An exploration into the utilisation of the biopsychosocial model by chiropractors in the eThekwini Municipality

by

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I, Rosanne Louise Williamson, state that this dissertation is representative of my own work, in both conception and execution (except where acknowledgments indicate to the contrary).

30/05/2022

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DEDICATION

I dedicate this research to my family – Mom, Dad, Nigel and Reece, each one of you has played a profound role in my life.

This research is also dedicated to patients and medical professionals. To patients that seek medical care, may you be treated as an individual, may you realise that you are more than your illness, disabilities and struggles, may you be well informed and educated on your presenting complaints. To medical professionals, may you realise the important role you play in your patients' lives, and may you be inspired to impact the lives of your future patients and their loved ones.

"I can do all things through Christ who strengthens me" - Philippians 4: 13

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ABSTRACT

Background: The biopsychosocial (BPS) model is one of the many models of healthcare and its utilisation has been encouraged when treating and managing musculoskeletal conditions, especially neck and low back pain. Chiropractors are viewed as primary care providers, focused on the treatment and management of musculoskeletal conditions, most of which are spine related.

This study aims to explore the utilisation of the biopsychosocial model by chiropractors in the eThekwini Municipality.

Method: A qualitative, exploratory, descriptive study was conducted, in which twelve chiropractors within the eThekwini Municipality were interviewed to explore their understanding, attitudes, utilisation and challenges when utilising the BPS model. Semi-structured interviews were conducted in English, and later transcribed verbatim. Transcripts were analysed using Tesch's method to form codes, themes and sub-themes.

Results: Female and male chiropractors were interviewed. They displayed knowledge of and a positive attitude towards the BPS model and its constituents. The chiropractors' felt that chiropractic institutions should implement further practical training in the model to adequately prepare students for practice as many of the interviewees felt that addressing psychosocial factors was beyond their scope of practice and that they did not have the required skills. The most mentioned challenge was time, and how it resulted in constraints when utilising the model. This impacted them being able to implement the model effectively. Few used screening tools citing a lack of training or that they added to the time constraints.

Conclusion: Chiropractors had positive attitudes towards and knew about the BPS model. They used the model in their practices to varying degrees with time and skills being the biggest challenges to effective implementation. It is recommended that chiropractic associations and training institutions provide additional practical training to teach students and practitioners how to implement the model in a clinical setting.

Keywords: Perceptions, biopsychosocial model, chiropractic, psychosocial factors, and musculoskeletal pain.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF DEFINITIONS

Biomedical model: is model of health that focuses on biological factors, and the treatment and elimination of symptoms (Taukeni, 2019).

Biopsychosocial model: is a model of health that focuses biological, psychological and social factors, while considering the individual's perception and response to their symptoms (Taukeni, 2019).

Psychosocial factors: Facets that influence an individual psychologically or socially. They can be used to describe individuals in relation to their social environment and how such factors may affect their mental or physical health (Thomas et al. 2020).

Holistic: Dealing with or treating the whole of something or someone, and not just a part (Cambridge Dictionary, 2022).

Ethnomedical cultural model: is the area of anthropology that studies different societies' and cultures' beliefs of health and illness, and the way in which people think and act regarding health and illness (Quinlan in Singer and Erickson, 2011).

Mixers: Chiropractors who utilise a spinal manipulation therapy alongside other treatment modalities, such as heat therapy, cold therapy, electrotherapy, offer dietary advice, postural advice, and many others (Meeker and Haldeman, 2002).

Vitalists: Chiropractors focused on the analysis and correction of vertebral subluxation, to foster the fullest expression of the individual's innate intelligence (Senzon, 2014).

Pain: Is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage (International Association for the study of Pain, 2020).

Musculoskeletal: Relating to or involving both the musculature or the skeleton (Merriam Webster Medical Dictionary, 2022)

Acute: Pain that has been present for less than or equal to four weeks (Dorland, 2007).

Chronic: Pain that is present from twelve weeks or more (Treede et al. 2015).

Prevalence: The number of people in a defined population, who have a specified disease or condition at a point in time. Therefore, prevalence equals the number of people with a health problem at a point in time, divided by the total population alive at that point in time (Encyclopedia Britannica, 2018).

Pandemic: an outbreak of a disease that occurs over a wide geographic area and typically affects a significant proportion of the population (Merriam Webster Medical Dictionary, 2022).

Coronavirus: Any of a family (Coronaviridae) of a large single-stranded RNA viruses that have a lipid envelope studded with club-shaped spike-proteins, infect birds and many mammals, including humans, and include the causative agents of MERS, SARS and COVID-19 (Merriam Webster Medical Dictionary, 2022).

KwaZulu-Natal: One of the nine provinces in South Africa. It is located on the eastern sea boarder of the country.

LIST OF ABBREVIATIONS AND ACRONYMS

AHPCSA	Allied Health Professions Council of South Africa
BPS	Biopsychosocial model
KZN	KwaZulu-Natal
DUT	Durban University of Technology
UJ	University of Johannesburg
IREC	Institutional Research Ethics Committee
WHO	World Health Organization
HPA	Hypopituitary-adrenal axis
ECCE	European Council of Chiropractic Education
CCE's	Chiropractic Council of Education
CCE-Int	Chiropractic Council of Education International
EBM	Evidence-based medicine
EBP	Evidence-based practice
EIP	Evidence-informed practice
EBCAM	Evidence-based complementary and alternative medicine
WFC	World federation of chiropractic
GBD	Global Burden of Disease Study
ACCRAC	Association of Chiropractic Colleges Research Agenda conference
APA	American Psychiatric Association
USA	United States of America

LIST OF SYMBOLS

%	Percentage

CHAPTER ONE
INTRODUCTION

1.1 Introduction

The Global Burden of Disease (GBD) study identified musculoskeletal disorders as accounting for more than 21% of disability worldwide (Murray et al. 2013; Cross et al. 2014). Musculoskeletal disorders are multi-factorial, with physical and psychological manifestations (Andersen et al, 2002; Macdonald et al. 2008), which may result in consequences such as mental strain, social challenges, financial burdens, disability, and a decrease in quality of life (Duffield et al. 2017; March et al. 2014). Poor quality of healthcare was reported as a contributing factor to disability caused by musculoskeletal pain (GBD 2016 Disease and Injury Incidence and Prevalence Collaborators, 2017).

Healthcare providers have a responsibility to ask questions, listen, diagnose, and recommend the appropriate treatments (Farre and Rapley, 2017). Previously, the definition of illness was rooted in physiological causes, however, illness is now identified as result of physiological, psychological, and social factors (Farre and Rapley, 2017). The World Health Organization (WHO) defines health as “a complete state of physical, mental and social well-being, and not merely the absence of disease or infirmity” (WHO, 1946).

The appropriate healthcare models assist in providing patients with value-based care (Speerin et al. 2020). The dominant healthcare model is biomedical, however, it views illness as a result of organic malfunction (Farre and Rapley, 2017), with the focus on tissues, biochemical and physiological changes within the body attributing to either health or illness (Gliedt et al. 2017). The need to consider the psychosocial factors that play a role in health or illness led to the introduction of the Biopsychosocial (BPS) model (Bolton and Gillett, 2019; Engel, 1980). The model considers psychological, biological and social factors as interconnecting contributing factors to pain (Bolton and Gillet, 2019; Gatchel et al. 2006). Calamitous thoughts and beliefs are believed to play

a role in the development of disability and are associated with treatment outcomes (Nicholas et al. 2011), therefore it is important to address psychosocial factors when managing musculoskeletal pain (Sitwell et al. 2017).

In patients that present with psychosocial factors, the implementation of the biopsychosocial model allows for favourable outcomes in the management of musculoskeletal pain (Pollard et al. 2006), yet many health professionals report challenges with its implementation (Sitwell et al. 2017; Kusnanto et al. 2018). When practicing in a biopsychosocial framework, the clinician should recognise that relationships are central to providing health care, self-awareness is used as a diagnostic and therapeutic tool, the patient's history is obtained in the context of their life experiences, emphasis would be placed on which factors of the biological, social and psychological domains are most important to understanding and promoting the patient's health, and then the offer of multi-dimensional treatment (Kusnanto et al. 2018; Engel,1980).

According to the World Health Organization (2005), Chiropractors play a pivotal role in preventing and minimising disability and functional limitations as a result of musculoskeletal disorders. The profession adopts a holistic approach to patient care, in order to investigate, eliminate and prevent the cause of the disease (LeFebvre et al. 2012). Historically the profession has aligned itself with a BPS approach (Gliedt et al. 2017).

The BPS model can help chiropractors fully understand the degree of a patient's disability, impairment and underlying pathology, which can assist in an effective patient approach and positive treatment outcomes (Pollard, 2006). According to Main et al. (2002), identification of psychological aspects of symptom presentation can help reduce the risk of developing chronicity. By utilising BPS strategies to identify psychosocial factors in patients, higher patient satisfaction, improved outcomes and reduced financial layout for the patient were found (Pollard et al. 2006).

Although the benefits of this model are documented, many practitioners struggle with its implementation in practice. Studies from developed countries showed that chiropractors understood the importance of addressing psychosocial factors in their practice, however, they utilised anatomical and biomedical approaches in their

practices as their patient management strategies. They reported feeling inadequately prepared to address the social and psychological factors (Sitwell et al. 2017; Haanstra and Miller, 2011).

South Africa has a rich cultural diversity but is plagued by crime and poverty. Many South Africans live with high levels of stress (Mthembu et al. 2017), with a reported prevalence of 28.4% (Shisana et al. 2014). South African chiropractors mainly treat musculoskeletal conditions related to the spine, such as neck and low back pain (Ismail et al. 2021), both of which have been reported to be exacerbated by psychological issues, like anxiety and depression (Robertson et al. 2017). Chiropractic training in South Africa promotes evidence-based teaching and learning, with an emphasis on the BPS model (DUT Chiropractic, 2021; UJ Chiropractic, 2021). In an era where the BPS model is becoming central to the management of patients with musculoskeletal conditions, it was prudent to explore how South African chiropractors utilise the BPS in their practices and to determine what challenges they experience.

1.2 Problem statement

Musculoskeletal pain is identified as a global burden (Briggs et al. 2018), with tangible and intangible effects – resulting in high economic and personal costs (Freimann et al. 2016). It has been reported that the use of the BPS model results in improved understanding of the complexity of pain (Pollard et al. 2006) and treatment outcomes (Kusnanto et al. 2018). The role of psychosocial factors in the development of chronicity of musculoskeletal pain has been shown (Edwards et al. 2016) and thus recommendations have been made for practitioners to utilise the BPS approach when dealing with musculoskeletal problems (Ng et al. 2021). Currently there has been little investigation into how South Africa chiropractors utilise this model in practice and if they experience any challenges with its implementation.

1.3 Aim and objectives

1.3.1 Aim of the study

The study sets out to explore the utilisation of the biopsychosocial model by chiropractors in the eThekwini Municipality.

1.3.2 Objectives of the study

1) To explore chiropractors' understanding and attitudes towards the biopsychosocial model.

2) To determine if chiropractors utilised the biopsychosocial model in their practice.

3) To identify any challenges chiropractors had when implementing the biopsychosocial model.

1.4 Rationale of the study

Musculoskeletal conditions are the most common cause of severe persistent pain and disability affecting millions of individuals globally (Woolf et al. 2003; Malik et al. 2018). In Africa, the lifetime prevalence was reported as 62% among adults, with a point prevalence of 32% (Louw et al. 2007). Musculoskeletal pain can lead to severe personal impact and societal costs (Kamper et al. 2016).

Managing patients in a biopsychosocial model allows the practitioner to assess the patient holistically and determine the impact of psychological and social factors (Fava and Sonino, 2007). Psychosocial factors have been found to have decreased pain tolerance, led to increased levels of self-reported pain severity and result in a greater impact on disability (Vargas-Prada and Coggon, 2015; Vranceanu et al. 2009). Patients who present with high levels of depression and anxiety pre-operatively, were more likely to report increased pain and analgesic use, fewer benefits and more complications (Edwards et al. 2016). It has been recommended that patients with

lower back pain should be screened with a prognostic tool, which includes anxiety, fear of avoidance beliefs and low mood assessment, as this was found to lead to cost effective improvements in disability at twelve months (Hill et al. 2011).

The majority of patients seen by chiropractors present with lower back and neck pain (Herman et al. 2018). Nana (2018) states that 36.9% of participants seeking chiropractic treatment at a training facility in South Africa were at high risk of developing chronicity due to existing psychosocial factors. Yet few studies have assessed chiropractors' use of the BPS model. Only two international studies in this area have been found and they reported that chiropractors acknowledged the importance of psychosocial factors in musculoskeletal pain but expressed a lack of confidence in addressing them (Sitwell et al. 2017; Haanstra and Miller, 2011). Both studies utilised a quantitative survey design.

South Africa is a unique country, with a diverse population and high levels of unemployment. Chiropractors are seen as primary health care practitioners, with the majority having graduated from one of two chiropractic programmes. These programmes adhere to an evidenced-based approach to healthcare and emphasise the BPS model of healthcare (CASA, 2021; DUT chiropractic, 2021; UJ chiropractic 2021). By exploring the utilisation of the BPS model by South African chiropractors, this study aims to establish how the chiropractors integrate the model and, if deficits are found, to make recommendations to professional associations and educational institutions to provide skills training in the biopsychosocial model, to effectively manage patients in this model.

1.5 Delimitations of the study

This study was limited to chiropractors practicing within the eThekwini Municipality, KwaZulu-Natal (KZN), and may therefore not be representative of all chiropractors in South Africa. In person interviews are viewed as superior to online interviews in qualitative research, as interviewees often elaborate to a greater extent (Krouwel et al. 2019). During the COVID-19 pandemic, online interviews were allowed to

accommodate researchers with the data collection process, during the enforcement of national restrictions.

1.6 The researcher

I, the researcher, a chiropractic student from the North Coast of KZN. Grew up exposed to allied healthcare professionals, such as chiropractors and homeopaths. There was one chiropractor based in my hometown, with a few chiropractors in the surrounding towns or cities. I am a passionate advocate of the chiropractic profession, given its holistic approach.

My interest in emotional intelligence and psychosocial factors were ignited after being involved in a traumatic incident in my late teens. This made me more aware of the importance of psychological factors and the implications it may have on an individual's life and health. During my chiropractic studies at the Durban University of Technology (DUT), I was exposed to the biopsychosocial model. Having experienced a traumatic event in my life, it made me realise the need to explore psychological factors when consulting with patients during my chiropractic clinical training. As a future healthcare professional, I believe patients deserve healthcare that delves into the various factors that may contribute to their pain perception or illness.

1.7 Outline of dissertation

Chapter One - Introduces the study, provides the research aims and objectives, and discusses the rationale of the study.

Chapter Two - Presents a review of the relevant literature for this study.

Chapter Three - Outlines the methodology utilised in the research study. It describes the research design, sampling and study procedure.

Chapter Four - Presents the results and themes of study.

Chapter Five – Discusses the results and themes of the study.

Chapter Six – Concludes the study, recommendations and researcher’s reflections for future research.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter will provide an overview of the literature related to this study. It will present the theoretical framework used to understand the perceptual process and discuss the factors that would influence a chiropractor's perception of the biopsychosocial model.

Literature for this chapter was sourced from various search engines and databases, such as Summon, ScienceDirect, Google, Google Scholar, EBSO host, Biomed Central, SAGE Research methods and SA e-publications. The following key search terms were used: Perceptions, biopsychosocial model, chiropractic, psychosocial factors, and musculoskeletal pain.

2.2 Perceptual Process

Perception varies amongst individuals and is influenced by a variety of factors. There are various models of perception which entail different perceptual processes. It can be viewed as being dependent on contextual cues, expectations, learned visual experiences or probable outcomes about an environment, personality or factors which have influenced personality (Cropper and Wuerger, 2015; Grossberg, 2000; Schmack et al. 2013). The perceptual process is made up of selection, organisation and interpretation (Morris and Maistro, 2004). It involves a process which encompasses the experiencing person or a perceiver of an object, situation, person or relationship that is being perceived. According to Randolph and Blackburn's model (1989), perception involves all five senses.

A variety of factors influence why humans are selective regarding the processing of observed information. These factors pertain to the perceiver, the environment in which the perceptual process is taking place and the perceived object. The perception of the

perceiver is influenced by his or her personality, attitudes, interests, experiences, cultural background, expectations and motives (Robbins and Judge, 2014). Perception is viewed as subjective and experienced by the perceiver (Bergh and Theron, 1999). Attitudes are viewed as a subjective factor that affects perception (Levine et al. 1996). Attitudes can be defined as a mental or neural state of readiness, affected by experience, which influences an individual's response to situations or related objects. Attitudes can be viewed as an individual's emotions and behaviour (Allport, 1935; Pickens, 2005).

2.3 Theoretical framework/ model

The perceptual experience allows for many variations from one individual to the next, as reality is perceived in a unique way (Bergh and Geldenhuys, 2017). The subjective nature of a perception (Bergh, 2001) can be understood by utilising the Neiss classification presented by Bergh and Theron (1999), and Robbins and Judge (2004). This model identifies three components, as illustrated in Figure 2.1:

- *The perceiver*: this highlights the individual factors influencing the perception. In this study, this refers to South African chiropractors and their attitudes, preferences, motives, interests, expectations and past experiences.
- *The perceived object or phenomenon*: This entity will have its own characteristics that could influence how it is perceived. In this study the perceived object is the biopsychosocial model.
- *The environment*: this refers to the situation within which the perception is taking place and is an important component of a perception (Matsumoto and Juang, 2012). Environmental factors, such as physical, emotional, psychosocial development and cognition, affect human behaviour thus human behaviour should be analysed in respect to the environment in which an individual belongs (Bergh and Theron, 1999). In this study, the environment refers to the chiropractic profession and the health care context within which chiropractors work in South Africa.

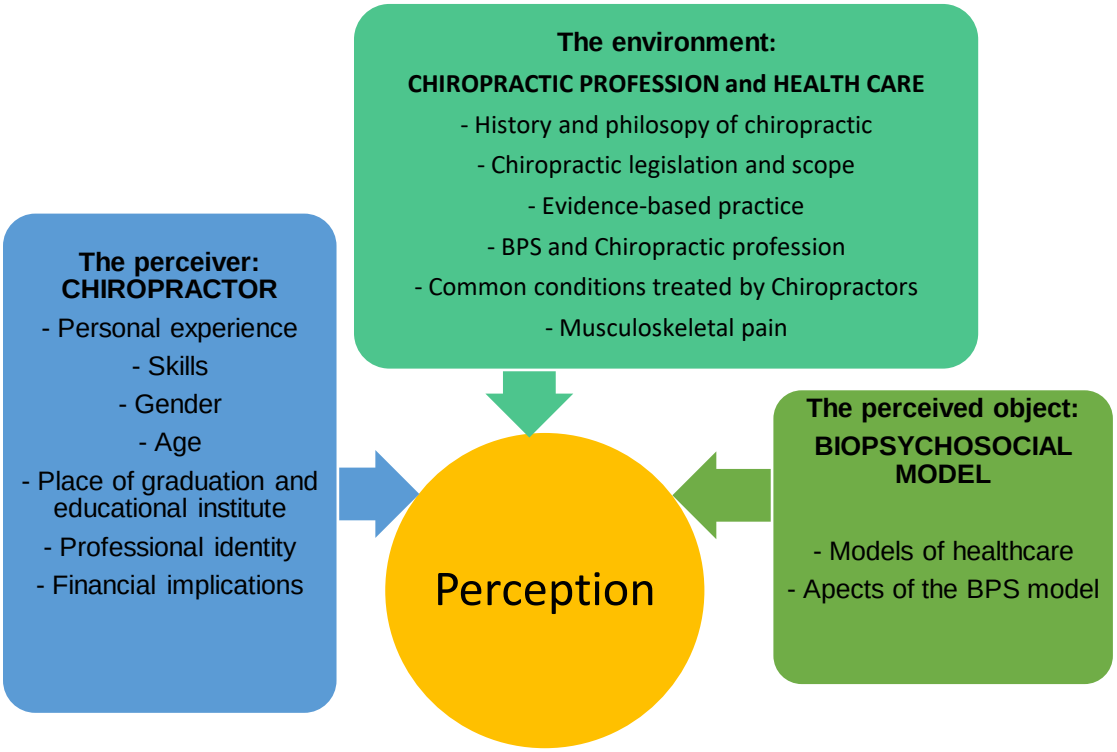

Figure 2.1: Factors influencing the perception of the biopsychosocial model by chiropractors.

2.4 The perceived object – the biopsychosocial model

Many models of health and disease have been proposed over the years and these have been utilised by a variety of people, including general healthcare providers and allied healthcare professionals (Miller, 1988). The predominant models are the biomedical and the BPS models.

2.4.1 Models of healthcare

2.4.1.1 The biomedical model

The biomedical model, derived from Louis Pasteur's germ theory of disease, was the dominant model of healthcare in the 20th Century. It focused on disease or illness occurring at a cellular, tissue or organ level (Johnson, 2012; Halveka et al. 2009). Disease was identified as occurring due to a single underlying cause. This could be either internal, such as immunologic, vascular or metabolic; or external, such as chemical, physical or microbiological causes, and the removal of this cause would result in a return to health (Wade and Halligan, 2004).

Thus, signs and symptoms of illness, in this model, are due to abnormalities in the structure or functioning of an organ (Havelka et al. 2009; Wade and Halligan, 2004). Mental phenomena were seen as unrelated aspects of bodily function (Wade and Halligan, 2004). The body is viewed as a machine, where it is responsible for the disease or illness. It assumes that each disease has a primary biophysical cause. The model does not identify psychosocial aetiologies as a causative factor in disease, nor the bio-behavioural influences in healthcare (Gong et al. 2015).

This model aligns with Rene Descartes mind-body dualism, where the mind and body were viewed as different entities. The mind was seen as a non-material, a thinking substance, and the body was viewed as a material, non-thinking, substance. Individuals were said to live in two separate worlds, the mental and the physical (Mehta, 2011). The model was said to have been rooted in a more scientific understanding of illness and health (Gong et al. 2015). With advances in biotechnology and the increased use of imaging, the importance of social, environmental, emotional and other human factors in illness or health were not prioritised, causing medical treatment to be departed from humanities. Biological factors were viewed as playing a primary role in the development, treatment, progression and prognosis of the disease (Gong et al. 2015), and thus became the focus. It has been stated that biomedical treatment protocols have been noted as challenging when attempting to tailor treatment according to the needs of each patient (Farre and Rapley, 2017), highlighting one of the deficits of this model.

2.4.1.2 The biopsychosocial model

George Engel, in 1977, noted the limitations of the biomedical model, while practicing as a psychiatrist in New York, United States of America (USA). He often had cases where the patient presented with positive laboratory results yet displayed no signs or symptoms of the condition, hence the patient was treated in the absence of symptomatology. Yet in instances where patients reported feeling unwell, and their laboratory tests were negative, they were given reassurance that they are well and no treatment intervention was given, as it was viewed as unwarranted (Farre and Rapley, 2017). These types of scenarios led Engel to advocate for a more holistic approach to medicine. Thus, proposing the BPS model of health care to further prevent the dehumanisation of medicine and the disempowerment of patients (Borrell-Carrio et al. 2004).

Disease is seen as a complex entity with multiple factors, which include stressors and aspects of social support systems. The BPS model, unlike the biomedical model, accounted for the psychosocial aspects of the disease process. It addressed patient's health beliefs, behaviours and attitudes, thereby assisting in reducing the risk of developing chronic diseases and illnesses (Havelka et al. 2009). It has evolved further to incorporate cultural factors, giving rise to the ethnomedical cultural model. This model emphasises a patient's understanding of his or her illness, with the focus on a patient's ethnomedical beliefs, diet, stress, family structure and social support systems (Sandberg, 2019).

Different to the paternalistic approach of the biomedical model, the BPS model focuses on a patient-centred approach – with the patient playing an active role in health-related decisions. This holistic model aims at ensuring that the mind, body and spirit are in harmony. Where the biomedical model has been utilised by physicians, this patient-centred model was adopted by chiropractors, nurses, physical therapists and other allied healthcare professionals (Farre and Rapley, 2017).

The BPS model, unlike the biomedical model, views the mind and body as separate entities which interact with each other. The mind-body connection indicates that psychological and biological processes of the human body are interlinked, which can influence health. Psychological stress can affect the development of disease

(Engel,1977). The way an individual feels is said to influence the way in which they view themselves and the world around them, thus noting thoughts and feelings can lead to physiological alterations – which can affect health. Emotions, biological changes, coping or adaptations can affect each other, thus influencing health. In addition, the social environment of an individual should not be ignored, as social and interpersonal factors can influence psychological and, therefore, biological processes (Engel, 1980). Stress responsivity and the hypothalamic-pituitary adrenal (HPA) axis is an example of how the mind-body connection operates. The HPA axis mediates the physiological response to stress by regulating the level of circulating glucocorticoid hormones (Bangasser and Valentino, 2014). Conditions such as Cushing's syndrome and Addison's disease are associated with anxiety and other psychiatric symptoms, due to the dysfunction of the HPA axis (Kendler and Gardner, 2010; Pereira et al. 2010).

The BPS model consists of three main components:

- Social factors

Socio-economic status, cultural and religious beliefs are among the many social factors which are identified within the BPS approach. Social factors consist of interpersonal relationships that can range from the doctor-patient communication style to socio-economic status, community health resources, work environment, relationships and social support (Kiecolt-Glaser and Newton, 2002; Reblin and Uchino, 2008; Repetti et al. 2002; Lehman et al. 2017; Suls and Rothman, 2004).

Cultural influence plays a role in the understanding, experience, and manifestation of the disease (Engel, 1977; Burkett, 1990). Culture is defined as "*shared ideas, meanings and values acquired by individuals as members of society*". Such ideas, meanings and values are socially learned and not genetically inherited, which may lead to unconscious influence (Institute of Medicine, 2002). The patient is placed in a social context, while noting social influences, however, this remains the centre of analysis, interpretation and intervention (Hatala, 2012). Cultural beliefs or traditions may prevent people from accepting or seeking the required medical care (Abel and Greer, 2017; Hatah et al. 2015). The Coronavirus (COVID-19) pandemic has led to an

increase in fear and anxiety, substance abuse, domestic violence, suicide, and a decline in well-being (Al Sabaha et al. 2020).

Socio-economic status can affect an individual's access to care due to the lack of financial means for medical aid or the ability to seek care outside of their residential area (Mielck et al. 2014).

- Physiological/ biological factors

Biological factors may be identified as physical elements of the human body, which may affect health and range from age, gender, social genomics, genetics, neurochemistry, tissue health, and many other factors (Lehman et al. 2017; Gliedt et al. 2017).

Genetic factors can increase an individual's risk of illness and their resulting behavioural phenotypes. Stress can affect phenotypic behavioural expression, leading to altered behaviour and psychosocial effects (Nackley and Diatchenko, 2010; Hunter and McEwen, 2013).

The release of cortisol is required for stress adaptation, however, excessive release of cortisol may lead to negative effects, due to continuous activation of the hypothalamic-axis. This can result in the breakdown of bones, tissues and muscles (Gatchel, 2004).

- Psychological factors

Psychological factors can be viewed as personal and religious beliefs, expectations, personality, identity, emotions, stress appraisals, illness schemas, coping strategies and cognition (Lehman et al. 2017; Gliedt et al. 2017).

Evaluating psychosocial factors is important, as it plays a role in the acceptance and progression of a condition (Dersh et al. 2002). Distress, following injury or diagnosis of a condition, can led to the development or exacerbation of psychosocial factors in an individual. This may lead to physical and mental deconditioning, thus bringing about anxiety, the feeling of helplessness (Gatchel, 2006). Behaviours such as fear of avoidance and catastrophising can become exacerbated by pain which is influenced

by an individual's experience, personality and temperament (Gatchel et al. 2007). Complementary healthcare professionals utilise the BPS model by using various therapies, including movement-based therapy such as yoga to assist with chronic pain, post-traumatic stress disorder (PTSD) and other mental health conditions (Cushing et al. 2018)

Engel described the biopsychosocial model as a way for health professionals to garner information from each patient on a psychological, biological and social level (Farre and Rapley, 2017), with each of these components interacting with one another, as seen in Figure 2.2.

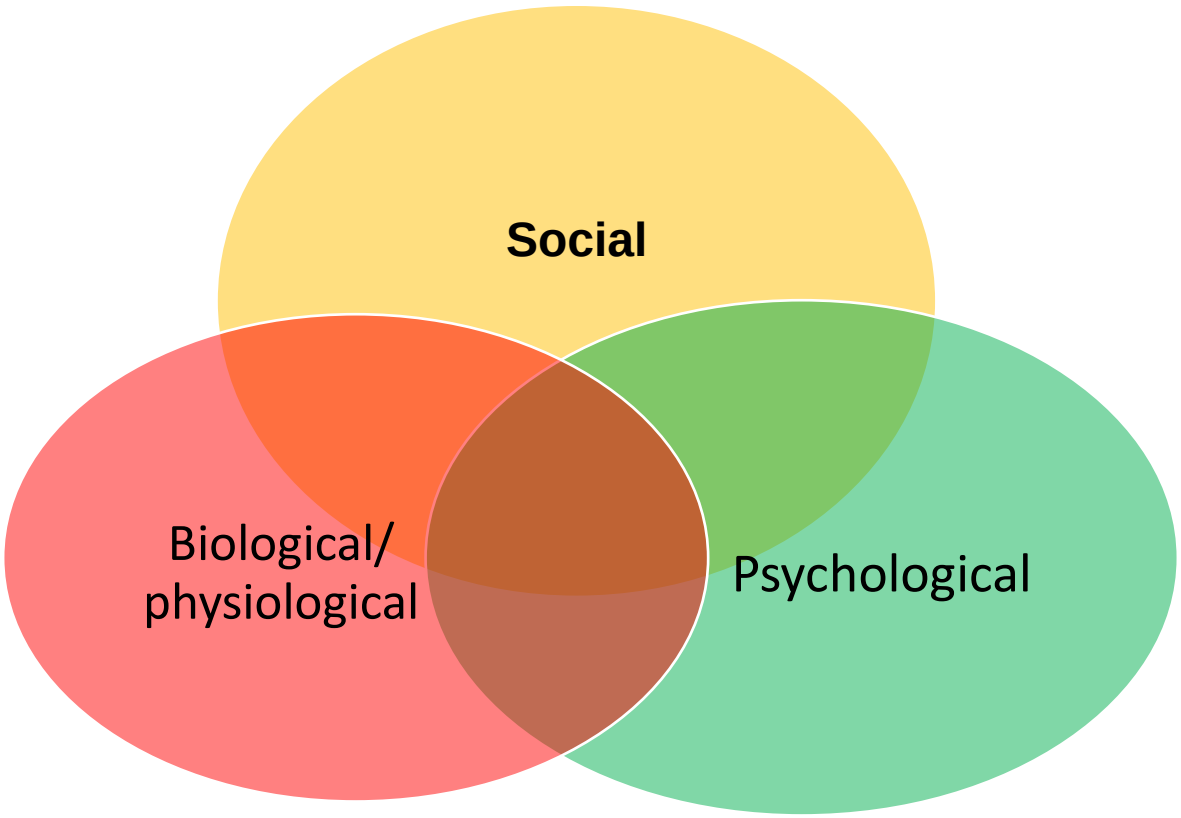

Figure 2.2: Components of the biopsychosocial model

(Adapted by Levy-Storms and Chen, 2016).

Each component allows for the clinician to obtain necessary information to holistically view the presenting illness/condition. Information regarding tissues and organs at a biological level, attribution of meaning at a social level, and perception and experience at a psychological level are gathered from a patient to integrate various levels. By doing so, health professionals can holistically understand a patient's illness and offer a humanistic care approach to their patients, considering that every individual is a thinking, feeling and acting individual, with a constant interplay between the mind and body (Farre and Rapley, 2017).

Patient needs are addressed according to his or her social and psychological environment, allowing for a more individualistic approach, unlike the biomedical model that provides a generalised care (White and Sashidharan, 2014). It has been reported that, when using the BPS model, practitioners garner information pertaining to the biomedical and psychosocial aspects of a patient, which has been shown to enhance patient satisfaction and improve health outcomes (Nadir et al. 2018; Margalit et al. 2004).

2.4.1.3 Evidence in support of the BPS model

A step-by-step approach to the BPS model was described by Katon and Kleinman (1980) to manage patients pre and post operatively. This approach highlighted a decrease in patient-doctor conflict, improved patient satisfaction, maintained behavioural changes, better physical and psychosocial health, and overall compliance (Katon and Kleinman, 1980; Williams et al. 2000; Covic et al, 2003). The utilisation of the BPS model was identified as being time consuming and expensive, yet cost-effective in the long run, as it leads to better diagnosis and treatment (Kaplan and Groessl, 2002). A study conducted found that the BPS model was favourable and resulted in better health outcomes when used for managing patients with rheumatoid arthritis (Covic et al. 2003).

However, research regarding the practical application of the BPS model throughout the many medical professions is scarce (Xiao et al. 2021). The BPS model is supported by pain neuroscience as neurophysiological changes in central

sensitisation are influenced by behavioural, cognitive and social factors (Turk and Okifuji, 2002), highlighting the need for clinical BPS assessments to understand the process of central sensitisation (Gallagher et al. 2013).

2.4.1.4 Implementation of the BPS model in clinical practice

The management of patients with chronic disorders, psychological illnesses and autoimmune conditions are applicable for the use of a BPS approach, along with diseases that are organic in nature. This assists physicians on deciding the suitable diagnostic and treatment strategies (Drossman, 1996). The strong focus on doctor-patient relationships requires that the practitioners must develop awareness of how they interact with patients and how this may influence the prognosis. Ensuring a multi-disciplinary approach is adopted could guarantee that patients receive the required care and better quality of life (McInerney, 2015; Smith et al. 2013; Engel, 1981; Stewart et al. 1995). Notably, the patient-centred approach utilised within the model has been identified to positively affect outcomes (Drossman, 1996).

The BPS model requires practitioners to spend more time gathering information about patients' cultural and religious influences, socio-economic status and psychological factors that may influence their condition (Gatchel and Oordt, 2012). This approach requires medical professionals to thoroughly evaluate the different components of a patient which, although comprehensive, is time consuming (Ghaemi, 2010).

Many healthcare workers have struggled to fully utilise a BPS approach as a result of inadequate guidance on the clarity of psychosocial factors and lack of formal assessment scales (Cowell et al. 2018; Franca et al. 2019), not possessing the skills and confidence to identify psychosocial factors (Singla et al. 2015) and the appropriate management of them (Karstens et al. 2018; Sitwell et al. 2017).

The lack of counselling skills (Lin et al. 2020; Sitwell et al. 2017) and skills to manage emotions was also identified as one of the many barriers (Franca et al. 2019). The belief of insufficient time to communicate, investigate and address psychosocial factors and ensuring administrative tasks are completed was also a factor (Sitwell et

al. 2017). The lack of remuneration for practitioners to investigate psychosocial factors was also highlighted as a factor hindering effective implementation (Kartens et al. 2018; Karstens et al. 2015).

2.4.2 Evidence-based practice

Evidence-based guidelines are intended for the use of health care professionals to encourage quality improvement and health outcomes (Grol et al. 2007). In 1980, David Sackett and the Clinical Epidemiology Department of Mc Master's University aimed to improve the medical curricula and training for future medical professionals, by educating them to remain up to date on scientific research by means of utilising various available resources and databases (Sackett et al. 1997). This led to the development of evidence-based medicine (EBM) that consisted of the following four major categories:

- Critical evaluation of individual research studies.
- Meta-analysis or systemic reviews of studies in a particular area or practice.
- Evidence-based practice guidelines, outlining standards for the profession.
- Evidence-based systems of care focused on implementation (Woolf, 2000).

EBM did not include medical professionals from alternative and complementary medicine, thus evidence-based complementary and alternative medicine (EBCAM) was introduced to allow for an integrative approach to patient care between allopathic and alternative practitioners (Mills et al. 2002). This allows for objective and scientific research to validate chiropractic procedures, thus becoming more accepted by mainstream medicine (Kaptchuk and Eisenberg, 1998).

Evidence-based practice (EBP) emerged from evidence-based medicine (French, 2002) and is defined as the integration of clinical expertise, patient values and the best research evidence into the decision-making process for patient care (Sackett, 1996). Evidence-based practice allows for internal personal factors and external environmental factors to be considered when addressing health conditions (WHO,

2005). It was implemented within the chiropractic profession to ensure patients receive the best care. This was done by incorporating quality evidence during the clinical decision-making process (Muir Gray, 2001; Guyatt et al. 2004). Decisions about assessments and treatment processes were based on the highest level of evidence (Tickle-Degnen and Bedell, 2003). Chiropractors have been identified as possessing positive attitudes towards EBP, with interests to better their EBP skills (Walker et al. 2013; Schwarz and Hondras, 2007; Roecker et al. 2013). Emphasis was placed on continued educational programmes to assist in improving EBP skills by chiropractors (Bussieres et al. 2016).

Evidence informed practices (EIP) emerged to allow medicine to become more "person-centred" rather than science-centred – which is in line with EBP. This was to restore humanity in clinical practice. EIP encourages practitioners to have an individualistic approach while utilising scientific evidence in line with their decision-making process, assessment and treatment plan (Miles and Loughlin, 2011).

A patient-centred approach is rooted in holism (Henbest and Stewart, 1989) and was identified to further encourage aspects of the biopsychosocial approach, therefore further enhancing patient satisfaction, improving communication, encouraging shared decision making and self-management support (Kinnersely et al. 1999).

Components of a patient centred approach (Stewart, 1995):

- Viewing and understanding each person and all their attributes/ factors.
- Enhancing doctor-patient relationship.
- Viewing management as a partnership between the doctor and patient, thus acknowledging the patient's input or concerns.
- Exploring the disease process and patient's experience of the disease.
- Promoting health and attempting to prevent further complications or illnesses.
- Taking into consideration patient's personal limitations and other limitations such as time and resources.

A BPS approach acknowledges that each patient should be approached individualistically due to differences in biological, physiological and social factors. The

needs and expectations of each patient differ, therefore a general approach does not offer patients quality care (Engel, 1977). Higher quality of care is delivered when practitioners implement a BPS approach, ensuring patient-centred strategies and overall evidence-based practice is used.

2.5 The environment – Healthcare in South Africa and the Chiropractic profession

2.5.1 Healthcare in South Africa

Healthcare in South Africa is divided between private and public healthcare settings (Surender et al. 2014). Over 80% of the population rely on public healthcare (Naidoo, 2012) with 70% of medical doctors working in the public sector (World Health Report, 2006).

2.5.1.1 Public healthcare

The BPS model is often viewed as a model that is not applicable to all healthcare settings. Public health is known to have poor resources and the application of this model requires more time (Gatchel and Oordt, 2012; Lane, 2014; Suls and Rothman, 2004). Physicians and medical practitioners are already overburdened by administrative and clinical tasks, all while partaking in research tasks (Kusnanto et al. 2018), coupled with inadequate human resources in the sub-Saharan African healthcare, with less than one healthcare worker per thousand population (Fonn et al. 2011). Unequal distribution of healthcare workers between private and public sectors, along with unequal distribution between provinces in South Africa, was identified as one of the many factors that led to weakness in healthcare systems (Barron and Padarath, 2017), thus medical staff are not afforded the time to spend with patients (Maphumulo and Bhengu, 2019).

There is paucity of information on the practical application of the BPS model in healthcare settings. Research has shown that medical staff often focus on the physical

aspects of a disease and disr egard the psychosocial aspects of patients (Xiao et al. 2021). Consultations consist of long waiting times, rushed appointments and poorer care in comparison to private health (Montgomery, 2016). Migration of healthcare workers from the public to private sectors is often as a result of high patient load, heavy workload, long working hours and lack of resources (George et al. 2013).

A study conducted on the utilisation of the biopsychosocial model in Pakistan, noted that doctor-patient rapport was not established, and a paternalistic and a reductionistic biomedical approach was utilised during treatment (Nadir et al. 2018). Some patients reported that medical professionals in public settings refused to take note of their psychosocial factors. Patients expressed their desire to connect with healthcare workers on an emotional level, to ease the feelings of hopelessness, helplessness and feel supported when faced with illness (Vinson and Underman, 2020).

2.5.1.2 Private healthcare

Healthcare insurance is expensive, thus the minority of the population do not have access to it. Advantages of private healthcare are a better quality of care, shorter waiting time and it allows for longer consultation times – with some healthcare professionals spending an hour with each patient (Montgomery, 2016).

In South Africa, chiropractors work in the private sector as they are yet to be incorporated into the public healthcare sector. This leaves chiropractic services inaccessible to the general public due to lack of access and costs (Myburgh and Mouton, 2007). Two chiropractic educational institutions (DUT and UJ) ran a clinic where the general public can access chiropractic treatment at a reduced rate (DUT Chiropractic, 2021; UJ Chiropractic). The majority of chiropractors in South Africa practice in the main metropolitan areas, with sparse distribution of chiropractors in the more remote areas (CASA, 2021; AHPCSA, 2021). Being privately run, chiropractors can adjust their consultation times as they control their own booking systems, as opposed to public healthcare where the patients arrive and wait to be seen.

2.5.2 The chiropractic profession

Chiropractic is a healthcare profession where regulation, defined scope of practice, current and historical context, among other factors, shaped the growth of the profession (Jamison 1991; Jamison 2001).

2.5.2.1 Historical and current context of the Chiropractic profession

Research regarding manipulation as a treatment method for human illness has been conducted over the past century, leading to acceptance of manipulation as part of a manual therapist's armamentarium (Keating, 2003). The chiropractic profession was founded in 1895 by Daniel David Palmer, when he restored a deaf janitor, Harvey Lillard, of his hearing loss through applying a vertebral manipulation (Wardwell, 1992). One year later, Palmer open the first school of Chiropractic in Idaho, United States of America (Hynes and Callender, 2008; DeVocht, 2006). Although manipulation was known as an ancient form of healing to various cultures around the world, Palmer believed he was the first to make use of the spinous or transverse processes as a lever during manipulation, thus claiming the manipulation procedures as original (Palmer, 1910). The chiropractic manipulation or adjustment was seen as separate from other forms of spinal manipulative procedures (Gielow, 1981). Palmer believed that a displaced anatomical part would lead to friction, resulting in inflammation, he termed this the vertebral subluxation. This would block the innate intelligence of the body and prevent it from healing itself and, through vertebral manipulation, health could be restored (Keating, 1992). He positioned chiropractic as a science of healing without the use of drugs (Palmer, 1910), and focused on patient-centred as opposed to physician-centred healthcare, upholding the philosophical constructs of holism, naturalism, vitalism, conservatism and humanism (Jamison 1991; Jamison 2001).

Chiropractic began to grow and, with this, a divide occurred within the profession. Those who adhered to the founding fathers' principles were termed the *"straight chiropractors*" and those that viewed it as a more encompassing health profession,

aligned with scientific advancement, were called the "*mixers*" (Leboeuf-Yde et al. 2019). The straight chiropractors, held to the vitalistic principles and believed their role was not to treat the disease, but to restore any obstructed impulse that travelled from the brain to the nervous system, by removing vertebral subluxations (Simpson and Young, 2020). The vitalistic approach has been criticised for a lack of scientific evidence to validate their philosophy (Villanueva- Russell, 2005). The straight chiropractors are seen as the minority in relation to mixers, with more chiropractors steering towards scientific reasoning (Senzon, 2014; Palmer, 1910).

The mixer chiropractors embraced other treatment methods, such as traction, heat, massage, ultrasound, biofeedback, nutritional supplements and electric stimulation, to prepare or assist spinal adjustments (Villanueva- Russel, 2005; Lamm et al. 1993) and did not solely focus on spinal adjustments. The mixers identified the need to improve educational training, obtain accreditation and aimed for chiropractic to be covered by private health insurance plans. They realised that, in order to do this, the profession would require restructuring, along the lines of orthodox medicine in the early 1900s and 1970s (Wardwell, 1992).

Today, although the division between the straight (known today as the vitalistic chiropractors) (Simpson and Young, 2020) and the mixers chiropractors are still present, the profession has reached a truce under the umbrella of the World Federation of Chiropractic as being defined as a healthcare profession that *"is concerned with the diagnosis, treatment and prevention of mechanical disorders of the musculoskeletal system and the effects of these disorders on the function of the nervous system and general health. Emphasis is placed on manual treatments, including spinal adjustments and other soft-tissue manipulation*" (WFC, 2021). Chiropractors are seen as having the knowledge, abilities and skills to diagnose, treat, rehabilitate and prevent neuro-musculoskeletal conditions (Mirtz, 2017; Glucina et al. 2020).

2.5.2.2 Chiropractic legislation and scope of practice

It is a statutory requirement that chiropractors in South Africa register with the Allied Health Professions Council of South Africa in order to practice (AHPCSA ACT 63). The Act 63 of 1982 states that chiropractors as "*practitioners may diagnose, and treat or prevent, physical and mental disease, illness or deficiencies in humans*" (AHPCSA - Regulations in terms of the associated health service professions ACT, 2001). The defined scope includes:

- History taking, physical examination.

- Reading and interpreting X-ray images.

- Diagnosing physical defects, illness or deficiency.

- Treatment or prevention of any physical defect, illness or deficiency that is spinal, spinovisceral, neuromuscular or pelvic related.

Treatment or management options that may be utilised:

- Spinal or extremity manipulation/ adjustment
- Electrotherapy
- Hydrotherapy
- Traction therapy
- Thermal therapy
- Exercise therapy
- Vibration therapy
- Immobilisation therapy
- Neuromuscular reflex therapy
- Massage therapy
- Acupuncture, acupressure, or dry needling
- Nutritional or dietary advice
- Advice regarding dietary supplementation
- Remedies

2.5.2.3 Chiropractic education and training

Chiropractic is offered at over forty universities and college's worldwide (Salehi et al. 2015). The chiropractic profession adopts a holistic view on health, in which it aims to acknowledge physical, psychosocial, emotional and spiritual factors in a patient. This is aligned with the WHO's definition of health, which is "*a state of complete physical, mental and social well-being and not merely the absence of disease*" (WHO, 1946). In 1997, the chiropractic profession was admitted into official relations with the WHO and has maintained an active programme (WFC, 2021). Monitoring and evaluation of the profession occur on an ongoing basis to ensure quality practice and proper use of chiropractic (WFC, 2021).

In 1989, the first intake of students studying towards a Master's Degree in chiropractic took place at Technikon Natal, now known as DUT. Four years later, Witwatersrand Technikon, which is today known as University of Johannesburg (UJ), established the second chiropractic education faculty in South Africa (Till, 1999). These institutions offer a five-year programme, culminating in a Master of Technology in Chiropractic Degree. The minimum requirement for registration with the Professional Board of Chiropractic and Osteopathy in SA is a Master's Degree to be eligible to practice (ECCE, 2018). With the re-engineering of the higher education sector in SA, the exit qualification from 2021/2022 will be a Master of Health Sciences in Chiropractic. Clinical training is undertaken in on-campus chiropractic clinics that offer treatment to the local communities at reduced rates (DUT Handbook, 2021; UJ Handbook, 2021).

Both institutions have received international accreditation with the European Council on Chiropractic Education (ECCE) (CASA, 2021). Practice regulations vary from country to country, which align to the different accrediting agencies, hence the WHO has created a mandate to provide Chiropractic guidelines. These guidelines were created to provide the minimum chiropractic educational requirements, to develop an examination and licensing for qualified chiropractic practice, identify contra-indications to prevent the incidence of accidents, and promote safe chiropractic practices (WHO, 2005).

The DUT Chiropractic Department's mission is to "*develop chiropractors for a holistic neuro-musculoskeletal healthcare*" by ensuring evidence-based teaching takes place,

implementing innovative research and allowing for responsive engagement and collaboration with communities (DUT Chiropractic, 2021). The institution sets out to ensure high standards are upheld, by educating students to acknowledge the biopsychosocial model, provide quality advice on topics related to nutrition, stress management, exercise therapy and quality care of the regulated treatment options – such as electrotherapy, massage, acupuncture, traction and other modalities. Emphasis is also placed on ensuring a multi-disciplinary approach to health and disease, by encouraging referrals to other medical professionals when warranted (DUT Chiropractic, 2021). Both DUT and UJ align to the position statement of the International Chiropractic Education Collaboration, which states the importance of the biopsychosocial model of healthcare, underpinned by biologically plausible theories and peer-reviewed research (The International Chiropractic Education Collaboration, 2014).

2.5.2.4 The Biopsychosocial model and the chiropractic profession

According to the World Federation of Chiropractic Congress (2005), the chiropractic profession identifies as having a biopsychosocial approach. The biopsychosocial model is reflective of the chiropractic profession in that it includes a "*whole person approach*" with the aim to investigate, eliminate and prevent the cause of disease or illness (Gliedt et al. 2017). The chiropractic profession acknowledges that mental, emotional, structural and biochemical factors are all interdependent (Keating et al. 2008). Chiropractors are identified as having an egalitarian relationship with their patients, which includes patience and attention (Kane et al. 1974). In addition to providing manual treatments, they offer nutritional or dietary counselling, stress reduction strategies, exercise, and focus on early intervention and prevention of both biological and psychosocial aspects of a patient's illness (Hawk et al. 2012; Keating et al. 2008; Goncalves et al. 2017; Moller et al. 2009). Focus is placed on early intervention and prevention (Hawk et al. 2012). Unknowingly, chiropractors often indirectly utilise a biopsychosocial approach by identifying and addressing emotional, physical, lifestyle, spiritual and psychosocial factors, the pain experience and quality of life (Hawk et al. 2012; Johnson et al. 2012).

The following Chiropractic perspectives align with a holistic approach to patient care (Mootz, 1997):

- Patient-centred approach.
- Identifies the need to monitor patient progress and effectiveness of treatments.
- Multifactorial approach which encompasses biological, physiological and chemical factors.
- Identifies the link and implication that an individual's lifestyle and environment have on their health.
- Attempts to eliminate unnecessary barriers in doctor-patient interactions.
- Emphasis is placed on the cause of the illness and not associated signs and symptoms.

Although there is acknowledgement of the BPS model by the WFC Congress (2005), literature of strategies and effort to practically address psychosocial factors in chiropractic care are scarce, with limited implementation of the biopsychosocial model (Russel, 2013). From the 2010 to 2016 Association of Chiropractic Colleges Research Agenda Conferences (ACCRAC), it was noted that abstract titles were associated with psychosocial factors, however, efforts to better equip chiropractors to utilise the BPS model in a clinical setting was scarce, with minimal evidence of BPS course work within chiropractic curricula worldwide (Gliedt et al. 2017; SOTO-USA, 2021), highlighting the need for further intervention to assist in the application of the biopsychosocial model by assisting healthcare workers through training and other interventions (Xiao et al. 2021).

2.5.2.5 Chiropractic clinical practice

Chiropractors treat conditions of the musculoskeletal system. The most common of which are neck and low back pain, and headache (Christensen et al. 2010). According to the 2010 Global Burden of Disease Study (GBD), musculoskeletal pain conditions, especially low back and neck pain, were the leading contributor to the global burden of disability (Blyth et al. 2019). They result in an increase in health-related complaints in the working population (Ng et al. 2019) and are seen as a growing concern.

Gender, occupation, obesity, presence of psychosocial factors, physical activity and smoking are among the many risk factors for musculoskeletal pain (Hendi et al. 2019; Cavallari et al. 2016; Abate et al. 2013).

Women experience chronic musculoskeletal pain more than men, although everyone experiences muscle or joint pain at some stage in their life (Sluka, 2013). Dyer (2012) found that amongst the white population in the greater eThekwini metropolitan area, the lifetime prevalence of low back pain was 47%. The prevalence of low back pain worldwide is 30% to 80% and increases with age (Morris et al. 2018). In developed and developing countries, the point prevalence of chronic pain accounts for 41% of the population (Gliedt et al. 2017), with musculoskeletal conditions accounting for 54% of all long-term disability (Cimmino et al. 2011). The point prevalence of low back pain ranges from 1% to 58% (Hoy et al. 2010).

2.5.3 Pain

Pain is a subjective experience that can be experienced differently by each individual and can be influenced by biological, social or psychological factors (Bart et al. 2013). It is viewed as an unpleasant sensory or emotional experience that occurs due to damage or potential damage of tissues (Crofford, 2015; Smith et al. 2013), acting as a defence mechanism to provide a stimulus to prevent further tissue damage (Yam et al. 2018). Musculoskeletal pain can be identified as widespread, localised or regional pain, affecting movement, and can present as stiffness, muscle fatigue, altered range of motion, sensory and motor abnormalities (Arendt- Nielson et al. 2011), often leading to increased absenteeism, costs for employers, patients and the healthcare systems (Buscemi et al. 2017). It has multiple contributors, including psychological, biophysical, social, genetic and comorbidities, which are interdependent, adding to the pain experience and disability levels (Field et al. 2010). Psychosocial factors have been identified to greatly influence the response to treatment and development of chronicity (Field et al. 2010).

Psychosocial factors can be viewed as a contributing factor to persistent pain, as pain may lead to avoidance of physical activity. Avoidance of physical activity may result in

social and physical withdrawal, which may lead to emotional or mental effects, thus leading to an increase in pain experience and further contributing to an individual's disability (Field et al. 2010). Positive psychosocial dynamics and interventions have been identified in reducing the risk of developing chronic pain and disability (Edwards et al. 2016; Kerns et al. 2010). Low back pain is the leading cause of disability globally. In 2015, there was a marked increase in disability caused by low back pain, noted in low- and middle-income countries within Africa, Asia and the Middle East (Hoy et al. 2015; Hartvigsen et al. 2018)

There are various factors that attribute to an individual's perception or experience of pain, which may not be equivalent or equal to the disease or diagnosis (Turk and Flor, 1999). According to John J. Bonica, the founding father of pain medicine in 1953, pain no longer serves its purpose in its late phase when it becomes intractable, in which case it becomes destructive through its mental and physical effects (Rafaelli and Arnuado, 2017). Calamitous thoughts and fear of avoidance beliefs have been identified as playing a role in the development of disability following the onset of pain (Nicholas et al. 2011). A recent meta-analysis revealed that patients who have reported exposure to psychological trauma are three times more likely to develop persistent pain (Edwards et al. 2016). This highlights the importance of treating people in pain within the BPS model.

2.5.3.1 Psychosocial factors in musculoskeletal disorders

Many psychosocial factors have been identified in attributing to pain, such as fear of avoidance beliefs, post-traumatic stress disorders, low levels of self-efficacy and maladaptive beliefs, depression and anxiety, which are also leading contributors when predicting the transition from acute to chronic pain (Edwards et al. 2016; Buscemi et al. 2017). Psychosocial factors have been identified as playing a role in the increase and exacerbation of musculoskeletal disorders, and have been identified in determining the susceptibility, course and severity of an illness (Borrell-Carrio et al. 2004).

The presence of psychosocial factors has been associated with an increased chance of experiencing pain (Blyth et al. 2007). There are three stages of pain, the first stage being sensitivity, the second stage is when signals are transmitted to the dorsal horn from the periphery, this occurs via the peripheral nervous system. The third stage involves the central nervous system, in which signals are transmitted to the brain. Signals are transmitted via ascending and descending pathways. The ascending pathway is an upward pathway that transmits sensory information from the body via the spinal cord and the brain. The descending pathways transmits signals from the brain to the reflex organs via the spinal cord. The central nervous system and peripheral nervous system are therefore both involved in the mechanism and perception of pain (Yam et al. 2018).

Studies and modern advancements in neuroimaging revealed changes in both the brain structure and function, such as enhanced microglial activation in patients with chronic low back pain, changes in the primary and secondary somatosensory cortices and reduction in gray matter in the dorsolateral prefrontal cortex and insula (Meints and Edwards, 2018). The amygdala plays a role in the processing of emotional reactions, decision-making and memory. Neuroimaging advocates that the amygdala plays a role in the development of chronic pain and increases the sensitivity of pain pathways in the central nervous system (Yang and Chang, 2019). Somatosensory amplification or central sensitisation often correlates to the psychological features of an individual. Neuropathic processes of sensitisation at the peripheral spinal cord or brain are often enhanced by psychosocial factors contributing to the pain experience (Edwards et al. 2016).

Poor mental health has been identified as a risk factor for developing musculoskeletal disorders (Meints and Edwards, 2018; Ng et al. 2019). While social support was proven to be beneficial to individuals with pain conditions, thus individuals had improved physical functioning (Meints and Edwards, 2018).

Psychological stress such as lack of concern by leaders for employee safety and decreased job control was associated with work-related musculoskeletal complaints (Ng et al. 2019), hence noting the importance of addressing the psychosocial factors in patients that present with musculoskeletal disorders. According to a study on the

psychological and physical workload and the development of musculoskeletal symptoms among female elderly care workers, it was noted that a high psychological workload increased the risk of developing neck and upper back symptoms, in comparison to a marginal physical workload (Larsman and Hanse, 2008). Individuals with higher work stress levels may be predisposed to chronic disability (Soucy et al. 2006).

2.6 The perceiver – South African Chiropractors

There are multiple factors that may influence a person's perception of an object. In the context of this study, the perceiver is the South African chiropractor practicing in KZN. Chiropractors identify themselves as primary care providers, with a focus on health promotion and injury or disease prevention (Rosner, 2016; Baer et al. 2006). The manner in which they practice is influenced by their worldview, personal experience and a plethora of other experiences they have had.

2.6.1 Personal experiences

How individuals interpret data is influenced by past experiences, their moods, assumptions about human nature, and their expectations about objects, people and events (Bokeno, 2011). Characteristics, personality traits, interpersonal skills, work-life balance, financial status and distress experienced during educational training are a few of the factors that may affect professionalism (Hojat et al. 2004). Willingness to implement the biopsychosocial model is dependent on each healthcare professional's beliefs and attitudes (Ng et al. 2021). According to a study of primary care clinicians' barriers and enablers to the management of osteoarthritis, it was revealed that negative attitudes of clinicians during the management and progression of the condition, may lead to apathy and avoidance. Clinicians' assumptions of patients' adherence to advice and doubts about treatment effectiveness influenced the type of management patients receive (Ergeton et al. 2017).

2.6.2 Skills

According to a study conducted in Sweden, chiropractors reported a high level of perceived skill in precise clinical questioning, acquiring and applying evidence (Leech et al. 2002). South African chiropractors are required to partake in continued professional development (CPD) to ensure practitioners are well-informed with updated knowledge, acquire new skills, and are aware of updated ethical requirements or changes. CPD activities are in place for post-graduate learning. Such activities are selected by the practitioner to tailor his/ her requirements according to existing knowledge, practice environment and interests and skills. Certificates are issued as proof to document CPD attendance requirements have been met over a two-year period (AHPCSA, 2021). According to the Federation of Chiropractic Licensing Board, 1997, continued education is a requirement to ensure requirements are met to renew or maintain license to practice. The Allied Health Professions Council of South Africa Guidelines for professional development (2019-2021) states that chiropractors are required to accumulate forty continued education units (CEUs) and are required to have a basic life support certificate per cycle, which is over a two-year period.

There are many post-graduate diplomas and courses chiropractors have access to nationally and internationally. These additional courses may influence the use of BPS approaches by chiropractors, which was seen in a similar study that revealed healthcare professionals to have had transitional changes in practice as a result of the influences made by postgraduate qualifications (Sethi et al. 2018).

2.6.3 Gender

In Switzerland, the United Kingdom and the USA, it was found that the chiropractic profession was male dominated (Humphreys et al. 2010; Christensen et al. 2015). The female to male ratio of chiropractors within South Africa are almost identical, indicating that there has been an increase in female chiropractors, as the profession was previously male dominated (CASA, 2017). Similarly, in other medical professions, both globally and within South Africa, there is an increase in female uptake (Ncayiyana,

2011). Female medical professionals have been identified to possess more empathy and better communication skills, which has shown to strengthen doctor-patient relationships (Roter et al. 2002). In Switzerland it was found that low back pain patients' outcomes differed if the patient was treated by a male or female chiropractor. Those with acute pain treated by females showed greater improvements at one week, three weeks and one year time intervals than those patients treated by male chiropractors. The empathetic nature of the women made the patients feel more at ease during the case history process and examination. Yet patients who fell in the subacute and chronic categories showed no difference in outcomes when comparing treatment provided by female and male chiropractors (Muehlemann et al. 2017). Female medical professionals focus more on the psychosocial factors of a patient than their male counterparts, as females utilise emotion-coping strategies more frequently than males (Menendez-Espina et al. 2019). In contrast, a study comparing treatment outcomes in neck pain patients, depending on the sex of the chiropractor, found no significant difference in treatment outcomes (Thöni et al. 2017). Thus, it is possible that the gender of the chiropractor may influence their perception of the BPS model and utilising it in practice.

2.6.4 Age

Age and years of employment is identified as factors which determine the probability of medical staff focusing on psychosocial factors in a patient. A study conducted in the Hangzhou, Zhejiang province found that medical professionals, between the age of thirty-one and forty, paid the most attention to psychosocial factors when compared to other age groups. Professionals aged fifty-one and older paid the least attention to a patient's psychosocial factors (Xiao et al. 2021). This was due to the likelihood of severe burnout, heavier workload and increased pressure for promotions, which was identified to commonly affect medical professionals in that age group (Xiao et al. 2021).

2.6.5 Place of graduation and educational institution

Chiropractic education is offered across the globe, from private institutions to colleges to state-funded universities. Accreditation authorities, such as Chiropractic Councils of Education (CCEs) and the Chiropractic Council of Education International (CCE-Int), are responsible for ensuring professional standards to ensure that chiropractic programmes produce graduates that are competent and possess the necessary knowledge, skills, understanding, behaviours and attitudes (Asch et al. 2009). In South Africa, the statutory body – the AHPCSA – regulates chiropractic and both Chiropractic programs at DUT and UJ, have local as well as international accreditation with the European Chiropractic Council of Education (ECCE, 2017/2018; DUT and UJ Handbooks, 2021). DUT and UJ were part of the International Chiropractic Education Collaboration, in which they have undersigned a statement to acknowledge the biopsychosocial model while embracing the importance of clinical experience, shared decision-making and a patient-centred approach, while upholding principles of evidence-based care, in addition to being aligned with an EBP approach. Chiropractic institutes were encouraged to support their faculties in aiding innovative strategies in the teachings of emerging healthcare models (DUT and UJ Chiropractic, 2021). Adopting the biopsychosocial approach in practice may be viewed as a contrast in beliefs if trained at a Chiropractic institute that aligns to a vitalistic philosophy. Vitalistic beliefs contrast with moral and duties that are required for the chiropractic profession to maintain its social contract requirements (Simpson and Young, 2020).

There are many other international chiropractic educational institutes that have adopted the above-mentioned statement (DUT and UJ Chiropractic, 2021). This displays the potential influence chiropractic educational institutes may have on the perception of the BPS model. The perception of chiropractors who have attended institutes that do not acknowledge the BPS model and do not align to EBP may differ from those that have. It was noted that a chiropractic student's viewpoint of the role/scope and identity of chiropractic was influenced by the institution they attended (De Luca et al. 2018).

A study performed among Canadian chiropractors found variations in practitioner beliefs regarding vaccinations, referral patterns, treatment protocols and X-ray

usage. The variations of beliefs amongst chiropractors were influenced by the different laws and scope of practice in the different countries (Veldhuijzen van Zanten, 2015). Both the similarities and differences in beliefs and practicing styles within the profession are influenced by the various educational institutes (Innes et al. 2016).

2.6.6 Professional identity

Professional identity can be described as the transformation process an individual undergoes from a lay person to a professional (Holden et al. 2015). An individual's identity can be influenced by a multitude of factors and is the product of their genetics, environment, acquired beliefs, attitudes and behaviours, social circumstances, and upbringing. Professional identity is the amalgamation of people from different social groups coming together to deliver a service, thus leading to a common purpose. However, their action to the provision of that service may differ due to a variety of factors (Brown, 2016). A practitioner's values, beliefs, personal experiences and other external forces are identified as influencing their professional identity (Kimura et al. 2016; Coulter and Shekelle, 2005).

In 2005, the World Federation of Chiropractic (WFC) set out to unite the profession by attempting to create an international identity for the chiropractic profession, this took place at the 8th Biennial Congress in Sydney, Australia, to identify chiropractic as evidence-based providers of spine health who provide holistic care, with a biopsychosocial approach (Brown, 2016; WFC Congress report, 2005). Chiropractors trained at South African chiropractic institutions are exposed to the BPS model in the chiropractic programmes (DUT Chiropractic, 2021; DUT and UJ Handbooks, 2021), therefore practitioners within the eThekwini Municipality should be more willing to utilise the BPS model apart from encountering other possible barriers.

2.6.7 Financial implications

Financial barriers were identified in the various chiropractic and physiotherapy practices which influenced the willingness for practitioners to adopt a BPS approach. Lack of remuneration for practitioner's time was identified as influencing the utilisation of the BPS model. Practitioners were not compensated for using time to explore psychosocial factors (Karstens et al. 2018; Karstens et al. 2015; Ng et al. 2021). Healthcare reimbursement systems are focused on biomedical aspects of patient care, in which it focuses on diagnostic workups and management of biomedical components (Frankel et al. 2003). Thus, compensation from healthcare insurance was identified as a solution to encourage practitioners to use BPS approaches (Coté et al. 2009; Karstens, 2015).

2.7 Conclusion

The BPS model was first introduced over twenty-five years ago (Borrell-Carrió et al. 2004). Research has shown the many benefits for medical professionals to utilise this approach (Covic et al. 2013; Borrell-Carrió et al. 2004). The BPS model has been introduced across the medical profession, with limited application of the model (Xioa et al. 2021). Barriers against the implementation have been noted, with research depicting the need for further practical education to allow for greater utilisation of the model.

Factors influencing the utilisation of the biopsychosocial model among the various medical professions highlight the need to assess whether chiropractors within the eThekwini Municipality encounter similar challenges. This will assist in implementing the changes required to better equip the profession to ensure that quality patient care is developed to further improve patient satisfaction and treatment outcomes.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter details the qualitative methodology utilised in this study. The study design, sampling method, study setting, population, data collection procedure and data analysis will be presented.

3.2 Research design

The research design utilised was an exploratory descriptive design, set in a naturalistic paradigm using a qualitative approach. The ontological position was relativism and constructivism was the epistemological stance. Semi-structured interviews were used to collected data, as depicted in Figure 3.1.

A research design is defined as the way in which research is collected, analysed and reported (Cresswell et al. 2007; Maxwell, 2012). In this study the qualitative approach allowed for exploration of the multiple realities that may exist regarding the phenomena being investigated. Qualitative research should be well articulated, ethical with the use of appropriate and rigorous methods (Cohen and Crabtree, 2008). It aims to achieve a depth of understanding until a point of data saturation, where no new substantive information is identified (Palinkas et al. 2015). It assists in the advancement of healthcare (Hunter et al. 2019).

This approach together with an explorative descriptive design allowed for the exploration of each participant's knowledge, attitudes, perceptions and experience of the phenomena being investigated (Stebbins, 2001). This was necessary to gain in depth information of the existing relationships between the research participants and various themes related to the biopsychosocial model. This design seeks to discover,

describe and understand the investigated phenomenon through the perspectives and worldviews of the people involved (Caelli et al. 2011; Merriam, 1998).

The naturalistic paradigm allowed for an understanding of the phenomenon through assessing the meaning that the participants place on them and to ensure a wealth of descriptive information relating to the phenomena (Bradsaw et al. 2017; Armstrong, 2010). Naturalistic inquiry seeks to understand the experience and point of view of the participants. The researcher records the actions and words of the participants during the data collection process and then analyses them. The use of naturalistic research allows the researcher to generate new questions during the interview to better understand the phenomena (Armstrong, 2010).

The ontological position of a research project focuses on the nature of reality (Walach, 2020). The ontological position of this research study was relativism, whereby reality is considered subjective and can thus vary from person to person (Parahoo, 2014). The multiple realities allowed for an in-depth understanding of the phenomena being investigated.

Epistemology is defined as the study of knowledge and a way of making sense of the world (Bryman, 2008). The epistemological position utilised in this research was constructivism as it views knowledge as being personally and socially constructed, hence knowledge allows constructs or frameworks to make sense of experiences. Emphasis is placed on the ability of the human mind to construct and impose categories on the world (Olssen, 1995).

Figure 3.1: The research design

3.3 Study population and permission to conduct the study

The population being investigated in this study were registered South African chiropractors, of any age or gender, who were practicing within the eThekwini Municipality at the time of the study. Permission to conduct this study was obtained from the Durban University of Technology Institutional Research Ethics Committee ethical clearance (IREC) number 140/20 (Appendix D).

3.4 Research setting

The study took place within the eThekwini Municipality located in the province of KZN on the east coast of South Africa. This municipality extends to Tongaat in the north, Freeland Park in the south and Cato Ridge in the west. The eastern border is the Indian Ocean. The eThekwini municipality consists of coastal and inland areas and encompasses a beautiful coastal line, harbour as well as residential, industrial and business parks areas. Durban is the largest city in the province with an estimated

population size of 3,176,254 million people. Most of the population speak English, followed by isiZulu, Afrikaans and Xhosa (World population review, 2021). The DUT is located in the city of Durban in the eThekwini Municipality which and is home to the first Chiropractic programme in South Africa.

This municipality is home to 18.75 % of the total practicing chiropractors in South Africa. Most chiropractors are self-employed in private practices, these are mostly found in the urban and peri-urban areas and in the middle to high-income areas (CASA, 2021). Many of the chiropractors in this area are alumni from the chiropractic program at DUT, being residents of the area or coming from surrounding provinces to study at DUT, others have migrated after graduating.

3.5 Sampling

3.5.1 Sample size

At the time of data collection, there were 150 qualified and practicing chiropractors within eThekwini Municipality. A list of all eligible participants was compiled by the researcher utilising the Allied Health Professions Council of South Africa (AHPCSA) online list of chiropractors, along with the *find a chiropractor* option available on the Chiropractic Association of South Africa Website, to identify those chiropractors practicing in the eThekwini Municipality. This provided the sampling frame for the study.

Purposive sampling is a technique utilised in qualitative research to obtain information rich cases, which involves selecting individuals who are knowledgeable and possess experience with a specific phenomenon (Patton, 2002).

Participants were recruited either via telephone and/or email, where they were informed about the study and invited to participate. The sample size for this study was not pre-determined, but a minimum of 10 participants was anticipated. The sample size depended on the point of data saturation (O' Reilly and Parker, 2012; Morse et al. 2014). Data saturation is often used to determine sample size in studies using

qualitative interviews (Mason, 2010). It occurs when no new themes, patterns or categories emerge from the data and it is the point when maximum information is obtained (Moser and Korstjen, 2017).

The decision on when an adequate data situation is reached is dependent on various factors, such as the richness of the data, data collection methods, the variety of research participants and the broadness of interview questions (Moser and Korstjen, 2017).

3.5.2 Sample characteristics

For the chiropractor to participate in the study they were required to meet the following inclusion and exclusion criteria:

- Inclusion criteria:

1. Be a graduate of either Durban University of Technology or the University of Johannesburg.
2. Actively practicing within the eThekwini Municipality.
3. Registered with the AHPCSA.
4. Read and agree to partake, by signing a letter of information (Appendix A) and consent (Appendix B).

- Exclusion criteria

1. Any chiropractor who was involved in the approval or supervision of this study.

3.5.3 Sample recruitment

Purposeful and snowball sampling was utilised to recruit participants for this study. Purposeful sampling is the deliberate choice of participants based on the qualities they possess (Bernard, 2002; Palinkas et al. 2015). It allows the researcher to select participants based on their knowledge and experience related to the investigated phenomena (Flick, 2014). It is widely utilised in qualitative research to obtain information rich data (Palinkas et al. 2015). Snowball sampling was used, in addition

to purpose sampling, to allow the researcher to be referred by existing research participants to their acquaintances who were seen to be knowledgeable regarding the investigated phenomena (Naderifar et al. 2017).

From the sampling frame, and in consultation with the supervisor, the researcher identified two to three potential chiropractors, who were seen to be knowledgeable in the BPS model, to be invited to partake in the study. From there, a combination of purposeful and snowball sampling was used. Using a combination of these techniques allowed for informants knowledgeable about the investigated phenomena to share their knowledge and refer potential colleagues or acquaintances that could add to the research study (Dolores et al. 2007).

3.5.4 Semi-structured interviews

This study utilised interviews that were semi-structured and conducted in English. Interviews were utilised to gain in-depth information of the research participant's knowledge, perceptions, attitudes and experience regarding the researched phenomena (Austin and Sutton, 2014). English is one of the main languages of South Africa and is also the medium used at both Chiropractic programmes in South Africa – DUT and UJ. This ensured that the participants would feel comfortable conversing in a language that they could speak.

It was anticipated that the interviews would last approximately 30 minutes. The researcher developed a rapport with each research participant prior to the interview, to allow the participant to engage and feel comfortable. An interview schedule was used during data collection. It consisted of a grand tour question, which allowed the interviewee an opportunity to give a verbal tour of their knowledge in the phenomena being studied (Leech, 2002). This was followed by other questions related to the biopsychosocial model. Prompts were used to encourage interviewees to continue talking to gather rich and informative data, in situations when responses were brief (Leech, 2002).

The interviews were digitally voice recorded and then transcribed into a Microsoft Word document to be analysed. The researcher made field notes during the interviews. Written field notes were created shortly after interviews which made note of participants' non-verbal behaviours, which cannot be captured on a digital voice recorder. Field notes are used to assist the researcher in analysing the data provided by participants (Philippi and Lauderdale, 2017).

Interview schedule:

1. Explain your understanding of the biopsychosocial model?
2. How do you feel about this model of health care?
3. Do you implement the biopsychosocial model in your practice when managing musculoskeletal pain? If so elaborate/ if not, why not?
4. How do you implement the biopsychosocial model in practice?
5. Describe the challenges, if any, you encounter when implementing the biopsychosocial model?

3.5.5 Pilot study

A pilot study was conducted. This is the main study,but conducted on a smaller scale than the main research study to improve the quality of the study and identify if changes need to be made (In, 2017). It also enhances the credibility of the study (Padgett, 2008) and allows for rich data to be obtained (Gudmundsdottir and Brock-Utne, 2010). The feedback received would allow the researcher to make modifications prior to embarking on the main study.

Three participants were recruited to partake in the pilot study after providing a letter of information and informed consent (Appendix A and B). Two of the three were lecturers from the chiropractic programme at the Durban University of Technology, who were also actively practicing, and the third was a chiropractor who was chosen at random from the sample frame. These characteristics allowed the pilot study participants to mimic the study population, thus ensuring a suitable simulation of the main study. By partaking in the pilot study, they were excluded from the main study.

The pilot study participants were given an option of having the interview conducted via Zoom Video Communications or face-to-face. Two selected Zoom Video Communications, and the other met the researcher at a coffee shop. The semi-structured interviews lasted approximately fifteen to twenty-five minutes and were digitally voice recorded.

No changes were required to the interview schedule after conducting the pilot study.

3.6 Data collection

The interviews were conducted either at each participant's place of work, another suitable venue of their choice or, due to the COVID-19, via Microsoft Teams/ Zoom video calls when difficulties arose to conduct face-to-face meetings. Zoom was the preferred platform when participants were not able to have contact interviews. Interviews conducted via Zoom were recorded and interviews in person were recorded using a digital voice recorder. All interviews conducted via Zoom were conducted with both the interviewer and interviewees camera on. The research setting aimed to take place in the participants' natural environment (work or another suitable venue) to ensure it meets the research design, alternatives such as virtual interviews had to be considered to accommodate the implications of the COVID-19 pandemic. Seven out of the thirteen interviews were conducted in person, with the remaining interviews being conducted via Zoom.

Once the study received ethical approval from the IREC, the researcher contacted potential participants via email and/or telephonically. The researcher introduced herself as a chiropractic student, who is currently conducting a research project for the Master's Degree in Technology: Chiropractic. A brief overview of the research was then given, and an outline of the requirements needed for participation, as outlined in section 3.6.2, was provided.

Those agreeing to partake, and who met the requirements were then scheduled for a face-to-face interview at his/her place of work or a Microsoft Teams /Zoom call, at a convenient date and time. The researcher then sent the participants, who were willing

to partake, the letter of information (Appendix A) via email to read prior to the scheduled appointment.

On the day of the interview, the researcher provided the interviewee with a copy of the letter of information (Appendix A) explaining the research study in detail and a letter of consent (Appendix B). In addition, a verbal explanation was provided, and the participant was given an opportunity to ask questions. The participant was then required to sign the informed consent form and provide permission for the interview to be digitally voice recorded or if done via Microsoft Teams/ Zoom, for the session to be recorded, before proceeding with the interview. Due to the COVID-19 pandemic, the face-to-face interviews were conducted in line with the required safety protocols. Masks were worn, hands were washed, and pens were sanitised before and after the interview.

After establishing rapport, the researcher conducted the interview based on the interview guide which, when necessary, was followed by probing question and prompts. On completion, the participants were thanked for their time and contribution.

During and after the interview, the researcher made entries in a reflexive journal to document her own reflections and to acknowledge her personal perspectives, opinions and biases which may influence the outcome of the study (Ortlipp, 2008). Reflexive journaling aims to improve the quality of the data collection by allowing the researcher to acknowledge her presence in the research process (Annink, 2017).

To ensure that the interview data was kept safe, the recordings and transcripts were stored on a password protected laptop which only the researcher had access to. These were downloaded and stored on a password protected flash drive. On completion of the study, the flash drive – together with the signed consent forms – will be stored in the Department of chiropractic at DUT for five years. Thereafter, all electronic data will be deleted and paper data will be shredded and disposed.

3.7 Data analysis

On completion of the interview, the researcher transcribed all interviews into a Microsoft Word document verbatim. The written transcripts were sent to each participant for member checking, whereby participants could verify their transcribed contents of the interview to ensure credibility and allow interviewees to verify the validity of the data collected (Theron, 2015).

Once all interviews were completed, data was analysed using Tesch's method to identify themes and subthemes (Tesch, 1990; Creswell, 2007). The researcher gained a sense of the information by reading thoroughly through all the collected data and wrote down any ideas that came to mind. The researcher then began to analyse each document by identifying and making notes on the topics that were associated with each document. This process was repeated for each transcript, with a list of topics of each document placed in separate columns and compared.

Similar topics were grouped and placed under a heading that represented the topics. The topics were then abbreviated into codes. The list of codes was then analysed alongside the appropriate segments of the transcribed data. Topics were reduced to themes and sub-themes. Codes were then alphabetised to ensure no duplication occurred. Each theme and sub-theme were analysed with the research question in mind (Tesch, 1990; Creswell, 2007; Theron, 2015). The researcher analysed and interpreted the data with on-going review from her supervisor to eliminate any bias, and ensure all interpretations were fair and adequate. Field notes were made to enhance data, improve trustworthiness and aid in data analysis (Phillippi and Lauderdale, 2017).

In qualitative research, it is important to note that the researcher's world views exert an influence on the research process (Austin and Sutton, 2014). The researcher is a South African born and educated chiropractic student who grew up in KZN, which may influence her world views.

3.8 Trustworthiness

Trustworthiness was obtained by ensuring confirmability, credibility, dependability, transferability and reflexivity. Trustworthiness in qualitative research is associated with reliability and validity (Cypress, 2017) and is dependent on content analysis that is rich, appropriate and well saturated (Elo et al. 2014).

Trustworthiness was ensured by performing the coding process and identifying themes and subthemes. The researcher transcribed voice recorded interviews into a Microsoft Word document, which was sent to each participant for member checking. The coding process was completed by using Tesch's method (Tesch, 1990, Creswell, 2007). To ensure all interpretations are fair and adequate, the researcher eliminated any bias by means of ongoing review with the supervisor during data analysis. To improve and enhance data, field notes were taken to assist in the data analysis process (Phillippi and Lauderdale, 2017).

Credibility is described as the confidence placed in the truth of research findings and the interpretation of the data (Kortjsen and Moser, 2018). Credibility and dependability were obtained by reaching data saturation and member checks (Thomas, 2017; Kortjsen and Moser, 2018). Participants were sent transcribed interviews to allow for verification. When analysing data, the researcher used a self-reflective journal, in which the researcher will document her thoughts and feelings throughout the research to obtain reflexivity (Ortlipp, 2008; Moser and Korstjens, 2017). Reflexive journaling was utilised to create transparency during the research process and for the researcher to examine her personal assumptions, belief systems and subjectivities (Ortlipp, 2008). This process allowed the researcher to acknowledge her own preconceived assumptions and role during the process if collecting, analysing and interpreting the data.

Authenticity is defined as gathering the true understanding of a person's experiences. This was obtained using a digital voice recorder and verbatim transcriptions to ensure findings accurately represent the activities on the ground. The researcher also utilised cross-checking of themes with the supervisor during data analysis (Shenton, 2004).

Transferability is described as the aspects of applicability in which findings can be applied to other groups (Kortjsen and Moser, 2018). This was ensured by collecting data until the point of saturation in which no new data, themes or sub-themes were identified and supplying reflections to allow the reader to acknowledge the environment in which the study was conducted (Shenton, 2004).

Confirmability is achieved by providing transparency of the research path and ensuring interpretation of the data is not based on the researcher's own viewpoints or preferences (Shenton, 2004; Kortjsen and Moser, 2018). In this research, this was obtained by utilising an audit trail in which the researcher documents each decision and procedure made throughout the research study, and ensuring selected participants met the inclusion and exclusion criteria.

3.9 Ethical considerations

The ethical issues related to this study are provided below:

Permission and approval to conduct this research project was granted by the Durban University of Technology Research Ethics Committee (Appendix D).

Autonomy can be defined as research participants' right to freedom of will, privacy, liberty and individual choice (Pietila et. al. 2019). Participant autonomy was ensured as participants were given a verbal description of the study and, upon agreeing to partake, were provided a written letter of information (Appendix A) and informed consent document (Appendix B). This letter elaborates on the purpose of the study, the risks and benefits, methods to ensure confidentiality, and the right to leave the study at any point. Prior to agreeing to be interviewed, the participant was allowed to ask questions and, at any time, were free to withdraw from the study without any adverse effects. This was made available to participants to ensure transparency. Each participant was reassured that their name would not be published in the dissertation and that a pseudonym would be used. On completion of the study, the data collected will be kept at the Department of Chiropractic for the duration of five years, thereafter the flash drive will be formatted, and the paperwork will be shredded.

Non-maleficence refers to the researcher's obligation to ensure harm is avoided (namely psychological, emotional and social), with minimal risk to the society and research participants (Pietila et al. 2019). This was ensured by having the recorded interviews stored on the researcher's laptop under password protection, ensuring that only the researcher had access to the interview. During the analysis of the transcribed interviews, the researcher assigned a pseudonym to each participant and participants' names were not used in any publications. Only the researcher and the supervisor had access to the interviews.

Beneficence is defined as preventing harm and doing good for others (Orb et al. 2001). Pseudonyms were assigned to participants in order to protect their identity. The results of this study will be used to assist educational institutions and professional associations to identify areas where skill deficits occur related to the biopsychosocial model. In order to address these changes to the curriculum, post-graduate courses may be offered to improve skills of practitioners to deliver health care in the biopsychosocial model.

Justice refers to treating all individuals in a fair manner, without discrimination (Pietila et al. 2019). There was no discrimination in terms of age, gender or ethnicity when recruiting participants.

CHAPTER FOUR
RESULTS

4.1 Introduction

This chapter presents analysis of the data obtained from the transcribed interviews. Following transcription of the interviews, the participants were assigned pseudonyms of chiropractor A to M. The researcher felt that this type of pseudonym was most appropriate, given the professional status of the participants.

4.2 Sample size and demographics

The study recruited 13 chiropractors during the month of June and July 2021.

4.3 Description of participants' socio-demographic characteristics and practice settings

The participants were aged from their late twenties through to their late forties. Seven were female and five were male. The average years of practicing as a registered chiropractor ranged from as little as three years, to over sixteen years in practice.

The interviewees were conscientious, friendly, empathetic, thorough, displayed caring natures and willingness to discuss research questions. More than half of the participants had completed short courses since graduating, with the majority of participants having relied on CPD events and short courses to gain extra knowledge that has benefited them in practice. Participants were given an option, due to the COVID-19 pandemic, to have either face-to-face interviews or interviews via Microsoft Teams/Zoom. Seven out of the thirteen participants selected in person interviews, with the remainder being done via Zoom due to the University implementing restrictions on contact data collection during the third wave of the COVID-19 pandemic.

The chiropractic practices that were visited ranged from multi-disciplinary practices to practices run from home. Practices ranged from cosy to spacious, consisting of mainly

neutral tones. Many had a receptionist, whereas some were managed solely by the practitioner. Practices were in middle to upper-class areas, within urbanised parts of the municipality.

Most practices were located along a busy road, close to shopping centres, within the heart of the community, while a few practices were located away from amenities. Many of the participants had utilised the same practice location for many years, with some practicing at the same location since graduation. The practices were set up in a way that discouraged over-crowding, many practices had set up daily patient schedules to ensure patients are not waiting in the waiting/ reception room to ensure the potential spread of COVID-19 is limited. Chiropractic equipment ranged from simple low-cost chiropractic beds to electronic beds and modalities.

4.4 Thematic analysis

The thematic analysis allowed the main themes to emerge, these themes focused on:

1. Knowledge of the BPS model.
2. Perception of the BPS model.
3. Challenges utilising the BPS model.
4. Education of the BPS model within the Chiropractic course.
5. Utilisation of the BPS model and screening tools.

Each theme contained sub-themes, which elucidated various thoughts. These perspectives were captured in data analysis tables (Appendix E).

Table 4.1: Reflection of the themes and sub-themes that emerged from the interviews

Theme 4.1	**Knowledge of the BPS model**
Theme 4.1.1.	BPS model is multi-factorial
Theme 4.1.2	Interactions
Theme 4.1.3	Mind-body connection
Theme 4.2	**Perception of the BPS model**
Theme 4.2.1	Comprehensive
Theme 4.2.2	More training required
Theme 4.2.3	Improved treatment outcomes
Theme 4.2.4	Beyond scope of practice
Theme 4.3	**Challenges utilising the BPS model**
Theme 4.3.1	Time constraints
Theme 4.3.2	Financial burden
Theme 4.3.3	Emotional burden
Theme 4.4	**Education of the BPS model within the chiropractic course**
Theme 4.1	Chiropractic education of the BPS model
Theme 4.2	Recommendations of teaching of the BPS model
Theme 4.5	**Utilisation of the BPS model and screening**

4.5 Theme One: Knowledge of the BPS model

4.5.1 BPS model is multi-factorial

The majority of the participants mentioned that the BPS model is multi-factorial, highlighting the need for practitioners to consider all factors when consulting with a patient, as psychological factors may be an attributing factor. A few participants mentioned the COVID- 19 pandemic, recent looting and unrest in Kwa-Zulu Natal, South Africa, and how it has made practitioners more aware of the implications of psychological stress or factors that may have on effect on musculoskeletal complaints.

> "*With regards to the COVID pandemic, a lot of people are coming in due to isolation stresses, stress from working at home or an alternative environment, and that plays out in headaches, tension and muscular trigger points,"* said Chiropractor D.

Participants went on to explain that the BPS model encompasses social, psychological, physical, occupational factors, pain tolerance, level of pain and response to treatment.

> "…*taking into account all the factors such as psychological, social, occupational and environmental factors that will contribute to a patient's presenting complaints, the history, the pain tolerance, the level of pain, their response to treatment and their compliance with treatment and everything,"* said Chiropractor B.

> *"So, we look at everything from the pain threshold that the patients have, all the way through to the effects of depression, anxiety, and other mental disorders on pain. Then, with those disorders, we looked at how it affects them developing pain and how it affects their recovery and the prognosis,"* said Chiropractor H.

One participant viewed the BPS model as an extension of the biomedical model, which looks at three main factors that can be responsible for the disease.

> "*…the model addresses the three main factors responsible for disease, it's sort of an extension of the biomedical model," said* Chiropractor K.

Participants highlighted that practitioners could choose to practice with a BPS model and emphasised the holistic nature of the model:

> *"…the biopsychosocial model is a method of practice, where you consider the patient holistically, you're looking at various factors that affect the disease process, that affect health and wellness. You try and address all of those," said Chiropractor A.*

> *"Well, you know, in terms of holistic health care, there is no other approach that I would have. When assessing a patient, you have to use this model,"* said Chiropractor H.

Given the holistic nature of the BPS model requiring medical professionals to delve into the many factors which patients present with, a few participants expressed how the BPS model is more appropriate for private health care settings:

> *"In public healthcare settings, it may not always be appropriate because of time and resource constraints. Some healthcare practitioners have queues of patients waiting, they don't always have time to delve so deeply into finding out so much about the patient,"* said Chiropractor A.

The BPS model is a model that encompasses addressing "*various factors that affect the disease process*", which was mentioned by most of the participants. They mentioned that the BPS model encourages practitioners to look at all factors pertaining to "*physiology, anatomy, pathology and psychology, as there is often a mental component to diseases*" and psychosocial factors such as depression and anxiety may play a role in pain threshold or disease processes. The BPS model was viewed as an "*excellent model*", however, a few participants expressed that it may not be appropriate for the public sector due to "*time and resource constraints*". Medical

professionals in the public sector often have "*queues of patients waiting*" thus making it a challenging task to delve so deeply into finding out so much about the patient.

4.5.2 Mind-body connection

The mind-body connection featured in the interviews where participants mentioned it, but they did not discuss it in detail, in terms of its role in the BPS model. Two of the participant's mentioned the link between the mind and the body, and briefly elaborated how various factors can influence physical symptoms:

> *"…there is a link between the mind and the body…"* said Chiropractor D.

> *"I would assume the bio as in body and psycho as in the mind. So, the link between the two,*" said Chiropractor G.

They recognised the effect that the mind has on the body:

> *"So, your psyche can actually affect your physical well-being as well,"* said Chiropractor J.

> *"One's environment, one's resources and whatever has a physical effect, as well as an emotional one, and that plays out in one's life and can present with physical symptoms,"* said Chiropractor D.

One participant went on to highlight that one should not focus solely on the physical factors of a condition, as mental and emotional factors also have an influence:

> *"So just addressing that it's not only the physical, but also the mental and emotional aspects, have a weighting as well,"* said Chiropractor I.

The BPS was viewed as a holistic model which addresses factors which the biomedical model failed to:

> *"…that it's a holistic model, as opposed to the biomedical model. So biomedical doesn't include the mental, emotional, psychological side of health, whereas the biopsychosocial model does and is more holistic,"* said Chiropractor F.

When describing the BPS model, the link between the mind and the body was highlighted:

> *"How they deal with factors and stresses, and how it all culminates together,"* said Chiropractor C.

> *"Basically, noticing a* change*, looking at things like immune function, physical illness. If a patient is on medication, what do those side effects have on the body biologically and then psychologically, obviously state of mind, the temperament, attitudes, beliefs, things like the avoidance behaviours, past traumas, all of that is also important. Then the social factors would be sort of like family background with it, from what sort of education they have and their understanding of everything,"* said Chiropractor L.

The BPS model was viewed as complex:

> "…*my understanding of the biopsychosocial model was that it looks at the biological or cellular levels of mechanisms of disease, it looks at the psychological and emotional impacts of whatever it is that people go through, and this can also either manifest as underlying conditions or it can make a pre-existing condition even worse. So, there's kind of a relationship, it's not linear, it doesn't go from biology to psychology to social, it's sort of all intertwined,"* said Chiropractor K.

Participants indicated the importance of the mind-body link in the BPS model. They mentioned the mind and body should be considered with equal importance. However, participants did not discuss the mind-body link in detail. A few participants referred to the Biomedical model and the progression which led to the incorporation of psychological factors. It was noted that a vast number of participants referred to the BPS model as a model focusing beyond the patho-anatomical complaints of a patient.

4.5.3 Interactions

Participants felt the BPS model allowed practitioners to build better relationships with their patients, which assisted in the patient feeling comfortable and willing to disclose aspects of their life:

> "…*like really be there for them. A lot of the time, when someone comes to you as an alternative practitioner, they've already been to lots of other people. They need to feel supported or listened to. I definitely try my best to implement this model," said* Chiropractor F.

There was a feeling that the BPS model allowed for better doctor-patient relationships, and patients feeling supported and cared for:

> "…*So, the biopsychosocial also creates a deeper, more meaningful relationship between the doctor and the patient, because you delve far deeper than just what meets the eye in medicine,"* said Chiropractor A.

The BPS model addresses factors which the biomedical model does not, hence practitioners may require more time with their patients. This, in turn, resulted in better responses to treatment and management of conditions:

> "…*patients feel you have a connection with them, they feel you care about them, and they actually respond better to treatment and management,"* said Chiropractor H.

Although all participants knew about the BPS model, very few comprehensively explained it. Most of the participants identified the three main elements of the BPS model and mentioned the importance of addressing psychological aspects of the patient in the context of the patients presenting musculoskeletal complaints. They often did not go beyond elaborating on the various factors and the potential implications they have on the management of their patients. Participants did not delve into personality types, behavioural influences, physiological responses and the potential implications it could have on a patient's prognosis, and the challenges they may face should a patient present with psychosocial factors.

4.6 Theme Two: Perception of the BPS model

4.6.1 Comprehensive

Participants felt the BPS model was more thorough and comprehensive, as it included factors beyond the path-anatomical cause.

> *"…the model addresses the three main factors responsible for disease, it's sort of an extension of the biomedical model, a biomedical model works on Virchow's principles, that disease occurs at the cellular level and what this particular model does is incorporate, as I said, but also encompasses the psychology and the social aspect of that as well…as a chiropractor, I think it is a great model to use and to understand," said Chiropractor K.*

It was perceived that, as complementary healthcare practitioners, it was their role to address the components of the BPS model:

> *"Well, as a complementary healthcare practitioner, it's something that we always focus on. It's something we always tell our patients about and educate them about, because it's something we see as well, so, regardless of how we feel about it, it's part and parcel of how to look at the person. Firstly we are physical practitioners, so we look at them physically, but also to consider what's going on in the environment around them, how it's affecting them psychologically and how it might actually affect them physically, as well," said Chiropractor J.*

It was emphasised that time is required for this comprehensive model and that chiropractors had the privilege of longer consultation periods, thus allowing the chiropractor to garner in-depth information from their patients.

> *"It's about addressing all the factors in a patient that affects them,"* said Chiropractor C.

> *"It may not be appropriate to some healthcare practitioners because they have queues of patients waiting, they don't always have time to delve so deeply into finding out so much about the patient, they just have to treat, because they need to move on to the next patient and they've got a quota to meet. In chiropractic, it's far more appropriate because it's a one-on-one consultation, you have that time with the patient, its private healthcare, which already means you've got more time and more resources available to draw on…We have the luxury of time with the patient," said* Chiropractor A.

The participants reflected on their own experiences being treated in the biomedical model and how if differs in its approach from the BPS model:

> *"I think it's really important…literally having been in hospital last week, I saw the biomedical model and it was not great. It's a broken system. So the biopsychosocial model was so important, especially as alternative practitioners, we have just so much more focus on people's mental state of health and addressing the body as a whole, like, we can't just look at it from a biological point of view. It is super important,"* said Chiropractor F.

> *"It includes a lot of a patient's personal life, which doctors can't exclude in the long run,"* said Chiropractor E.

Participants acknowledged that the BPS model addresses a patient beyond what the biomedical model does and felt this model should be utilised throughout the medical professions, and not only in complementary alternative healthcare. The biomedical model was viewed as "*a broken system*". It was, however, acknowledged that the resource needed to implement the BPS model effectively is time, thus "*it may not be appropriate to some healthcare practitioners",* yet there was an aspiration that all healthcare professionals would attempt to utilise the BPS model.

4.6.2 More training required

The majority of participants felt more training was required to utilise this model, with one participant mentioning that it was *"tricky to tackle"*.

“Well, you know, in terms of holistic health care, there is no other approach that I would have. When assessing a patient, you have to use this model. It's not emphasised enough in training. It is not part of training. It's something you learn in private practice of how you approach patients and what or why some patients get better and others don't, and why some patients respond better than others,” said Chiropractor H.

“Well, I feel like I wish we learned a little bit more about it at university because it plays a big role in treating patients and I feel like I'm only learning that in practice,” said Chiropractor K.

“We only have so much training for biopsychosocial issues,” said Chiropractor C.

Participants were not averse to learning more about how to effectively implement the BPS model, but also realised their limitations:

“So, I feel like I do wish that I had the tools to identify a little bit more, but I'm happy to refer as well,” said Chiropractor L.

There was a sense of the BPS model being a challenge:

“It is incredibly important to factor into patient healthcare, but can also be quite tricky to tackle,” said Chiropractor C.

Participants felt that chiropractic education, although providing theoretical understanding, did not equip them to implement the BPS model in practice, due to the lack of skills. Time spent in practice and treating patients has taught them how to utilise the model. Utilisation of the BPS model was not seen as an easy task, due to lack of practical skills and further training beyond chiropractic education.

4.6.3 Improved treatment outcomes

One participant expressed his passion towards the BPS model and its benefits as a primary spine care provider, and further stated that spinal complaints are a BPS problem.

> *"I think is the model. For the most part, I think, depending on how one practices, I think we've got a very good opportunity. Chiropractors should arguably lead this model. I think that the spine is your quintessential biopsychosocial problem. So I think, yeah, this should be. I mean, there's other models that go hand-in-hand with it and, you know, in terms of defining Treatment-based classification (TBC) & Clinical Reasoning in Spine Pain (CRISP),"* said Chiropractor B.

Another participant highlighted that it plays a role in the way patients respond to treatment.

> "…*it also affects the way that they respond to treatment…I think it does play a big role,"* said Chiropractor L.

> *"I just think that it's a very real thing, the more you're aware of it, there is a whole group of patients that can benefit from it,"* said Chiropractor I.

4.6.4 Beyond scope of practice

A few participants felt addressing psychosocial factors was beyond their scope of practice and emphasised the importance of knowing one's professional boundaries.

> "…*you find out what's really going on and sometimes it's not something I can help with, but at least I can then refer them to somebody better,"* said Chiropractor D.

Participants emphasised the importance of a professional referral network:

> "…*if I find them hitting a brick wall or if I get the feeling that there are other aspects that are on the psychosocial, I should say during the during the*

assessment of their bio or physical aspects that there are social aspects that are impacting their health or their condition as much as the patient does or doesn't want to engage in that, and I will sometimes even refer patients to a psychologist or something like that," said Chiropractor I.

The challenge of addressing psychological issues was seen as a challenge to offering holistic care:

"…you can only do so much. Sure you can direct people to the necessary care that they may require…We often use the term holism and holistic care, but we don't really know where the boundaries are for these things. How far do you push this? You know, the other thing is, what's the difference between genuine clinical care and trying too much? It's a bit tricky but, yeah, those are some of the challenges with this," said Chiropractor K.

Knowing the limits of scope of practice was emphasised:

"Knowing where our boundaries are as practitioners is definitely something that they need to look at," said Chiropractor L.

The general perception was in favour of the BPS model with participants stating that it is appropriate for the chiropractic profession, especially with regards to the effects of the COVID-19 pandemic.

4.7 Theme Three: Challenges utilising the BPS model

4.7.1 Time constraints

Time was highlighted as an important factor influencing the ability of the participants in identifying and addressing the various BPS elements which affected a person's health and disease status:

"I think time constraints," said Chiropractor I.

"Sometimes we don't always have time to get into it," said Chiropractor C.

"*Time is probably the biggest issue,"* said Chiropractor F.

"Yeah, we have constraints regarding time – how long I can spend with the patient?" said Chiropractor H.

It was acknowledged that the time factor is a problem across healthcare professions:

"The main challenge is time, I think you know, even with my medical practitioner friends, it's the same thing. You don't have the time…that's the main thing," said Chiropractor J.

Compensatory efforts for the "lack of time" were identified where the practitioner would use other time either in the consultation…

"But, as much as possible, I'll try to talk to them while treating and assessing…" said Chiropractor C.

Or as indicated by Chiropractor F:

"…*if I don't have enough time…I'll usually just get flustered and work until late at night trying to get stuff out to patients regarding extra information or to supplement what we did address and discuss during the consult.*"

One participant mentioned the use of a recovery room to assist with time constraints:

"…but I often have a recovery room that we will ask patients to wait and just relax there, and then I'll try and go out and talk to the patient to see how they are doing in between patients. We'd only let a patient leave here once they are in a stable state or calm. So, I find that really helps a lot," said Chiropractor H.

Other strategies utilised included learning how to manage a conversation and being aware of scope of practice:

"It's just about learning how to manage the conversation. You're asking very clinically, I mean there is kindness and empathy, but its a chiropractic consult, it's not a psychology consult, you know?" said Chiropractor I.

Other participants expressed that time is not a challenge for them:

"*I do tend to have longer treatment plans. It works well for me. I found that I have better outcomes in terms of patient outcomes,"* said Chiropractor D.

"I do have time to talk and explore…I believe that charging a part of the consultation fee is for your time," said Chiropractor A.

"I have enough time. I don't see the financial implication. It's about the patient for me…" said Chiropractor K.

4.7.2 Financial burden

Participants mentioned the financial burden that comes with utilising the BPS model, as it often leads to longer consultations, although most participants who were interviewed already have lengthy consultations.

"*I have a set time frame, especially for my initial, it's an hour," said* Chiropractor A.

"I typically book 50-minute sessions, because I try cover a lot in a session," said Chiropractor C.

"I tend to have longer treatment plans. It works well for me*,"* said Chiropractor D.

"It isn't something we can 'bill' for. It doesn't figure high up on the 'hierarchy' of treatment options (for patients) - unlike surgery, injections, strong meds or even hands-on treatment," said Chiropractor B.

The lack of monetary reward was seen as a financial implication for the practitioner.

"This (time constraints) goes hand-in-hand with the challenge of how current reimbursement models are set up. There is no real reward for spending time exploring psychosocial issues with patients, educating patients," said Chiropractor B.

"Sometimes it is a financial one that is a challenge to overcome," said Chiropractor C.

It was highlighted that reimbursement models are outdated:

"Ironically, evidence continues to outline the high value of this approach/model - but reimbursement models aren't set up to reward the most high-value interventions in health care…especially spine care" – Chiropractor B.

In contrast one practitioner emphasised that it was not about financial reward but more about ensuring the patient returned to health:

"…I don't see the financial implication for me, it's about the patient. Of course, you know, anyone else is free to disagree about it and that's fine. Yeah, for me, when I go down and I see my patient, it's about the patient and the financial things will sort themselves out with that," said Chiropractor K.

Another participant expressed it was the passion over monetary rewards:

"It's the passion, that's the most important part," said Chiropractor G.

There was a relationship between time and financial burden when effectively implementing the BPS model. Where practitioners were caught between providing the best, evidence-based care and the need to pay bills. Many participants expressed challenges with regards to time and further expressed how it can lead to a financial burden if many of their patients present with psychosocial factors. They mentioned not being reimbursed or rewarded for the extra time that is required when implementing this model, which then impacts on the financial aspect of running a practice.

4.7.3 Emotional burden

Many practitioners mentioned that they felt "emotionally drained", "exhausted" and "burdened" after working with patients in addressing psychosocial factors. This led to a professional respect for psychologists.

> *"…it's more of a burden on you as a practitioner… people end up wanting to share stuff with you and you need to know how to separate yourself from the patient and to make them realise that there are boundaries as well,"* said Chiropractor D.

There was reflection that although the work of a chiropractor is physically demanding, it did not compare to the emotional toll:

> *"A challenge is definitely that this approach can be time consuming, but more important, very emotionally draining, energy draining. People say to me, am I tired after a day at work? Yeah, but not because of the adjustment! I am exhausted from the mental drain, and it does equate to finances because it does equate to minutes,"* said Chiropractor E.

Using the BPS model was seen as adding stress:

> *"Yeah, it actually puts a lot of stress on you…You're absorbing some of the stress from the patient..."* said Chiropractor J.

It was also indicated that one needed clear boundaries to prevent patient dependency:

> *"You never want a patient to be dependent on you. So that's, I think, the biggest challenge with that kind of model,"* said Chiropractor D.

Participants experienced emotional strain when addressing the psychological factors of a patient, as it can be a difficult task to disassociate themselves from a patient's psychological stressors. Some participants did not encounter emotional burden, as they believed they were able to learn how to disassociate themselves after a few years in practice, therefore they could empathise with their patients and not carry the emotional burden. One participant stated: "…with experience you kind of work through that, but if someone is not experienced, it's easy to become emotionally entangled."

Another participant mentioned having boundaries: "…make them realise there are boundaries".

4.8 Theme Four: The education of the BPS model within the chiropractic course

This theme addressed whether chiropractors felt they were adequately educated about the biopsychosocial model during their chiropractic education and suggestions as to what chiropractic education in South Africa can implement to bring about the required change for future chiropractors.

4.8.1 Chiropractic education of the BPS model

The majority of the participants felt chiropractic education in South Africa incorporated an introduction of the BPS model, but there was a sense that more training should be done:

> *"…we basically learn it from a very theoretical point of view, we basically learn that this is what the biopsychosocial model is…"* said Chiropractor A.

> *"…never delved into the degree in which it should be,"* said Chiropractor *C.*

Chiropractor H spoke of the undergraduate programme module "psychopathology" and how the focus on pain management was limited:

> *"You have a little bit of psychopathology in third year, but the syllabus is not even sufficient in terms of pain management. So most chiropractors will move away completely from dealing with those aspects of a patient…"* said Chiropractor H.

This differed from Chiropractor I, who emphasised the volume of work that a chiropractic student needs to cover:

> "…*I think there's so much to learn as a chiropractor in varsity, I think their introduction to that was sufficient, in my opinion, and it opened you up to the to the knowledge and the fact that there is this other realm that can definitely affect people's well-being."*

They acknowledged that this basic training could be elaborated on by teaching “skills” and “techniques” that could be implemented to make using the model, in practice, less burdensome:

> *“…I do think there is more that can be done within the academic framework, to help us understand, to help us with techniques…but we don't really learn how to apply it, how to practice it,”* said Chiropractor A.

> *“…I definitely think education or lectures on how to deal with these factors could have been improved on through our education, how to overcome certain challenges people are having,”* said Chiropractor C.

> *“…to actually learn how to interact with people like how to draw people and those type of things. But I think it's also very much a personality type as ,”* said Chiropractor D.

> *“…So, I don't have the skills to help people change habits…I really know what people should be doing regarding their diet, exercise, mental health, but I don't know how to teach them, like I don't know what skills to give them or tools to give them to change their habits or to help them,”* said Chiropractor F.

Specific mention was made of the clinical training environment:

> “*…the clinicians in the clinic could push the 5th and 6th year students a bit more. With regards to the holistic approach of the biopsychosocial approach. I think that's where the focus should come. Because I mean, the students are well equipped beforehand, but to implement it in practice, that's where the implementation should come in fourth and sixth year from the clinicians…”* said Chiropractor J.

> *“I would say that this model does need to come out in the clinic, so to speak, that there should be relevant practitioners, there should be relevant sites attached to the clinic, so that there are avenues that are available for students*

and clinicians, and the academics to kind of steer – and also use these sites for studying purposes. So, students can go there and learn under the experts under the tutelage…" said Chiropractor K.

"I really feel like in fifth year in clinical chiropractic, we should have had a specific subject that helped incorporate it and tie it together, because it's very different learning things in theory and then, in first year, you have to go back and try and actually implement this into practice and you start doing it on patients…" said Chiropractor L.

Besides formal training, there was an appreciation that training occurred through peer-mentorship and through engagement with other professionals:

"…*I was mentored by another chiropractor…She spent time with her patients, and she talked to her patients…I was more influenced by her,"* said Chiropractor G.

"…There needs to be involvement from a trained psychologist and a pain management specialist to train students how pain affects patients psychologically, and what are the other factors that can affect a patient, you know, from the workplace and society…" said Chiropractor H.

"Maybe, you know, the varsity could get someone in who specialises in that, and can come in and speak about it or even a chiropractor that has gone further down that road and can share a little bit, and say these are some of the patients that have seen," said Chiropractor I.

The benefit of continued education post-graduation allowed an opportunity for individuals to skill themselves:

"…*I think, like it is with a lot of things, when you finish your degree, it's for you to take further if you want to or not,"* said Chiropractor *I.*

There was a perspective of responsibility in ensuring that the practitioner had the "know how", even if it was for a referral:

> *"…I think that with any good doctor, it's knowing how to help your patient best, even if that's to also say, I think I should refer you to this person, or here is the number of someone who can assist you. If you're interested in X, Y, and Z, leave it to them to do what they need to,"* said Chiropractor I.

With some participants feeling that they required more training:

> *"So yeah, I definitely could do with a bit more training,"* said Chiropractor C.

Some chiropractors believed that the years spent in private practice assisted them in utilising the BPS approach, others mentioned being mentored by chiropractors that had a BPS approach in practice, due to placing importance on psychological factors. The majority of the chiropractors feel further training and changes are required to allow future chiropractors to practically utilise the BPS model. Some chiropractors felt that chiropractic education offered in South Africa already covers a broad range of information, therefore training and further education should be available after graduating.

4.8.2 Recommendations of the BPS model teachings

It was felt that adjustments needed to be made to the clinical training to school the chiropractic students in managing their patients in the BPS model:

> *"…maybe you just need to incorporate some sort of psychological element into clinical chiropractic, it's such a difficult thing to empathise with the patient or relate to them on that level because they're human beings at the end of the day, they're not objects, they're not textbook cases, they are people with feelings and stresses, and different things stress different people. So, I think just learning how to approach them in a more kind of manner, or more empathetic manner,"* said Chiropractor L.

There was acknowledgment of the scope of practice and that the training did not cover aspects of communication covered in professions like psychology and social work, but that this trading was necessary:

"…we aren't trained to be psychologists, we aren't trained to be social workers, we aren't trained to be all of that as well. But that's all incorporated in the biopsychosocial model and maybe in the clinic, the clinicians, or whoever is in charge of these academic programmes, should encourage students to discuss cases along the biopsychosocial model, rather than just say, the main complaint was this and this, and that's it. So, encourage the students to come up and try and get them to think around it as well," said Chiropractor K.

"…get a basic counselling component…that module…psychopathology should be focused more on how to manage patients within our scope of practice…" said Chiropractor G.

Besides recommendations for the educational facilities, professional recommendations spoke to CPD activities:

"…look for my CPD activities…Students can utilise it, practitioners can utilise it, and they can learn a lot from those things they have available," said Chiropractor J.

Recommendations made ranged from advising students to attend CPD courses, lifeline volunteering and counselling courses. Suggestions were made for the implementation of educational talks, in which senior students can attend to further inform them of the various aspects of the BPS model, as well as how to implement it in practice. Other suggestions were made to incorporate practical case-based approaches, which will equip students to utilise the BPS model from a practical point.

4.9 Utilisation of the BPS model and screening

4.9.1 Utilisation of the biopsychosocial model

One participant mentioned they utilise the BPS approach with most patients, but not all:

"I try to implement the biopsychosocial model, because I believe that it's the right thing to do with a patient. In the majority of my cases, I do that, but if you

have a sports injury case, where a person has an ankle sprain injury, it may not always be necessary. I do take a case-based approach, but I would say that in the majority of my cases, I tried to implement this model and then I want to identify any yellow flags or psychosocial aspects of patients," said Chiropractor A.

Two participants alluded that the BPS model was to guide them in practice and was not used as a specific protocol:

"I try to bring it in with every patient…in fast treatment responders versus chronic patients. You pick that up, if not the first session within a couple of sessions. So, you'd gauge how deep to dive. So, I would say that it's good to have a model, but I don't think it needs to be like this thing where I'm using this biopsychosocial model," said Chiropractor B.

"I would say it is something I think about and keep in mind instead of like, a hard, fast rule to live by or practice accordingly, but yeah, I try as much as possible to keep it in mind in practice," said Chiropractor C.

"Yes, it's limited to environmental factors in terms of work, posture, leisure activities, static postures, just sitting angles, watching television and that sort of thing, and the patients will often volunteer that information about relationships at home, although many of them don't declare it as problematic, and so that is discussed as techniques or stress management in addition to all the physical key aspects," said Chiropractor E.

A few participants believed they utilised the BPS model by taking a thorough case history and talking about psychological factors in their life:

"I definitely have a very holistic practice and not because I don't see as many patients as some other chiros do. I'll take much more time with patients with regards to taking history," said Chiropractor F.

"Yeah, sometimes in the initial consult, I'll bring it up, depending on what you know, a person might sit in front of me and say, I'm going through so much stress at the moment, I feel like this is all stress related, and they'll say that to

me, and I'll just be like, well, we just opened the door, and go a little bit down that road," said Chiropractor I.

"I do, a lot of my treatment involves speaking to patients and finding the psychological aspect of it, finding out what are the stressors, what stresses them out, and try to give them little things to do, like go for a run or meditate or mindfulness, or something to try and help them to get out of that rut," said Chiropractor L.

Other participants stated they do not intentionally practice within the BPS model, however aspects of the model come out during their consultation:

"…*that you don't think about it when you are practicing. But although you do, you don't think oh, now I'm in the biological avoid the psychosocial or whatever. It just becomes second nature, so to speak, in terms of practicing it,"* said Chiropractor K.

"So no, I don't use any specific screening tools, apart from actual trauma, injury, or whatever that patient comes in with, these being an accident or a fall or whatever that's triggered the injury, you always have to look at what other factors are triggering that condition or what else is precipitating it," said Chiropractor D.

Many participants stated they do not utilise the BPS approach for every patient, instead they take a case-based approach. If a patient appears to have underlying psychosocial factors, it would warrant them to probe further. Their understanding was that not all patients require this approach and made reference to athletes. Many participants relied on a thorough case history, which they believed was their way of adopting a BPS approach. Some participants mentioned they do not intentionally utilise this approach, but still address aspects of the model during their consultations.

4.9.2 Utilisation of screening tools

The majority of the participants mentioned they do not utilise any screening tools:

“No, I don't use any sort of tools or questionnaires or any sort of objective measures,” said Chiropractor A.

“No particular screening tools I can think of, so low back pain as an example, I'll find out about their work life. Are they sitting behind the desk for a certain amount of hours, how is their chair, how is their posture, those sort of questions. Then sometimes I get them to show me how they are sitting at home or at work. So, no screening tools as per se, but I will try follow up where relevant,” said Chiropractor C.

“I don't, I do want to, I did think about that recently, getting a few different questionnaires, also questionnaires to help with mental health questions and to find out how patients are coping with stress levels and stuff. It's really nice and objective to get that stuff, but I still need to get down to doing it,” said Chiropractor F.

One participant stated that it was not their job, as their role is to identify if the patient has any psychosocial factors which may affect their pain experience and prognosis:

“I'm not going to use the DSM to categorise wherever, because that's not my job, I just need to know, is there a psychological history or any presence of psychological factors, are there potential effects in the development of this pain and is it affecting the prognosis. So, I mean, yeah, I don't screen, it’s basically gut instinct in private practice, you just learn to read a patient*,”* said Chiropractor H.

“The only thing I have is my initial consult. So obviously, this isn't if someone keeps coming back to me, but if it were a new patient, in the form that they fill out with all their accidents, operations, what supplements they are on, what medications…and at the end of the questionnaire, I've got like some general things – like tick these physical things like, you know, gastric disorders, that kind of thing, and that can sometimes give me an idea. Then, with regards to medications, they’ll come up with stuff like they are on anxiolytics or antidepressants or whatever,” said Chiropractor I.

One participant mentioned they were not trained to utilise screening, as they are not equipped to give patients feedback on questionnaire findings:

> *"No, I don't use anything for a few reasons. One, you know, I'm not trained to do that. Second, because if there's any outcome from that questionnaire, let's say it's an anxiety questionnaire. What feedback do I give them and at what capacity, you know?"* said Chiropractor K.

Two participants stated they utilise screening tools in practice:

> *"When someone comes in and I suspect they have been seriously affected by their complaint, I often get them to fill out Keele STartBack-9 questionnaire. It's a very short tool that gives you a score out of 9 that helps to categorise the patient in terms of risk. This gives me a fair idea from the outset,"* said Chiropractor B.

> *"Yes. Especially the one for depression. I'm not sure what it's called. But I've used that quite a lot in the past. If that person ticks up enough of those boxes on that questionnaire, then they get referred,"* said Chiropractor J.

The main consensus regarding the utilisation of screening tools was that it was beyond chiropractors' scope of practice. Almost all the participants mentioned they do not utilise any screening tools in practice but, instead, have a case-based approach where, if a patient presents with what may appear to be underlying psychosocial factors, they will further question them during an extensive case history. Some participants mentioned they were not trained to do so.

4.10 Conclusion

The themes and sub-themes mentioned above showcase the responses from chiropractors during the interviews. Knowledge of the BPS model varied. The majority of the participants believed the BPS model was appropriate for the chiropractic

profession. Utilisation of the BPS model focused on addressing and identifying psychosocial factors and not necessarily utilising screening tools. Most participants felt private practice taught them how to practically utilise the BPS model and further training is still required. The predominant challenge encountered when utilising the BPS model was time constraints, although most chiropractors that participated in this study already conduct lengthy initial consultations with their patients. The majority of participants made recommendations to better equip future graduates on how to practically utilise the BPS model.

CHAPTER FIVE
DISCUSSION

5.1 Introduction

This chapter will present a discussion of the results that emerged from the interviews and integrate this with the current literature. The discussion will be done as per the study objectives.

5.2 Discussion of the results

5.2.1 Knowledge, attitudes and utilisation of the BPS model

The chiropractic profession has traditionally been affiliated with the BPS model of health care (Gliedt et al. 2017). Over the last decade, there has been discussion about the model and its relationship in understanding the pain experience (Gatchel et al. 2007). This heightened awareness and uptake of this model by other professions resulted in a need to formally determine how chiropractors in South Africa utilised the BPS model in their practices, and if they experienced any barriers to its implementation.

Emerging from the data was that the model was multi-factorial and was an extension of the biomedical model, incorporating a more holistic approach which included assessing psychosocial factors. As described by one participant: "*it's not linear, it doesn't go from biology to psychology to social, it's sort of all intertwined".* This is in line with Engel (1977), who posited that disease was viewed as a complex entity, with psychosocial factors affecting its development. Emphasis was placed on the model assisting with addressing various factors related to humans, supported by the statement that humans are "*complex beings"*.

Participants discussed the three components of the model: biological, psychological and social, and indicated that the psychosocial condition of the patient, including occupational factors, level and tolerance of pain, and response to treatment could all

influence the patient's well-being. The connection between the mind and the body was central to the way the respondents defined the BPS as a healthcare model. It was stated that "…o*ne's environment, one's resources and whatever have a physical effect, as well as an emotional one and that plays out in one's life and can present with physical symptoms*". The role of identifying and addressing psychosocial factors was emphasised as being important in the healing processes. In an era of EBP, numerous studies have identified the role psychosocial factors can play in health and illness (Kiecolt-Glaser et al. 2002; Salovey et al. 2000; Rozanski et al. 1999). Similar results were found in Canadian (Al Zoubi et al. 2019) and Dutch chiropractic populations (Haanstra and Miller, 2011). Factors to assess included: the work/ home life situation, low mood status or disorders such as anxiety or depression, catastrophising or fear-avoidance behaviours and social isolation (Sitwell et al. 2017). This would be above biological factors like genetics, chemical and hormonal imbalances, and neural activity that could contribute to the experience of pain (Gatchel et al. 2007).

One participant mentioned that as an alternative practitioner they "*treat and manage patients as a whole".* This statement highlights two things: firstly, that Chiropractic is seen as an "*alternative/ complementary*" healthcare profession. In South Africa, statutory regulation occurs through the Allied Health Professions Council, a separate council to the South African Medical Council, where orthodox medical practitioners register. Secondly, that the health care paradigm "*alternative/complementary*" healthcare is, by nature, associated with the BPS model.

Several of the practitioners alluded to the impact of COVID- 19 and how it had affected the case presentation of patients, further emphasising the role of the BPS model. This is best highlighted by this statement: "*a lot of people are coming in due to isolation stresses, stress from working at home or alternative environments, and how it plays out in headaches, tension and muscular trigger points*". A recent study exploring the biopsychosocial factors linked with the well-being of students and educators during the COVID-19 pandemic, highlighted a similar association (Al-Sabbah et al. 2020).

The BPS model emphasises a patient-centred approach, where healthcare providers work as a network with the patient. The model encourages interdisciplinary care, as it optimises clinical care and patient outcomes, which is done by offering patients a

variety of therapeutic options from the different specialists (Persuad-Sharma, 2020). A fundamental principle of Engel's model (1977) discusses the responsibility of medical professionals to build relationships with patients to effectively treat them, and not just their illness/ condition. This places emphasis on humanism and the empowerment of patients. Persuad- Sharma (2020) stated that practicing within the BPS model allowed for a better understanding of a patient, as a lack of effective communication can lead to preventable mistakes. Effective communication, understanding patients' perspectives, and doctor-patient relationships are a few of the key features of a BPS approach (Persuad-Sharma, 2020).

The respondents in this study discussed how the BPS model led to better doctor-patient interactions, in that patients feel supported and heard. Participants from this study also believed that the BPS approach led to patients' feeling as if they can connect with the practitioners, with this, in turn, leading to better doctor-patient relationships. Patients were comfortable expressing themselves to divulge sensitive information, resulting in a more comprehensive understanding of the condition and its effects. There was a sense that there were better treatment and management outcomes due to doctor-patient interactions when utilising a BPS approach, and that the practitioners felt that if they did not ask patients about BPS components, they were not connecting with their patients, thus leaving them feeling as if they were "*just another healthcare provider that wants to burden them with costs*". This is in accordance with a review of multiple studies that found that patients who felt supported reported a decrease in pain, improved physical functioning and overall outcomes (Jensen et al. 2011). Although this improved communication was seen as beneficial, it also had a negative effect on the practitioner, with some reporting a sense of feeling "*exhausted"*, "*burnt out*" and "*emotionally drained*".

The participants expressed an overall favourable attitude towards the model due to the attention it placed on factors beyond those that are patho-anatomical. Evidence of using the model was given by reference to conducting in-depth case histories to identify underlying anxiety or depression issues. One respondent indicated that they "...*take time to talk to patients about their life",* while another mentioned *"you have to use this model".*

Kusnanato et al. (2018) attributes the lack of utilisation of the BPS model to the need for distinct biopsychosocial clinical practice guidelines which would assist primary care providers and medical professionals to better utilise the model. It was also felt that certain conditions were less likely to need the BPS model, such as sports injuries, while others like chronic conditions – such as low back pain – needed the comprehensive BPS model (Deter, 2012).

5.2.2 Challenges associated with the utilisation of the BPS model

Although the respondents knew and used the model, the depth of understanding the model appeared to be limited. Some respondents gave very in-depth answers, while others superficially referred to the three components of the model. A lack of confidence in their knowledge could be attributed to the participants' feeling, as many recommended, the need for further training. Similar sentiments were echoed by Canadian chiropractors (Sitwell et al. 2017), who expressed that they had limited awareness in the management of psychosocial factors (Sitwell et al. 2017). Respondents expressed that there was "*not enough emphasis placed on the model*", especially in the undergraduate training, and that they learned more about BPS approaches in the "*years of private practice"*.

Chiropractic training in South Africa has an academic rich syllabus, covering basic medical subjects like anatomy and physiology, to more in-depth medical subjects like diagnostics, radiology and chiropractic specific subjects. This qualification is intensive, over five years, and culminates in a coursework Master's Degree which includes clinical training. Students undertake courses in philosophy, sociology and psychology, where theoretical training of the BPS model occurs (DUT Chiropractic, 2021; DUT Handbook, 2021; UJ Handbook, 2021). The practitioners felt that this training lacked practical application of the model.

Gliedt et al. (2017) undertook a review of chiropractic colleges' curricula and found limited evidence of BPS coursework and practical teaching to assist students in implementing the model. This is not unique to chiropractic training, as medical students in India, when assessed on the extent they used the BPS model while

working in public sector hospitals, found that there was minimal integration of the model with superficial understanding and difficulties in delving into psychosocial aspects of the patients. Inadequate theoretical and practical teachings of the model were identified as the underlying cause, with suggestions to develop designs and tools to practically implement the model in clinics and other healthcare settings (Nadir et al. 2018). Similar recommendations could be made in South Africa. Herman, as cited in Weston (2005), stated that clinicians often struggle to determine when to focus on biological, psychological or social aspects, or all three components of the BPS model, during patient consults. Guidance or training could be sought from psychologists, pain specialists and clinicians to effectively start implementing the model during clinical training, thus, equipping new graduates to utilise the model confidently and effectively.

Respondents recommended that the chiropractic curricula include "*practical psychological aspects"* into modules dealing with patient care, that the departments host talks centred around the BPS model, teaching techniques on "*how to manage psychosocial factors as chiropractors"*, encouraging student interns to discuss "*BPS cases"* seen in clinics, to encourage thinking in a BPS approach. The introduction of a "*basic counselling"* component was also suggested to be of benefit and encouraging students to attend CPD activities related to BPS model. These recommendations align with those from Gliedt et al. (2017).

The issue of professional scope of practice is important. There was a feeling that chiropractors are "*not psychologists".* Thus, knowing one's professional boundaries when dealing with psychosocial factors was necessary. One participant expressed that dealing with psychosocial issues was beyond the scope of practice and, hence, referred these patients to the relevant health providers. This contrasted with another respondent who stated that: *"I would definitely address psychosocial factors with the patient."*

This contrast highlights the individual perceptions of practitioners and how that will influence their utilisation of a healthcare model. Most respondents felt that it was their role, as a chiropractor, to identify psychosocial factors, make the patient aware of the need for further intervention and recommend it. Psychosocial interventions ranged from encouraging patients to *"exercise, basic coping mechanisms, to advice on time*

management, pain reduction exercises and meditation". Canadian chiropractors were found to use similar techniques (Sitwell et al. 2017). The varying perceptions, influenced by attitude towards and knowledge (e.g., appropriate training) of the BPS model resulted in respondents either engaging willingly in this healthcare paradigm or shying away from it. Emphasising the importance of proper training and skill acquisition.

When practicing in a BPS model, chiropractors, as manual therapists, have a range of tools that can assist them in determining if a patient's condition is related to psychosocial issues, such as Keele STarTBack, the central sensitisation and the fear avoidance questionnaire. The respondents felt that they lacked "*training on how to use screening tools"* and indicated that they were *"tedious",* thus they reverted to using the case history to garner the relevant information. Clinical practice guidelines for low back pain recommended that patients should be screened for psychosocial factors, resulting in better treatment outcomes (Koes et al. 2010; Dagenais et al. 2010). Chiropractors in Australasia (93.5%) and healthcare practitioners in North America (80.6%) acknowledged that psychosocial factors were of importance in pain syndromes, yet only 45.8% of Australasian chiropractors and 50.5 % of North American healthcare practitioners utilised tools and techniques to evaluate such factors (Walker et al. 2005). Similar to Canadian chiropractors, the respondents in this study requested the need for simple and effective screening tools and management protocols to assist in the management of psychosocial factors (Sitwell et al. 2017).

Time was viewed as a challenge. Many practitioners emphasised that "*time equates to money"*. This was not seen solely from a practitioner point of view, but also from that of the patient. If the patient required chiropractic care and referral to a psychologist, psychiatrist or other medical professional, their medical bills would increase. Current reimbursement models were seen as hindering the use of the BPS model, as it was not something that could be billed for. Similar difficulties were expressed in an international study conducted in eleven countries, in which primary health care providers expressed the lack of remuneration for their time and qualification (Ng et al. 2021; Dziedzic and Allen, 2018; Karstens et al. 2018; Karstens et al. 2015) and that they were not compensated for the extra timed used to explore psychosocial factors (Ng et al. 2021).

One respondent indicated that when using the BPS model, it often led to consultations running over time, which then left the practitioner feeling "*flustered".* In contrast, several respondents mentioned that time was inconsequential, as their role was to ensure that the patient received the "*best care they could offer*" and if time was running out, that they would let patient know that their consultation time had ended. A lack of training may lead practitioners to assess "all factors" or have feelings of being unsure on which factors to focus on, which would negatively affect the time duration of the consultation, as the practitioner then delves into all aspects for every patient (Herman, as cited in Weston 2005). This could then lead to a lack of utilisation of the BPS model.

Time constraints were seen as a greater challenge than financial burden when utilising the model. The BPS has been seen as a cost-effective model, as it results in accurate diagnosis and favourable treatment outcomes. Evidence also supports a decrease in hospitalisations, a reduction in prescription drugs, and the reduction of multiple follow-up consultations (Kaplan and Groessl, 2002).

The emotional burden of using the BPS model was highlighted. Addressing patient psychosocial factors often led to practitioners reporting feeling emotionally drained or "*burnt out*". Respondents mentioned they needed to separate themselves from the patient and that these skills were often only learnt after several years in practice. Disassociating oneself from a patient's psychosocial stressors, but still being empathetic, was viewed as a formidable task. During the COVID-19 pandemic, nurses were found to be at a higher risk of emotional exhaustion as they took on the role of emotionally supporting patients due to visitation restrictions (Woo et al. 2020). Chiropractors, when practicing in a BPS model, act as an emotional support system to their patients, allowing them to talk about their psychosocial issues, thus opening communications and the path to healing.

5.3 Conclusion

Chiropractors within the eThekwini Municipality possessed knowledge of the BPS model and its constituents. All participants were in favour of the model, utilising it in varying degrees in their chiropractic practice. The majority expressed the need for the

implementation of practical training within the chiropractic curricula. This could be associated with the perception that addressing psychosocial factors by chiropractors was beyond the scope of practice. Time constraints were found to be a leading challenge, amongst other challenges experienced when utilising the model. This study revealed that all participants utilised the model, however, only a few participants used screening tools.

CHAPTER SIX
CONCLUSION

6.1 Conclusion

This study aimed to explore the utilisation of the BPS model by chiropractors within the eThekwini Municipality. An explorative, descriptive, qualitative design was used, in which semi-structured interviews, of which twelve were included, were conducted with chiropractors from the eThekwini Municipality. It was found that the chiropractors were knowledgeable about the BPS model but expressed a lack of deep understanding of the model. This knowledge was obtained during chiropractic education, from CPD activities, or from being exposed to the model in private practice. All participants expressed positive attitudes towards the model, with a few participants highlighting the need for it to be incorporated in all healthcare systems and utilised by all healthcare providers. The chiropractors perceived that the model led to better doctor-patient relations, and improved treatment and management outcomes. Several participants expressed that the model played an important role when dealing with patients in pain.

The interviewees felt that they lack the necessary skills to effectively implement the model. They suggested that undergraduate training should include more skills-based application of the model, specifically in the clinical program. Training in the use of screening tools was necessary, as very few utilised these to identify patients at risk of psychosocial problems.

Some participants felt that the management of psychosocial factors were beyond their scope of practice, however, participants stated that they allowed patients space to talk about personal problems, as that was viewed as therapy. They also mentioned they would encourage patients to exercise, meditate, do yoga, address nutrition, give patients advice on time management, and other activities were also mentioned. This indicates that participants were managing psychosocial factors within their scope, regardless of the beliefs that psychosocial factors cannot be managed by chiropractors. Emphasis was also placed on multi-disciplinary management of the patients and a good referral network, including a psychologist/ psychiatrist.

Several challenges were raised with the most pressing being "*time*". Despite this, all participants conducted lengthy consultations. It was highlighted that reimbursement models needed to be addressed to allow compensation for the time that it takes to successfully implement the BPS model.

6.2 Limitations

This study sought out chiropractors from the eThekwini Municipality. Those who partook were graduates from DUT and, therefore, their utilisation of the BSP model may differ from chiropractors who have graduated from other chiropractic training institutions. This, together with the qualitative paradigm utilised in this study, may result in an inability to extrapolate these findings to the broader chiropractic profession in South Africa.

The recruitment of participants relied on purposeful and snowball sampling. This type of sampling may have resulted in only those who were knowledgeable and using the BPS model agreeing to partake. Thus, the results of the study may be reflective of this population.

6.3 Recommendations

6.3.1 Recommendations regarding training chiropractic students or chiropractors in the BPS model

Chiropractic institutions in South Africa are encouraged to identify practical teachings that can be incorporated into the curricula to provide students with skills to effectively work in a BPS model. This can be done by implementing a practical approach during clinical training at the university-based clinics, implementing practical techniques or a short counselling course, hosting discussions with other healthcare providers, encouraging and enabling a multi-disciplinary approach to managing a patient in the BPS model.

The Chiropractic Association of South Africa could host workshops or short courses where training can be provided to provide skills to chiropractors to work effectively in this model. Training of which specific screening tools to use, and when to refer to them, would enable chiropractors to have more confidence in applying the model to their patients.

6.3.2 Recommendations for further research

A similar study should be conducted in a different geographic location in South Africa to determine if these issues identified in this research relate to chiropractors in other areas. In addition, a follow up study – using a quantitative survey – would allow all South African chiropractors to partake and to determine if their utilisation of the BPS model is similar to that reported in this study.

Lecturers and academic staff could be interviewed together, with a curriculum audit to determine how the BPS model is incorporated in the academic curricula, to support or refute the findings of this study. There is a need for a guideline to be developed to assist clinicians in effectively implementing this model. International research, using Delphi groups, could be used as a mechanism to produce this guideline.

6.4 Researcher reflections

Considering research was conducted during a pandemic, many chiropractors were happy to partake in the study. Some participants expressed that they were interested in the research topic, hence they agreed to partake and felt research regarding the model within the chiropractic profession was needed. The majority of chiropractors were eager to participate, whereas a few practitioners did not respond to the invitation. Setting up interviews was often viewed as a challenging task, as some participants preferred interviews to be conducted during their breaks, at the least busy time of day, or on days in which their practice had few patient bookings. Rescheduling of a few interviews was required for the week in which looting and unrest in KwaZulu-Natal took place.

Most participants opted to have interviews conducted in person at their place of work while a few chose to have interviews conducted via Zoom. The last few participants were not granted a chance to choose due to the University implementing restrictions on contact data collection during the third wave of the COVID-19 pandemic.

There was some apprehension by a few of the participants when they were informed that the interviews would be recorded, however, no participants withdrew their participation after being informed that their identities would not be revealed in the study. A lack of confidence was noted when asking participants to define the model in their own words, this was evident in their pauses and body language. Participants often sought approval after answering questions.

Chiropractors within the eThekwini Municipality have demonstrated the use of the model to the degree of their perceived training and professional scope of practice. The model could be utilised to a greater extent once practical teachings on the implementation of the model was incorporated within the chiropractic syllabus at university level.

This study has highlighted the need for further research to be conducted to assist alternative healthcare providers with the utilisation of the model.

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APPENDICES

Appendix A – Letter of Information

Dear Chiropractor

Thank you for agreeing to partake in this research project.

Title of the Research Study: An exploration into the utilisation of the biopsychosocial model chiropractors in the eThekwini Municipality.

Principal researcher: Rosanne Louise Williamson

Supervisor/s: Dr Laura O'Connor, M. Tech Chiropractic

Brief Introduction and purpose of the study: Musculoskeletal pain is a global burden resulting in economic and personal costs. Psychosocial factors have been identified to have an intimate relationship with the chronicity of pain. In patients that present with psychosocial factors, the implementation of the biopsychosocial model has assisted in understanding the complexity of pain, thus improving management outcomes.

The aim of this study is to explore the factors influencing the utilisation of the biopsychosocial model by chiropractors.

Outline of the Procedure: The researcher will state the inclusion and exclusion criteria before starting the interview to ensure you meet the criteria. Once you have agreed to partake in the study, you will be required to sign a letter of consent and grant the researcher approval for the use of a digital voice recorder/ approval to record interviews on Microsoft Teams/ Zoom calls prior to the interview. The interview will be conducted according to an agreed upon interview schedule. You will be requested to answer a series of questions relating to the biopsychosocial model, utilisation within the chiropractic profession and if you use any screening tools to identify psychosocial factors in patients. The interview will be approximately forty-five minutes long. Once the interview is complete, the researcher will transcribe the interview into a Microsoft document. You will be sent a transcript of your interview in order to verify the contents from the interview. Interview recordings and transcripts will be stored on a password protected laptop which only the researcher will have access to. These will be downloaded and stored on a password protected flash drive and will be stored with all other research records in the Department of Chiropractic for five years, thereafter all electronic data will be deleted and paper data will be shredded and disposed of.

Benefits: The results of this study aims to assist the Chiropractic profession in identifying strategies currently utilised within the profession, in order to further develop the implementation of the biopsychosocial model within the profession. It will further assist in identifying problems practicing chiropractors face when attempting to utilize the biopsychosocial model when managing musculoskeletal pain.

Risks or Discomforts to the participant: There is no risks/discomforts or costs involved from your participation in this study.

Reason/s why the participant will be withdrawn from the study: If under any circumstance, you are unable to complete the full duration of the interview. There will be no adverse reactions should you withdraw from this study.

Remuneration: There is no remuneration involved in your participation in this study. A DUT mug will be given to each participant as a token of appreciation for their time.

Costs of the study: There are no costs involved from your participation in this study.

Confidentiality: Information acquired from participants and interviews will be used for research purposes only. The researcher and supervisor (after the allocation of pseudonyms) will only have access to the collected data. Interviews will be transcribed and coded. Each participant will be assigned a pseudonym to ensure anonymity. Should you have any concerns, you may contact the Durban University of Technology Research Ethics Committee.

Research-related injury: None to be expected.

Persons to contact in the event of any problems or queries:

Researcher: Rosanne Louise Williamson (B. tech chiropractic) – 081 599 9825

Supervisor: Dr Laura O'Connor (M. tech Chiropractic) – 031 373 2923

Institutional Research Ethics administrator: 031 373 2375

Complaints can be reported to the Director of Research and Postgraduate support Dr Linganiso on 031 373 2577 or researchdirector@dut.ac.za

Thank you for your participation.

Yours sincerely,

Rosanne Williamson

(Researcher)

Dr Laura O' Connor

M.Tech Chiropractic

(Supervisor)

Appendix B - Informed Consent

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Rosanne Williamson, about the nature, benefits and risks of this study – Research Ethics Clearance Number: 140/20_____
- 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.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research, which may relate to my participation will be made available to me.

_____	_____	_____	_____
Full Name of Participant	**Date**	**Time**	**Signature / Right Thumbprint**

I, Rosanne Williamson (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**

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

Appendix C – Gatekeepers permission

9 December 2020

Durban University of Technology Research Director

Request for permission to conduct research

Dear Dr Linganiso

My name is Rosanne Williamson, a Master's Chiropractic student at the Durban University of Technology. The research I wish to conduct for my Master's dissertation involves the Factors influencing the utilisation of the biopsychosocial model by chiropractors in the eThekwini Municipality.

I am hereby seeking your consent to conduct research involving the Durban University of Technology staff members at the Durban University of Technology.

I have provided you with a copy of my proposal which includes copies of the data collection tools and consent and/ or assent forms to be used in the research process, as well as a copy of the approval letter which I received from the Institutional Research Ethics Committee (IREC).

If you require any further information, please do not hesitate to contact me 081 599 98 25, Rosanne.l.williamson@gmail.com / 21209570@dut4life.ac.za. Thank you for your time and consideration in this matter.

Yours Sincerely

Rosanne Williamson

Durban University of Technology

Appendix D – Institutional Research Ethics Committee Approval

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

P O Box 1334, Durban, South Africa, 4001

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

www.dut.ac.za

15 February 2021

Ms R L Williamson
50 Mimosa Drive
Mtuzini
3867

Dear Ms Williamson

Factors influencing the utilisation of the biopsychosocial model by chiropractors in the eThekwini Municipality
Ethical Clearance number IREC 140/20

The Institutional Research Ethics Committee acknowledges receipt of your notification regarding the piloting of your data collection tool.

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.

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

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

Yours Sincerely

Professor J K Adam
Chairperson: IREC

Appendix E – Coding tables

Table 1.1 Theme one -Knowledge of the BPS model

Codes	Sub-themes	Theme
• Holistic • Mind and body • Psyche and physical well-being	Mind body connection	**Knowledge**
• Environmental • Extension of biomedical model • Occupational • Physical • Psychological • Social • Spiritual	Multi-factorial approach	
• Interactions • Meaningful relationships	Interactions	

Table 1.2 Theme two – perception of the BPS mode

Codes	Sub-themes	Theme
• In-depth information • Multi-disciplinary • One on one • Private healthcare • Requires experience • Requires more time	Comprehensive	**Perception of the BPS model**
• Important • Not emphasized enough • Should be utilised • Tricky to tackle	More Training required	
• Better treatment outcomes • Holistic healthcare • Useful model	Improved treatment outcomes	
• Beyond scope • Cannot address all psychosocial factors • Not psychologists	Beyond scope of practice	

Table 1.3 Theme three- challenges utilising the BPS model

Codes	Sub-themes	Theme
• Biggest issue • Lengthy consultations • Main challenge • Not enough time • Time consuming	Time constraints/ intensive	**Challenges utilising the BPS model**
• Financial strain for patients • Not billable • No practitioner reimbursements	Financial burden	
• Emotionally draining • Energy draining	Emotional burden	

Table 1.4. Theme four - education of the BPS model within the Chiropractic course

Codes	Sub-themes	Theme
• Lacked extensive education • Mentored • Sufficient introduction • Theoretical understanding • Touched on	Education of the BPS model	Education of the BPS model within the Chiropractic course
• Counselling courses • CPD events • Practical cases • Educational talks	Recommendations	

Table1.5. Theme five - Utilisation of the BPS model and screening tools

Codes	Sub-themes	Themes
• Address psychosocial aspects • Right thing • Case dependent • Case history • Every patient • I try • Not required for all patients • Unknowingly	Case dependent	Utilisation of the BPS model
• Beyond my scope • Case based approach Indirectly through history • No, not trained to • Not beneficial • Not my job • Refer if needed • Screened telephonically or in person	Scope of practice	Utilisation of screening tools