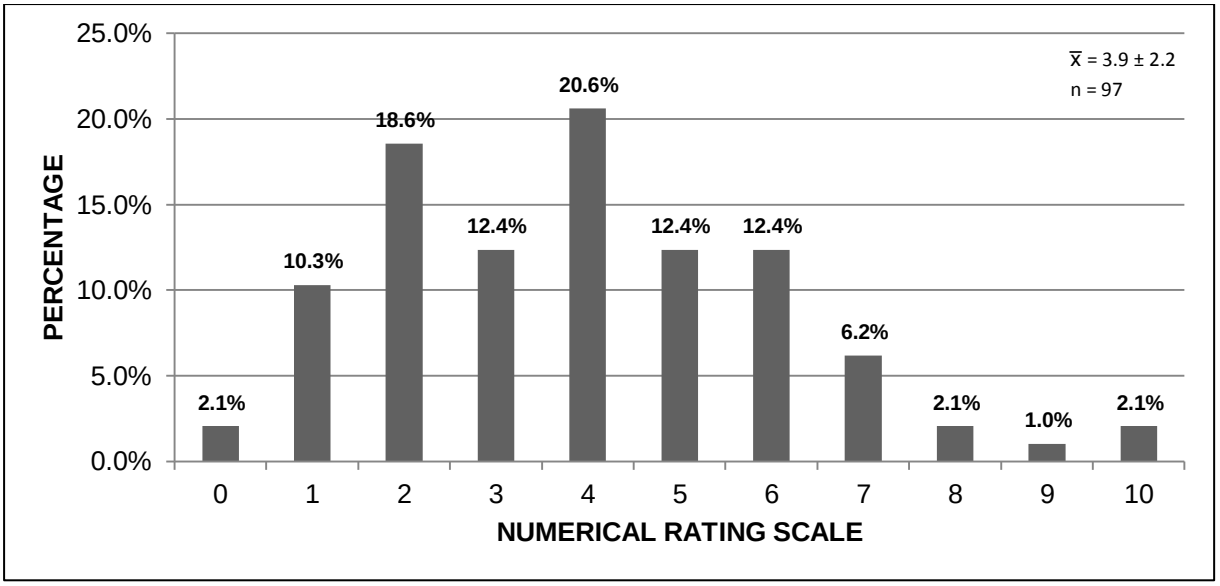
Neck pain intensity was measured on an 11 point NRS ranging from 0 (representing no pain) to ten (representing the worst possible pain).

4.3.2.2.1 General Intensity

The majority of the participants scored less than 5 on the NRS and this group had a mean score of 3.9 ± 2.2 (Figure 4.2).

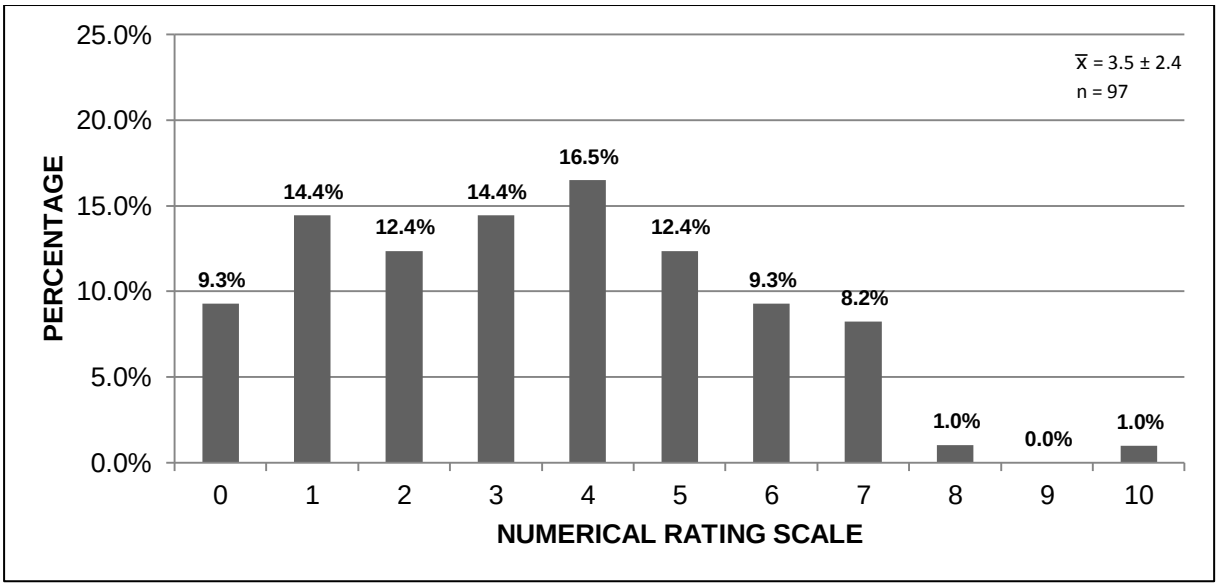
4.3.2.2.2 One Week Intensity

One week neck pain intensity was measured using the NBQ. The majority of the participants scored less than 5 on the NRS. Furthermore, this group had a mean score of 3.5 ± 2.4 (Figure 4.3).



x̄ = mean, ± = standard deviation, n = total number of participants

Figure 4.2: Bar graph representing neck pain general intensity



x̄ = mean, ± = standard deviation, n = total number of participants

Figure 4.3: Bar graph representing neck pain intensity over the past week

4.3.2.3 Frequency of Neck Pain

The majority of the participants experienced pain between one and three times a week. The mean frequency of neck pain that this group experienced was 2.6 ± 1.6 times per week (Table 4.12).

Table 4.12: Neck pain frequency

(EPISODES per WEEK)	FREQUENCY (n)	PERCENTAGE
0	6	6.2%
1	23	23.7%
2	19	19.6%
3	21	21.6%
4	15	15.5%
5	10	10.3%
6	1	1.0%
7	2	2.1%
TOTAL	**97**	**100.0%**
N/A	38	
Missing	0	$\bar{x}$ = 2.6 ± 1.6
TOTAL	**135**	

$\bar{x}$ = mean, ± = standard deviation

4.3.2.4 Periodicity of Neck Pain

Seventy five percent of participants experienced intermittent neck pain (Figure 4.4).

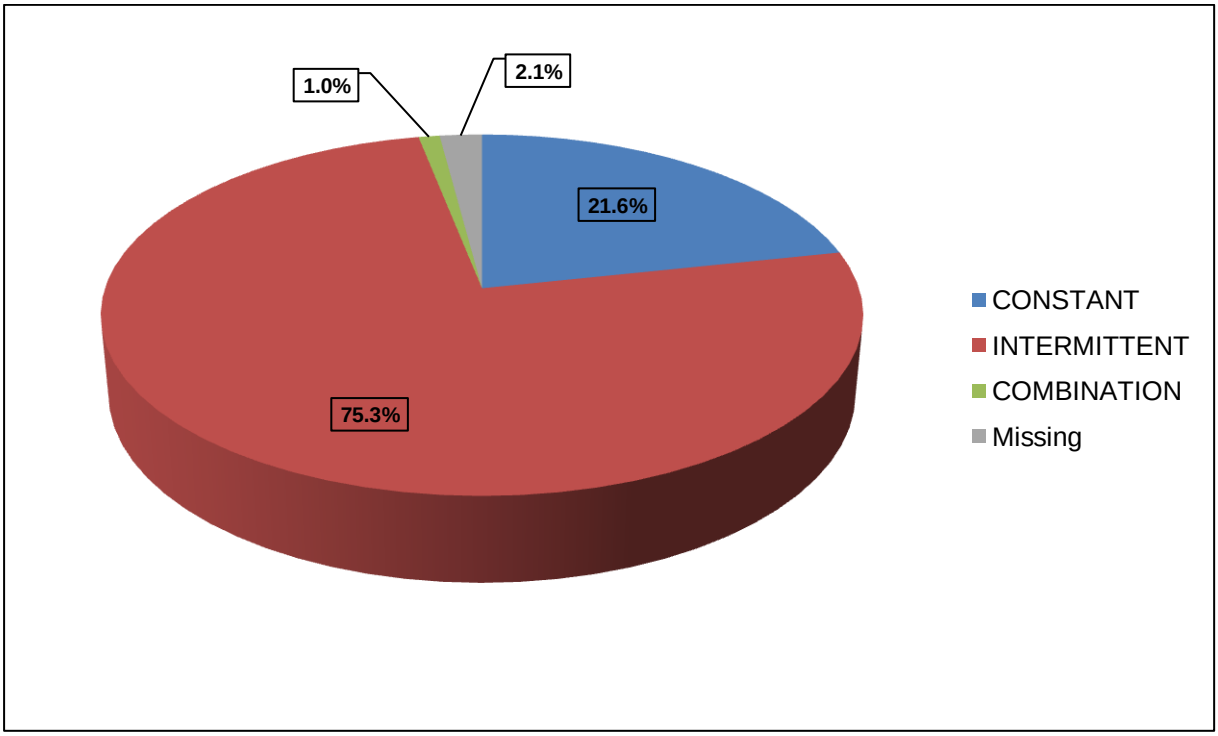


Figure 4.4: Pie chart showing neck pain periodicity

4.3.2.5 Timing of Neck Pain

The majority of the participants (45.4%) experienced their neck pain in the afternoon (Table 4.13).

Table 4.13: The timing of the neck pain

NECK PAIN TIMING	FREQUENCY (n)	PERCENTAGE
MORNING	22	22.7%
AFTERNOON	44	45.4%
NIGHT	27	27.8%
MORNING, AFTERNOON & NIGHT	1	1.0%
MORNING & NIGHT	1	1.0%
AFTERNOON & NIGHT	1	1.0%
Missing	1	1.0%
TOTAL	**97**	**100.0%**
N/A	38	
Missing	0	
TOTAL	**135**	

4.3.2.6 The Quality/Nature of Neck Pain

The majority of the participants (55.7%) described their pain as aching in nature (Table 4.14).

Table 4.14: The nature of the neck pain

NECK PAIN NATURE	FREQUENCY (n)	PERCENTAGE
ACHING	54	55.7%
BURNING	6	6.2%
DULL	13	13.4%
FATIGUE	1	1.0%
PINS & NEEDLES	9	9.3%
SHARP & SHOOTING	8	8.2%
ACHING / PINS & NEEDLES	1	1.0%
ACHING /SHARP & SHOOTING	2	2.1%
PINS & NEEDLES / SHARP & SHOOTING	1	1.0%
Missing	2	2.1%
TOTAL	**97**	**100.0%**
N/A	38	
Missing	0	
TOTAL	**135**	

4.3.2.7 Functional Limitations of Neck Pain

Disruption of function was measured by the NBQ on a 11 point NRS ranging from zero (representing no disruption) to ten (representing maximum disruption). It was measured in relation to neck pain over the past week. These quantitative (ordinal) results have been presented in the form of summary statistics (mean, standard deviation, and minimum and maximum values) in Table 4.15, and the main findings

have been highlighted under each of their respective headings.

4.3.2.7.1 Disruption of Daily Activities

The average score on the NRS for this question was 2.3 ± 2.3 for the participants.

4.3.2.7.2 Disruption of Social Activities

The average score on the NRS for this question was 1.7 ± 2.4 for the participants.

4.3.2.7.3 Fear-Avoidance Behaviour

The average score on the NRS for this question was 3.2 ± 3.0 for the participants.

4.3.2.7.4 Locus of Control

The average score on the NRS for this question was 3.5 ± 3.2 for the participants.

Table 4.15: Frequencies and summary statistics for scores on NBQ

PHYSICAL LIMITATIONS											
DAILY ACTIVITIES (n = 96)	NRS SCORE (%)										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	30.9	16.5	6.2	15.5	10.3	12.4	3.1	1.0	2.1	1.0	0.0
	SUMMARY STATISTICS										
	$\bar{x}$			±			min			max	
	2.3			2.3			0			9	
SOCIAL ACTIVITIES (n = 96)	NRS SCORE (%)										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	54.6	6.2	10.3	5.2	10.3	3.1	3.1	4.1	0.0	1.0	1.0
	SUMMARY STATISTICS										
	$\bar{x}$			±			min			max	
	1.7			2.4			0			10	
COGNITIVE LIMITATIONS											
FEAR-AVOIDANCE BEHAVIOUR (n = 96)	NRS SCORE (%)										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	29.9	9.3	12.4	7.2	4.1	10.3	9.3	7.2	5.2	1.0	3.1
	SUMMARY STATISTICS										
	$\bar{x}$			±			min			max	
	3.2			3.0			0			10	
LOCUS OF CONTROL (n = 96)	NRS SCORE (%)										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	26.8	9.3	10.3	8.2	7.2	10.3	10.3	5.2	1.0	2.1	8.2
	SUMMARY STATISTICS										
	$\bar{x}$			±			min			max	
	3.5			3.2			0			10	

n = total number of participants; $\bar{x}$ = mean, ± = standard deviation.

4.3.2.7.5 Absenteeism

The majority of the participants (92.8%) never skipped lectures due to their neck pain (Table 4.16).

Table 4.16: Absenteeism and neck pain

SKIPPED LECTURES DUE TO NECK PAIN		FREQUENCY (n)	PERCENTAGE
NEVER		90	92.8%
SELDOM		3	3.1%
SOMETIMES		2	2.1%
Missing		2	2.1%
	TOTAL	**97**	**100.0%**
N/A		38	
Missing		0	
	TOTAL	**135**	

4.3.2.8 Diagnosis and Management

The majority (89.7%) of the neck pain sufferers stated that their neck pain had not been diagnosed by a medical practitioner, with 9.3% of the neck pain sufferers having been diagnosed by a medical practitioner. One percent of the participants did not answer. The majority (69.1%) had attempted to manage their neck pain in some way while 29.9% of the neck pain sufferers had not yet sought management for their condition. One percent of the participants did not answer. Of the 69.1% that had sought management, the types of management were as follows: massage (32.7%), stretching (28.6%), medication (10.2%), exercise (9.2%), chiropractic (5.1%), heat therapy (7.1%), yoga (3.1%), stress management (2.0%), general practitioner (1.0%), and other (1.0%). The participants were most likely to engage in self-directed methods of management (50.0%) compared to alternative (37.8%) and mainstream (11.2%) methods of management.

4.3.3 Objective Three

The third objective of the study was to determine the psychosocial risk factors of participants (registered first year FHS students suffering with neck pain at DUT).

4.3.3.1 Psychosocial Risk Factors

In the study, the psychological risk factors that were the main area of focus were depression, anxiety and stress. These factors were measured by both the DASS-21 and the NBQ. Table 4.17 on the following page provides all of the raw data for both of these scales, however, the raw data of the quantitative measures have been presented in measures of central tendency. The main values from this table have been highlighted in the paragraphs which follow, under their respective headings.

4.3.3.1.1 Depression

There was a high prevalence of depression symptoms among the participants (59.8%), with depression being absent in the remaining 40.2%. However, for the majority of the participants (39.2%), these symptoms of depression were classified as within normal range. The DASS-21 yielded a mean score of 13.4 ± 10.7 which corresponded with a mild severity rating on average and the NBQ yielded a mean score of 4.3 ± 3.2 which corresponded with a moderate severity rating.

4.3.3.1.2 Anxiety

There was a high prevalence of anxiety symptoms among the participants (68.1%), with anxiety symptoms being absent in the remaining 31.9%. However, for the majority of these participants these symptoms of anxiety were classified as within normal range (32.0%) and extremely severe (32.0%). The DASS-21 yielded a mean score of 13.4 ± 9.7 which corresponded with an average severity rating of moderate and the NBQ yielded a mean score of 4.3 ± 3.1 which corresponded with a moderate severity rating.

4.3.3.1.3 Stress

There was a high prevalence of stress symptoms among the participants (53.6%), with stress symptoms being absent in the remaining 46.4%. However, for the majority of these participants (45.4%) these symptoms of stress were classified as within normal range. The DASS-21 yielded a mean score of 15.7 ± 10.1 which corresponded with a mild severity rating on average.

Table 4.17: Severity classification distribution and summary statistics of DASS-21 and NBQ psychosocial risk factors for the participants

DEPRESSION	**DASS-21 CLASSIFICATIONS in %**						
	n	**NORMAL**	**MILD**	**MODERATE**	**SEVERE**	**EXTREMELY SEVERE**	**INVALID**
	96	39.2	16.5	18.6	11.3	13.4	1.0
	DASS-21 SCORE SUMMARY STATISTICS						
	$\bar{x}$ = 13.4 ± 10.7; minimum score = 0; maximum score = 38						
	NBQ SCORE SUMMARY STATISTICS						
	$\bar{x}$ = 4.3 ± 3.2; minimum score = 0; maximum score = 10						
ANXIETY	**DASS-21 CLASSIFICATIONS in %**						
	n	**NORMAL**	**MILD**	**MODERATE**	**SEVERE**	**EXTREMELY SEVERE**	**INVALID**
	97	32.0	6.2	23.7	6.2	32.0	0.0
	DASS-21 SCORE SUMMARY STATISTICS						
	$\bar{x}$ = 13.4 ± 9.7; minimum score = 0; maximum score = 36						
	NBQ SCORE SUMMARY STATISTICS						
	$\bar{x}$ = 4.3 ± 3.1; minimum score = 0; maximum score = 10						
STRESS	**DASS-21 CLASSIFICATIONS in %**						
	n	**NORMAL**	**MILD**	**MODERATE**	**SEVERE**	**EXTREMELY SEVERE**	**INVALID**
	96	45.4	17.5	17.5	12.4	6.2	1.0
	DASS-21 SCORE SUMMARY STATISTICS						
	$\bar{x}$ = 15.7 ± 10.1; minimum score = 0; maximum score = 38						

% = percentage**;** n = total number of participants; $\bar{x}$ = mean; ± = standard deviation

4.3.3.2 Psychosocial Risk Factor Associations with Neck Pain

In the following section the associations of the psychosocial risk factors for neck pain are presented.

4.3.3.2.1 Depression, Anxiety and Stress (DASS-21) and Neck Pain

The Mann-Whitney U test was conducted to establish statistically significant associations of neck pain with the individual psychosocial risk factors. As can be seen in Table 4.18, only a statistically significant association of neck pain with stress (p = 0.009) was observed. No statistically significant associations were observed between neck pain and depression or neck pain and anxiety.

Table 4.18: Mann-Whitney U test of significance for independent samples

DASS-21 VARIABLES	p value
DEPRESSION	0.198
ANXIETY	0.214
STRESS	0.009*

*significant at the 0.05 level

4.3.3.2.2 Possible Stressors

There were four other questions in the NPQ which assessed the level of possible stress among the participants against certain variables. Three of these possible stressors (transport strikes, staff & student protests and financial aid) are factors unique to a South African tertiary educational context whereas the last possible stressor (upcoming tests) is unique to a general student context. All four factors used the same five point Likert scale to assess the level of stress in relation to the stressor. This scale ranged from “no increase in stress” to “a very high increase in stress”. These possible stressors were assessed against neck pain prevalence using a 2-sided Pearson’s Chi-square test to determine statistical significance with a 95% confidence interval. A value of $p = 0.05$ was considered to be statistically significant.

As can be seen in Table 4.19, there were no statistically significant associations between these identified possible stressors and neck pain as all of them yielded a p value > 0.05. The closest association observed was between neck pain and the 2016 staff and student protests at DUT ($p = 0.104$).

Table 4.19: Potential stressors unique to first year Faculty of Health Sciences students at the DUT

PS	INCREASE IN STRESS	LIFETIME PREVALENCE				
		NO		YES		p value
TRANSPORT PROTESTS	NONE	17	44.7%	38	39.2%	0.948 (CI: 0.911 - 0.986)
	MILD	9	23.7%	22	22.7%	
	MODERATE	5	13.2%	14	14.4%	
	HIGH	5	13.2%	14	14.4%	
	VERY HIGH	2	5.3%	9	9.3%	
	TOTAL	**38**	**100.0%**	**97**	**100.0%**	
FINANCIAL AID	NONE	5	13.2%	17	17.5%	0.252 (CI: 0.179 - 0.325)
	MILD	6	15.8%	12	12.4%	
	MODERATE	11	28.9%	15	15.5%	
	HIGH	5	13.2%	27	27.8%	
	VERY HIGH	11	28.9%	26	26.8%	
	TOTAL	**38**	**100.0%**	**97**	**100.0%**	

Table 4.19 continued

PS	INCREASE IN STRESS	LIFETIME PREVALENCE				
		NO		YES		p value
STUDENT PROTESTS	NONE	8	21.1%	7	7.3%	0.104 (CI: 0.052 - 0.155)
	MILD	8	21.1%	15	15.6%	
	MODERATE	9	23.7%	20	20.8%	
	HIGH	6	15.8%	29	30.2%	
	VERY HIGH	7	18.4%	25	26.0%	
	TOTAL	**38**	**100.0%**	**96**	**100.0%**	
UPCOMING TESTS	NONE	2	5.6%	1	1.0%	0.289 (CI: 0.212 - 0.365)
	MILD	3	8.3%	4	4.1%	
	MODERATE	10	27.8%	22	22.7%	
	HIGH	12	33.3%	34	35.1%	
	VERY HIGH	9	25.0%	36	37.1%	
	TOTAL	**36**	**100.0%**	**97**	**100.0%**	

PS = potential stressor; n = total number of participants; % = percentage; CI = confidence interval

4.3.3.3 Psychosocial Risk Factor Correlations

Spearman's Rank-Order Correlation Coefficient was conducted to assess the level of correlation between the psychosocial risk factor scores across the instruments administered within the NPQ (DASS-21, NBQ, and Likert stress scales in the NPQ). The level of correlation was only assessed in the symptomatic participants against the psychosocial risk factors. While correlations were included in the tables that follow for the 0.01 level, only the correlations at the 0.05 level were reported and discussed as these were the only correlations that were considered statistically significant for the study.

As can be seen in Table 4.20, there were no statistically significant correlations observed between the psychological risk factors from DASS-21 and NBQ for participants with a lifetime prevalence of neck pain.

Table 4.20: Psychosocial risk factor correlations for participants with a lifetime prevalence of neck pain (DASS-21 & NBQ)

Spearman's Rho		DASS - D	DASS - A	DASS - S	BNQ - D	BNQ - A
DASS DEPRESSION (DASS - D)	Correlation Coefficient		0.650**	0.684**	0.478**	correlation not measured
	Sig. (2-tailed)		0.000	0.000	0.000	
	n		96	95	95	
DASS ANXIETY (DASS - A)	Correlation Coefficient	0.650**		0.781**	correlation not measured	0.268**
	Sig. (2-tailed)	0.000		0.000		0.008
	n	96		96		96
DASS STRESS (DASS - S)	Correlation Coefficient	0.684**	0.781**		correlation not measured	correlation not measured
	Sig. (2-tailed)	0.000	0.000			
	n	95	96			
BOURNEMOUTH DEPRESSION (BNQ - D)	Correlation Coefficient	0.478**	correlation not measured	correlation not measured		0.506**
	Sig. (2-tailed)	0.000				0.000
	n	95				96
BOURNEMOUTH ANXIETY (BNQ - A)	Correlation Coefficient	correlation not measured	0.268**	correlation not measured	0.506**	
	Sig. (2-tailed)		0.008		0.000	
	n		96		96	

**Significant at the 0.01 level

Table 4.21 shows that the following statistically significant correlations were observed between DASS-21 stress scores and the other Likert stress scores from the NPQ for participants with a lifetime prevalence of neck pain:

- Transport protest stress and student/staff protest stress (p = 0.018).
- Transport protest stress and upcoming test stress (p = 0.026).
- Financial aid stress and upcoming test stress (p = 0.043).
- DASS-21 stress and student/staff protest stress (p = 0.037).

Table 4.21: DASS-21 stress correlation with other Likert stress scales in participants with a lifetime prevalence of neck pain

Spearman's Rho		TP	FA	SP	UT	DASS - S
TRANSPORT PROTESTS (TP)	Correlation Coefficient		0.272**	0.241*	0.226*	0.087
	Sig. (2-tailed)		0.007	0.018	0.026	0.401
	n		97	96	97	96
FINANCIAL AID (FA)	Correlation Coefficient	0.272**		0.150	0.205*	0.134
	Sig. (2-tailed)	0.007		0.144	0.043	0.192
	n	97		96	97	96
STUDENT PROTESTS (SP)	Correlation Coefficient	0.241*	0.150		0.344**	0.215*
	Sig. (2-tailed)	0.018	0.144		0.001	0.037
	n	96	96		96	95
UPCOMING TESTS (UT)	Correlation Coefficient	0.226*	0.205*	0.344**		0.147
	Sig. (2-tailed)	0.026	0.043	0.001		0.154
	n	97	97	96		96
DASS STRESS (DASS - S)	Correlation Coefficient	0.087	0.134	0.215*	0.147	
	Sig. (2-tailed)	0.401	0.192	0.037	0.154	
	n	96	96	95	96	

* Significant at the 0.05 level
** Significant at the 0.01 level

To summarise these findings, it has been demonstrated that symptoms of depression, anxiety and stress are common among the participants with neck pain. However, these high psychosocial prevalence values translated to mild severity (in depression and stress), and moderate severity (in anxiety). The same observation was noted in Objective One with the high neck pain prevalence, but low overall impact of the neck pain. Although symptoms of anxiety were higher than depression and stress among these participants, the only significant association between neck pain and these psychosocial factors were symptoms of stress. Additionally, a number of correlations were drawn between the stressors measured by the Likert scales and stress levels measured by DASS-21.

4.3.4 Objective Four

The fourth objective was to determine the association between demographic characteristics, socio-demographic and psychosocial risk factors in the participants (first year FHS students at the DUT) in relation to the neck pain that they presented with.

4.3.4.1 Selected Risk Factors

For the following reports on the associations between neck pain and the selected risk factors, only the main points have been highlighted under their respective headings. Furthermore, neck pain was reported with 95% confidence intervals (CI) for selected variables where Chi-square tests were used and where the cross-tabulation was larger than 2 x 2 (i.e. ethnicity). If the cross-tabulation was 2 x 2, exact results were provided (i.e. gender and current smoking).

The Mann-Whitney U test was used to determine the association of age and neck pain. Chi-square tests were applied for gender and ethnicity as they consisted of categorical data. As can be seen in Table 4.22, of the demographic characteristics tested, age was considered to have a significant association with neck pain (p = 0.036).

Table 4.22: Associations between demographic characteristics and neck pain

POSSIBLE RISK FACTORS	SUB-GROUPS	LIFETIME PREVALENCE				
		NO		YES		*p* value
AGE	18	7	21.20%	30	33.00%	0.036*
	19	7	21.20%	30	33.00%	
	20	8	24.20%	13	14.30%	
	21	5	15.20%	10	11.00%	
	22	2	6.10%	2	2.20%	
	23	2	6.10%	2	2.20%	
	24	1	3.00%	2	2.20%	
	26	0	0.00%	1	1.10%	
	27	1	3.00%	1	1.10%	
	TOTAL	**33**	**100.00%**	**91**	**100.00%**	
GENDER	FEMALE	24	63.20%	64	67.40%	0.687
	MALE	14	36.80%	31	32.60%	
	TOTAL	**38**	**100.00%**	**95**	**100.00%**	
ETHNICITY	ASIAN	0	0.00%	2	2.10%	0.267 (CI: 0.192 - 0.341)
	BLACK	27	73.00%	57	58.80%	
	COLOURED	1	2.70%	1	1.00%	
	INDIAN	9	24.30%	29	29.90%	
	WHITE	0	0.00%	8	8.20%	
	TOTAL	**37**	**100.00%**	**97**	**100.00%**	

*Significant at 0.05 level

Chi-square tests were used to determine the association of the selected socio-demographic characteristics with neck pain. As can be seen in Table 4.23, of the possible socio-demographic risk factors, a history of head/neck injury was considered to have a significant association with neck pain (p = 0.037) with a confidence interval of between 0.005 and 0.069.

Table 4.23: Associations between selected socio-demographic possible risk factors and neck pain

POSSIBLE RISK FACTORS	SUB-GROUPS	LIFETIME PREVALENCE				
		NO		YES		*p* value
MODE OF TRANSPORT	BUS	4	10.50%	11	11.30%	0.148 (CI: 0.088 - 0.208)
	LIFTCLUB	3	7.90%	11	11.30%	
	OWN CAR	0	0.00%	8	8.20%	
	PARENTS CAR	5	13.20%	15	15.50%	
	TAXI	4	10.50%	21	21.60%	
	TRAIN	3	7.90%	4	4.10%	
	WALKING	15	39.50%	23	23.70%	
	MULTIPLE	4	10.50%	4	4.10%	
	TOTAL	**38**	**100.00%**	**97**	**100.00%**	
FACULTY OF HEALTH SCIENCES PROGRAMME	CHIROPRACTIC	2	5.30%	15	16.00%	0.237 (CI: 0.165 - 0.309)
	DENTAL TECHNOLOGY	7	18.40%	13	13.80%	
	RADIOGRAPHY	10	26.30%	20	21.30%	
	SONOGRAPHY	1	2.60%	2	2.10%	
	HOMOEOPATHY	2	5.30%	15	16.00%	
	MOP	5	13.20%	11	11.70%	
	NUCLEAR MEDICINE	0	0.00%	3	3.20%	
	SOMATOLOGY	11	28.90%	15	16.00%	
	TOTAL	**38**	**100.00%**	**94**	**100.00%**	
FINANCIAL AID	SELF	0	0.00%	2	2.10%	0.096 (CI: 0.047 - 0.146)
	PRIVATE	18	47.40%	60	61.90%	
	BANK LOAN	0	0.00%	1	1.00%	
	GOVERNMENT	8	21.10%	4	4.10%	
	INSTITUTIONAL / ORGANISATION	4	10.50%	11	11.30%	
	MULTIPLE FUNDING	8	21.10%	18	18.60%	
	NO FUNDING	0	0.00%	1	1.00%	
	TOTAL	**38**	**100.00%**	**97**	**100.00%**	
HX OF NECK INJURY	NO	34	97.10%	79	84.00%	0.037* (CI: 0.005 - 0.069)
	YES	1	2.90%	15	16.00%	
	TOTAL	**35**	**100.00%**	**94**	**100.00%**	
CURRENT SMOKER	NO	36	94.70%	86	88.70%	0.282
	YES	2	5.30%	11	11.30%	
	TOTAL	**38**	**100.00%**	**97**	**100.00%**	

*Significant at the 0.05 level

4.3.4.2 Risk Factors

In order to determine the independent risk factors for neck pain among this sample, a Binary Logistic Regression analysis was conducted. The regression was completed in 11 steps with the following 11 variables being entered on the first step: age, gender, ethnicity, mode of transport, FHS programme, financial aid, history of head/neck injury, current smoker, total depression score, total anxiety score, and

total stress score. As can be seen in Table 4.24, the only variable remaining in the equation at step 11 was the stress experienced by the participants which was measured by the DASS-21. Stress had a *p* value of 0.023 (1.007 to 1.104) among participants with neck pain and an odds ratio of 1.1 which meant that participants who displayed high levels of stress were 1.1 times more at risk of developing neck pain than their counterparts.

Table 4.24: Binary logistic regression model to determine independent risk factors

BINARY LOGISTIC REGRESSION				95.0% CI for OR	
STEP	**VARIABLE**	***p* value**	**OR**	**Lower**	**Upper**
11(a)	DASS-S	0.023	1.054	1.007	1.104

(a) = variables entered on step 1: age, gender, ethnicity, mode of transport, Health Sciences programme, financial aid, history of head and / or neck injury, current smoker, total depression score, total anxiety score, total stress score. DASS-S = total stress score, OR = odds ratio, CI = confidence intervals.

4.4 CONCLUSION

While 11 possible risk factors were entered into the logistic regression analysis on the first step, only stress remained as an independent risk factor for neck pain. Although age and a history of head/neck injuries were identified as having associations with neck pain, they were not found to be independent risk factors of neck pain. A discussion of these results follows in the next chapter.

CHAPTER 5 : DISCUSSION

5.1 INTRODUCTION

In this chapter, the study results are interpreted and discussed by contrasting the observed similarities and differences to that of the literature which was presented in Chapter 2. This process enabled the results of the current study to be placed into a larger context which provided insight regarding the sample under study. This chapter is structured in a similar way to Chapter 4, where the results were discussed in the order of each objective.

5.2 INTERPRETATION OF THE DATA

In the interpretation of the data it is important to bear in mind that the data was collected at the end of the academic year and during final test and examination sessions, following student protests which had erupted and resulted in a suspension of the academic programme. This type of climate is typically a time of increased postural and intellectual stress where students are likely to spend long hours studying for their upcoming tests and examinations (Khoshhal *et al.* 2017). This coupled with the lecture time lost due to the shut-down of the institution, the uncertainty of the outcome, and the typical violent nature of these protests, may have caused an increase in distress among these students (those who may have been part of the protests and those who were not). Although student protesters are generally painted in a bad light by the media, the researcher thought it important (particularly due to the nature of the study) to note the very real motivation of these protests which are usually instigated as a result of the gross financial instability and inequality that exists in the South African student population at large. The student protests at the DUT have historically been a motivation for affordable tuition, accommodation/residence, transport, and more comprehensive and inclusive funding from the NSFAS (Student protests in democratic South Africa 2015). In this light and due to the aforementioned reasons, it is possible that this climate could have had a direct or indirect impact on the prevalence of neck pain and the levels of distress which were observed in this sample.

5.2.1 The Prevalence of Neck Pain in study participants

The lifetime prevalence of neck pain in the sample (n = 135) was established to be 71.9%, with 97 participants reporting that they had experienced neck pain in their lifetime and 38 reporting never having experienced neck pain. Additionally, it was possible to determine the one week prevalence of neck pain in this sample by analysing the responses from the first question of the NBQ which enquired about the neck pain intensity that had been experienced over the past week. The one week prevalence of neck pain was established to be 64.4%, with 87 participants reporting that they had experienced neck pain over the past week and neck pain being absent in 48 (35.6%) of the participants over the past week. Of the 48 participants who had not experienced neck pain over the past week, 10 (20.8%) of these participants had never experienced neck pain in their lifetime while 38 (79.2%) participants had experienced neck pain in their lifetime, but just not in the last week. These results indicate a very high (lifetime and one week) prevalence of this condition among this sample relative to the general population and student population presented and discussed in Chapter 2 (Fejer, Kyvik and Hartvigsen 2006; Venketsamy 2007; Hogg-Johnson *et al.* 2008; Ayanniyi, Mbada and Iroko 2010; Khan and Chew 2013; Student protests in democratic South Africa 2015). Furthermore, it was observed that the lifetime prevalence of neck pain was higher than the one week prevalence, which is consistent with the trend observed in the literature where prevalence measured over longer periods was higher than prevalence measured over shorter periods. It is also interesting to note that this one week prevalence was significantly higher than that reported in the literature (Fejer, Kyvik and Hartvigsen 2006; Hogg-Johnson *et al.* 2008). This could be due to the fact that these authors reported on one week neck pain prevalence in adults and not students as well as the fact that the data in this study was collected in a climate of possibly increased physical and intellectual stress, as mentioned above. While prevalence values have been provided for both lifetime and one week time frames, the results of the study were only presented and discussed in relation to the lifetime prevalence of the neck pain. This time frame of measurement was chosen (as opposed to period or point prevalence) as it was based on the most common time frame observed in previous literature used to determine neck pain prevalence among the student population at large (Ayanniyi,

Mbada and Iroko 2010; Khan and Chew 2013). This method of choosing the same time frame, enabled more reliable correlations to be drawn among the various student population groups.

When contrasting the lifetime prevalence of this sample to that found in the literature it can be seen that the lifetime prevalence in this sample was higher than the annual prevalence of 30.2% found in the Durban students in the study conducted by Venketsamy (2007), the 34.9% lifetime prevalence of the Nigerian undergraduate students (Ayanniyi, Mbada and Iroko 2010), and the overall neck pain prevalence of 41.0% found in non-clinical Malaysian dental students (Khan and Chew 2013). A possible reason for the difference that exists between the prevalence in the current study when compared to the prevalence of the Durban student population in the study conducted by Venketsamy (2007) is that the prevalence of neck pain was measured over different time frames for each study. As noted in the literature, prevalence measured over longer periods tends to be higher than that measured over shorted periods (Fejer, Kyvik and Hartvigsen 2006; Hogg-Johnson *et al.* 2008; Carroll *et al.* 2009). While Venketsamy (2007) used students from the much larger general population who had sought treatment at the Chiropractic Day Clinic at the DUT, the current study considered symptomatic and asymptomatic participants. Furthermore, the difference observed between the lifetime prevalence of this population and the lifetime prevalence of the Nigerian undergraduate students could be due to the difference in sample size and population sampled. The latter had a much larger sample size of n = 1069 and sampled a vast range of students from various levels of study and faculties, whereas the current study only had 135 participants who were all first-year students from the Faculty of Health Sciences. Although the sample size of the current study (n = 135) was similar to that of the Malaysian non-clinical dental students (n = 158), a possible reason for the lower prevalence among Malaysian students could be the fact that Khan and Chew (2013) excluded participants who were overly involved in sport, who had been diagnosed with musculoskeletal conditions and who played musical instruments for prolonged periods whereas the current study did not.

In addition, the lifetime prevalence of this sample was lower than the neck pain prevalence of 82.0% found in the Malaysian dental clinical students (Khan and Chew

2013) and the upper range of overall neck pain prevalence (86.8%) found in the general population globally (Hoy *et al.* 2010). However, it was comparable to the upper range of lifetime prevalence (71.0%) found internationally in the Asian, American, European and Scandinavian adult population (Fejer, Kyvik and Hartvigsen 2006; Hogg-Johnson *et al.* 2008). The prevalence of neck pain in this sample was lower than the neck pain prevalence found in the Malaysian dental clinical students and a possible reason for this was that the current study sampled participants who were not yet heavily involved in clinical subjects as it was their first year of study. It is comparable to the adult population neck pain prevalence reported by Fejer, Kyvik and Hartvigsen (2006) and Hogg-Johnson *et al.* (2008) as the prevalence time frame measured was the same for each of these groups.

While the prevalence of neck pain is seemingly high in this sample, it is evident from the above that it is difficult to compare prevalence values across different research studies, particularly studies that vary in methodological approaches, demographics, socio-demographics, location and where prevalence has been measured over a different time frame. For these reasons, comparisons must be made with due caution because of the lack of homogeneity among the studies, as suggested by Hoy *et al.* (2010).

5.2.2 The Clinical Characteristics of the Neck Pain

The clinical characteristics were measured by the NBQ as well as free standing questions in the questionnaire. It must be noted that the measurements of the NBQ are in relation to the neck pain the participants had experienced over the past week.

5.2.2.1 Duration of Neck Pain

The majority of the participants (63.9%) reported that their neck pain had lasted for less than three months (Table 4.11). This indicated that for most of the participants this neck pain was a fairly new occurrence which could be classified under the acute definition (Merskey and Bogduk 1994; Misailidou *et al.* 2010). In this way, the minority of the participants who had been experiencing neck pain for over three months were classified as chronic neck pain sufferers. This pattern is similar to that suggested by Walker and Colledge (2013), where it was reported that neck pain is often short

lasting and self-limiting with only a few individuals developing neck pain of a chronic duration.

5.2.2.2 Intensity of Neck Pain

Neck pain intensity was measured in relation to lifetime prevalence (Figure 4.2) and neck pain over the past week (Figure 4.3). Both were measured using an NRS for consistency when contrasting the results of each. As was observed, the mean score for general intensity of the neck pain was 3.9 ± 2.2, whereas, the mean score of neck pain over the past week was 3.5 ± 2.4. The mean pain intensity ratings were similar for both time frames with both being classified as moderate according to McCaffery and Beebe (1989), as demonstrated in Figure 2.3. However, when looking at the crude values, the average intensity, when asked in the general context of the neck pain, was slightly higher than the average intensity when asked in relation to the neck pain over the past week. The accuracy and validity of rating scales such as the NRS has been questioned in the past as there is always a risk of the participant over-exaggerating or under-exaggerating as a result of not having an accurate memory of their pain (Bolton, Humphreys and van Hedel 2010; Misailidou *et al.* 2010). Moreover, Bolton, Humphreys and van Hedel (2010) reported one week pain intensity ratings (using the NRS) to be a more reliable time frame of measurement in patients with non-specific neck pain than asking individuals to rate their present pain. Regarding longer (general) timeframes for pain intensity ratings, they suggested a need for further investigation into the accuracy of pain rating recall over such periods. In the current study, general intensity demonstrated a higher rating and this may be a result of more participants having reported a lifetime prevalence of neck pain than a one week prevalence. Based on the literature (Bolton, Humphreys and van Hedel 2010), it can be said that the one week intensity rating was more accurate than the lifetime rating, however, neck pain rating is subjective and based on each participants' unique experience of pain. What was important for the current study was to have a general indication of the participants' experience of their pain, in order to gauge the overall impact of the neck pain.

5.2.2.3 Frequency, Periodicity, Timing and Nature of Neck Pain

The participants most frequently experienced episodes of neck pain once a week and there was an average frequency of 2.6 ± 1.6 times per week among the participants (Table 4.12). This is a relatively low frequency which, as a characteristic, adds to the low impact of the neck pain. The neck pain was mostly intermittent (Figure 4.4), experienced in the afternoon (Table 4.13), and described as predominantly aching in nature (Table 4.14). A possible reason for neck pain being most common in the afternoon is that the participants (being students) would likely have spent the majority of the day attending lectures and sitting at desks which are likely to be poorly ergonomically designed. These work stations could place increased postural strain on the shoulders, head and neck of the participants which, as highlighted by Simons, Travell and Simons (1999), could result in pain experienced in the neck region. The fact that the nature of the neck pain experienced was an aching-type pain shows that the root cause of the pain was more muscular related rather than joint or nerve related pain which may present as sharp, shooting pain or pins and needles as explained previously in Figure 2.4 (Schmidt and Willis 2007). This cannot, however, be definitively concluded without performing the related diagnostic tests for neck pain. Furthermore, based on these characteristics, it appears that the neck pain was predominantly mechanical in classification. This was consistent with the literature which reported neck pain being more commonly mechanical than pathological/non-mechanical (Walker and Colledge 2013).

5.2.2.4 Functional Limitations of Neck Pain

These results are reported in Table 4.15. For the functional limitations of the neck pain that were measured by the NBQ, using a series of NRSs, the participants were prompted (in the instructions of the NBQ) to answer these questions in relation to the neck pain they had experienced over the past week. The functional limitations that were measured by the NBQ were: disruption of daily activity, disruption of social activity, avoidance behaviour, and pain locus of control.

The average scores for disruption of daily and social activities, as well as for fear-avoidance behaviour and locus of control were all low/mild according to the NRS severity classification provided by McCaffery and Beebe (1989). A possible reason is

that this low hindrance of functional activity could be related to the intensity and frequency of the neck pain also being low or mild. Moreover, when contrasting the results for neck pain absenteeism with the rates of absenteeism reported in the participant profiles in the beginning of this chapter, the participants were more likely to skip lectures as a result of transport problems or studying for a test than they were because of neck pain. However, the overall rates of absenteeism were still low among these participants. These characteristics imply a low impact or burden of neck pain among the participants which is consistent with the "Iceberg of Burden" presented by Hogg-Johnson *et al.* (2008) but differs from several large-scale studies where neck pain has been reported to be disabling (Gore *et al.* 2011; Murray *et al.* 2013a; Murray *et al.* 2013b; Hoy *et al.* 2014).

5.2.2.5 Diagnosis and Management

It was observed that most of the participants had not had their neck pain diagnosed by a medical professional. However, most of them had engaged in some form of management for their neck pain (Figure 4.6), with the majority reporting massage and/or stretching as the main form of pain management. It is interesting to note that, collectively, the majority of the participants engaged in self-directed management for their neck pain as opposed to seeking alternative and mainstream management approaches (Figure 4.7). Although there was a tendency for the remaining participants to favour alternative managements methods over mainstream approaches, only a very small portion of these participants utilised chiropractic in their management of their neck pain (5.0%). This low tendency among the sample to seek diagnosis and management from a health practitioner may be a result of the overall intensity and functional limitation of the neck pain being low. The phenomenon observed here is comparable to that of the medical, psychology, law and mechanical engineering students in a university in Adelaide, Australia (Leahy *et al.* 2010), as well as the students from seven universities around the United Kingdom (El Ansari and Stock 2011) who also showed a decreased tendency to make use of health services.

A possible theory for this observation in the current study could be that this "low impact" neck pain is more likely to be accepted as part of everyday life as it is

seemingly manageable because it does not cause much limitation, which perhaps then makes it harder to justify the utilisation of health care services. This proposed theory might also explain why the majority of the participants attempted self-directed management methods. Additionally, the majority of the participants with neck pain (56.7%) stated that their financial support was insufficient for their needs which may make it even harder to justify or afford seeking medical attention (Table 4.5). The Chiropractic Day Clinic at DUT offers chiropractic treatment at a reduced rate for DUT students and staff, however, this reduced fee might still be too expensive relative to the financial strain experienced by the majority of the participants.

Therefore, in light of the neck pain characteristics observed in this objective, it appears that the overall impact of the neck pain experienced by these participants could be regarded as relatively low which, coupled with financial insecurity, may have resulted in the decreased tendency to seek diagnosis and management from a health care professional. This echoes the "Iceberg of Burden" theory proposed by Hogg-Johnson *et al.* (2008), although it remains unclear the motives of the participants as to the lack of health care service utilisation. While this trend is consistent (Hogg-Johnson *et al.* 2008), it differs from the reported disabling and burdensome nature of neck pain observed worldwide (Côté *et al.* 2008; Gore *et al.* 2011; Murray *et al.* 2013a; Murray *et al.* 2013b; Hoy *et al.* 2014).

5.2.3 The Psychosocial Risk Factors of the First-Year Students and their Association with Neck Pain

These results are reported in Table 4.17. Although there are many psychosocial risk factors that could have been considered and assessed in the study, certain specific risk factors (depression, anxiety, and stress) were isolated for the following reasons:

1. In reviewing the literature, psychosocial risk factors (especially depression, anxiety and stress) were found to be some of the most common conditions among many population groups (Hanvold, Veiersted and Wærsted 2010; Szabó 2010; Crawford *et al.* 2011; Gore *et al.* 2011; Ferrari *et al.* 2013) and more specifically among the student population (Lovibond and Lovibond 1995a; Bayram and Bilgel 2008; El Ansari and Stock 2011; Szabó 2011; Ibrahim and Abdelreheem 2015; Lei *et al.* 2016).

2. These selected risk factors were able to be measured with instruments (the DASS-21 and NBQ) that were developed by professionals in the field and have been found to be valid and reliable in published literature. These instruments provided quantitative results for these factors which aligned well with the study design.
3. It was hoped that using established instruments would help contextualise the level of potential psychosocial risk among the participants in relation to other studies which utilised these instruments (Lovibond and Lovibond 1995a; Crawford and Henry 2003; Bayram and Bilgel 2008; Szabó 2010; Crawford *et al.* 2011; Szabó 2011).
4. Lastly, it was hoped that by refining the list of possible psychosocial risk factors more focus could be given to each one as opposed to including a vast range of factors and only being able to give minimal focus to each.

As explained in Chapter 4, these conditions were measured using the NBQ and the DASS-21. Again, it is important to note that in the interpretation of these results, instruments such as DASS-21 and NBQ do not provide definitive diagnoses for these conditions but rather an indication of the extent to which an individual has experienced symptoms of these conditions within the past week. Furthermore, DASS-21 measured depression, anxiety and stress in a general context, whereas, NBQ measured depression and anxiety in relation to the neck pain. It was chosen to use these instruments alongside each other for the following reasons:

- They both measured variables in relation to the past week. It was observed in the literature that heterogeneous qualities (such as different time frames) caused difficulty when comparing results (Fejer, Kyvik and Hartvigsen 2006; Hogg-Johnson *et al.* 2008). For this reason, instruments with only a one week time frame were included in this study to provide consistency when drawing comparisons between the scales.
- While NBQ provides insight on how these variables are influenced by neck pain, it is not a thorough assessment and does not account for these variables outside of the neck pain. In contrast, DASS-21 measures these variables quite extensively in a general context but it does not account for these variables in relation to the neck pain. Thus, it was believed that these instruments used in

conjunction would complement each other by providing a more holistic insight about the extent to which these variables exist both in a general context and in relation to the neck pain. This is an important part of understanding the extent of the relationship between neck pain and these psychosocial risk factors (Lovibond and Lovibond 1995b; Linton 2000; Bolton and Humphreys 2002; Misailidou *et al.* 2010; Linton and Shaw 2011).

5.2.3.1 Psychosocial Risk Factors

5.2.3.1.1 Depression

The DASS-21 results indicated that there was a high prevalence of depression symptoms in this sample with over half of the neck pain participants (59.8%) indicating that they experienced symptoms of depression to varying extents over the past week. However, although this prevalence was high among the participants, the average severity of the group was mild when interpreted against the severity rating template of DASS-21 provided in Table 3.4. No statistically significant association was found between depression and neck pain in the current study (p = 0.198). The NBQ also indicated a high prevalence of depression symptoms (57.8%) in relation to neck pain over the past week which corresponded with moderate severity levels based on the guidelines of interpretation of the NRS scores suggested by McCaffery and Beebe (1989) and outlined in Figure 2.3. Although it appeared that there was a tendency for a heightened experience of depression symptoms related to the neck pain, only a weak positive relationship existed between DASS-21 depression ratings and NBQ depression ratings which was not considered statistically significant at the 0.05 level (Table 4.20). Therefore, there was no significant correlation observed between the general depression symptoms determined by the DASS-21 score and NBQ depression in relation to neck pain. These results differed from the reviewed literature that reported an observed association between depression and neck pain (Côté *et al.* 2004; Leijon, Wahlström and Mulder 2009; Muchna 2011; Shahidi, Curran-Everett and Maluf 2015).

Moreover, when contrasting the prevalence rates of depression among this sample to those observed in the literature, it was found to be within the range of 3.0% to 80.6% depression prevalence found in the Chinese student population (Lei *et al.* 2016). It

was comparable to the prevalence of 57.9% found in the Egyptian medical students, and it was higher than the 51.1% prevalence found among the Egyptian pharmaceutical students (Ibrahim and Abdelreheem 2015). These similarities could exist for the reason that in both the current study and the Egyptian study, first year Faculty of Health Sciences students were being sampled, although the data was collected immediately after the mid-year break so the prevalence might have been higher for the Egyptian students had the data been collected in a similar climate to that of the current study. The depression prevalence in the current study was also higher than the prevalence of 55.7% of the Moroccan adult population (Elbinoune *et al.* 2016). This could be due to the fact that both samples measured depression in participants with neck pain and had a similar research design. Furthermore, the depression prevalence of the current sample was significantly higher than that of the collective 28.1% prevalence found among United Kingdom students (El Ansari and Stock 2011). This vast difference in depression prevalence could be due to the fact that El Ansari and Stock (2011) had a much larger sample size, measured prevalence over a number of levels of study as opposed to only first year, and over a 12 month time frame. However, in making these comparisons among the studies above, two factors need to be considered: firstly, the populations in these studies did not necessarily have neck pain except for Elbinoune *et al.* (2016) who measured neck pain and El Ansari and Stock (2011) who reported neck and shoulder pain together; and, secondly, all these studies used different measurement tools and did not provide a breakdown of severity ratings which (given this heterogeneity among the studies) makes it difficult to draw accurate observations about the similarities or differences that exist. Additionally, as observed in objectives one and two, stand-alone prevalence values can often give a higher sense of a condition's affect when not quantified by characteristics such as intensity/severity.

Considering point two above, there are a few published studies that also used DASS (Table 2.7) and had similarities with the current study. When comparing the depression severity ratings of the current study to that of DASS published literature, this researcher noticed that the mild severity rating of the current study was higher (more severe) than the 1st year psychology students with a sample size of 117 and a mean age of 19.3 (Szabó 2011). It was also higher than both Australian samples with an age range of 18 to 24 (n = 102) and 25 to 90 (n = 395) in a study on the general

population (Crawford *et al.* 2011), and in the younger adolescents (mean age = 12.75) and older adolescents (14.46) in a study conducted by Szabó (2010) with sample sizes of 238 and 246, respectively. Again, it was higher than an early study conducted on 1st year psychology students (with a mean age of 21.0 and a sample size of 717) by Lovibond and Lovibond (1995a) the authors of DASS. All of these studies reported a normal severity rating among their samples. These discrepancies in severity ratings among the current study and the other studies mentioned could be for a number of reasons. Firstly, a common difference between the samples is that none of the samples in the other studies had co-morbid neck pain. A second difference is that it would seem that these other studies were conducted in climates much different to that of the current study; as mentioned earlier the climate of heightened distress and uncertainty could have biased the ratings of the current study. This being said, when looking for individual differences between the studies, Szabó (2011) followed a different procedural approach. The psychology students were asked to carry a "worry diary" with them for a week leading up to the DASS assessment being administered. This could have resulted in the students having a better feel for their symptoms and being more mindful about them as opposed to the current study where the participants were invited at different times to complete the questionnaire without prior warning. When considering both samples of the Australian general population, one could argue that differences existed because the population of the Australian study was large comparatively and even though there was an overlap in terms of age, the population did not necessarily consist of individuals enrolled in tertiary institutions. In the Szabó (2010) study, normal ratings existed and it is possible that this was due to the mean age of both samples being significantly younger. Although the mean age in the study conducted by Lovibond and Lovibond (1995a) was comparative to the current study, the sample size was significantly larger which allows for the possibility of more "normal" cases to be sampled than in a smaller sample size.

Lastly, the mild severity rating of the current study was comparable to the mild severity rating that was reported by Bayram and Bilgel (2008) among Turkish university students (n = 1617) with a mean age of 20.7 irrespective of the significantly larger sample size. These similarities could exist as both studies sampled participants from developing nations with a similar mean age.

5.2.3.1.2 Anxiety

There was also a high prevalence of anxiety symptoms observed in this sample, with 68.1% of the neck pain participants indicating that they experienced symptoms of anxiety to varying extents over the past week. When measuring the extent of the anxiety symptoms, the average severity rating, when interpreted against the severity rating template of DASS-21 provided in Table 3.4, was classified as moderate overall. No statistically significant association was found between anxiety and neck pain (p = 0.214). The NBQ indicated a high prevalence of anxiety symptoms in relation to neck pain which also corresponded with moderate severity levels based on the guidelines of interpretation of the NRS scores suggested by McCaffery and Beebe (1989) and outlined in Figure 2.3. However, only a weak positive correlation was observed between these two rating scales for anxiety which was not considered statistically significant at the 0.05 level (Table 4.20). Therefore, as with depression, it cannot be assumed that the anxiety score reported in relation to the neck pain (measured by NBQ) was significantly associated with the general anxiety symptoms determined by the DASS-21 score. The lack of association between anxiety and neck pain differs from Elbinoune *et al.* (2016) where a statistically significant association was observed. This could have been due to the fact that the participants in the study conducted by Elbinoune *et al.* (2016) had to have had chronic neck pain to be included in the study and a more powerful association has been established between psychosocial risk factors and chronic neck pain (Linton 2000). The population of the current study had mostly experienced acute episodes of neck pain.

When contrasting the prevalence rates of anxiety among this sample to those observed in the literature, it was found to be higher than the prevalence of 43.9% found in the Egyptian medical students, and also higher than the prevalence of 29.3% found among the Egyptian pharmaceutical students (Ibrahim and Abdelreheem 2015). These differences could exist due to the fact that Ibrahim and Abdelreheem (2015) collected their data after mid-year holidays which could have resulted in students feeling more rested after their mid-year break. It is also interesting to note that the aforementioned study observed a higher depression prevalence than anxiety prevalence among their sample whereas the converse is true of the current study. Moreover, the anxiety prevalence of the current study was

also similar but lower to the prevalence of 68.4% of the Moroccan adult population (Elbinoune *et al.* 2016). This could be due to the fact that both samples measured depression in participants with neck pain and had a similar research design. In this study it is noted that there was a higher anxiety than depression prevalence among participants with neck pain. This trend was also observed in the current study. Additionally, the anxiety prevalence of this sample was also higher than that of the collective students sample prevalence of 41.8% found across seven universities in the United Kingdom (El Ansari and Stock 2011). As mentioned previously with the depression prevalence for El Ansari and Stock (2011), the lower anxiety prevalence in this sample could be attributed to a much larger sample size which measured prevalence over a number of years of study, and over a 12 month time frame. Again, these three studies mentioned above all used different instruments of measurement and prevalence was not quantified by severity rating in each, making it difficult to report meaningful comparisons. In this light, anxiety ratings of the current study will also be contrasted in the following paragraph to published studies which utilised DASS.

When comparing the anxiety severity ratings of the current study to that of DASS published literature (Table 2.8), was observed that the moderate severity rating of the current study was higher (more severe) than: the 1st year psychology students with a sample size of 117 and a mean age of 19.3 (Szabó 2011), both Australian samples with an age range of 18 to 24 (n = 102) and 25 to 90 (n = 395) in a study on the general population (Crawford *et al.* 2011), the younger adolescents (mean age = 12.75) and older adolescents (14.46) in a study conducted by Szabó (2010) with sample sizes of 238 and 246, respectively, and an early study conducted on 1st year psychology students (with a mean age of 21.0 and a sample size of 717) by Lovibond and Lovibond (1995a), the authors of the DASS. All these studies reported a normal severity rating among their samples. This pattern was consistent with that found in the depression severity ratings mentioned above and the same reasons provided for the differences observed in the depression severity ratings above could account for this observation seen in the anxiety ratings.

However, the same cannot be said for the observation between the current study and that conducted by Bayram and Bilgel (2008) who observed a mild severity rating for

anxiety among their sample which is lower than that observed in the current study. While both studies sampled participants from developing nations with a similar mean age, the sample in the study conducted by Bayram and Bilgel (2008) did not necessarily have neck pain.

5.2.3.1.3 Stress

A high prevalence of stress symptoms (53.6%) was observed among the sample, which related to a mild severity rating when interpreted against the severity rating template of DASS-21 provided in Table 3.4. A statistically significant association was found between neck pain and stress in this sample (p = 0.009) as well as a number of stressors being highlighted (transport protests, student protests, financial aid, upcoming tests) causing increases in stress to varying degrees. Moreover, positive correlations were observed between the aforementioned stressors which implied that participants were most likely to answer similarly in these isolated variables above (i.e. participants who reported high stress levels associated with transport protests were also observed to report high stress levels associated with student protests and upcoming tests, and so on). This was particularly interesting to note in the positive relationship observed between stress associated with student protests and the stress levels measured by DASS-21. However, this significant correlation is not surprising given that the data was collected immediately after the student protests and DASS-21 stress was specific to symptoms of stress over the past week. These highlighted stressors are also not surprising considering that NSFAS tuition rates and transportation are known to be common roots of student protests (Student protests in democratic South Africa 2015). It is interesting that stress was the only psychological risk factor where a significant association was observed with neck pain, given that the association between stress and neck pain was least commonly observed in the reviewed literature, with the major focus commonly being on depression and anxiety (Côté *et al.* 2004; Leijon, Wahlström and Mulder 2009; Muchna 2011; Shahidi, Curran-Everett and Maluf 2015; Elbinoune *et al.* 2016).

When contrasting the prevalence of stress among this sample to the prevalence observed in the literature, it was found to be lower in the current study than stress prevalence reported among first (66.3%) and second (67.9%) year medical students

at a medical school in Pakistan (Shah *et al.* 2010). This discrepancy could be a result of the school being an international school which is part of a military hospital. This environment and the vast array of students with varying backgrounds is different to that of the current study. Furthermore, the DASS-21 stress prevalence in the current sample was significantly higher than the level of overall burden (referred to as stress) of 15.1% reported among the United Kingdom students (El Ansari and Stock 2011). Additionally, El Ansari and Stock (2011) also measured various stressors among the students. Two of their identified stressors "exams, assignments, presentations" and "financial situation" with stress prevalence reporting of 44.7% and 30.5%, respectively, align with two of the Likert scales from the current study (Table 4.19) which measured upcoming test stress (99.0%) and financial aid stress (82.5%). However, it can be seen that the stress prevalence was still significantly higher in the current study comparatively. A plausible explanation for this is the contrast between developed and developing nations, which suggests that these stressors are more of a concern in developing populations such as the one in the current study, than they are in developed populations such as the one in the population studied by El Ansari and Stock (2011). As mentioned in the aforementioned depression and anxiety discussion, observations such as those made above in relation to the comparison between stress prevalence among the various studies need to be made with caution as these prevalence rates have not determined severity and impact of the stress.

The following comparisons are between the stress severity of the current study in relation to a few published studies that also used DASS (Table 2.9). The same pattern was observed between stress severity ratings of the current study in relation to the published studies as was observed for depression and anxiety severity ratings. This pattern is that the mild stress severity of the current student was higher than that of certain published studies (Lovibond and Lovibond 1995a; Szabó 2010; Crawford *et al.* 2011). However, a new pattern has emerged surrounding the remaining published studies in that the stress severity rating of the current study was comparable to the mild severity rating of Szabó (2011) and Bayram and Bilgel (2008).

Therefore, considering the selected psychosocial risk factors discussed above, it has been observed that although there were high prevalence values reported for depression (59.8%), anxiety (68.1%) and stress (53.6%) among this sample, the

impact of these risk factors is classified as mild for depression and stress, and moderate for anxiety. Both the prevalence and severity reported in the current study differs from most of the literature demonstrating a higher impact of these conditions compared to this sample (Lovibond and Lovibond 1995a; Szabó 2010; Crawford *et al.* 2011). Moreover, although anxiety was classified as having a higher severity relative to depression and stress in this sample of participants with neck pain, the only statistically significant association that was established was that between stress and neck pain. Additionally, other statistically significant positive relationships were observed between the identified stressors within the sample. Generally, when comparing the DASS-21 severity ratings to that of published DASS literature, these psychosocial variables were higher than most, indicating comparatively higher levels of severity in these psychological variables in the sample of the current study.

5.2.4 The Degree of Association Between the Demographic, Socio-Demographic and Psychosocial Risk Factors with the Neck Pain

Here, the selected possible demographic and socio-demographic risk factors are discussed in relation to their association with neck pain and based on the questionnaire results which were presented in Chapter 4. Once these elements have been discussed the discussion focus shifts from looking at these elements in isolation towards the observed effect of these elements combined with the psychosocial elements and their association with neck pain. This is followed by discussing the identified independent risk factors of neck pain as a result of this process.

5.2.4.1 The Demographic Profile of the Neck Pain Sufferers

These results are reported in Table 4.22.

5.2.4.1.1 Age

Neck pain prevalence displayed a negative relationship with the age of the participants with those aged between 18 to 21 years reporting the highest prevalence. Furthermore, a statistically significant association was determined between age and neck pain (p = 0.036). However, when noting this significance, one must take cognisance of the 8.1% (n = 11) of the participants who did not report their age. This percentage of missing values is not ideal and could have influenced this

association. When this association is taken at face value it differs from the associations reported in certain published studies that neck pain is likely to be associated with older individuals particularly between the ages of 30 to 50 years (Ndlovu 2006; Hogg-Johnson *et al.* 2008; Slabbert 2010; Muchna 2011; Peterson, Bolton and Humphreys 2012), but is comparable to the observation reported by Skillgate *et al.* (2012) who reported that younger individuals are more at risk for developing neck pain. Due to the missing values reported above, it is difficult to make reliable or noteworthy assumptions regarding the observed associations.

5.2.4.1.2 Gender

There was a higher prevalence of neck pain among female participants (67.4%), however this higher prevalence did not equate to a statistically significant association between neck pain and the female gender. This is likely to be due to the fact that the higher prevalence reported in the female gender was only because the total sample (n = 135) had more female participants (n = 88) than it did male respondents (n = 45), with two participants (1.5%) not reporting their gender. So, comparatively the prevalence difference (between the participants who did have neck pain and those who did not have neck pain) was equal among the gender groups (females: 67.4% to 63.2% = 4.2%; males: 36.8% to 32.6% = 4.2%). This observation adds to the lack of certainty observed in the literature surrounding the impact of gender on neck pain (Guez *et al.* 2002; Côté *et al.* 2004; Fejer, Kyvik and Hartvigsen 2006; Hogg-Johnson *et al.* 2008; Carroll *et al.* 2009; Hellstenius 2009; Hanvold, Veiersted and Wærsted 2010; Slabbert 2010; Van Eerd *et al.* 2010; Muchna 2011; Skillgate *et al.* 2012). This observation differs from the general trend of the studies referenced above which reported the female gender as being at higher risk for neck pain. Considering the local studies, the observations of the current study differs from those of Muchna (2011) who observed that Indian males had a greater risk of neck pain than Indian females and Slabbert (2010) who reported that White females were at greater risk of neck pain than White males. A plausible reason for these discrepancies could be that the currents sample included participants of all ethnic backgrounds, whereas, these studies were isolated to the Indian and White population groups of the greater Durban area.

5.2.4.1.3 Ethnicity

The majority of the participants with neck pain were Black participants (58.8%) and Indian participants (29.9%), however, ethnicity was not found to be significantly associated with neck pain. This differs from Muchna (2011) and Slabbert (2010), for the same reason mentioned for gender observations. Additionally, Hogg-Johnson *et al.* (2008) reported that in their review of the literature on the burden and determinants of neck pain, there were no studies suggesting that neck pain is influenced by ethnicity.

5.2.4.2 The Socio-demographic Profile of the Neck Pain Sufferers

These results are reported in Table 4.23.

5.2.4.2.1 Mode of Transport

Walking was the most common mode of transport used among the participants (63.2%) but this and other modes of transport were not considered to be significantly associated with neck pain in this sample. This might be due to the fact that some studies have reported exercise to be a protective factor for neck pain and the majority of the sample walked to and from campus, so this mode of transport is also considered exercise (Larsson, Søgaard and Rosendal 2007; Slabbert 2010). However, this cannot be definitively concluded. This lack of significant association differs from the results of a study within the systemic review of Hogg-Johnson *et al.* (2008) which found the use of motorcycles to be significantly associated with neck pain.

5.2.4.2.2 Faculty of Health Sciences Programme

Of the eight Health Sciences programmes that were randomly selected and sampled, the highest prevalence of neck pain was observed among the Diagnostic Radiography students (23.1%). However, there was no significant association found between the programme of study and neck pain. It must be noted that three participants (3.1%) did not disclose their programme of study. A plausible reason for the lack of association could be that participants who participate in theory and clinically based subjects (typically those in years higher than first year in Health

Sciences programmes) might be more at risk than students who participate predominantly in theory based subjects (such as the first-year students in the current study). Additionally, this lack of association could imply that the programme itself does not increase the risk of neck pain, but rather the type of subjects taken and the nature of the coursework. It was difficult to compare this characteristic to other studies, as they mainly sampled a variety of years of study as well as Health Sciences and non-Health Sciences programmes (Hanvold, Veiersted and Wærsted 2010; El Ansari and Stock 2011; Kanchanomai *et al.* 2011; Vijay and Ide 2016). This was a delimitation of the study which will be discussed further in the following chapter.

5.2.4.2.3 Financial Aid

The descriptive results (Table 4.5) of the current study showed that 98.5% of the participants relied on financial assistance for their tertiary education and securing this financial aid was a source of high stress prevalence among these individuals, as seen in Table 4.19 and discussed earlier under stress. When analysing these results further it was seen that the participants mostly received financial aid from "private" bursars. This group of bursars was made up of parents, grandparents, siblings, extended family members, and friends. While financial aid was determined to be significantly associated with stress among these individuals, no significant association was observed between financial aid avenues and neck pain, although the *p* value of 0.074 for this association is not far from the statistically significant cut off of 0.05. This observation is difficult to compare with observations in the literature as the studies that have reported a significant association between financial background and neck pain have used different measures of financial stability, such as income and employment rate; with the association being in those of a lower income bracket and mixed reports of varying employment status (Ndlovu 2006; Hogg-Johnson *et al.* 2008).

5.2.4.2.4 History of Neck Injury

The questionnaire enquired extensively about the participants' history of bodily injury, with the raw data being further summarised into whether the participant had ever experienced injury to the head and neck region. A significant association was

observed between the prevalence of head and neck injury and neck pain (p = 0.044). This is consistent with the literature which also reported observing an association between these variables (Hogg-Johnson *et al.* 2008; Slabbert 2010). However, the association observed in the current study differed from the usual trend observed in past literature in that it was observed in the current study that the majority of the participants did not have a history of head and/or neck injury, but they still had a high prevalence of neck pain. In past studies, the association between these two variables was that participants who had a history of head and/or neck injury were also likely to have neck pain (Hogg-Johnson *et al.* 2008; Slabbert 2010).

5.2.4.2.5 Smoking

A low prevalence of (16.6%) was found in this sample with regards to the smoking of tobacco, with only 11.3% of these participants being smokers and having neck pain. Furthermore, there was no significant association observed between current smoking and neck pain for this sample which is consistent with the lack of certainty in the literature of the association between tobacco smoke and neck pain (Hogg-Johnson *et al.* 2008).

5.2.4.3 The Combined Association of the Selected Risk Factors with Neck Pain

By this point, we have an idea of the association between various demographic, socio-demographic and psychosocial associations with neck pain in this sample, which can or cannot be generalised to the population at large, in relation to neck pain. However, these associations, while important to note, do not account for whether these factors are independent risk factors for neck pain or not. In order to determine this, a Binary Logistic Regression analysis was conducted which allowed for all 11 selected risk factors discussed previously (statistically significant or not) to be entered into one regression model. Of the 11 selected risk factors that were entered into the model in the first step, only one variable remained as an independent risk factor for neck pain. This variable was DASS-21 stress which yielded a p value of 0.023 and an odds ratio of 1.1 which indicated that participants who had stress were 1.1 times more likely to have neck pain than those participants who did not. As mentioned earlier, this observation of stress being the only independent risk factor, is interesting in that this has not been a common finding in

the reviewed literature and it differs from Elbinoune *et al.* (2016) who reported anxiety to be independently associated with neck pain disability and depression to be independently associated with cervico-brachial neuralgia.

5.3 CONCLUSION

To summarise the important points of this discussion, it can be said that, based on the significant associations observed in the results of the current study, the following is true of the population regarding the selected demographic, socio-demographic, and psychosocial risk factors and neck pain: participants who are younger in age are more likely to have neck pain than participants who are older in age, participants with no history of head and neck injury are more likely to have neck pain than participants with a history of head and/or neck injury, and stress is an independent risk factor for neck pain with participants with symptoms of stress being 1.1 times more likely to have neck pain than participants with no symptoms of stress.

CHAPTER 6 : CONCLUSION

6.1 INTRODUCTION

This final chapter highlights the significant findings in each objective in an evaluation of the research study. It then creates an understanding of these findings by placing them within the scope defined by the delimitations and limitations of the current study. Moreover, it offers a reflection on the research process by providing a subjective account of the researcher's experience throughout. It is from this holistic assessment of all aspects of the research process that a conclusion will be drawn in order to provide a succinct summary of the results of the current study in their appropriate context.

6.2 EVALUATION OF THE RESEARCH

Here, an evaluation of the current study is provided by assessing whether the objectives have been met in light of the aims defined for the study.

6.2.1 Aims

The current study aimed to determine the prevalence and psychosocial risk factors of neck pain in first year FHS students at DUT. It furthermore aimed to determine the associations between neck pain presentation, demographic characteristics, socio-demographic and psychosocial risk factors among these students. For the purpose of fulfilling these aims it was believed that a quantitative, descriptive, cross-sectional survey design would be most appropriate in that it would provide the necessary insight into the demographic, socio-demographic and psychosocial contexts of these students and allow for observations of the extent to which these contexts influence neck pain, if at all. The lifetime prevalence of neck pain among the participants was 72% and the one week prevalence was 64.4%. Both prevalence values were considered comparatively high, but with an overall low impact. While, age, a history of head and/or neck trauma, and stress was observed to be significantly associated with neck pain prevalence, stress was the only independent risk factor identified.

6.2.2 Objectives

Objective one sought to determine the prevalence of neck pain in the registered first year FHS students at the DUT. The participants were recruited from the Durban campuses in Kwa-Zulu Natal, as these campus sites are the main hub of the FHS programmes at DUT. **Through the analysis of the primary data, the lifetime prevalence of this sample was high.** In addition, the one week neck pain prevalence of 64.4% was also determined. Both of these prevalence values were established to be high relative to the published literature.

Objective two established the characteristics of the neck pain in order to understand the relationship that existed between the prevalence value determined in objective one contrasted with its apparent impact in this sample. While relatively high prevalence values were observed in objective one, when the neck pain was quantified by its characteristics in objective two **the observation was that the overall impact (intensity, frequency, duration and functional limitations etc.) of this neck pain were apparently low.** Furthermore, a pattern emerged in the observation of the primary data, which displayed a decreased tendency of neck pain sufferers to seek professional diagnosis and management of their condition. This overall pattern of a high prevalence with a low impact was also consistent with some of the literature. Although it appeared that neck pain disability was much lower in this sample than has been reported worldwide.

Objective three was to determine the psychosocial risk factors of the first year FHS students at DUT who were suffering with neck pain. Through an analysis of the primary data and the application of various statistical techniques, **it was established that symptoms of depression, anxiety and stress were high among the neck pain participants; however, the severity of these symptoms were mild (for depression and stress) and moderate (for anxiety).** The prevalence and severity of the psychosocial risk factors was generally higher in the current study when compared to the literature. Moreover, the only significant associations of the psychosocial risk factors with neck pain was stress with an important statistically significant positive relationship being highlighted between the stress associated with student protests and the level of stress measured by DASS-21. This implies that the stress caused by the recent student protests correlated with levels of stress reported

in DASS-21, which was found to be associated with neck pain.

Objective four was the last objective which sought to determine the association between the demographic characteristics, socio-demographic and psychosocial risk factors in the first year FHS students at DUT in relation to the neck pain they presented with. By analysing the primary data and applying certain statistical techniques, it was determined that age was the only demographic association with neck pain (however it is cautioned that this association must be interpreted bearing in mind the missing values) and a history of neck injury was the only socio-demographic association with neck pain. Once these associations (significant and non-significant) had been established, they (together with the selected psychosocial risk factors) were entered into a Binary Logistic Regression Analysis in order to determine if any of these 11 variables were independent risk factors for neck pain. **Of the 11 variables the only independent risk factor identified was the level of stress measured by DASS-21**. These results provided valuable insight into the nature of the demographic (age), socio-demographic (head and/or neck injury) and psychosocial (stress) associations of neck pain, with stress being determined as an independent risk factor. This is useful information for the participants, lecturers, health care providers, and the institution at large. This insight calls for due acknowledgement of the relationship which exists between stress and neck pain and, furthermore, a more extensive investigation of the highlighted stressors (transport protests, student protests, and upcoming tests) among the first year FHS students of the DUT is required if one is going to effectively address the co-morbidity of stress and neck pain which exists in this population.

6.3 RESEARCH DELIMITATIONS and LIMITATIONS

As mentioned in Chapter 3, there were several delimitations and limitations within the current study. These are outlined below in relation to their observed impact on the results of the current study.

6.3.1 Delimitations

The delimitations were set by the researcher in order to refine the topic and to keep within the projected budget and time constraints. The first delimitation was the

researcher only selecting first year FHS students at DUT. While it might have been ideal for the study to be inclusive of the higher years of study, this would not have been practical or affordable for the researcher as some FHS programmes have as many as seven years of study. Furthermore, repeating first-year students (i.e. students who had re-registered for first year in 2016 due to previously failing first year) and students who had previous higher education experience (i.e. had studied another degree before) were excluded from the study as it was anticipated that these participants might have skewed the results had they been included due to the fact that this was not their first experience of first year. For the purpose of this research, it was more important for the researcher to attempt to get an objective feel for the factors at play in the demographic, socio-demographic and psychosocial contexts which were unique to first time first year students. This line of thinking was informed by observations which were made in the review of the current literature (Wolf *et al.* 1991; Thawabieh and Qaisy 2012).

The second delimitation was limiting the study to one independent variable which was neck pain. While there is a host of prevalent musculoskeletal conditions, the topic was refined to focus on the condition of neck pain only. Had more than one condition been the main focus, this could have resulted in an overwhelming volume of results which might have detracted from the overall value or contribution of the research. The selection of neck pain as the main condition of focus was based on the reported prevalence and impact of the condition within the literature (Côté, Cassidy and Carroll 1998; Fejer, Kyvik and Hartvigsen 2006; Hogg-Johnson *et al.* 2008; Tsang *et al.* 2008; Hanvold, Veiersted and Wærsted 2010; Hoy *et al.* 2010; Hoy *et al.* 2014) coupled with it being named one of the primary causes of disability worldwide (Murray *et al.* 2013b). It was along this same line of thought that the researcher limited the number of dependent variables measured in the socio-demographic and psychosocial contexts of the students. These selected variables were based on the common risk factors highlighted in the literature to have established associations with neck pain and/or a high prevalence in the general population, and particularly pertaining to the student population in some instances (Lovibond and Lovibond 1995a; Bayram and Bilgel 2008; Szabó 2010; Crawford *et al.* 2011; Szabó 2011; Ferrari *et al.* 2013; Khan and Chew 2013; Elbinoune *et al.* 2016; Lei *et al.* 2016).

The fourth and last delimitation was in the selection of the design of the research and the sampling strategy. A quantitative, descriptive cross-sectional survey was believed to be the design most suited to achieving the aim and objectives of the study, and was conducted in a two stage cluster approach. This design was chosen as it was also utilised in other studies with similar aims and objectives (Venketsamy 2007; Shah *et al.* 2010; Slabbert 2010; El Ansari and Stock 2011; Muchna 2011; Ibrahim and Abdelreheem 2015; Elbinoune *et al.* 2016).

6.3.2 Limitations

Throughout the study there were limitations of the study which presented and provided challenges for the researcher. Although these limitations were not within the control of the researcher it is important that they are mentioned as well as their effect on the results of the study.

The first limitation was due to the nature of the chosen research design. Although it is still believed that this design was best suited to research of this nature, it was limiting in that it was only able to determine association or correlation between the independent and dependent variables. The result of this is that assumptions cannot be made about which came first (i.e. "cause and effect"). The statistical analysis is limited in that it can demonstrate a relationship to exist between neck pain and stress, but it falls short in determining whether neck pain is a result of stress or the converse.

The second limitation was the climate (as a result of the recent student protests) during the data collection process of the study and the challenges that emerged as a result. The extent of the impact of this climate had a knock-on effect because it created an atmosphere of uncertainty and possible distress among the participants. The escalated violence and uncertain outcome led to the suspension of the academic programme which resulted in the originally planned data collection dates being delayed by a number of weeks. This meant that, with the close of the academic year looming, data could only be collected in the weeks leading up to (and including) final tests and examinations for the academic year. This new period of data collection was not ideal for the following reasons: the students were preoccupied with the tests and examinations, and contact time was limited due to lecturers needing to make up for

lost lecture time. This affected the response rate as a number of the students were, as a result, reluctant to participate in the research. It also affected the quality of responses of some of the NPQs (n = 12) which had to be excluded due to the significant amount of missing data within the NPQs (as explained in Chapter 3). Unfortunately, due to budget and time constraints, it was impossible for the researcher to wait for the following academic year to conduct data collection, especially considering that the study ideally needed the first-year students to have had "enough" of an experience of first year to be able to measure the associated impact of the first year environment. Moreover, the study required all of the participants to have experienced the same first year environment (i.e. it was not possible to collect some data in 2016 and the rest of the data in 2017). While these conditions are not ideal, it has to be noted that the occurrence of student protests (and other forms of protest) at DUT and in South Africa at large are not uncommon, with protests sometimes occurring as often as twice in one academic year. This then provides some value to the data being collected at such a time, however, it remains important for the results to be interpreted accordingly. Some relatively interesting points to consider in order to have a clearer understanding of the nature and effect of these protests include the following: the motivation of the student protests were mainly rooted in a request for equality and better provision for students (i.e. affordable education, affordable and liveable residency, affordable transportation etc.) generally led by students subjected to structural inequality who have experienced unmet expectations, bearing in mind that the first-year students sampled may or may not have been a part of these student protests.

For the students who participated in these protests one needs to understand the possible impact of these structural inequalities on a student's general and psychosocial well-being. Furthermore, one needs to understand that these protests are a struggle in all senses of the word. The requests are frequently denied and protests often turn violent. All of these factors could lead to heightened levels of distress, possible injury, and/or arrest of these individuals.

The students who do not participate in the protests may experience heightened levels of distress for completely different reasons. This may be the first time some of these students have come face to face with protests of this nature. Some students

may fall victim to intimidation and violence.

Regardless of whether a student is a protester or not, both end up in a similar position of an increased and rushed work load as a result of the lecture time lost during the protests. However, some may have the compounding effect of still being in a position of structural inequality with unmet needs and expectations. So, taking cognisance of the above was of particular importance when interpreting the results of the research.

The last limitation of the study was the structure of the NPQ. The chosen quantitative paradigm of research dictated this limit. The effect of closed ended questions and quantitative scales is that there are limited solid conclusions that can be made about the results and it is often the case that the researcher (and the reader) is left with unanswered questions about why certain relationships exist. This being said, it is believed that there is value in research which is descriptive with a cross-sectional design (particularly in an under-researched population), in that the results provide a starting point which provides an overall feel for the general characteristics of a population and may highlight areas of interest for further research.

6.4 RECOMMENDATIONS

When nearing the end of the research process and in the evaluation of this process, several ideas come to mind about how the study could have be done differently, how the current research could be built upon to increase the body of knowledge in this area, how the results of the study could be used to build on the support structures in order to benefit the students, and the direction future research could take based on the study results and the apparent paucity in the literature of research of this nature in South Africa. In light of this, a few recommendations have been made below for further research, for DUT, and for the chiropractic profession.

6.4.1 Recommendations for Further Research

Now that there is a general idea of the challenges and types of stressors among the first year FHS students at DUT, the researcher proposes that further investigation into these stressors would add great value to understanding the relationship that exists between stress and neck pain, specifically in this population, as well as further

investigation into the high prevalence of neck pain (71.9%); and the symptoms of depression (59.8%), anxiety (68.1%) and stress (53.6%) among these individuals. It might be of use, to apply a different research paradigm and design (such as a case-control or cohort study) to investigate the bidirectional relationship which exists between neck pain and stress although this may require one to identify specific timelines of these conditions prevalence.

The results of the study provided insight into the prevalence of neck pain and its associations within the demographic, socio-demographic and psychosocial context of the first year FHS students at DUT. However, the data of the current study was collected at the end of the academic year and in a climate of possibly heightened distress. It would be interesting to compare research results of a study conducted at a different point in the academic year.

Considering the seemingly sparse body of research on South African students enrolled at tertiary level education, this research could be conducted among the higher years of study within the FHS, on other first-year students from other faculties within DUT, or even other universities and/or institutions in South Africa in general in an attempt to fill the gap in the literature.

6.4.2 Recommendations for the Durban University of Technology

It has become apparent in this study that the first year FHS students at DUT face many challenges within their demographic, socio-demographic and psychosocial environments. The full extent to which these challenges interfere with their personal, academic and professional growth is not known at this stage due to the limitations of this study. However, the study has been able to highlight the following areas of potential concern:

- The financial background: 98.5% of the participants are reliant on some form of financial aid, with securing this financial aid being a stressful activity (in varying severity) in 83.7% of these students. The National Student Funding Scheme was the second highest financial aid stressor (20.9%) among the participants, as was the amount of stress caused by trying to secure financial aid through promised bursaries (20.9%), with financial reliance on parents being the highest source of stress (25.2%). Furthermore, an alarming

percentage of the participants (59.3%) stated that the financial aid they receive is insufficient for their needs, with 37.0% of the participants not always having enough money to buy food.

- Education: there was a high percentage of participants (40.7%) who felt that high school had not prepared them adequately for university and 45.9% of the participants reported that they experienced some level of difficulty learning at an English medium institution due to English not being the first language. Additionally, a large portion of the participants feel that they are not coping with their academic load (42.2%) with 91.1% experiencing moderate to extremely high increases in stress levels right before a test.
- Emotional well-being: 42.2% of the participants reported that the emotional support they received was insufficient for their needs. Furthermore, there is a seemingly high prevalence of depression (59.8%), anxiety (68.1%), and stress (53.6%) among participants with neck pain. These symptoms are still mild and moderate in severity at this point.

Further investigation is needed into creating better awareness of the health care services available at DUT, and understanding why DUT students are not utilising these facilities, specifically the Chiropractic Day Clinic which is situated on Ritson Campus which is the main hub of the FHS programmes. A plausible reason for this, based on the apparent financial instability of the students, could be an issue of affordability. If this is the case, a suggestion would be for DUT (and the Chiropractic Day Clinic) to look into making treatment freely available for its students to ensure that it is an accessible service for its students by removing this possible financial barrier. While the Chiropractic Day Clinic does offer reduced rates for DUT students, for some, particularly those who reported not always having enough money to buy food, this reduced rate might still be too much.

In highlighting these areas of concern and risk providing greater insight into the challenges facing first year students, the researcher hopes that this will encourage DUT management to facilitate the physical and emotional growth of their students by addressing these areas and creating better awareness of the magnitude of support services that DUT has to offer, while making these support structures more accessible to the students (Student services and development 2015).

6.4.3 Recommendations for the Chiropractic Profession

It can be seen that one cannot take a condition such as neck pain at face value. It needs to be understood in relation to its many layers. This understanding of the factors at play are important for one's approach in the management of a condition. In the context of the current study, it can be seen that in the treatment of a first year FHS student with neck pain, it is important to understand the synchronous relationship the condition may have with stress. On the note of management, it was observed that only a small percentage of students had sought a diagnosis for their neck pain (9.3%) and while the majority of the students had attempted to manage their neck pain (69.1%) only a small percentage had sought to do so by means of alternative management methods, with only 5% of the students having included chiropractic in their management. This observation calls for greater professional awareness to be created about the benefits of chiropractic management in conditions such as neck pain, specifically in the student population.

6.5 CONCLUSION

This study concludes that a high prevalence of neck pain (71.9%) exists within the first-year student participants from the FHS programmes at the DUT, however, when quantified by the clinical characteristics of the neck pain it appears that this condition can be described as having a generally low impact or burden on these students. Furthermore, a high prevalence of depression (59.8%), anxiety (68.1%) and stress (53.6%) symptoms exists among the participants, which were also relatively low or moderate in severity but higher than most student populations observed in the literature. Moreover, while significant associations existed between neck pain and age (p = 0.036), a history of head and/or neck pain (p = 0.044), and stress (p = 0.009), the only identified independent risk factor for neck pain was stress (p = 0.023), as determined by a Binary Logistic Regression analysis. The finding in this case was that participants who displayed symptoms of stress over the past week were 1.1 times more likely to have neck pain than those students who did not have symptoms of stress. As discussed, the nature of this observation was limited in that it only indicated that a synchronous relationship existed between these variables, at this point in the academic year, but it could not ascertain which condition came first. It

was with this in mind that further recommendations were outlined for the direction of future research into this subject along with a number of recommendations for the institution and the chiropractic profession.

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APPENDICES

APPENDIX A: Neck Bournemouth Questionnaire

For the following questions which have been designed to find out about your neck pain and how it is affecting you, please **circle** the number for each question that relates to how you have felt over the past week.

1. Over the past week, on average, how would you rate your neck pain?

0 = No pain 10 = Worst pain possible

0 1 2 3 4 5 6 7 8 9 10

2. Over the past week, how much has your neck pain interfered with your daily activities (housework, washing, dressing, lifting, reading, and driving)?

0 = No interference 10 = Unable to carry out activity

0 1 2 3 4 5 6 7 8 9 10

3. Over the past week, how much has your neck pain interfered with your ability to take part in recreational, social, and family activities?

0 = No interference 10 = Unable to carry out activity

0 1 2 3 4 5 6 7 8 9 10

4. Over the past week, how anxious (tense, uptight, irritable, difficulty in concentrating/relaxing) have you been feeling?

0 = Not at all anxious 10 = Extremely anxious

_____

0 1 2 3 4 5 6 7 8 9 10

5. Over the past week, how depressed (down-in-the-dumps, sad, in low spirits, pessimistic, unhappy) have you been feeling?

0 = Not at all depressed 10 = Extremely depressed

_____

0 1 2 3 4 5 6 7 8 9 10

6. Over the past week, how have you felt your work (both inside and outside the home) has affected (or would affect) your neck pain?

0 = Has made it no worse 10 = Has made it much worse

_____

0 1 2 3 4 5 6 7 8 9 10

7. Over the past week, how much have you been able to control (reduce/help) your neck pain on your own?

0 = Completely control it 10 = No control whatsoever

_____

0 1 2 3 4 5 6 7 8 9 10

APPENDIX A1: Neck Bournemouth Questionnaire Permission

Gmail by Google

Giselle Gevers <gisellegevers@gmail.com>

Permission to use Neck Bournemouth Questionnaire

3 messages

Giselle Gevers <gisellegevers@gmail.com> Wed, Apr 15, 2015 at 11:06 AM
To: kim.humphreys@balgrist.ch, jbolton@aecc.ac.uk

Dear Prof. Bolton and Dr Humphreys

I am a 6th year chiropractic master's student at the Durban University of Technology.

I am in the research process and the title of my research is, "The prevalence of neck pain in registered first year health science faculty students at Durban University of Technology."

I am writing to you to ask your permission to include and / or adapt the Neck Bournemouth Questionnaire in the questionnaire that I develop for my research study.

I look forward to hearing from you.

Kind regards
Giselle Gevers

Jenni Bolton <JBolton@aecc.ac.uk> Wed, Apr 15, 2015 at 11:20 AM
To: Giselle Gevers <gisellegevers@gmail.com>
Cc: Humphreys Kim <kim.humphreys@balgrist.ch>

Dear Giselle

There is no licence for the BQ so you are at liberty to use the BQ as you wish.

Good luck with your study!

Best wishes

Jenni Bolton

From: Giselle Gevers [mailto:gisellegevers@gmail.com]
Sent: 15 April 2015 10:07
To: kim.humphreys@balgrist.ch; Jenni Bolton
Subject: Permission to use Neck Bournemouth Questionnaire

[Quoted text hidden]

APPENDIX A2: Neck Bournemouth Questionnaire Scoring

NECK BOURNEMOUTH QUESTIONNAIRE SCORING

The Neck Bournemouth Questionnaire is used mainly for comparative purposes.

The first step is to obtain a **Baseline Score** which is best done on the day of the initial examination. This is done by summing up the 7 individual scores (total maximum score = 70). This score is then later compared with **Subsequent Scores**.

Comparison of the Baseline Score with a Subsequent Score

Step 1: Sum up the 7 individual scores (total 70)

Step 2: Divide the raw change score with the Baseline Score and then multiply by 100.

(raw change score / baseline score) x 100

Example:

Suppose the Baseline Score was 60 and the Subsequent Score is 35.

(35 / 60) x 100 = 58.3

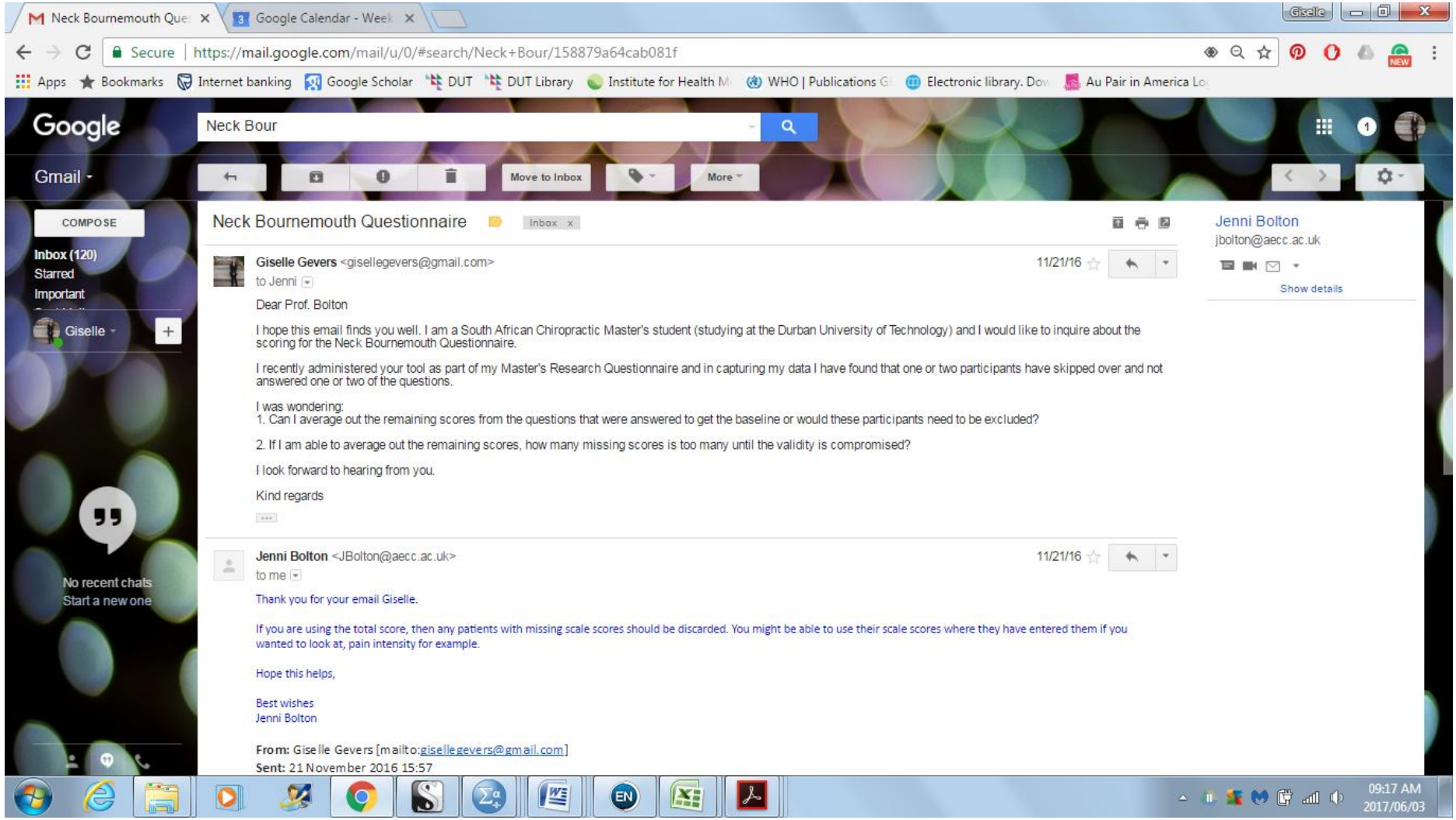
This means that there has been a 58.3% improvement from the Baseline Score to the

Subsequent Score.

Interpretation

Neck: 34% is estimated to be a clinically significant change for the neck.

APPENDIX A3: Neck Bournemouth Questionnaire Missing Data



APPENDIX B: Napier's Socio-demographic Questionnaire

Food and Nutrition Consumer Sciences

SOCIO-DEMOGRAPHIC QUESTIONNAIRE

This questionnaire covers certain aspects of your life, including work and personal details, health and illness, lifestyle and social life that is relevant to health. The answers to these questions will be kept strictly confidential and the information will not be identifiable on any reports or publications.

1. GENERAL INFORMATION

Participant number:……..……. Date: ……

Fieldworker name: ……

Please answer all questions by marking the correct answer with **X,** except where otherwise indicated.

Where do you live?

.....

2. PERSONAL INFORMATION

2.1 Your role in the family

Mother	Grandmother	Father	Grandfather	Other, specify……..

2.2 When were you born? Year: Month: Day:

2.3 How old are you? years

2.4 Gender:

Male	Female

3. ACCOMMODATION AND FAMILY COMPOSITION

3.1 Do you live in?

Town/City	Farm	Squatter camp	Rural village	Hostel	Township	Other, specify……..

3.2 How are you currently living?

Homeless	
Living with relatives	
Living with friends	
Hostel accommodation	
Squatter home	
Rented house/flat	
Own house/flat	
Employees Properties	
Other, specify…….	

3.3 Do other people live in the house with you?

Yes	No

3.4 How many people are permanent residents living in the house with you? (Only if these people eat and sleep in this house at least 4 days a week?)

1	2	3	4	5	6	7	8	9	10	10+

3.5 How long have you been staying permanent in this house?

< 1 year	1-5 years	>5 years

3.6 In what type of house are you staying?

Brick	Clay	Grass	Wood	Zinc/shack

3.7 How many rooms does your house have?

1 room	2 rooms	3 rooms	4 room	>5 rooms

3.8 Are there other houses/shacks within the same yard of the main house?

Yes	No

3.9 Do you have the following facilities/ services at home?

3.9.1 Water

Tap in the house	
Tap outside the house (in yard)	
Borehole	
Spring / river / dam water	
Fetch water from elsewhere	

3.9.2 Toilet facilities

None	
Pit latrine	
Flush / sewage	
Bucket system	
Other, specify…….	

Waste removal	Yes	No	3.9.3
Tarred road in front of house	Yes	No	3.9.4
Gravel road in front of house	Yes	No	3.9.5
Access to electricity	Yes	No	3.9.6

3.10 To what extent do you have problems with the state of your house (e.g. size, repairs, damp, etc.)?

……
……

3.11 Do you have problems with the following?

Mice/ Rats	
Cockroaches	
Ants	
Flees	
Mosquitoes	
Geckos	
Frogs	
Snakes	
Bed Bugs	

3.12. What is the floor inside your house made of?

Cement	
Tiles	
Carpet	
Dirt	
Sand/mud	
Dung	
Other, please state	

4. WORK STATUS AND INCOME

4.1. Are you currently employed?

Yes	No

If YES, go to Question 4.5.

4.2. If NO, how would you describe your current status (tick one box only)?

Unemployed	Retired	Housewife	Student	Other, specify……

4.3. Are you actively looking for paid employment at the moment?

Yes	No

4.4. How long have you been unemployed?

< 6 months	6-12 months	1-3 years	> 3 years

4.5. If YES (question 4.1) is your current job a:

Permanent position	Temporary position	Fixed term contract	Other, specify……..

4.6. Are you doing part time jobs as a second job on weekends and school vacations?

Yes	No

4.7 What is the exact title of your current job?
(Including self-employed)

4.8. What is the total income in the household per month?

R0- R500	R501-R1000	R1001-R1500	R1501-R2000	R2001-R2500	R2501-R3000
R3001-R3500	R3501-R4000	R4001-R4500	R4501-R5000	R5001-R6000	R6001-R7000
R7001- R8000	R8001- R9000	R9001- R10 000	>R10 000		

4.9. Please specify the monthly income in the household (if willing)……..

4.10 Do you receive any of the South African Government social grants?

Old age grant	Child grant	Disability grant	Foster grant

4.11. How often does it happen that you do not have enough money to buy food? for you and your family?

Always	Often	Sometimes	Seldom	Never

4.12. How many people e.g. partner, relatives & others (including yourself) contributed to your household income from any source, (including wages/salary from paid employment, money from second or odd jobs income from savings investments, pension, rent or property, benefits and or maintenance etc.) in the last 12 months?

People	0	1	2	3	4	5	6	7	8	9

4.13. How often do you buy food?

Every day	Once a week	Once a month	Other, specify……

4.14. Where do you buy food?

Tuck shop	Street vendor	Wholesalers	Supermarket	Other, specify……

4.15 What type of transport do you use to get around?

Taxi	
Bus	
Train	
Own car	
Bicycle/ Motorbike	
Other Specify	

4.16 How much money is spent on food PER MONTH? (Tick only one box)

R 0 – R 200	R 201 – R 300	R 301 – R 400	R 401 – R 500	R 501 – R 600	R 601 – R 700	R 701- R800	R801- 1000
R1001- R1200	R1201- R1400	R1401- R1600	R1601- R1800	R1801- R2000	>R2001		

5 EDUCATION AND LANGUAGE

5.1. What is your highest education level?

None	Primary	Standard 8	Standard	College/FET	Other post

	School		10		school

5.2 What language is spoken mostly in the house?

Zulu	Xhosa	English	Afrikaans	Other, specify……

5.3 How many children (in the household) have birth certificates?

None	1	2	3	4	5	6	7	8	All

5.4 How many children have completed their immunisation schedule?

None	1	2	3	4	5	6	7	8	All

5.5 Has any children in your household died in the past?

Yes	No

Reason: ……..

5.6 Number of children attending school

None	1	2	3	4	5	6	7	8	All

5.7 How do the children get to school?

Walk	Bus	Taxi	Parents car	Other, specify…….

Food practices in the household

Tick one block for every question:	Father	Mother	Sibling	Grandma	Grandpa	Aunt	Uncle	Cousin	Friend	Other
5.8 Who is mainly responsible for food preparation in the house?										
5.9 Who decides on what type of food is bought for the household?										
5.10 Who is mainly responsible for feeding/serving the children?										
5.11 Who is the head of this household?										

5.12 Who decides how much is spent on food?										

5.13 How many meals do you eat per day?

0	1	2	3	> 3

5.14 Where do you eat most of your meals?

Home	Friends	Work	School	Other, specify…….

5.15 Where do your children eat most of their meals?

Home	Friends	School	Other, specify…….

6. ASSETS

6.1 Does your home have the following items and how many?

	Yes
Electrical stove	
Gas stove	
Primus or paraffin stove	
Microwave	
Hot plate	
Radio	
Television	
Refrigerator	
Freezer	
Telephone/ Cell phone	
Bed with mattress	
Mattress only	
Lounge suite	
Dining room suite	
Electrical iron	
Electrical, kettle	
Car	
Bicycle	
Motorbike	

6.2 What type of fuel do you usually use for food preparation?

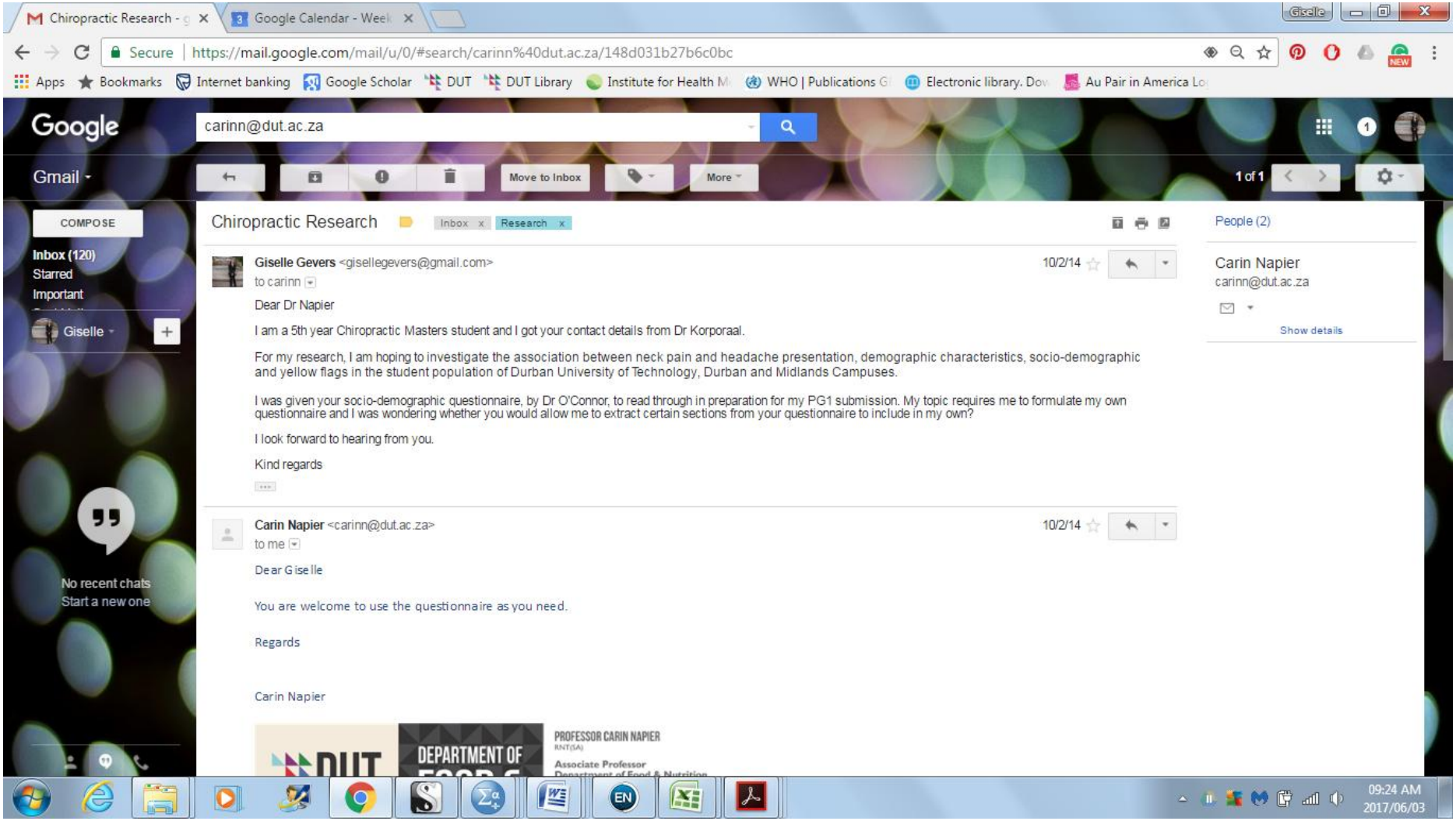
Wood fire	Paraffin	Electricity	Gas	Coal/Charcoal	Other, specify……

6.3 What type/s of material are your pots made off (tick all relevant options)?

Cast iron	Aluminium	Stainless steel	Clay	Other, specify……

Thank you very much for your co-operation. We appreciate the time

APPENDIX B1: Napier's Permission



APPENDIX C: Depression Anxiety and Stress Scale (DASS-21)

DASS21

Name: *Date:*

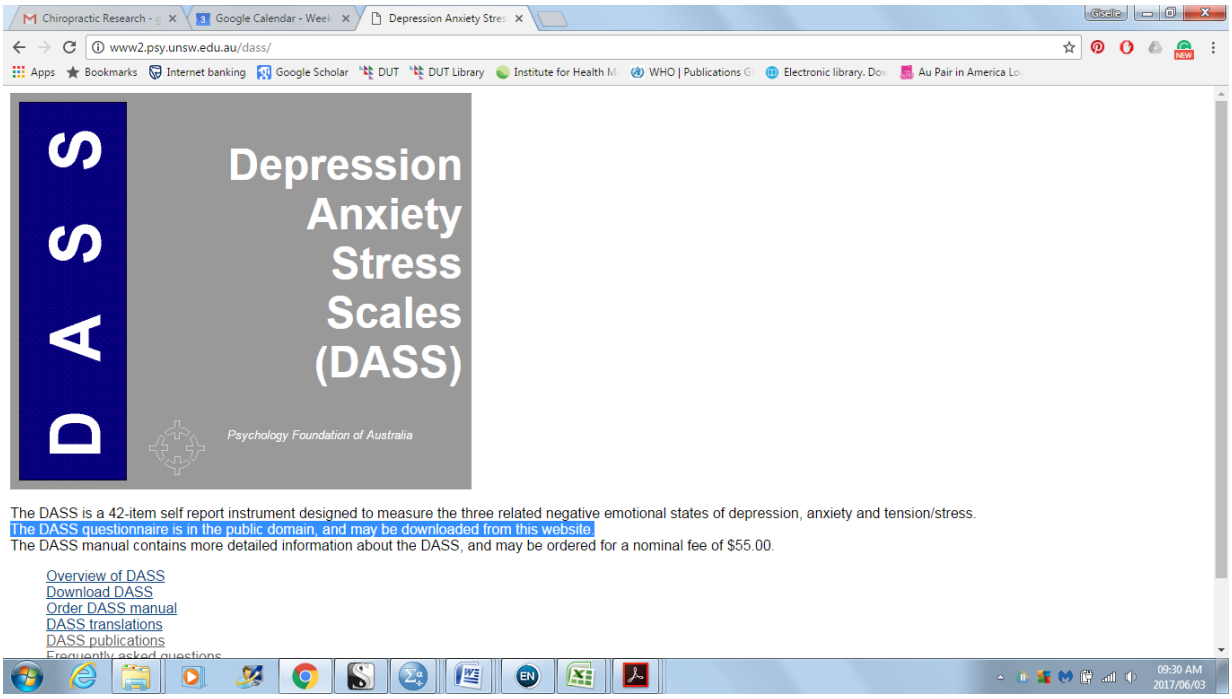
Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

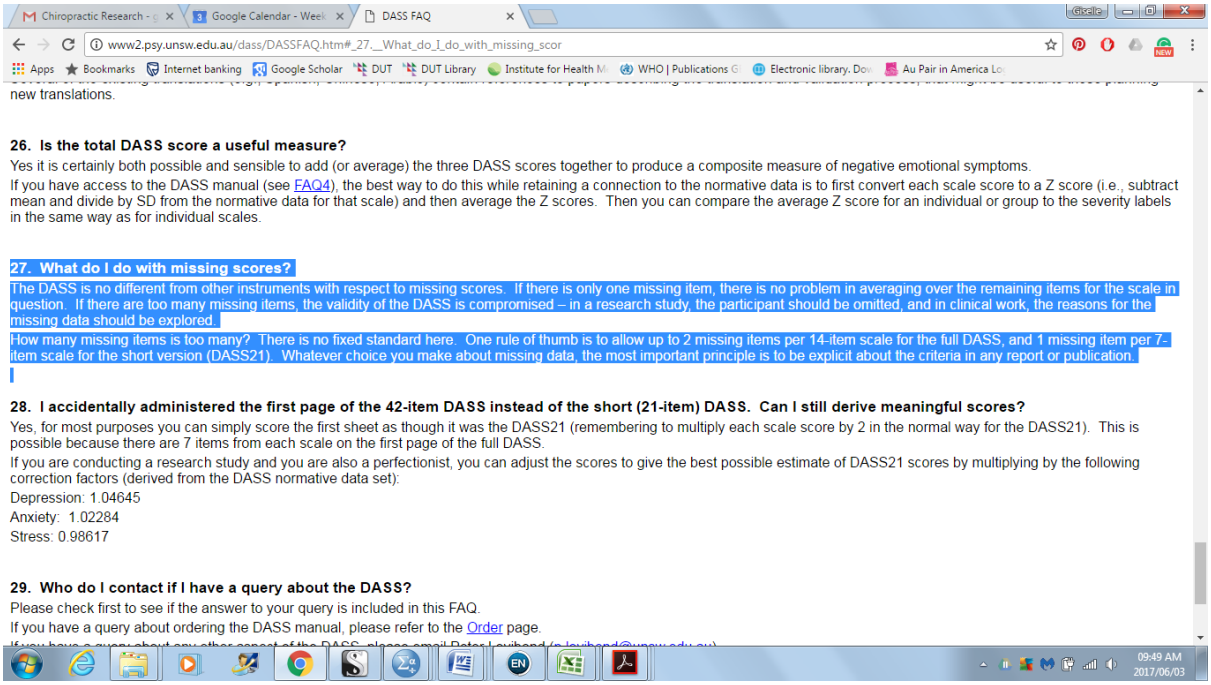
1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

APPENDIX C1: Depression Anxiety and Stress Scale (DASS-21) Permission



APPENDIX C2: Depression Anxiety and Stress Scale (DASS-21)

Missing Data



APPENDIX D: Focus Group Questionnaire

Please indicate the most appropriate answer by placing a tick ✓ in the box provided, or writing in your answer where applicable.

1.	Age:				
2.	Gender:	Female		Male	
3.	Ethnicity: (for statistical purposes)	African	Asian	Coloured	Indian
		White	Other, please specify:		
4.	Home Language:	Afrikaans	English	Xhosa	Zulu
		Other:			
5.	Are you fluent in English?			Yes	No
6.	What language is spoken mostly in the house?				
7.	Are you a registered full time Faculty of Health Sciences Student?			Yes	No
8.	Are you in first year for the first time?			Yes	No
9.	What course are you registered for?				
10.	How many dependants do you have (if any)?				
11.	Are you the breadwinner in your family?			Yes	No
12.	Please tick the most appropriate description of the area that you live in during term time:				
	Farm	Hostel	Rural Village	Informal settlement	Town / City
	Township	Other:			
13.	Please tick the most appropriate description of the area that you live in during holidays:				
	Farm	Hostel	Rural Village	Informal Settlement	Town / City
	Township	Other:			
14.	Please tick the most appropriate description that describes your current living situation:				
	Homeless	Hostel / Residence	Living with friends	Living with relatives	Own house / flat
	Rented house / flat	Informal Settlement	Other:		
15.	Are you doing part time job(s) on weekends & university holidays?			Yes	No
16.	If yes, please indicate, in the space provided, how many part time jobs you have (e.g. 2) and the nature of these jobs by writing a title for each (e.g. Waitress)				
17.	If you were previously doing part time work but are now unemployed, please state the reason for your unemployment.				
	I was fired	I resigned voluntarily	I was retrenched	I was not previously doing part time work	
18.	Do you feel pressured to have part-time job(s) while studying your degree?			Yes	No
19.	If yes, please state why you feel the need to have an income? (you may tick more than one box if appropriate)			To pay for my studies	To support my family
20.	To support my lifestyle	Other:			
21.	How long have you been unemployed for (if you were previously employed)? Write N/A if you have never been employed.				
22.	Would you consider your family to be under financial strain?			Yes	No
23.	Do you receive any of the following South African Government Social Grants?				

	Child grant	Disability grant	Foster grant	Other:	
24.	Does your family always have enough money to buy food?			Yes	No
25.	On average, how many meals do you eat per day?				0
	1	2	3	4	5
26.	What type of transport do you use to get around?				
	Bicycle / Motorbike	Bus	Own car	Taxi	Train
	Other:				
27.	How long (minutes / hours) does it take you to travel to and from DUT each day?				
28.	Do you ever skip lectures due to transport problems?			Very often	Often
	Sometime	Seldom		Never	

Please indicate the most appropriate answer by placing a tick ✓ in the box provided, or writing in your answer where applicable.

1.	Where do you study for your tests?					At a desk
	On a bed	On the couch	On the floor	Other:		
2.	How many days per week do you study for your tests?					
3.	How long are your study sessions?					
4.	What kind of light do you use when you study?					Candle light
5.	Electrical light	Lamp	Natural light	Other:		
6.	What is the most common position that your head is in while you are studying?					Head held in neutral position
7.	Head looking down	Head looking up	Head turned to one side	Other:		
8.	What is the most common position that your shoulders and upper back are in while studying?					
	Neutral / Straight back		Rounded back & shoulders			
9.	What is the most common position that your legs are in while studying?					
	Legs crossed	Legs straight in front of you		One leg under your buttock		
10.	Do you feel pain or itchiness in your eyes while studying?				Yes	No
	Do you take regular breaks while studying (roughly every hour)?				Yes	No
11.	What time of the day do you study?					
	Early morning	Midday – Afternoon	Night		All day	
12.	Are you ever cold and / or shivering when you are studying?			Yes	No	
13.	How many hours of sleep do you get on an average night?					
14.	How many hours of sleep do you get on a night when you are studying?					
15.	How many times do you exercise per week?					
16.	What type of exercise do you do?			Running	Swimming	
17.	Walking	Weights		Other:		
18.	Do you drink a lot of water (about 1L) per day?			Yes	No	
19.	Do you smoke?			Yes	No	
20.	If yes, roughly how many cigarettes do you smoke a day?					
21.	Do you ever experience neck pain?			Yes	No	
22.	If yes, has it been diagnosed by a practitioner in the medical field?			Yes	No	
23.	How do you manage your neck pain?				Stretch	
	Chiropractic Treatment	Heat Pack	Physiotherapy	No Management	Self-administered Massage	
24.	Do you wear a scarf when it is cold?			Yes	No	

25.	Do you ever study with the aircon directed at your neck?	Yes	No

Please read each statement and circle a number which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.					
The rating scale is as follows:					
0	Did not apply to me at all				
1	Applied to me to some degree, or some of the time				
2	Applied to me to a considerable degree, or a good part of the time				
3	Applied to me very much, or most of the time				
1.	I found it hard to wind down	0	1	2	3
2.	I was aware of dryness of my mouth	0	1	2	3
3.	I couldn't seem to experience any positive feeling at all	0	1	2	3
4.	I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5.	I found it difficult to work up the initiative to do things	0	1	2	3
6.	I tended to over-react to situations	0	1	2	3
7.	I experienced trembling (e.g., in the hands)	0	1	2	3
8.	I felt that I was using a lot of nervous energy	0	1	2	3
9.	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10.	I felt that I had nothing to look forward to	0	1	2	3
11.	I found myself getting agitated	0	1	2	3
12.	I found it difficult to relax	0	1	2	3
13.	I felt down-hearted and blue	0	1	2	3
14.	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15.	I felt I was close to panic	0	1	2	3
16.	I was unable to become enthusiastic about anything	0	1	2	3
17.	I felt I wasn't worth much as a person	0	1	2	3
18.	I felt that I was rather touchy	0	1	2	3
19.	I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)	0	1	2	3
20.	I felt scared without any good reason	0	1	2	3
21.	I felt that life was meaningless	0	1	2	3

The following scales have been designed to find out about your neck pain and how it is affecting you. Please answer ALL of the scales, and circle ONE number on EACH scale that best describes how you feel.

1. Over the past week, on average, how would you rate your neck pain?

No pain Worst pain possible

0 1 2 3 4 5 6 7 8 9 10

2. Over the past week, how much has your neck pain interfered with your daily activities (housework, washing, dressing, lifting, reading, and driving)?

No interference Unable to carry out activity

0 1 2 3 4 5 6 7 8 9 10

3. Over the past week, how much has your neck pain interfered with your ability to take part in recreational, social, and family activities?

No interference Unable to carry out activity

0 1 2 3 4 5 6 7 8 9 10

4. Over the past week, how anxious (tense, uptight, irritable, difficulty in concentrating / relaxing) have you been feeling?

Not at all anxious Extremely anxious

0 1 2 3 4 5 6 7 8 9 10

5. Over the past week, how depressed (down-in-the-dumps, sad, in low spirits, pessimistic, unhappy) have you been feeling?

Not at all depressed Extremely depressed

0 1 2 3 4 5 6 7 8 9 10

6. Over the past week, how have you felt your work (both inside and outside the home) has affected (or would affect) your neck pain?

Has made it no worse Has made it much worse

0 1 2 3 4 5 6 7 8 9 10

7. Over the past week, how much have you been able to control (reduce/help) your neck pain on your own?

Completely control it No control whatsoever

0 1 2 3 4 5 6 7 8 9 10

Thank you for taking the time to complete this questionnaire.

Your contribution is greatly appreciated!

APPENDIX D1: Focus Group Questionnaire Evaluation Form

Focus Group Questionnaire: Participant Comments

Q1	
Q2	
Q3	
Q4	
Q5	
Q6	
Q7	
Q8	
Q9	
Q10	
Q11	
Q12	
Q13....	
....last question of questionnaire	

APPENDIX D2: Letter of Information and Informed Consent for Focus Group Participants

Letter of Information and Informed Consent for Focus Group

Dear participant

I am a registered chiropractic master's student at the Durban University of Technology and I invite you to participate in the following focus group. All the relevant information about the research study and focus group can be found below. Please take some time to read through it to better your understanding.

The purpose of this focus group is to discuss the questionnaire, for this study, at length in order to fine tune and refine it. It is also part of the process of validating the questionnaire so that it can be used in the research study. I encourage you to discuss your thoughts freely along with the other participants during this focus group so that we can create an environment that stimulates the growth and development of this questionnaire.

Background to Study:

Neck pain has been shown to be highly prevalent in society in both developed and developing countries. It has been known to affect students in their studies and in daily life. Although it occurs commonly, the extent to which demographic, social and psychological factors contribute towards the development of neck pain is not yet fully understood.

Objectives of Study:

1. To determine the prevalence of neck pain in registered DUT first year Faculty of Health Sciences students.
2. To determine the characteristics (pain type, duration and intensity) of the neck pain
3. To determine the psychosocial risk factors of registered DUT first year faculty of health sciences students suffering with neck pain.

4. To determine the association between demographic characteristics, socio-demographic and psychosocial risk factors in the student population in relation to the neck pain that they present with.

Title of Research Study:

The prevalence of and risk factors for neck pain in first year Faculty of Health Sciences students, at the Durban University of Technology.

Researcher:	Ms Giselle Gevers	0766052761	B.Tech Chiropractic
Supervisor:	Dr Praveena Maharaj	0732567399	M.Tech Chiropractic
Co - Supervisor:	Prof. T. Puckree	031 373 2967	Ph.D

Outline of Procedures:

Before the focus group commences you will be required to:

- Read, understand and sign this letter of information which confirms your willingness to participate in this study. You are encouraged to ask questions about the process to better your understanding before you agree to participate.
- Read and sign a confidentiality statement, code of conduct and an informed consent form and understand what they entail.
- You will be given a copy of the pre-focus questionnaire and you will have time to read through it thoroughly and jot down any thoughts / queries you might have.
- I (the researcher) will read out the questions chronologically and after each question there will be time to discuss the question and its relevance to the study. Each member will have an opportunity to comment on each question and provide their views / insights.
- The focus group proceedings will be voice and / or video recorded for ease of editing of the questionnaire and to ensure that important points are not forgotten / left out.

Risks or Discomforts to the Participants:

There are no foreseeable risks to participation in this focus group.

Benefits:

Your co-operation would aid the expansion of literature and knowledge on neck pain. Furthermore, the outcomes of this study are expected to benefit the students in that the practitioners would be able to address more effectively those factors predisposing students to neck pain. It would also allow institutions of higher education to be able to address factors within the socio-demographic of the students that would enable the student to improve and develop personally based in their programme for which they are registered.

Reason/s why the Participant May Be Withdrawn from the Study:

The participant may withdraw from the focus group at any stage without any negative effect or repercussions on the participant.

Remuneration:

There will be no remuneration for participation in this focus group.

Costs of the Study:

As a participant, you will not be expected to cover any cost towards the focus group or study.

Confidentiality:

The personal information that you provide during the focus group session will remain strictly confidential and anonymous.

Research-related Injury:

There are no foreseeable injuries to participants of this focus group. Should you pick up an injury during the focus group, you may not hold DUT or the Researcher responsible / liable.

Persons to Contact in the Event of Any Problem or Query:

Please contact the researcher (0766052761) my supervisor (0732567399) or the Institutional Research Ethics administrator on 031 373 2900. Complaints can be reported to the DVC: TIP, Prof F. Otieno on 031 373 2382 or dvctip@dut.ac.za.

General:

Please note that there is no obligation for you to participate in this focus group, participation is on a volunteer basis. There will be approximately 6-8 participants in the focus group. If you choose to participate in this focus group you will be required to answer questions and discuss at length the questionnaire. Please answer the questions as honestly as possible, and be assured the answers you provide will be kept strictly anonymous and confidential. If you have any queries during the focus group session – please don't hesitate to ask me for clarification. Copies of this information letter will be available, should you want one.

CONSENT

Statement of Agreement to Participate in the Focus Group of 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 Focus Group.
.
I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the Focus Group.

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

_____

Signature / Right Thumbprint

I, _____ (name of researcher) 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

Dr P. Maharaj (Research Supervisor)

_____

Prof. T. Puckree (Research Co-supervisor)

_____

APPENDIX D3: Code of Conduct for Focus Group Participants

Code of Conduct for Focus Group

This form needs to be completed by every member of the Focus Group prior to the commencement of the focus group meeting.

As a member of this committee I agree to abide by the following conditions:

1. All information contained in the research documents and any information discussed during the focus group meeting will be kept private and confidential. This is especially binding to any information that may identify any of the participants in the research process.

2. Due respect to be given to every suggestion and comment by any member of the focus group and be debated with reference to the outcomes of the research.

3. The information gathered from this focus group by the researcher will be made public in terms of a mini dissertation and journal publication. The researcher will ensure that any participants in the focus group and research remain anonymous and confidential.

MEMBER REPRESENTS	MEMBER'S NAME	SIGNATURE	CONTACT DETAILS

APPENDIX D4: Confidentiality Clause for Focus Group Participants

Confidentiality Statement Focus Group

IMPORTANT NOTICE:

THIS FORM IS TO BE READ AND FILLED IN BY EVERY MEMBER PARTICIPATING IN THE FOCUS GROUP, BEFORE THE FOCUS GROUP MEETING CONVENES.

1. All information contained in the research documents and any information discussed during the focus group meeting will be kept private and confidential. This is especially binding to any information that may identify any of the participants in the research process.
2. The returned questionnaires will be coded and kept anonymous in the research process.
3. None of the information shall be communicated to any other individual or organisation outside of this specific expert group as to the decisions of this expert group.
4. The information from this focus group will be made public in terms of a journal publication, which will in no way identify any participants of this research.

Once this form has been read and agreed to, please fill in the appropriate information below and sign to acknowledge agreement.

MEMBER REPRESENTS	MEMBER'S NAME	SIGNATURE	CONTACT DETAILS

APPENDIX D5: Amendments to the Focus Group questionnaire

Focus Group Questionnaire Comment Sheet with Combined Comments from Participants

SECTION A	
1	No change. Can classify age groups after data is captured if need be.
2	No change.
3	Change "African" to "Black". Suggested to look at an official form (i.e. SARS form) to see what terminology is used for ethnicity.
4	Change Zulu to isiZulu etc.
5	Delete question. The inclusion / exclusion criteria should eliminate those who are not fluent in English.
6	Follow on from Q5, should read, "What other language is spoken at home?" Participants should be able to tick more than one option.
7	Delete question. Can make an announcement at the beginning (before handing out questionnaire) that only registered Health Sciences students must complete questionnaire.
8	Delete question. Include a statement at the top of the questionnaire which reads that only first time first year students are to answer the questionnaire.
9	Change "course" to "programme". Make closed ended with programme options.
10	Clarify type of dependents by giving options to tick (i.e. child, grandparent etc.). Can split this into two questions with the follow up question being how many dependents to they have.
11	No change.
12	Include options: DUT residence, homeless, commune, own house / flat, rented house / flat.
13	Same options at Q12.
14	Delete options: homeless, hostel / residence, own house, rented house, informal settlement. Include options: living alone, living with friends.
15	Can change question to read: do you have a part-time job during: the week (Y/N); the weekend (Y/N); the holidays (Y/N).
16	Separate into two questions: 1. how many (open ended); 2. description (open ended).
17	Change last option, "I was not previously....work" to "N/A". Add option: contract ended.
18	No change.
19	Add option: to gain independence
20	ERROR

21	Make closed ended and move question to follow on from Q17.
22	Use "support system" instead of "family". This question can have two parts: 1. where do you receive financial aid from? (closed ended); 2. Do you feel that the support you receive is sufficient for your needs? (Y/N).
23	Add option: no grant.
24	Reword: do you / your household always have enough money to buy food?
25	Need to clarify what a meal is: split into 3 questions: 1. how many full meals do you have a day? 2. How many snacks do you have a day? 3. What types of food do you commonly eat?
26	Add options: walking, car-pooling / lift club
27	No change.
28	No change.
SECTION B	
1	Move option "at a desk" to the next line of cells for ease of reading and to see that it is not missed in its current location. Move Q1 to below Q3 for a more logical flow.
2	Replace "tests" with "programme". More NB to ask about the nature of study habits (i.e. night before / weeks in advance) to understand the types of stress.
3	No change.
4	Add options: torch / battery operated devices
5	ERROR
6	Might be easier to use pictures.
7	ERROR
8	Assumes the person is sitting. Need to account for all positions.
9	Could combine Q6, Q8 & Q9.
10	Separate questions for this Q and put Q10"b" with Q3 (duration of study etc.). For Q10"a" give options of eye symptoms: blurry, dry, pain, itchy etc.
11	Move to near Q3 and divide into 3 questions: 1. when is your optimal time to study; 2. when do you actually study.
12	Reword: use "tremble" instead of "shiver". Ask them to give a reason for trembling (i.e. hunger, cold, nerves etc. and include N/A as an option).
13	Closed ended. Reword to on an average week night.
14	Reword to on an average week night before a test.

15	Make closed ended.
16	Add option: dancing.
17	ERROR
18	Make closed ended including various quantities.
19	No change.
20	No change but could make closed ended.
21	No change.
22	No change.
23	Add options: exercise, stress management, yoga, massage, medication, traditional therapies etc.
24	Move to follow on from Q12.
25	Reword: is there ever a breeze on your neck while you are studying? Move to near Q12.
SECTION C (DASS-21)	
1 - 21	Consensus that abridged version (21 questions) should be used instead of the full version. Make rating scale example and explanation look like the scale when answering to avoid confusion.
SECTION D (NBQ)	
1 - 7	Could add in questions that speak to how neck pain affects studying.

General Comments:

Formatting:

- Grey out question blocks for ease of reading
- List all answer options in alphabetical order
- Instead of changing numbering, separate questionnaire into four sections
- Make sure that all answer options start on a new line of cells and not in the same line as the question (unless it is a Y/N question)

Additional Questions:

Section A

- Between Q9&10: relationship status
- Between Q16 & 17: Length of shift / time spent on work each week
- Between Q17 & 18: reason for resigning

Section B

Add at the top of the section, "In the context of the programme you are studying for..."

- Q2: nature of studying habits / routine (closed ended) with options night before, week before etc.
- Add in question about stress levels before test
- Between Q4 &5: medium of studying (notes, laptop etc.)
- Between Q11 &12: Absenteeism due to studying for tests
- Between Q14&15: Reason for getting less than 6 - 8 hours sleep
- Between Q15&16: Duration of exercise
- Between Q20&21: Alcohol intake & quantity
- End of section: questions on history of injury, support services on campus & utilisation of them, chronic conditions.
- Other question topics: coping with academic load; did High School adequately prepare them for Tertiary education; physical / learning disabilities; language medium of High School; language barriers

APPENDIX E: Pilot Study Questionnaire

PILOT STUDY QUESTIONNAIRE

Please only fill in this questionnaire if you are a Faculty of Health Sciences student and this is your **first time** registering for first year this year.

SECTION A

Please indicate the most appropriate answer by placing a cross ☒ in the box provided, or writing in your answer where applicable.

1.	**Age:**					
2.	**Gender:**					
3.	**Ethnicity: (for statistical purposes)**					
	Asian	Black	Coloured	Indian	White	
	Other:					
4.	**What is your Home Language?**					
	Afrikaans	English	isiXhosa	isiZulu		
	Other:					
5.	**What other language is spoken in the house? (you can select more than one option)**					
	Afrikaans	English	isiXhosa	isiZulu		
	Other:					
6.	**What was the language medium of the High School you went to?**					
	Afrikaans	English	isiXhosa	isiZulu		
	Other:					
7.	**Do you experience any barriers to learning due to the fact that your programme and related materials are presented in English?**			Yes	No	
8.	**Please rate the level of difficulty you experience learning at an English medium institution:**					
	No difficulty	Mild difficulty	Moderate difficulty	High difficulty	Extreme difficulty	
9.	**What programme are you registered for?**					
	Option 1	Option 2	Option 3			
	Option 4	Option 5	Option 6			
10.	**What is your current relationship status?**					
	Divorced	Engaged	In a civil union	In a domestic partnership	In a relationship	
	In an open relationship	Married	Single	Separated	Widowed	
11.	**Are any of the following people dependant on you for financial support? (Dependants)**					
	Child	Grandparent	Extended family member	Friend		
	Parent	Partner	Sibling	Spouse		
	Other:					
12.	**How many dependants do you have, in total?**					
	0	1	2			
	3	4	5 or more			
13.	**Are you the breadwinner in your family?**			Yes	No	
14.	**Please select the most appropriate description of the area that you live in during term time:**					
	Homeless	Informal settlement	Rural	Suburban	Urban	
	Other:					
15.	**Please select the most appropriate description of the area that you live in during**					

	holidays:					
	Homeless	Informal settlement	Rural	Suburban	Urban	
	Other:					
16.	**Please select the most appropriate description of the type of home you live in during term time:**					
	Commune / Digs	DUT residence	Homeless	Hostel	Own home	Rented home
	Other:					
17.	**Please select the most appropriate description of the type of home you live in during holidays:**					
	Commune / Digs	DUT residence	Homeless	Hostel	Own home	Rented home
	Other:					
18.	**In general, what type of transport do you use to get to and from campus?**					
	Bicycle	Bus	Lift club / Car pool	Metered taxi	Motorbike	
	Own Car	Parents' car	Taxi	Train	Walking	
	Other:					
19.	**How long (minutes / hours) does it take you to travel to and from DUT each day?**					
20.	**Do you ever skip lectures due to transport problems?**					
	Very often	Often	Sometimes	Seldom	Never	
21.	**Please state how the 2016 transport strikes have affected your level of stress, with regards to getting to and from lectures:**					
	No increase in stress	Mild increase of stress	Moderate increase in stress	High increase in stress	Very high increase in stress	
22.	**With whom do you live during term time? (you can select more than one option)**					
	Acquaintances	No-one	Extended Family	Friends	Immediate Family	Relatives
	Other:					
23.	**With whom do you live during the holidays? (you can select more than one option)**					
	Acquaintances	No-one	Extended Family	Friends	Immediate Family	Relatives
	Other:					
24.	**How many jobs do you have in a part-time capacity?**					
	0	1	2	3	More than 3	
25.	**When do you carry out this part-time work? (you can select more than one option)**					
	N/A	During the week (day)	During the week (night)	On the weekend (day)	On the weekend (night)	In the holidays
26.	**Please state your employment position(s) in your job(s) (e.g. Waitress, Admin clerk etc.)**					
27.	**Please indicate the average time spent on your job each week:**					
	N/A	Less than 5 hours	5 – 10 hours	10 – 15 hours	15 – 20 hours	20 – 25 hours	25 – 30 hours	More than 30 hours
28.	**If you were previously doing part-time work but are now unemployed, please state the reason for your unemployment:**					
	N/A	I resigned voluntarily	I was fired	I was retrenched	My contract ended	
	Other:					
29.	**If you resigned from your previous employment, please state the reason for your resignation:**					
	N/A	Reason:				
30.	**For how long have you been unemployed? (If you were previously employed)**					

	N/A	0 – 6 months	6 – 12 months	More than 12 months
31.	**Do you feel pressured into having a part-time job(s) while studying for your degree?**	Yes	No	
32.	**If yes, please state why you feel the need to have an income? (you can select more than one option)**			
	N/A	To gain independence	To pay for my studies	To support my family	To support my lifestyle
	Other:				
33.	**Where do you receive financial support from? (you can select more than one option)**				
	Bank loan	Bursary	Child Dependency Grant	Child Support Grant	Disability Grant
	Extended Family Member	Foster Child Grant	Friend	Grandparent(s)	NSFAS
	Self	Parent(s)	Partner / Spouse	Scholarship	Sibling(s)
	Other:				
34.	**Do you feel that the financial support you receive is sufficient for your needs?**	Yes	No		
35.	**Would you consider your support system to be under financial strain?**	Yes	No		
36.	**In general, please indicate your level of stress associated with securing your financial support:**				
	No increase in stress	Mild increase of stress	Moderate increase in stress	High increase in stress	Very high increase in stress
37.	**Please indicate which avenues of financial support, if any, cause an increase in your general stress levels: (you can select more than one option)**				
	Bank loan	Bursary	Child Dependency Grant	Child Support Grant	Disability Grant
	Extended Family Member	Foster Child Grant	Friend	Grandparent(s)	NSFAS
	Self	Parent(s)	Partner / Spouse	Scholarship	Sibling(s)
	None				
38.	**Do you / your household always have enough money to buy food?**	Yes	No		
39.	**On average, how many full meals do you eat per day?**				
	0	1	2	3	4	5 or more
40.	**On average, how many snacks do you have per day?**				
	0	1	2	3	4	5 or more
41.	**What types of food do you commonly eat daily? (you can select more than one option)**				
	Amasi	Animal organs	Baked goods	Beans / samp	Bread	Cereal / grains
	Dairy products	Chocolates	Crisps	Eggs	Fruit	Hot Chips
	Meat curry	Nuts / seeds	Pap	Pasta	Porridge / Maize meal	Processed food
	Red meat	Rice	Roti	Samoosas	Seafood	Sweet meats
	Sweets	Take away	Vegetable curry	Vegetables	Vetkoek	White meat
	Other:				
42.	**On average, how much water do you drink per day?**				
	None	Less than 500ml	500ml – 1000ml	1000ml – 1500ml	1500ml – 2000ml	More than 2000ml
43.	**What other beverages do you drink on a regular basis? (you can select more than one option)**				
	None	Alcoholic	Coffee	Energy drinks	Fizzy drinks	

		beverages			
	Flavoured milk	Fruit juice	Milk	Tea	
	Other:				

SECTION B

In the context of the programme for which you are studying, please indicate the most appropriate answer by placing a cross ☒ in the box provided, or writing in your answer where applicable.

1.	**In general, do you feel that your high school prepared you adequately for University?**			Yes	No
2.	**Have you made friends with people in your programme?**			Yes	No
3.	**Please describe your experience with regards to making friends in your programme?**				
	I found it difficult to make friends	I made friends easily	Making friends is not a priority for me		
	Other:				
4.	**Are you aware of the following support services offered at the Durban University of Technology?**				
a.	Book Club			Yes	No
b.	Chiropractic Clinic			Yes	No
c.	Computer Use and Laptop Loan			Yes	No
d.	Dentistry Clinic			Yes	No
e.	First Year Mentoring Programme			Yes	No
f.	Food Security Programme			Yes	No
g.	Group Study Rooms (Library)			Yes	No
h.	Homeopathic Clinic			Yes	No
i.	Somatology Clinic			Yes	No
j.	Student Counselling Centre			Yes	No
k.	The Careers Resource Centre			Yes	No
l.	The HIV / AID centre			Yes	No
m.	The Isolempilo Campus Health Clinic			Yes	No
n.	The Writing Centre			Yes	No
o.	Time Concession			Yes	No
5.	**Do you utilize any of the following support services offered at the Durban University of Technology?**				
a.	Book Club			Yes	No
b.	Chiropractic Clinic			Yes	No
c.	Computer Use and Laptop Loan			Yes	No
d.	Dentistry Clinic			Yes	No
e.	First Year Mentoring Programme			Yes	No
f.	Food Security Programme			Yes	No
g.	Group Study Rooms (Library)			Yes	No
h.	Homeopathic Clinic			Yes	No
i.	Somatology Clinic			Yes	No
j.	Student Counselling Centre			Yes	No
k.	The Careers Resource Centre			Yes	No
l.	The HIV / AID centre			Yes	No
m.	The Isolempilo Campus Health Clinic			Yes	No
n.	The Writing Centre			Yes	No
o.	Time Concession			Yes	No
6.	**Please state how the 2016 student strikes at DUT have affected your general stress levels:**				
	No increase in stress	Mild increase of stress	Moderate increase in stress	High increase in stress	Very high increase in stress
7.	**Please state how the 2016 staff strikes at DUT have affected your general stress levels:**				
	No increase in	Mild increase of	Moderate	High increase in	Very high

	stress	stress	increase in stress	stress	increase in stress
8.	**How would you rate your stress levels right before a test?**				
	Low stress level	Moderate stress level	High stress level	Very high stress level	
9.	**Do you feel that you are coping with your academic load?**			Yes	No
10.	**On average, how many hours do you spend studying for your programme per week?**				
11.	**What is the nature of your study routine for tests / exams? I study:**				
	More than a month before	A month before	2-3 weeks before	A week before	2-6 days before	The night before	The day of the test
12.	**When is your best time to study?**				
	Early morning	Late morning	Early afternoon	Late afternoon	Early evening	Late at night	Random times
	Other:				
13.	**When do you actually study?**				
	Early morning	Late morning	Early afternoon	Late afternoon	Early evening	Late at night	Random times
	Other:				
14.	**In general, how long are your study sessions (in minutes or hours)?**				
15.	**Please indicate the average frequency of the study breaks you take while you are studying:**				
	Every 30 minutes	Every 45 minutes	Every hour	Every 1.5 hours	Every 2 hours	No breaks
	Other:				
16.	**What medium do you use to study? (you can select more than one option)**				
	Audio recording	Cell phone	Computer	Hard copy notes	Tablet	Text book
	Other:				
17.	**What best describes the notes you study from? (you can select more than one option)**				
	Study straight from text book	Use given notes (any format)	Use own audio recorded notes	Use own typed notes	Use own written notes
	Other:				
18.	**What type of light do you use when you study?**				
	Candle light	Electric light	Lamp	Natural light	Battery operated device (e.g. torch / cell phone etc.)
	Other:				
19.	**Please describe where you most commonly study:**				
	At a desk	On a bed	On a couch	On a pilates ball	On the floor
	Other:				
20.	**Please describe your most common position while studying:**				
	Lying on back	Lying on side	Lying on stomach	Sitting	Standing
	Other:				
21.	**Please describe the most common position of your head and neck while studying? (You can select more than one option)**				
	Bent to the side	Neutral	Tilted backwards	Tilted forward	Turned to one side
	Other:				
22.	**Please describe the most common position of your shoulders while studying? (You can select more than one option)**				
	Hunched up by ears	In a relaxed position	One shoulder higher than the other	Rounded forward	
	Other:				
23.	**Do your eyes experience any of the following symptoms while studying? (You can select more than one option)**				

	N/A	Blurriness	Dryness	Flashing lights	Itchiness	Pain	Strain
	Other:						
24.	**Do you ever miss lectures to study for a test?**						
	Very often	Often	Sometimes	Seldom	Never		
25.	**Do you ever tremble / fidget for the following reasons while you are studying? (You can select more than one option)**						
	N/A	ADD / ADHD	Cold	Hunger	Nerves		
	Other:						
26.	**Is there ever a breeze on your neck while you are studying?**						
	Very often	Often	Sometimes	Seldom	Never		
27.	**In general, do you wear a scarf when it is cold?**						
	Very often	Often	Sometimes	Seldom	Never		

SECTION C

In the context of your current lifestyle please indicate the most appropriate answer by placing a cross ☒ in the box provided, or by writing in your answer where applicable.

1.	**Roughly how many hours of sleep do you get on an average week night?**						
	Less than 4 hours	4 – 6 hours	6 – 8 hours	8 – 10 hours	More than 10 hours		
2.	**If you are getting less than 6 – 8 hours please state why:**						
	N/A	Insomnia	Part-time work	Restless sleeper	Socialising	Studying	Transport
	Other:						
3.	**On average, how many hours of sleep do you get on a night when you are studying?**						
	Less than 4 hours	4 – 6 hours	6 – 8 hours	8 – 10 hours	More than 10 hours		
4.	**On average, how many days do you exercise per week?**						
	0	1	2	3	4	5	6	7
5.	**On average, how many times a day do you exercise?**						
	0	1	2	3	More than 3		
6.	**On average, how long are your exercise sessions?**						
	N/A	Less than 30 minutes	30 minutes – 1 hour	More than 1 hour			
7.	**What type of exercise do you do?**						
	No exercise	Basketball	Boxing	Cross fit	Cycling		
	Dancing / Zumba	Gymnastics	Hockey	Long Distance Running	Netball		
	Pilates	Pole dancing	Powerlifting	Racket sport	Rock Climbing		
	Rowing / Canoeing	Short Distance Running	Skateboarding	Soccer	Surfing		
	Swimming	Volleyball	Walking	Weight Training	Yoga		
	Other:						
8.	**Do you smoke tobacco?**				Yes	No	
9.	**Roughly, how many cigarettes do you smoke per day?**				N/A		
10.	**Do you smoke an electronic cigarette?**				Yes	No	
11.	**Roughly, how many times do you smoke an electronic cigarette per day?**				N/A		
12.	**Do you use social drugs?**				Yes	No	
13.	**How often do you use social drugs?**						
	Very often	Often	Sometimes	Seldom	Never		
14.	**Do you drink alcohol?**				Yes	No	
15.	**On average, how many units of alcohol do you drink per week? (1 unit = about 250ml beer or cider / 76ml [or half a glass of wine] / 25ml [or half a shot] of spirits)**						
	0	1-2	2-4	4-8	8-10	More than 10	

16.	**Have you ever sustained any of the following injuries?**				
	N/A	Concussion	Disc Injury – Lower back	Disc Injury – Neck	Disc Injury – Upper back
	Fracture – Arm	Fracture – Collar Bone	Fracture – Foot	Fracture – Hand	Fracture – Leg
	Fracture – Lower Back	Fracture – Neck	Fracture – Pelvis	Fracture – Rib	Fracture – Skull
	Fracture – Upper Back	Nerve Root Injury – Neck	Soft Tissue Injury – Abdomen	Soft Tissue Injury – Arm	Soft Tissue Injury – Chest
	Soft Tissue Injury – Foot	Soft Tissue Injury – Hand	Soft Tissue Injury – Head / Face	Soft Tissue Injury – leg	Soft Tissue Injury – Lower back
	Soft Tissue Injury – Neck	Soft Tissue Injury – Upper back	Spinal Cord Injury (with paralysis)	Spinal Cord Injury (without paralysis)	Whiplash Injury
	Other:				
17.	**Do you have any physical disabilities?**			Yes	No
18.	**Please describe your disability or mark N/A if this is not applicable to you:**				
	N/A				
19.	**Do you have any learning disabilities?**			Yes	No
20.	**Please describe your disability or mark N/A if this is not applicable to you:**				
	N/A				
21.	**Have you been diagnosed with any of the following chronic conditions?**				
	N/A	Anxiety Disorder	Asthma	ADD / ADHD	
	Depression	Diabetes Mellitus	Epilepsy	High Blood Pressure	
	High Cholesterol	Hyperthyroidism	Hypothyroidism	Mood Disorder	
	Other:				
22.	**Do you ever experience neck pain?**			Yes	No
23.	**Has your neck pain been diagnosed by a practitioner in the health field?**			N/A	Yes / No
24.	**For how long have you been experiencing neck pain?**				
	N/A	Less than 3 months	3-6 months	More than 6 months	
25.	**On average, how many times a week do you experience neck pain?**				
	0 / 1	2	3	4	5 / 6 / 7
26.	**On days that you experience neck pain, please indicate the duration of your pain:**				
	N/A	Constant pain	Intermittent / “on and off” pain		
27.	**Please indicate, roughly, the time of the day you experience neck pain the most:**				
	N/A	Between 12am & 6am	Between 6am &12pm	Between 12pm & 6pm	Between 6pm & 12am
28.	**Please indicate the nature of your neck pain:**				
	Aching	Burning	Dull	Pins and Needles	Sharp / shooting
	Other:				
29.	**How do you manage your neck pain?**				
	Chiropractic	Exercise	General Practitioner	Heat therapy	
	Massage	Medication	No management	Physiotherapy	
	Stress management	Stretching	Traditional Therapies	Yoga	
	Other:				
30.	**Do you ever miss lectures because of neck pain?**				
	Very often	Often	Sometimes	Seldom	Never
31.	**Do you ever miss lectures due to other health reasons?**				
	Very often	Often	Sometimes	Seldom	Never

The following scales have been designed to find out about your neck pain and how it is affecting you. Please answer ALL of the scales, and circle ONE number on EACH scale that best describes how you feel.

32. Over the past week, on average, how would you rate your neck pain?

No pain Worst pain possible

0 1 2 3 4 5 6 7 8 9 10

33. Over the past week, how much has your neck pain interfered with your daily activities (housework, washing, dressing, lifting, reading, and driving)?

No interference Unable to carry out activity

0 1 2 3 4 5 6 7 8 9 10

34. Over the past week, how much has your neck pain interfered with your ability to take part in recreational, social, and family activities?

No interference Unable to carry out activity

0 1 2 3 4 5 6 7 8 9 10

35. Over the past week, how anxious (tense, uptight, irritable, difficulty in concentrating /relaxing) have you been feeling?

Not at all anxious Extremely anxious

0 1 2 3 4 5 6 7 8 9 10

36. Over the past week, how depressed (down-in-the-dumps, sad, in low spirits, pessimistic, unhappy) have you been feeling?

Not at all depressed Extremely depressed

0 1 2 3 4 5 6 7 8 9 10

37. Over the past week, how have you felt your work (both inside and outside the home) has affected (or would affect) your neck pain?

Has made it no worse — Has made it much worse

0 1 2 3 4 5 6 7 8 9 10

38. Over the past week, how much have you been able to control (reduce/help) your neck pain on your own?

Completely control it — No control whatsoever

0 1 2 3 4 5 6 7 8 9 10

SECTION D

Please read each statement and put a cross over the number which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:					
Did not apply to me at all.		0	1	2	3
Applied to me to some degree, or some of the time.		0	1	2	3
Applied to me to a considerable degree, or a good part of the time.		0	1	2	3
Applied to me very much, or most of the time.		0	1	2	3
1.	I found it hard to wind down.	0	1	2	3
2.	I was aware of dryness of my mouth.	0	1	2	3
3.	I couldn't seem to experience any positive feeling at all.	0	1	2	3
4.	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion).	0	1	2	3
5.	I found it difficult to work up the initiative to do things.	0	1	2	3
6.	I tended to over-react to situations.	0	1	2	3
7.	I experienced trembling (e.g. in the hands).	0	1	2	3
8.	I felt that I was using a lot of nervous energy.	0	1	2	3
9.	I was worried about situations in which I might panic and make a fool of myself.	0	1	2	3
10.	I felt that I had nothing to look forward to.	0	1	2	3
11.	I found myself getting agitated.	0	1	2	3
12.	I found it difficult to relax.	0	1	2	3
13.	I felt down-hearted and blue.	0	1	2	3
14.	I was intolerant of anything that kept me from getting on with what I was doing.	0	1	2	3
15.	I felt I was close to panic.	0	1	2	3
16.	I was unable to become enthusiastic about anything.	0	1	2	3
17.	I felt I wasn't worth much as a person.	0	1	2	3
18.	I felt that I was rather touchy.	0	1	2	3

19.	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat).	0	1	2	3
20.	I felt scared without any good reason.	0	1	2	3
21.	I felt that life was meaningless.	0	1	2	3

THE END

Thank you for taking the time to complete this questionnaire,
your contribution is greatly appreciated.

APPENDIX E1: Pilot Study Questionnaire Evaluation Form

Pilot Study Questionnaire Evaluation Form

The purpose of this evaluation form is to use your feedback to streamline the questionnaire and to make it appropriate for the participants that it will be tested on (first year Health Sciences Students). Please fill in the evaluation form honestly and critically.

Please mark only one box with a ✓or a ✗ that provides the most correct answer for each question.

1. Please indicate the clarity of the Letter of Information you received:

- ☐ 1.1 Very Clear
- ☐ 1.2 Clear
- ☐ 1.3 Adequate
- ☐ 1.4 Unclear
- ☐ 1.5 Needs revising

If you ticked boxes “Adequate”, “Unclear”, or “Needs revising”, please indicate what you found confusing in the document by highlighting the relevant section on the Letter of Information and in the space below, suggest how it could be improved:

_____
_____
_____
_____
_____

2. Please describe your overall response to the content presented in this questionnaire:

- ☐ 2.1 Extremely interesting
- ☐ 2.2 Interesting
- ☐ 2.3 Average
- ☐ 2.4 Boring
- ☐ 2.5 Very boring

Please indicate, in the space provided, which questions (if any) you found to be boring: (e.g. Section A: Q’s 44, 49 and 65; Section C: Q’s 50 and 62 etc.)

_____
_____
_____
_____
_____

3. On the whole, do you think the topics raised in this questionnaire are relevant to the nature of the research study, as described in the Letter of Information?

☐ 3.1 Yes
☐ 3.2 No

Please indicate which topic(s) (if any) you believe to be irrelevant to this study:

_____
_____
_____
_____
_____

4. On the whole, do you think each topic raised in this questionnaire was adequately covered?

☐ 4.1 Yes
☐ 4.2 No

Please indicate which topic(s) (if any) could be covered in greater depth:

_____
_____
_____
_____
_____

5. Please give a rating of the instructions, on the whole, which accompanied each question:

☐ 5.1 Very clear
☐ 5.2 Clear
☐ 5.3 Adequate
☐ 5.4 Unclear
☐ 5.5 Needs revising

Please indicate which instructions (if any) were unclear by writing the question number below, followed by your suggestion as to how they could be improved:

_____
_____
_____
_____
_____

6. Please describe your response to the wording of the questionnaire overall:

☐ 6.1 The meaning of all of the questions is absolutely clear
☐ 6.2 The meaning of most of the questions is clear

☐ 6.3 Too much Chiropractic / medical terminology is used
☐ 6.4 Most of the questions were difficult to understand
☐ 6.5 The questionnaire needs to be revised because it is generally unclear

Please indicate which question(s) (if any) were unclear and should be reworded. Where possible, please provide a suggestion of better wording / phrasing to make the question more understandable:

_____
_____
_____
_____
_____

7. Do you think the questionnaire was too long?

☐ 7.1 Yes, but I felt that the length was necessary in order to generate a thorough understanding of the research sample
☐ 7.2 Yes, I think the questionnaire needs to be shortened
☐ 7.3 No

8. Please describe your experience with regard to answering this questionnaire:

☐ 8.1 I really enjoyed answering this questionnaire
☐ 8.2 I enjoyed answering this questionnaire
☐ 8.3 I feel neutral about answering this questionnaire
☐ 8.4 I did not enjoy answering this questionnaire
☐ 8.5 I really did not enjoy answering this questionnaire

9. Do you think other first year students would be willing to fill in this questionnaire?

☐ 9.1 Yes
☐ 9.2 No

If you selected “No”, please elaborate on your answer by giving a reason:

_____
_____
_____
_____
_____

10. If you have any other comments or suggestions that you would like to make about this questionnaire, please feel free to do so in the space provided below.

_____
_____
_____
_____

Thank you for giving of your time by answering this questionnaire and evaluation form. Your contribution is invaluable and is greatly appreciated.

Pilot Study Questionnaire Evaluation Form with Collated Feedback from Participants

The purpose of this evaluation form is to use your feedback to streamline the questionnaire and to make it appropriate for the participants that it will be tested on (first year Health Sciences Students). Please fill in the evaluation form honestly and critically.

Please mark only one box with a ✓or a × that provides the most correct answer for each question.

1. Please indicate the clarity of the Letter of Information you received:

X3	1.1	Very Clear
X2	1.2	Clear
☐	1.3	Adequate
☐	1.4	Unclear
☐	1.5	Needs revising

If you ticked boxes “Adequate”, “Unclear”, or “Needs revising”, please indicate what you found confusing in the document by highlighting the relevant section on the Letter of Information and in the space below, suggest how it could be improved:

NO ADDITIONAL COMMENTS

2. Please describe your overall response to the content presented in this questionnaire:

X1	2.1	Extremely interesting
X2	2.2	Interesting
X1	2.3	Average
X1	2.4	Boring
☐	2.5	Very boring

Please indicate, in the space provided, which questions (if any) you found to be boring: (e.g. Section A: Q’s 44, 49 and 65; Section C: Q’s 50 and 62 etc.)

BORING CONTENT: SECTION A, Q14

3. On the whole, do you think the topics raised in this questionnaire are relevant to the nature of the research study, as described in the Letter of Information?

X4	3.1	Yes
X1	3.2	No

Please indicate which topic(s) (if any) you believe to be irrelevant to this study:

IRRELEVANT CONTENT: SECTION A Q’S: 18, 19, 20, 21 & 41 (TRANSPORT & FOOD)

4. On the whole, do you think each topic raised in this questionnaire was adequately covered?

X5	4.1	Yes
	4.2	No

Please indicate which topic(s) (if any) could be covered in greater depth:

TRANSPORT ISSUES
FINANCIAL SUPPORT
STRIKES

5. Please give a rating of the instructions, on the whole, which accompanied each question:

X2	5.1	Very clear
X3	5.2	Clear
	5.3	Adequate
	5.4	Unclear
	5.5	Needs revising

Please indicate which instructions (if any) were unclear by writing the question number below, followed by your suggestion as to how they could be improved:

NO ADDITIONAL COMMENTS

6. Please describe your response to the wording of the questionnaire overall:

X1	6.1	The meaning of all of the questions is absolutely clear
X4	6.2	The meaning of most of the questions is clear
	6.3	Too much Chiropractic / medical terminology is used
	6.4	Most of the questions were difficult to understand
	6.5	The questionnaire needs to be revised because it is generally unclear

Please indicate which question(s) (if any) were unclear and should be reworded. Where possible, please provide a suggestion of better wording / phrasing to make the question more understandable:

IT WAS CLEAR BUT IT SHOULD HAVE FOCUSSED MORE ON NECK PAIN AND NOT IRRELEVANT STUFF

7. Do you think the questionnaire was too long?

X4	7.1	Yes, but I felt that the length was necessary in order to generate a thorough understanding of the research sample
X1	7.2	Yes, I think the questionnaire needs to be shortened
	7.3	No

8. Please describe your experience with regard to answering this questionnaire:

	8.1	I really enjoyed answering this questionnaire
X2	8.2	I enjoyed answering this questionnaire

X3	8.3	I feel neutral about answering this questionnaire
	8.4	I did not enjoy answering this questionnaire
	8.5	I really did not enjoy answering this questionnaire

9. Do you think other first year students would be willing to fill in this questionnaire?

X4	9.1	Yes
X1	9.2	No

If you selected “No”, please elaborate on your answer by giving a reason:

IT IS TOO LONG AND TIME CONSUMING

10. If you have any other comments or suggestions that you would like to make about this questionnaire, please feel free to do so in the space provided below.

I FEEL LIKE EVEN THOUGH THE QUESTIONNAIRE IS MAINLY FOR HEALTH SCIENCES STUDENTS ONLY, IN FUTURE IT SHOULD ALSO CATER FOR OTHER FACULTIES.

APPENDIX E2: Letter of Information and Informed Consent for Pilot Study Participants

Information Letter for Pilot Study Participants

Dear participant

I am a registered chiropractic master's student at the Durban University of Technology and I invite you to participate in the following pilot study. All the relevant information about the research and pilot study can be found below. Please take some time to read through it to better your understanding.

Background to Study:

Neck pain has been shown to be highly prevalent in society in both developed and developing countries. It has been known to affect students in their studies and in daily life. Although it occurs commonly, the extent to which demographic, social and psychological factors contribute towards the development of neck pain is not yet fully understood.

Objectives of Study:

1. To determine the prevalence of neck pain in registered DUT first year Faculty of Health Sciences students.
2. To determine the characteristics (pain type, duration and intensity) of the neck pain
3. To determine the psychosocial risk factors of registered DUT first year faculty of health sciences students suffering with neck pain.
4. To determine the association between demographic characteristics, socio-demographic and psychosocial risk factors in the student population in relation to the neck pain that they present with.

Title of Research Study:

The prevalence of and risk factors for neck pain in first year Faculty of Health Sciences students, at the Durban University of Technology.

Researcher:	Ms Giselle Gevers	0766052761	B.Tech Chiropractic
Supervisor:	Dr Praveena Maharaj	0732567399	M.Tech Chiropractic
Co-Supervisor:	Prof. T. Puckree	031 373 2967	Ph.D

Outlines of Procedure:

- Read, understand and sign this letter of information which confirms your willingness to participate in this study. You are encouraged to ask questions about the process to better your understanding before you agree to participate. Once you have signed the letter of information, please place it in the ballot box labelled “Letters of Information”.
- Read and sign a confidentiality statement, code of conduct and an informed consent form and understand what they entail. Once you have signed the above, please place the forms in the appropriately labelled ballot box (i.e. place confidentiality statement in the box labelled “Confidentiality Statements”)
- You will receive a questionnaire and you will be given time to read through it and answer the questions. Please answer the questions as honestly as possible and be assured that your answers will be kept strictly anonymous and confidential. I.e. your responses will not be linked to your identity, thus, please do not write your name, identity number or student number on the questionnaire.
- Once you have completed the questionnaire please place it in the sealed ballot box provided by the researcher labelled “Questionnaires”. You will then be given an evaluation form to fill in, critiquing the questionnaire. Please note that these responses will also be kept strictly anonymous and confidential (i.e. your responses will not be linked to your identity). Once you have completed the evaluation form, please place it in the box labelled “Evaluation Forms”.

Risks or Discomforts to the Participants:

There are no foreseeable risks to participation in this focus group.

Benefits:

Your co-operation would aid the expansion of literature and knowledge on neck pain. Furthermore, the outcomes of this study are expected to benefit the students in that the practitioners would be able to address more effectively those factors predisposing students to neck pain. It would also allow institutions of higher education to be able to address factors within the socio-demographic of the students that would enable the student to improve and develop personally based in their programme for which they are registered.

Reason/s why the Participant May Be Withdrawn from the Study:

The participant may withdraw from the pilot study at any stage without any negative effect or repercussions on the participant.

Remuneration:

There will be no remuneration for participation in this pilot study.

Costs of the Study:

As a participant, you will not be expected to cover any cost towards the pilot study.

Confidentiality:

The information that you provide during as the pilot study, as well as the answering of this questionnaire will remain strictly confidential and anonymous (i.e. there will be no form of identification, such as names, ID numbers or signatures on the questionnaire).

Research-related Injury:

There are no foreseeable injuries to participants of this pilot study. Should you pick up an injury during the pilot study, you may not hold DUT or the Researcher responsible / liable.

Persons to Contact in the Event of Any Problem or Query:

Please contact the researcher (0766052761) my supervisor (0732567399) or the Institutional Research Ethics administrator on 031 373 2900. Complaints can be reported to the DVC: TIP, Prof F. Otieno on 031 373 2382 or dvctip@dut.ac.za.

General:

Please note that there is no obligation for you to participate in this pilot study, participation is on a volunteer basis. There will be approximately 4-5 participants in the pilot study. If you choose to participate, you will be required to answer questions and discuss at length the questionnaire. Please answer the questions as honestly as possible, and be assured the answers you provide will be kept strictly anonymous and confidential. If you have any queries during the pilot study – please don't hesitate to ask me for clarification. Copies of this information letter will be available, should you want one.

Thank you for the time you have taken to read through this information pertaining to the study. If you have any questions, please do not hesitate to ask. If you wish to participate in this focus group please read and sign the consent form attached.

CONSENT

Statement of Agreement to Participate in the Pilot 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**

_____

Signature / Right Thumbprint

I, _____ (name of researcher) 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

Dr P. Maharaj (Research Supervisor)

_____

Prof. T. Puckree (Research Co-supervisor)

_____

APPENDIX E3: Code of Conduct for Pilot Study Participants

Code of Conduct for Pilot Group

This form needs to be completed by every member of the pilot study prior to the commencement of the pilot study.

As a member of this committee I agree to abide by the following conditions:

1. All information contained in the research documents and any information discussed during the pilot study meeting will be kept private and confidential. This is especially binding to any information that may identify any of the participants in the research process.

2. Due respect to be given to every suggestion and comment by any member of the pilot study and be debated with reference to the outcomes of the research.

3. The information gathered from this pilot group by the researcher will be made public in terms of a mini dissertation and journal publication. The researcher will ensure that any participants in the pilot study and research remain anonymous and confidential.

MEMBER REPRESENTS	MEMBER'S NAME	SIGNATURE	CONTACT DETAILS

APPENDIX E4: Confidentiality Clause for Pilot Study Participant

Confidentiality Statement Pilot Study

IMPORTANT NOTICE:

THIS FORM IS TO BE READ AND FILLED IN BY EVERY MEMBER PARTICIPATING IN THE PILOT STUDY, BEFORE THE PILOT STUDY CONVENES.

1. All information contained in the research documents and any information discussed during the pilot study will be kept private and confidential. This is especially binding to any information that may identify any of the participants in the research process.
2. The returned questionnaires will be coded and kept anonymous in the research process.
3. None of the information shall be communicated to any other individual or organisation outside of this specific expert group as to the decisions of this expert group.
4. The information from this pilot study will be made public in terms of a journal publication, which will in no way identify any participants of this research.
5.

Once this form has been read and agreed to, please fill in the appropriate information below and sign to acknowledge agreement.

MEMBER REPRESENTS	MEMBER'S NAME	SIGNATURE	CONTACT DETAILS

APPENDIX E5: Amendments to the Pilot Study Questionnaire

Q No. (Pilot)	Q No. (Final)	SECTION	PAGE (Pilot)	PAGE (Final)	SUGGESTED AMMENDMENT	SUGGESTED BY	RESEARCHER'S COMMENTS
1	1	A	1	1	Change "Age" to "Date of Birth" as some students don't know how to calculate their age	Co-supervisor	Q1 changed to Date of Birth
10	N/A			N/A	Delete question as it is not vital to the data you want to collect and any assumptions drawn would be generalisations	Co-supervisor	Agreed. Question deleted.
11	10			1	Need to add option "none" / "N/A"	Pilot study participant	Option "N/A" added
14 & 15	13				Confusion about definitions of urban, suburban etc.	Pilot study participant	Definitions added to bottom of page one
16 - 17	N/A		2	N/A	Delete questions as they are not vital to the data you want to collect	Co-supervisor	Questions deleted
18 - 21	15 - 18			1	The questions on transport are irrelevant	Pilot study participant	Type of transport & time spent travelling could affect posture and thus could be a risk factor for neck pain
					The questions on transport could be covered in greater depth	Pilot study participant	The questionnaire is already lengthy. So only NB questions have been included. Adding more questions may dilute the results with unnecessary data
22 & 23	19				These questions are to try and ascertain their level of emotional support but who a person lives with may not align with who they rely on for support. Rephrase these questions.	Supervisor	Questions merged and rephrased to "Do you feel that the emotional support you receive is sufficient for your needs?" Essentially I just want to know if they feel supported or not.
26	22			2	Need option "N/A" or statement prompting to write N/A	Pilot study participant	Prompt and option "N/A" added
29 & 30	N/A			N/A	Delete questions as they are not vital to the data you want to collect	Co-supervisor	Agreed. Questions deleted
31 & 32	25	A	2 & 3	2	Some confusing in the answering of these questions as one participant answered "No" they did not feel pressured to have a part time job but then ticked options in Q32 of why they felt the need to have an income	Observation from pilot study data	Q31 and 32 have been merged to avoid ambiguous answers
35	N/A	A	3	N/A	This question can be	Co-supervisor	Agreed. Question

					deleted as the data from Q34, 36 & 37 is more what you are interested in (stress related to financial support)		deleted.
37	29			2	Include "Other" option	Researcher	Option included.
39 - 41	N/A			N/A	Delete questions as they are not vital to the data you want to collect	Co-supervisor	Questions deleted as questionnaire is already long and I just want to know that their basic hunger needs are being met. Q41 on food types is more relevant to headaches / allergies and is a bit too far removed from neck pain causation
					Q41 is irrelevant	Pilot study participant	
43	N/A			N/A	Delete question as it is not vital to the data you want to collect (as like Q41)	Supervisor	Question deleted
4 & 5	4	B	4	2 & 3	Collapse these questions into one and add options; "The Language Lab" & "NSFAS"	Co-supervisor	Change made. I like this suggestion as it cuts down the length of the questionnaire
6 & 7	5			3	Merge to form one question. Change "strikes" to "protests"	Co-supervisor	Questions merged and "strikes" changed to "protests"
					Cover strikes in greater depth	Pilot study participant	Change rejected. I don't want to go into too much detail about topics such as this as it does not directly relate to neck pain and I don't want to dilute my results with data that is not strictly relevant
10	8		5		One focus group participant confused "studying" with attending lectures	Observation from pilot study data	Question reworded to avoid ambiguity.
14	12				One focus group participant wrote "hours" instead of writing total hours spent	Observation from pilot study data	Example added to avoid ambiguity
Before 1	1	C	7	4	Add in question about what surface they sleep on	Co-supervisor	Questions added as understanding posture related to sleeping is important to understanding neck pain & possible risk factors
2	3				Add in "condition of sleeping surface"	Researcher	
Between 3 & 4	5				Add in question about sleeping position	Co-supervisor	
	6 & 7				Add in questions about pillows	Co-supervisor	
Between 22 & 23	26 & 27		8	5	If students answer "No" i.e. they do not have neck pain, prompt them to skip ahead to Section D	Supervisor	Statement added in order to save time for participants that don't have neck pain. Having neck pain is not part of the inclusion criteria so the questionnaire needs to account for those that do not have neck pain

23; 24; 26; 27	27; 28; 30; 31				Remove N/A because people who do not experience neck pain will skip to section D	Supervisor	N/A removed
Between 24 & 25	29	C	8	5	Add general pain numerical rating scale	Researcher	Bournemouth only has a pain NRS that accounts for the past week. I also want to have an idea of how intense their pain is generally
27	32				Confusion about if "12am" meant midnight or midday	Observation from pilot study data	Options changed to broader terms: "morning / afternoon / night" to avoid possible confusion
29	34				Move "No management" to first option to save time for participants answering	Researcher	Option moved to first position to save participants time when answering as it is easily identifiable
Between 31 & 32	36 & 37			6	Some participants wrote their number rating on the line instead of circling the correct number	Observation from pilot study data	Space added before instruction and instruction has been reworded to make it clearer. Example has been added.
After 38	After 43	D	10	7	In the instructions for the Depression, Anxiety & Stress scale, change "over the past week" to "in general"	Co-supervisor & Researcher	Change made. I want to get a general idea of their depression, anxiety and stress levels, not just over a one week time frame. The explanation of the rating scale has been revised.

APPENDIX F: Neck Pain Questionnaire (NPQ)

NECK PAIN QUESTIONNAIRE

Please only fill in this questionnaire if you are a Faculty of Health Sciences student and this is your **first time** registering for first year this year.

SECTION A

Please indicate the most appropriate answer by placing a cross ☒ in the box provided, or writing in your answer where applicable.

1.	**Date of Birth: (day/month/year)**					
2.	**Gender:**					
3.	**Ethnicity: (for statistical purposes)**					
	Asian	Black	Coloured	Indian	White	
	Other:					
4.	**What is your Home Language?**					
	Afrikaans	English	isiXhosa	isiZulu		
	Other:					
5.	**What other language is spoken at home? (you can select more than one option)**					
	Afrikaans	English	isiXhosa	isiZulu		
	Other:					
6.	**What is the language medium of the High School to which you went?**					
	Afrikaans	English	isiXhosa	isiZulu		
	Other:					
7.	**Do you experience any barriers to learning due to the fact that your programme and related materials are presented in English?**				Yes	No
8.	**Please rate the level of difficulty you experience learning at an English medium institution:**					
	No difficulty	Mild difficulty	Moderate difficulty	High difficulty	Extreme difficulty	
9.	**For which Health Sciences programme are you registered?**					
10.	**Is any of the following people dependant on you for financial support? (Dependants)**					
	Child	Grandparent	Extended family member	Friend		
	Parent	Partner	Sibling	Spouse		
	N/A	Other:				
11.	**How many dependants do you have, in total?**					
	0	1	2			
	3	4	5 or more			
12.	**Are you the breadwinner in your family?**				Yes	No
13.	**Please select the most appropriate description of the area *(see definitions below) in which you live <u>during term time</u>:**					
	Homeless	Informal settlement	Rural	Suburban	Urban	
	Other:					
14.	**Please select the most appropriate description of the area *(see definitions below) in which you live <u>during holidays</u>:**					
	Homeless	Informal settlement	Rural	Suburban	Urban	
	Other:					
15.	**In general, what type of transport do you use to get to and from campus?**					
	Bicycle	Bus	Lift club / Car pool	Metered taxi	Motorbike	
	Own Car	Parents' car	Taxi	Train	Walking	
	Other:					
16.	**How long (in minutes / hours) does it take you to travel to and from DUT each day? E.g. 15minutes / 1.5 hours**					
17.	**Do you ever skip lectures due to transport problems?**					
	Very often	Often	Sometimes	Seldom	Never	
18.	**Please state how the 2016 transport strikes have affected your level of stress with regard to getting to and from lectures:**					
	No increase in stress	Mild increase of stress	Moderate increase in stress	High increase in stress	Very high increase in stress	
19.	**Do you feel that the emotional support you receive is sufficient for your needs?**				Yes	No

***<u>Definitions</u>**

Homeless: Living on the street
Rural: Farm /countryside outside of cities and towns
Suburban: A residential area or suburb outside of the city
Informal Settlement (or Township): Areas outside of cities / towns where informal houses / shacks have been built by government /individuals
Urban: Inside a city or town

20.	**How many jobs do you have in a part-time capacity?**							
	0		1		2		3	More than 3
21.	**When do you carry out this part-time work? (you can select more than one option)**							
	N/A	During the week (day)	During the week (night)	On the weekend (day)	On the weekend (night)	In the holidays		
22.	**Please state your employment position(s) in your job(s) (e.g. Waitress, Admin clerk etc.) OR select N/A if you do not have a job**				N/A			
23.	**Please indicate the average time spent on your job each week:**							
	N/A	Less than 5 hours	5 – 10 hours	10 – 15 hours	15 – 20 hours	20 – 25 hours	25 – 30 hours	More than 30 hours
24.	**If you were previously doing part-time work but are now unemployed, please state the reason for your unemployment:**							
	N/A		I resigned voluntarily	I was fired		I was retrenched		My contract ended
	Other:							
25.	**Do you feel pressured, for any of the following reasons, into having a part-time job(s), while studying towards your degree? (you can select more than one option)**							
	N/A		To gain independence	To pay for my studies		To support my family		To support my lifestyle
	Other:							
26.	**Where do you receive financial support from? (you can select more than one option)**							
	Bank loan		Bursary	Child Dependency Grant		Child Support Grant		Disability Grant
	Extended Family Member		Foster Child Grant	Friend		Grandparent(s)		NSFAS
	Parent(s)		Partner / Spouse	Scholarship		Self		Sibling(s)
	Other:							
27.	**Do you feel that the financial support you receive is sufficient for your needs?**					Yes		No
28.	**In general, please indicate your level of stress associated with securing your financial support:**							
	No increase in stress		Mild increase of stress	Moderate increase in stress		High increase in stress		Very high increase in stress
29.	**Please indicate which avenues of financial support, if any, cause an increase in your general stress levels: (you can select more than one option)**							
	Bank loan		Bursary	Child Dependency Grant		Child Support Grant		Disability Grant
	Extended Family Member		Foster Child Grant	Friend		Grandparent(s)		NSFAS
	Self		Parent(s)	Partner / Spouse		Scholarship		Sibling(s)
	None			Other:				
30.	**Do you / your household always have enough money to buy food?**					Yes		No
31.	**On average, how much water do you drink per day?**							
	None	Less than 500ml	500ml – 1000ml	1000ml – 1500ml		1500ml – 2000ml		More than 2000ml

SECTION B

In the context of the programme for which you are studying, please indicate the most appropriate answer by placing a cross ☒ in the box provided, or, where applicable, writing in your answer.

1.	**In general, do you feel that your High School prepared you adequately for University?**		Yes	No
2.	**Have you made friends with people in your programme?**		Yes	No
3.	**Please describe your experience with regard to making friends in your programme?**			
	I found it difficult to make friends	I made friends easily	Making friends is not a priority for me	
	Other:			

4.	**Which support services offered at the Durban University of Technology are you aware of, and of which do you make use?** In column (1): Place a tick next to the support services of which you are aware and a cross next to the services of which you are not aware. In column (2): Place a tick next to the support services of which you make use and a cross next to the services of which you do not make use.	**(1) I am aware of this service:**	**(2) I make use of this service:**
e.g.	**Book Club**	✓	✖
a.	Book Club		
b.	Chiropractic Clinic		
c.	Computer Use and Laptop Loan		
d.	Dentistry Clinic		
e.	First Year Mentoring Programme		
f.	Food Security Programme		
g.	Group Study Rooms (Library)		
h.	Homeopathic Clinic		
i.	National Student Financial Aid Scheme		
j.	Somatology Clinic		
k.	Student Counselling Centre		
l.	Student Social Awareness: Stop Suicide		
m.	The Careers Resource Centre		
n.	The HIV / AID centre		
o.	The Isolempilo Campus Health Clinic		
p.	The Language Lab		
q.	The Writing Centre		
r.	Time Concession		

5.	**Please state how the 2016 protests at DUT have affected your general stress levels:**				
	No increase in stress	Mild increase of stress	Moderate increase in stress	High increase in stress	Very high increase in stress

6.	**How would you rate your stress levels right before a test?**				
	No stress	Low stress level	Moderate stress level	High stress level	Very high stress level

7.	**Do you feel that you are coping with your academic load?**	Yes	No

8.	**On average, how many hours do you spend studying for your programme per week (outside of lecture hours)? (E.g. 10 hours)**	

9.	**What is the nature of your study routine for tests / exams? I study:**						
	More than a month before	A month before	2-3 weeks before	A week before	2-6 days before	The night before	The day of the test

10.	**When is your best time to study?**						
	Early morning	Late morning	Early afternoon	Late afternoon	Early evening	Late at night	Random times
	Other:						

11.	**When do you actually study?**						
	Early morning	Late morning	Early afternoon	Late afternoon	Early evening	Late at night	Random times
	Other:						

12.	**In general, how long are your study sessions (in minutes or hours)? E.g. 45 minutes / 1.5 hours**	

13.	**Please indicate the average frequency of the study breaks you take while you are studying:**					
	Every 30 minutes	Every 45 minutes	Every hour	Every 1.5 hours	Every 2 hours	No breaks
	Other:					

14.	**What medium do you use to study? (you can select more than one option)**					
	Audio recording	Cell phone	Computer	Hard copy notes	Tablet	Text book
	Other:					

15.	**What best describes the notes you study from? (you can select more than one option)**				
	Study straight from text book	Use given notes (any format)	Use own audio recorded notes	Use own typed notes	Use own written notes
	Other:				

16.	**What type of light do you use when you study? (you can select more than one option)**						
	Candle light	Electric light	Lamp	Natural light	Battery operated device (e.g. torch / cell phone etc.)		
	Other:						
17.	**Please describe where you most commonly study:**						
	At a desk	On a bed	On a couch	On a Pilates ball	On the floor		
	Other:						
18.	**Please describe your most common position while studying:**						
	Lying on back	Lying on side	Lying on stomach	Sitting	Standing		
	Other:						
19.	**Please describe the most common position of your head and neck while studying? (You can select more than one option)**						
	Bent to the side	Neutral	Tilted backwards	Tilted forward	Turned to one side		
	Other:						
20.	**Please describe the most common position of your shoulders while studying? (You can select more than one option)**						
	Hunched up by ears	In a relaxed position	One shoulder higher than the other	Rounded forward			
	Other:						
21.	**Do your eyes experience any of the following symptoms while studying? (You can select more than one option)**						
	N/A	Blurriness	Dryness	Flashing lights	Itchiness	Pain	Strain
	Other:						
22.	**Do you ever miss lectures to study for a test?**						
	Very often	Often	Sometimes	Seldom	Never		
23.	**Do you ever tremble / fidget for the following reasons while you are studying? (You can select more than one option)**						
	N/A	ADD / ADHD	Cold	Hunger	Nerves		
	Other:						
24.	**Is there ever a breeze on your neck while you are studying?**						
	Very often	Often	Sometimes	Seldom	Never		
25.	**In general, do you wear a scarf when it is cold?**						
	Very often	Often	Sometimes	Seldom	Never		

SECTION C

In the context of your current lifestyle please indicate the most appropriate answer by placing a cross ☒ in the box provided, or by writing in your answer where applicable.

1.	**What surface do you most commonly sleep on?**						
	A bed	A couch	The floor				
	Other:						
2.	**Roughly how many hours of sleep do you get on an average week night?**						
	Less than 4 hours	4 – 6 hours	6 – 8 hours	8 – 10 hours	More than 10 hours		
3.	**If you are getting less than 6 – 8 hours please state why:**						
	Condition of sleeping surface / environment	Insomnia	Part-time work	Restless sleeper	Socialising	Studying	Transport
	N/A	Other:					
4.	**On average, how many hours of sleep do you get on a night when you are studying?**						
	Less than 4 hours	4 – 6 hours	6 – 8 hours	8 – 10 hours	More than 10 hours		
5.	**What position is your body most commonly in while you are sleeping?**						
	I sleep on my back	I sleep on my left side	I sleep on my right side	I sleep on my stomach			
	Other:						
6.	**How many pillows do you sleep on?**						
	0	1	2	More than 2			

7.	**What is the condition of your pillows?**							
	N/A		Flat and thin		Rounded and thick		Orthopaedic Pillow	
8.	**On average, how many days do you exercise per week?**							
	0	1	2	3	4	5	6	7
9.	**On average, how many times a day do you exercise?**							
	0		1		2		3	More than 3
10.	**On average, how long are your exercise sessions?**							
	N/A		Less than 30 minutes		30 minutes – 1 hour		More than 1 hour	
11.	**What type of exercise do you do?**							
	No exercise		Basketball		Boxing		Cross fit	Cycling
	Dancing / Zumba		Gymnastics		Hockey		Long Distance Running	Netball
	Pilates		Pole dancing		Powerlifting		Racket sport	Rock Climbing
	Rowing / Canoeing		Short Distance Running		Skateboarding		Soccer	Surfing
	Swimming		Volleyball		Walking		Weight Training	Yoga
	Other:							
12.	**Do you smoke tobacco?**						Yes	No
13.	**Roughly, how many cigarettes do you smoke per day?**						N/A	
14.	**Do you smoke an electronic cigarette?**						Yes	No
15.	**Roughly, how many times do you smoke an electronic cigarette per day?**						N/A	
16.	**Do you use social drugs?**						Yes	No
17.	**How often do you use social drugs?**							
	Very often		Often		Sometimes		Seldom	Never
18.	**Do you drink alcohol?**						Yes	No
19.	**On average, how many units of alcohol do you drink per week? (1 unit = about 250ml beer or cider / 76ml [or half a glass of wine] / 25ml [or half a shot] of spirits)**							
	0	1-2	2-4	4-8	8-10	More than 10		
20.	**Have you ever sustained any of the following injuries?**							
	N/A		Concussion		Disc Injury – Lower back		Disc Injury – Neck	Disc Injury – Upper back
	Fracture – Arm		Fracture – Collar Bone		Fracture – Foot		Fracture – Hand	Fracture – Leg
	Fracture – Lower Back		Fracture – Neck		Fracture – Pelvis		Fracture – Rib	Fracture – Skull
	Fracture – Upper Back		Nerve Root Injury – Neck		Soft Tissue Injury – Abdomen		Soft Tissue Injury – Arm	Soft Tissue Injury – Chest
	Soft Tissue Injury – Foot		Soft Tissue Injury – Hand		Soft Tissue Injury – Head / Face		Soft Tissue Injury – Leg	Soft Tissue Injury – Lower back
	Soft Tissue Injury – Neck		Soft Tissue Injury – Upper back		Spinal Cord Injury (with paralysis)		Spinal Cord Injury (without paralysis)	Whiplash Injury
	Other:							
21.	**Do you have any physical disabilities?**						Yes	No
22.	**Please describe your disability or mark N/A if this is not applicable to you:**							
	N/A							
23.	**Do you have any learning disabilities?**						Yes	No
24.	**Please describe your disability or mark N/A if this is not applicable to you:**							
	N/A							
25.	**Have you been diagnosed with any of the following chronic conditions?**							
	N/A		Anxiety Disorder		Asthma		ADD / ADHD	
	Depression		Diabetes Mellitus		Epilepsy		High Blood Pressure	
	High Cholesterol		Hyperthyroidism		Hypothyroidism		Mood Disorder	
	Other:							
26.	**Do you ever experience neck pain?**						Yes	No

If you answered "No" to question 26 (i.e. you do not experience neck pain) please skip ahead to Section D and leave out questions 27 – 43 of this section.

27.	**Has your neck pain been diagnosed by a practitioner in the health field?**							Yes		No	
28.	**For how long have you been experiencing neck pain?**										
	Less than 3 months			3-6 months				More than 6 months			
29.	**In general, how would you rate your neck pain? (0 = no pain at all; 10 = worst imaginable pain)**										
	0	1	2	3	4	5	6	7	8	9	10
30.	**On average, how many times a week do you experience neck pain?**										
	0	1	2	3	4	5	6	7			
31.	**On days that you experience neck pain, please indicate the duration of your pain:**										
	Constant pain					Intermittent / "on and off" pain					
32.	**Please indicate, roughly, the time of the day you experience neck pain the most:**										
	Morning			Afternoon				Night			
33.	**Please indicate the nature of your neck pain:**										
	Aching		Burning		Dull		Pins and Needles		Sharp / shooting		
	Other:										
34.	**How do you manage your neck pain?**										
	No management		Chiropractic		Exercise		General Practitioner				
	Heat therapy		Massage		Medication		Physiotherapy				
	Stress management		Stretching		Traditional Therapies		Yoga				
	Other:										
35.	**Do you ever miss lectures because of neck pain?**										
	Very often		Often		Sometimes		Seldom		Never		
36.	**Do you ever miss lectures due to other health reasons?**										
	Very often		Often		Sometimes		Seldom		Never		

For the following questions which have been designed to find out about your neck pain and how it is affecting you, please **circle** the number for each question that relates to how you have felt over the past week.

37. Over the past week, on average, how would you rate your neck pain? (e.g. 0 = no pain, 10 = worst possible pain)

0 = No pain 10 = Worst pain possible

0 1 2 3 4 5 6 7 8 9 10

38. Over the past week, how much has your neck pain interfered with your daily activities (housework, washing, dressing, lifting, reading, and driving)?

0 = No interference 10 = Unable to carry out activity

0 1 2 3 4 5 6 7 8 9 10

39. Over the past week, how much has your neck pain interfered with your ability to take part in recreational, social, and family activities?

0 = No interference 10 = Unable to carry out activity

0 1 2 3 4 5 6 7 8 9 10

40. Over the past week, how anxious (tense, uptight, irritable, difficulty in concentrating/relaxing) have you been feeling?

0 = Not at all anxious 10 = Extremely anxious

0 1 2 3 4 5 6 7 8 9 10

41. Over the past week, how depressed (down-in-the-dumps, sad, in low spirits, pessimistic, unhappy) have you been feeling?

0 = Not at all depressed 10 = Extremely depressed

0 1 2 3 4 5 6 7 8 9 10

42. Over the past week, how have you felt your work (both inside and outside the home) has affected (or would affect) your neck pain?

0 = Has made it no worse 10 = Has made it much worse

0 1 2 3 4 5 6 7 8 9 10

43. Over the past week, how much have you been able to control (reduce/help) your neck pain on your own?

0 = Completely control it 10 = No control whatsoever

0 1 2 3 4 5 6 7 8 9 10

SECTION D

Please read each statement and put a cross over the number which indicates how much the statement has applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:					
0 =	Did not apply to me at all.	~~0~~	1	2	3
1 =	Applied to me to some degree, or some of the time.	0	~~1~~	2	3
2 =	Applied to me to a considerable degree, or a good part of the time.	0	1	~~2~~	3
3 =	Applied to me very much, or most of the time.	0	1	2	~~3~~

1.	I found it hard to wind down.	0	1	2	3
2.	I was aware of dryness of my mouth.	0	1	2	3
3.	I couldn't seem to experience any positive feeling at all.	0	1	2	3
4.	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion).	0	1	2	3
5.	I found it difficult to work up the initiative to do things.	0	1	2	3
6.	I tended to over-react to situations.	0	1	2	3
7.	I experienced trembling (e.g. in the hands).	0	1	2	3
8.	I felt that I was using a lot of nervous energy.	0	1	2	3
9.	I was worried about situations in which I might panic and make a fool of myself.	0	1	2	3
10.	I felt that I had nothing to look forward to.	0	1	2	3
11.	I found myself getting agitated.	0	1	2	3
12.	I found it difficult to relax.	0	1	2	3
13.	I felt down-hearted and blue.	0	1	2	3
14.	I was intolerant of anything that kept me from getting on with what I was doing.	0	1	2	3
15.	I felt I was close to panic.	0	1	2	3
16.	I was unable to become enthusiastic about anything.	0	1	2	3
17.	I felt I wasn't worth much as a person.	0	1	2	3
18.	I felt that I was rather touchy.	0	1	2	3
19.	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat).	0	1	2	3
20.	I felt scared without any good reason.	0	1	2	3
21.	I felt that life was meaningless.	0	1	2	3

THE END

Thank you for taking the time to complete this questionnaire.

Your contribution is greatly appreciated.

APPENDIX F1: Letter of Information and Informed Consent for Research Participants

Dear participant

I am a registered chiropractic master's student at the Durban University of Technology and I invite you to participate in the following research study. All the relevant information about the study can be found below. Please take some time to read through it to better your understanding.

Background to Study:

Neck pain has been shown to be highly prevalent in society in both developed and developing countries. It has been known to affect students in their studies and in daily life. Although it occurs commonly, the extent to which demographic, social and psychological factors contribute towards the development of neck pain is not yet fully understood.

Objectives of Study:

1. To determine the prevalence of neck pain in registered DUT first year Faculty of Health Sciences students.
2. To determine the characteristics (pain type, duration and intensity) of the neck pain
3. To determine the psychosocial risk factors of registered DUT first year faculty of health sciences students suffering with neck pain.
4. To determine the association between demographic characteristics, socio-demographic and psychosocial risk factors in the student population in relation to the neck pain that they present with.

Title of Research Study:

The prevalence of and risk factors for neck pain in first year Faculty of Health Sciences students, at the Durban University of Technology.

Researcher:	Ms Giselle Gevers	0766052761	B.Tech Chiropractic
Supervisor:	Dr Praveena Maharaj	0732567399	M.Tech Chiropractic
Co - Supervisor:	Prof. T. Puckree	031 373 2967	Ph.D

Outlines of Procedure:

- Before you answer the questionnaire please read and sign this letter of information and an informed consent form which confirms that you fully understand the research, what is required of you and your willingness to participate in this study. You are encouraged to ask questions about the process to better your understanding before you agree to participate.
- Once you have done so please place these forms in the sealed ballot box's labelled "Letters of Information" and "Letters of Informed Consent", which will be provided by the researcher.
- You will then be given a questionnaire. Please answer the questions as honestly as possible and be assured that your answers will be kept strictly anonymous and confidential. I.e. your responses will not be linked to your identity, thus, please do not write your name, identity number or student number on the questionnaire.
- Once you have completed the questionnaire please place it in the sealed ballot box labelled "Questionnaires", which will be provided by the researcher.

Risks or Discomforts to the Participants:

There are no foreseeable risks to participation in this research study.

Benefits:

Your co-operation would aid the expansion of literature and knowledge on neck pain. Furthermore, the outcomes of this study are expected to benefit the students in that the practitioners would be able to address more effectively those factors predisposing students to neck pain. It would also allow institutions of higher education to be able to address factors within the socio-demographic of the students that would enable the student to improve and develop personally based in their programme for which they are registered.

Reason/s why the Participant May Be Withdrawn from the Study:

The participant may withdraw from the research study at any stage without any negative effect or repercussions on the participant.

Remuneration:

There will be no remuneration for participation in this research study.

Costs of the Study:

As a participant, you will not be expected to cover any cost towards the research study.

Research-related Injury:

There are no foreseeable injuries to participants of this research study. Should you pick up an injury during the research study, you may not hold DUT or the Researcher responsible / liable.

Persons to Contact in the Event of Any Problem or Query:

Please contact the researcher (0766052761) my supervisor (0732567399) or the Institutional Research Ethics administrator on 031 373 2900. Complaints can be reported to the DVC: TIP, Prof F. Otieno on 031 373 2382 or dvctip@dut.ac.za.

Confidentiality:

The information that you provide during the research study, as well as the answering of this questionnaire will remain strictly confidential and anonymous (i.e. there will be no form of identification, such as names, ID numbers or signatures on the questionnaire).

General:

Please note that there is no obligation for you to participate in this research study, participation is on a volunteer basis. There will be approximately 151 – 212 participants in the research study. If you choose to participate, you will be required to answer questions and discuss at length the questionnaire. Please answer the questions as honestly as possible, and be assured the answers you provide will be kept strictly anonymous and confidential. If you have any queries during the research study – please don't hesitate to ask me for clarification. Copies of this information letter will be available, should you want one.

Thank you for the time you have taken to read through this information pertaining to the study. If you have any questions, please do not hesitate to ask. If you wish to participate in this focus group please read and sign the consent form attached.

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

_____

Signature / Right Thumbprint

I, _____ (name of researcher), 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

Dr P. Maharaj (Research Supervisor)

_____

Prof. T. Puckree (Research Co-supervisor)

_____

APPENDIX F2: Coding of the Neck Pain Questionnaire

SECTION A (excel tab one)

Please indicate the most appropriate answer by placing a cross ☒ in the box provided, or writing in your answer where applicable.

1.	**Date of Birth: (day/month/year)**	Type participants age			
2.	**Gender:**	Type participants answer (1 = FEMALE; 2 = MALE)			
3.	**Ethnicity: (for statistical purposes)**				
	(1) Asian	(2) Black	(3) Coloured	(4) Indian	(5) White
	Other: Type participants answer				
4.	**What is your Home Language?**				
	(1) Afrikaans	(2) English	(3) isiXhosa	(4) isiZulu	
	Other: Type participants answer				
5.	**What other language is spoken at home? (you can select more than one option)**				
	(1) Afrikaans	(2) English	(3) isiXhosa	(4) isiZulu	
	Other: Type participants answer	(5) English & isiXhosa (2&3)	(6) English & isiZulu (2 & 4)	(7) Afrikaans, English & Siswati	
6.	**What is the language medium of the High School to which you went?**				
	(1) Afrikaans	(2) English	(3) isiXhosa	(4) isiZulu	
	Other: Type participants answer	(5) Afrikaans & English (1&2)	(6) English & Zulu (2&4)		
7.	**Do you experience any barriers to learning due to the fact that your programme and related materials are presented in English?**			(Y) Yes	(N) No
8.	**Please rate the level of difficulty you experience learning at an English medium institution:**				
	(1) No difficulty	(2) Mild difficulty	(3) Moderate difficulty	(4) High difficulty	(5) Extreme difficulty
9.	**For which Health Sciences programme are you registered?**	Type participants answer			
10.	**Is any of the following people dependant on you for financial support? (Dependants)**				
	(1) Child	(2) Grandparent	(3) Extended family member	(4) Friend	
	(5) Parent	(6) Partner	(7) Sibling	(8) Spouse	
	N/A	Other: Type participants answer			
11.	**How many dependants do you have, in total?**				
	0	1	2		
	3	4	(5) 5 or more		
12.	**Are you the breadwinner in your family?**			(Y) Yes	(N) No
13.	**Please select the most appropriate description of the area *(see definitions below) in which you live <u>during term time</u>:**				
	(1) Homeless	(2) Informal settlement	(3) Rural	(4) Suburban	(5) Urban
	Other: Type participants answer				
14.	**Please select the most appropriate description of the area *(see definitions below) in which you live <u>during holidays</u>:**				
	(1) Homeless	(2) Informal settlement	(3) Rural	(4) Suburban	(5) Urban
	Other: Type participants answer				
15.	**In general, what type of transport do you use to get to and from campus?**				
	(1) Bicycle	(2) Bus	(3) Lift club / Car pool	(4) Metered taxi	(5) Motorbike
	(6) Own Car	(7) Parents' car	(8) Taxi	(9) Train	(10) Walking
	(11) Bus & Walk (2&10) (12) Bus & Taxi (2&8) (13) Bus & Parent's Car (2&7) (14) Lift Club, Own Car & Parents Car (3; 6&7) (15) Own Car & Parents' Car (6&7) (16) Parents' Car and Taxi (7&8) (17) Taxi & Walk (8&10)				
	Other: Type participants answer				
16.	**How long (in minutes / hours) does it take you to travel to and from DUT each day? E.g. 15minutes / 1.5 hours**				
	(1) 0 – 15 minutes	(2) 16 – 30 minutes	(3) 31 – 45 minutes	(4) 46 -60 minutes	
	(5) 61 – 75 minutes	(6) 76 – 90 minutes	(7) 91 – 105 minutes	(8) 106 – 120 minutes	
17.	**Do you ever skip lectures due to transport problems?**				
	(5) Very often	(4) Often	(3) Sometimes	(2) Seldom	(1) Never
18.	**Please state how the 2016 transport strikes have affected your level of stress with regard to getting to and from lectures:**				
	(1) No increase in stress	(2) Mild increase of stress	(3) Moderate increase in stress	(4) High increase in stress	(5) Very high increase in stress
19.	**Do you feel that the emotional support you receive is sufficient for your needs?**			(Y) Yes	(N) No
20.	**How many jobs do you have in a part-time capacity?**				

	0	1	2	3	(>3) More than 3	
21.	**When do you carry out this part-time work? (you can select more than one option)**					
	N/A	(1) During the week (day)	(2) During the week (night)	(3) On the weekend (day)	(4) On the weekend (night)	(5) In the holidays
22.	**Please state your employment position(s) in your job(s) (e.g. Waitress, Admin clerk etc.) OR select N/A if you do not have a job**			N/A	Type participants answer	
23.	**Please indicate the average time spent on your job each week:**					
	N/A	(1) Less than 5 hours	(2) 5 – 10 hours	(3) 10 – 15 hours	(4) 15 – 20 hours	(5) 20 – 25 hours	(6) 25 – 30 hours	(7) More than 30 hours
24.	**If you were previously doing part-time work but are now unemployed, please state the reason for your unemployment:**					
	N/A	(1) I resigned voluntarily	(2) I was fired	(3) I was retrenched	(4) My contract ended	
	Other: Type participants answer					
25.	**Do you feel pressured, for any of the following reasons, into having a part-time job(s), while studying towards your degree? (you can select more than one option)**					
	N/A	(1) To gain independence	(2) To pay for my studies	(3) To support my family	(4) To support my lifestyle	
	Other: Type participants answer					
26.	**Where do you receive financial support from? (you can select more than one option)**					
	(1) Bank loan	(2) Bursary	(3) Child Dependency Grant	(4) Child Support Grant	(5) Disability Grant	
	(6) Extended Family Member	(7) Foster Child Grant	(8) Friend	(9) Grandparent(s)	(10) NSFAS	
	(11) Parent(s)	(12) Partner / Spouse	(13) Scholarship	(14) Self	(15) Sibling(s)	
	Other: Type participants answer					
27.	**Do you feel that the financial support you receive is sufficient for your needs?**			(Y) Yes	(N) No	
28.	**In general, please indicate your level of stress associated with securing your financial support:**					
	(1) No increase in stress	(2) Mild increase of stress	(3) Moderate increase in stress	(4) High increase in stress	(5) Very high increase in stress	
29.	**Please indicate which avenues of financial support, if any, cause an increase in your general stress levels: (you can select more than one option)**					
	(1) Bank loan	(2) Bursary	(3) Child Dependency Grant	(4) Child Support Grant	(5) Disability Grant	
	(6) Extended Family Member	(7) Foster Child Grant	(8) Friend	(9) Grandparent(s)	(10) NSFAS	
	(11) Self	(12) Parent(s)	(13) Partner / Spouse	(14) Scholarship	(15) Sibling(s)	
	(16) None		Other: Type participants answer			
30.	**Do you / your household always have enough money to buy food?**			(Y) Yes	(N) No	
31.	**On average, how much water do you drink per day?**					
	(1) None	(2) Less than 500ml	(3) 500ml – 1000ml	(4) 1000ml – 1500ml	(5) 1500ml – 2000ml	(6) More than 2000ml

SECTION B

In the context of the programme for which you are studying, please indicate the most appropriate answer by placing a cross ☒ in the box provided, or, where applicable, writing in your answer.

1.	**In general, do you feel that your High School prepared you adequately for University?**	(Y) Yes	(N) No
2.	**Have you made friends with people in your programme?**	(Y) Yes	(N) No
3.	**Please describe your experience with regard to making friends in your programme?**		
	(1) I found it difficult to make friends	(2) I made friends easily	(3) Making friends is not a priority for me
	Other: Type participants answer		
4.	**Which support services offered at the Durban University of Technology are you aware of, and of which do you make use?** In column (1): Place a tick next to the support services of which you are aware and a cross next to the services of which you are not aware. In column (2): Place a tick next to the support services of which you make use and a cross next to the services of which you do not make use.	**(1) I am aware of this service:**	**(2) I make use of this service:**
e.g.	**Book Club**	**1= aware 2 = not aware**	**1= makes use of 2 = does not make use of**
a.	Book Club		
b.	Chiropractic Clinic		
c.	Computer Use and Laptop Loan		
d.	Dentistry Clinic		
e.	First Year Mentoring Programme		

f.	Food Security Programme		
g.	Group Study Rooms (Library)		
h.	Homeopathic Clinic		
i.	National Student Financial Aid Scheme		
j.	Somatology Clinic		
k.	Student Counselling Centre		
l.	Student Social Awareness: Stop Suicide		
m.	The Careers Resource Centre		
n.	The HIV / AID centre		
o.	The Isolempilo Campus Health Clinic		
p.	The Language Lab		
q.	The Writing Centre		
r.	Time Concession		

5.	**Please state how the 2016 protests at DUT have affected your general stress levels:**						
	(1) No increase in stress	(2) Mild increase of stress	(3) Moderate increase in stress	(4) High increase in stress	(5) Very high increase in stress		
6.	**How would you rate your stress levels right before a test?**						
	(1) No stress	(2) Low stress level	(3) Moderate stress level	(4) High stress level	(5) Very high stress level		
7.	**Do you feel that you are coping with your academic load?**				(Y) Yes	(N) No	
8.	**On average, how many hours do you spend studying for your programme per week (outside of lecture hours)? (E.g. 10 hours)**					Type participants answer	
	(1) Less than 5 hours	(2) 5 – 10 hours	(3) 11 – 15 hours	(4) 16 – 20 hours	(5) 21 – 25 hours		
	(6) 26 – 30 hours	(7) 31 – 35 hours	(8) 36 – 40 hours	(9) 41 – 45 hours	(10) 46 – 50 hours		
9.	**What is the nature of your study routine for tests / exams? I study:**						
	(1) More than a month before	(2) A month before	(3) 2-3 weeks before	(4) A week before	(5) 2-6 days before	(6) The night before	(7) The day of the test
10.	**When is your best time to study?**						
	(1) Early morning	(2) Late morning	(3) Early afternoon	(4) Late afternoon	(5) Early evening	(6) Late at night	(7) Random times
	Other: Type participants answer						
11.	**When do you actually study?**						
	(1) Early morning	(2) Late morning	(3) Early afternoon	(4) Late afternoon	(5) Early evening	(6) Late at night	(7) Random times
	Other: Type participants answer						
12.	**In general, how long are your study sessions (in minutes or hours)? E.g. 45 minutes / 1.5 hours**					Type participants answer	
	(1) 30 – 60 min	(2) 61 – 90 min	(3) 91 – 120 min	(4) 121 – 150 min	(5) 151 – 180min		
	(6) 181 – 210 min	(7) 211 -240 min	(8) 241 – 270 min	(9) 271 – 300 min	(10) 301 – 330 min		
	(11) 331 – 360 min	(12) 361 – 390 min	(13) 391 – 420 min	(14) 421 – 450 min	(15) 451 – 480 min		
	(16) 481 – 510 min	(17) 511 – 540 min	(18) 541 – 570 min	(19) 571 – 600 min			
13.	**Please indicate the average frequency of the study breaks you take while you are studying:**						
	(1) Every 30 minutes	(2) Every 45 minutes	(3) Every hour	(4) Every 1.5 hours	(5) Every 2 hours	(6) No breaks	
	Other: Type participants answer						
14.	**What medium do you use to study? (you can select more than one option)**						
	(1) Audio recording	(2) Cell phone	(3) Computer	(4) Hard copy notes	(5) Tablet	(6) Text book	
	Other: Type participants answer						
15.	**What best describes the notes you study from? (you can select more than one option)**						
	(1) Study straight from text book	(2) Use given notes (any format)	(3) Use own audio recorded notes	(4) Use own typed notes	(5) Use own written notes		
	Other: Type participants answer						
16.	**What type of light do you use when you study? (you can select more than one option)**						
	(1) Candle light	(2) Electric light	(3) Lamp	(4) Natural light	(5) Battery operated device (e.g. torch / cell phone etc.)		
	Other: Type participants answer						
17.	**Please describe where you most commonly study:**						
	(1) At a desk	(2) On a bed	(3) On a couch	(4) On a Pilates ball	(5) On the floor		
	Other: Type participants answer						
18.	**Please describe your most common position while studying:**						
	(1) Lying on back	(2) Lying on side	(3) Lying on stomach	(4) Sitting	(5) Standing		
	Other: Type participants answer						
19.	**Please describe the most common position of your head and neck while studying? (You can select more than one option)**						

	(1) Bent to the side	(2) Neutral	(3) Tilted backwards	(4) Tilted forward	(5) Turned to one side
	Other: Type participants answer				
20.	**Please describe the most common position of your shoulders while studying? (You can select more than one option)**				
	(1) Hunched up by ears	(2) In a relaxed position	(3) One shoulder higher than the other	(4) Rounded forward	
	Other: Type participants answer				
21.	**Do your eyes experience any of the following symptoms while studying? (You can select more than one option)**				
	N/A	(1) Blurriness	(2) Dryness	(3) Flashing lights	(4) Itchiness	(5) Pain	(6) Strain
	Other: Type participants answer				
22.	**Do you ever miss lectures to study for a test?**				
	(5) Very often	(4) Often	(3) Sometimes	(2) Seldom	(1) Never
23.	**Do you ever tremble / fidget for the following reasons while you are studying? (You can select more than one option)**				
	N/A	(1) ADD / ADHD	(2) Cold	(3) Hunger	(4) Nerves
	Other: Type participants answer				
24.	**Is there ever a breeze on your neck while you are studying?**				
	(5) Very often	(4) Often	(3) Sometimes	(2) Seldom	(1) Never
25.	**In general, do you wear a scarf when it is cold?**				
	(5) Very often	(4) Often	(3) Sometimes	(2) Seldom	(1) Never

SECTION C

In the context of your current lifestyle please indicate the most appropriate answer by placing a cross ☒ in the box provided, or by writing in your answer where applicable.

1.	**What surface do you most commonly sleep on?**						
	(1) A bed	(2) A couch	(3) The floor				
	Other: Type participants answer						
2.	**Roughly how many hours of sleep do you get on an average week night?**						
	(1) Less than 4 hours	(2) 4 – 6 hours	(3) 6 – 8 hours	(4) 8 – 10 hours	(5) More than 10 hours		
3.	**If you are getting less than 6 – 8 hours please state why:**						
	(1) Condition of sleeping surface / environment	(2) Insomnia	(3) Part-time work	(4) Restless sleeper	(5) Socialising	(6) Studying	(7) Transport
	N/A	Other: Type participants answer					
4.	**On average, how many hours of sleep do you get on a night when you are studying?**						
	(1) Less than 4 hours	(2) 4 – 6 hours	(3) 6 – 8 hours	(4) 8 – 10 hours	(5) More than 10 hours		
5.	**What position is your body most commonly in while you are sleeping?**						
	(1) I sleep on my back	(2) I sleep on my left side	(3) I sleep on my right side	(4) I sleep on my stomach			
	Other: Type participants answer						
6.	**How many pillows do you sleep on?**						
	0	1	2	(>2)More than 2			
7.	**What is the condition of your pillows?**						
	N/A	(1) Flat and thin	(2) Rounded and thick	(3) Orthopaedic Pillow			
8.	**On average, how many days do you exercise per week?**						
	0	1	2	3	4	5	6	7
9.	**On average, how many times a day do you exercise?**						
	0	1	2	3	(4)More than 3		
10.	**On average, how long are your exercise sessions?**						
	N/A	(1) Less than 30 minutes	(2) 30 minutes – 1 hour	(3) More than 1 hour			
11.	**What type of exercise do you do?**						
	(1) No exercise	(2) Basketball	(3) Boxing	(4) Cross fit	(5) Cycling		
	(6) Dancing / Zumba	(7) Gymnastics	(8) Hockey	(9) Long Distance Running	(10) Netball		
	(11) Pilates	(12) Pole dancing	(13) Powerlifting	(14) Racket sport	(15) Rock Climbing		
	(16) Rowing / Canoeing	(17) Short Distance Running	(18) Skateboarding	(19) Soccer	(20) Surfing		
	(21) Swimming	(22) Volleyball	(23) Walking	(24) Weight Training	(25) Yoga		
	Other: Type participants answer						
12.	**Do you smoke tobacco?**					(Y) Yes	(N) No
13.	**Roughly, how many cigarettes do you smoke per day?**					N/A	Type participants answer
14.	**Do you smoke an electronic cigarette?**					(Y) Yes	(N) No

15.	**Roughly, how many times do you smoke an electronic cigarette per day?**				N/A	Type participants answer
16.	**Do you use social drugs?**				(Y) Yes	(N) No
17.	**How often do you use social drugs?**					
	(5) Very often	(4) Often	(3) Sometimes	(2) Seldom	(1) Never	
18.	**Do you drink alcohol?**				(Y) Yes	(N) No
19.	**On average, how many units of alcohol do you drink per week? (1 unit = about 250ml beer or cider / 76ml [or half a glass of wine] / 25ml [or half a shot] of spirits)**					
	(1) 0	(2) 1-2	(3) 2-4	(4) 4-8	(5) 8-10	(6) More than 10
20.	**Have you ever sustained any of the following injuries?**					
	N/A	(1) Concussion	(2) Disc Injury – Lower back	(3) Disc Injury – Neck	(4) Disc Injury – Upper back	
	(5) Fracture – Arm	(6) Fracture – Collar Bone	(7) Fracture – Foot	(8) Fracture – Hand	(9) Fracture – Leg	
	(10) Fracture – Lower Back	(11) Fracture – Neck	(12) Fracture – Pelvis	(13) Fracture – Rib	(14) Fracture – Skull	
	(15) Fracture – Upper Back	(16) Nerve Root Injury – Neck	(17) Soft Tissue Injury – Abdomen	(18) Soft Tissue Injury – Arm	(19) Soft Tissue Injury – Chest	
	(20) Soft Tissue Injury – Foot	(21) Soft Tissue Injury – Hand	(22) Soft Tissue Injury – Head / Face	(23) Soft Tissue Injury – Leg	(24) Soft Tissue Injury – Lower back	
	(25) Soft Tissue Injury – Neck	(26) Soft Tissue Injury – Upper back	(27) Spinal Cord Injury (with paralysis)	(28) Spinal Cord Injury (without paralysis)	(29) Whiplash Injury	
	Other: Type participants answer					
21.	**Do you have any physical disabilities?**				(Y) Yes	(N) No
22.	**Please describe your disability or mark N/A if this is not applicable to you:**					
	N/A	Type participants answer				
23.	**Do you have any learning disabilities?**				(Y) Yes	(N) No
24.	**Please describe your disability or mark N/A if this is not applicable to you:**					
	N/A	Type participants answer				
25.	**Have you been diagnosed with any of the following chronic conditions?**					
	N/A	(1) Anxiety Disorder	(2) Asthma	(3) ADD / ADHD		
	(4) Depression	(5) Diabetes Mellitus	(6) Epilepsy	(7) High Blood Pressure		
	(8) High Cholesterol	(9) Hyperthyroidism	(10) Hypothyroidism	(11) Mood Disorder		
	Other: Type participants answer					
26.	**Do you ever experience neck pain?**				(Y) Yes	(N) No

If you answered "No" to question 26 (i.e. you do not experience neck pain) please skip ahead to Section D and leave out questions 27 – 43 of this section. If participants indicated they did not have neck pain, I inserted "No neck pain" across the remaining blocks of questions for neck pain as well as the Bournemouth scale.

27.	**Has your neck pain been diagnosed by a practitioner in the health field?**									(Y) Yes	(N) No
28.	**For how long have you been experiencing neck pain?**										
	(1) Less than 3 months			(2) 3-6 months				(3) More than 6 months			
29.	**In general, how would you rate your neck pain? (0 = no pain at all; 10 = worst imaginable pain)**										
	0	1	2	3	4	5	6	7	8	9	10
30.	**On average, how many times a week do you experience neck pain?**										
	0	1	2	3	4	5	6	7			
31.	**On days that you experience neck pain, please indicate the duration of your pain:**										
	(1) Constant pain					(2) Intermittent / "on and off" pain					
32.	**Please indicate, roughly, the time of the day you experience neck pain the most:**										
	(1) Morning			(2) Afternoon				(3) Night			
33.	**Please indicate the nature of your neck pain:**										
	(1) Aching		(2) Burning		(3) Dull		(4) Pins and Needles		(5) Sharp / shooting		
	Other: Type participants answer										
34.	**How do you manage your neck pain?**										
	(1) No management			(2) Chiropractic			(3) Exercise			(4) General Practitioner	
	(5) Heat therapy			(6) Massage			(7) Medication			(8) Physiotherapy	
	(9) Stress management			(10) Stretching			(11) Traditional Therapies			(12) Yoga	
	Other: Type participants answer										
35.	**Do you ever miss lectures because of neck pain?**										
	(5) Very often		(4) Often		(3) Sometimes		(2) Seldom		(1) Never		
36.	**Do you ever miss lectures due to other health reasons?**										
	(5) Very often		(4) Often		(3) Sometimes		(2) Seldom		(1) Never		

For the following questions which have been designed to find out about your neck pain and how it is affecting you, please **circle** the number for each question that relates to how you have felt over the past week. Please see Bournemouth scoring template.

37. Over the past week, on average, how would you rate your neck pain? (e.g. 0 = no pain, 10 = worst possible pain)

0 = No pain 10 = Worst pain possible

0 1 2 3 4 5 6 7 8 9 10

38. Over the past week, how much has your neck pain interfered with your daily activities (housework, washing, dressing, lifting, reading, and driving)?

0 = No interference 10 = Unable to carry out activity

0 1 2 3 4 5 6 7 8 9 10

39. Over the past week, how much has your neck pain interfered with your ability to take part in recreational, social, and family activities?

0 = No interference 10 = Unable to carry out activity

0 1 2 3 4 5 6 7 8 9 10

40. Over the past week, how anxious (tense, uptight, irritable, difficulty in concentrating/relaxing) have you been feeling?

0 = Not at all anxious 10 = Extremely anxious

0 1 2 3 4 5 6 7 8 9 10

41. Over the past week, how depressed (down-in-the-dumps, sad, in low spirits, pessimistic, unhappy) have you been feeling?

0 = Not at all depressed 10 = Extremely depressed

0 1 2 3 4 5 6 7 8 9 10

42. Over the past week, how have you felt your work (both inside and outside the home) has affected (or would affect) your neck pain?

0 = Has made it no worse 10 = Has made it much worse

0 1 2 3 4 5 6 7 8 9 10

43. **Over the past week, how much have you been able to control (reduce/help) your neck pain on your own?**

0 = Completely control it 10 = No control whatsoever

0 1 2 3 4 5 6 7 8 9 10

SECTION D

Please read each statement and put a cross over the number which indicates how much the statement has applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

Please see DASS scoring template.					
The rating scale is as follows:					
0 =	Did not apply to me at all.	0	1	2	3
1 =	Applied to me to some degree, or some of the time.	0	1	2	3
2 =	Applied to me to a considerable degree, or a good part of the time.	0	1	2	3
3 =	Applied to me very much, or most of the time.	0	1	2	3

1.	I found it hard to wind down.	0	1	2	3
2.	I was aware of dryness of my mouth.	0	1	2	3
3.	I couldn't seem to experience any positive feeling at all.	0	1	2	3
4.	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion).	0	1	2	3
5.	I found it difficult to work up the initiative to do things.	0	1	2	3
6.	I tended to over-react to situations.	0	1	2	3
7.	I experienced trembling (e.g. in the hands).	0	1	2	3
8.	I felt that I was using a lot of nervous energy.	0	1	2	3
9.	I was worried about situations in which I might panic and make a fool of myself.	0	1	2	3
10.	I felt that I had nothing to look forward to.	0	1	2	3
11.	I found myself getting agitated.	0	1	2	3
12.	I found it difficult to relax.	0	1	2	3
13.	I felt down-hearted and blue.	0	1	2	3
14.	I was intolerant of anything that kept me from getting on with what I was doing.	0	1	2	3
15.	I felt I was close to panic.	0	1	2	3
16.	I was unable to become enthusiastic about anything.	0	1	2	3
17.	I felt I wasn't worth much as a person.	0	1	2	3
18.	I felt that I was rather touchy.	0	1	2	3
19.	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat).	0	1	2	3
20.	I felt scared without any good reason.	0	1	2	3
21.	I felt that life was meaningless.	0	1	2	3

INVALID = participant selected more than one number

THE END

Thank you for taking the time to complete this questionnaire.

Your contribution is greatly appreciated.

APPENDIX G1: Provisional Ethical Clearance for the Study

Institutional Research Ethics Committee
Faculty of Health Sciences
Room M5.60 Mansfield Street Site
Steve Biko Campus
Durban University of Technology

PO Box 1334, Durban, South Africa, 4001

Tel: 031 373 2577
Fax: 031 373 2407
Email: lawlahod@dut.ac.za
http://www.dut.ac.za/research/ethics_forms_research_ethics

www.dut.ac.za

28 April 2016

IREC Reference Number: **REC 28/16**

Ms G L Gevers
14 Moore Grove
5 Moreview
Glenwood
Durban
4001

Dear Ms Gevers

The prevalence of and risk factors for neck pain in first year Faculty of Health Sciences students at the Durban University of Technology

I am pleased to inform you that Provisional Approval has been granted to your proposal REC 28/16 subject to:

- Piloting of the data collection tool and
- Obtaining and submitting the necessary gatekeeper permission/s to the IREC.

Full approval is subject to meeting the above conditions.

The Proposal has been allocated the following Ethical Clearance number **IREC 027/16**. 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.

Please note that you may continue with validity testing and piloting of the data collection tool. Research on the proposed project may not proceed until IREC reviews and approves the final document. If there are no changes to the data collection tool, kindly notify the IREC in writing.

APPENDIX G2: Full Ethical Clearance for the Study

Institutional Research Ethics Committee
Faculty of Health Sciences
Room MS 49, Mansfield School Site
Gate 8, Ritson Campus
Durban University of Technology

P O Box 1334, Durban, South Africa, 4001

Tel: 031 373 2900
Fax: 031 373 2407
Email: lavishad@dut.ac.za
http://www.dut.ac.za/research/institutional_research_ethics

www.dut.ac.za

19 September 2016

IREC Reference Number: **REC 28/16**

Ms G L Gevers
14 Moore Grove
5 Moreview
Glenwood
Durban
4001

Dear Ms Gevers

The prevalence of and risk factors for neck pain in first year Faculty of Health Sciences students at the Durban University of Technology

The Institutional Research Ethics Committee acknowledges receipt of your final data collection tool for review.

We are pleased to inform you that the questionnaire has been approved. Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the IREC acknowledges receipt of your gatekeeper permission letter.

Please note that FULL APPROVAL is granted to your research proposal. You may proceed with data collection.

Yours Sincerely,

[redacted]

Professor J K Adam
Chairperson: IREC

DUT DURBAN UNIVERSITY OF TECHNOLOGY
2016 -09- 19
INSTITUTIONAL RESEARCH ETHICS COMMITTEE
P O BOX 1334 DURBAN 4000 SOUTH AFRICA

APPENDIX H: Gatekeeper Permission to Access the Relevant Students at the Durban University of Technology

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

1 September 2016

Ms Giselle Gevers
c/o Department of Chiropractic and Somatology
Faculty of Health Sciences
Durban University of Technology

Dear Ms Gevers

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 full permission for you to conduct your research "The prevalence of and risk factors for neck pain in first year Faculty of Health Sciences students, at the Durban University of Technology" at the Durban University of Technology.

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. S. MOYO
DIRECTOR: RESEARCH AND POSTGRADUATE SUPPORT