THE CLINICAL EXPERIENCE OF REGISTERED MASTER'S CHIROPRACTIC STUDENTS IN THE MANAGEMENT OF ELDERLY PATIENTS DURING THEIR PRACTICUM

Kimone Naidoo (21411622)

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Durban University of Technology

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

_____ _____

Kimone Naidoo Date

Approved for Final Submission

_____ _____

Supervisor: Dr D. Varatharajullu Co-supervisor: Prof. M.N. Sibiya

Date: 28 August 2020

DECLARATION

I, Kimone Naidoo, certify that this work is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources). The work has not previously been submitted in any form to the Durban University of Technology, or to any other institution, for assessment or for any other purpose.

_____ _____

Signature of student Date

Approved for final submission

_____ _____

Dr D. Varatharajullu Date

M. Tech: Chiropractic

_____ _____

Prof. M.N. Sibiya Date

RN, RM, D Tech: Nursing

DEDICATION

I dedicate this dissertation to my parents, Indran and Renee Desiree Naidoo,

for always standing by me and making my dream a reality.

I am eternally grateful for all that you do.

“This is what life is about - something bigger than ourselves must happen. That is the significance of these millions of years of evolution.”

-Sadhguru

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ABSTRACT

Background

The elderly population is increasing rapidly worldwide. As elderly individuals age, their physiological process changes, which means that elderly patients present differently, as a result of associated comorbidities and challenges in their physical and cognitive function, and thus the management of an elderly patient could present as a challenge.

Registered master's degree chiropractic students complete a theoretical elderly module during the fifth year of their studies, while entering their clinical practicum. The registered master's degree chiropractic students need to acquire and refine their clinical skills, as well as apply their theoretical knowledge during their clinical practicum.

The healthcare system in South Africa has limited knowledge on the management of elderly patients. Therefore, the aim of this study has been to determine the clinical experiences of registered master's degree chiropractic students during their clinical practicum with respect to the management of elderly patients.

Aim of the study

The aim of the research study was to explore and discuss the experiences of registered chiropractic master degree students in the management of elderly patients presenting at the Chiropractic Day Clinic at the Durban University of Technology.

Method

A qualitative, exploratory, descriptive study was conducted, using an interpretivist paradigm. The master's degree chiropractic students, who had been clinically active for four months during their clinical practicum, were interviewed to establish their experiences in the management of elderly patients during their clinical practicum. The interviews were semi-structured and conducted in English, and later transcribed verbatim into a Microsoft®

Word document. The transcripts were then analysed using Tesch's eight steps of thematic analysis to establish the themes, categories and codes.

Results

Of the twenty-four registered master degree chiropractic students, twelve (50%) participated in the study. There were five overarching themes that emerged from the data: attitudes and opinions towards the management of an elderly patient; important aspects of the management towards an elderly patient; positive aspects of managing an elderly patient; challenges faced during the management of an elderly patient and suggestions to improve a chiropractic clinical practicum.

The participants discussed the importance of having practical experience in managing an elderly patient and the significance of elderly patients being interactive with their own management protocols. The participants elaborated that they did have a sufficient basis to manage elderly patients. Many participants mentioned that they needed to be more involved in the management of elderly patients. Most of the participants felt that managing elderly patients was beneficial and they suggested that learning about elderly patients earlier in their studies would be beneficial to their clinical experience of managing elderly patients.

Conclusion

This is the first South African study that has been conducted on registered master's degree chiropractic students' clinical experiences in managing elderly patients during their clinical practical. This study will add to the existing body of literature and enable other registered master's degree chiropractic students and new graduate chiropractors to have a better understanding of the management of elderly patients.

Key words: Chiropractic care, chiropractic students, clinical experiences, clinical practicum, elderly population.

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DEFINITIONS

Clinical experience

Defined as a well-prepared programme which requires a healthcare student to apply their practical and theoretical knowledge in a clinical setting so that they can gain significant experience which is satisfying and beneficial to their self-confidence in being able to manage any patient (Garland 1995: 77-78).

Elderly population

An elderly individual is defined as an individual who is aged 65 years and above (World Health Organization 2013: 65).

Chiropractic

Defined as the diagnoses, treatment, management and prevention neuromuscular disorders and the effects of these orders in the general and nervous system (Chiropractic Association of South Africa 2020).

Clinical practicum

Defined as a learning environment which provides healthcare students with the opportunity to engage with patients and apply the theoretical and practical knowledge that they acquired from classroom learning (Nelson *et al.* 2015: 881).

Evidence based practice

“Evidence based practice is defined as using conscientious, explicit, and best current evidence to diagnose and manage a patient.” (Sackett *et al.* 1996: para. 2 lines 1-5).

Complementary alternative medicine (CAM)

Defined as a group of healthcare professionals who are not part of a country’s own tradition or conventional medicine (World Health Organization 2018: 1).

ABBREVIATIONS AND ACRONYMS

Abbreviation	Meaning
AIDS	Acquired Immunodeficiency Syndrome
BMD	Bone Mass Density
BP	Blood Pressure
CAM	Complementary Alternative Medicine
CASA	Chiropractic Association of South Africa
CDC	Chiropractic Day Clinic
DC	Doctors of Chiropractic
DUT	Durban University of Technology
EBP	Evidence Based Practice
HIV	Human Immunodeficiency Virus
LLLT	Low-level Laser Therapy
OP	Osteoporosis
OSCE	Observational Stimulation Clinical Examination
PD	Parkinson’s Disease
PEMF	Pulsed Electro Magnetic Field
SASSA	South Africa Social Security Agency
SMT	Spinal Manipulative Therapy
TENS	Transcutaneous Electrical Nerve Stimulation
UN	United Nations
WHO	World Health Organization

CHAPTER ONE

OVERVIEW OF THE STUDY

1.1 INTRODUCTION

This chapter presents information in the increase the elderly population in South Africa, with an overview of their associated conditions, co-morbidities and the holistic management. With inclusion of Chiropractic care at the Durban University of Technology Chiropractic Day Clinic Technology Chiropractic Day Clinic and the management of elderly individuals.

An elderly individual is defined as an individual who is aged 65 years and above (World Health Organization (WHO) 2013: 65). As stated by Ferreira (2006: 18), the elderly population is increasing in number and this has become a worldwide phenomenon. The elderly population has been projected to grow by 56%, i.e. from 901 million to 1.4 billion, between 2015 and 2030 (Fougere *et al.* 2018: 1). Elderly individuals who have retired from employment are known as the senior citizens of their country, with the age of retirement being different for each country (Kaphle *et al.* 2014: 3). Fougere *et al.* (2018: 3) explained the economy and social categories in a country are challenged by the needs of the elderly population.

Bayer (2011: 45) reported that elderly individuals are classified into two groups, known as the young-old and the old-old. The young-old individuals are those who have good health and use the benefits of a basic generalised healthcare system, whereas old-old individuals rarely have a good outcome from medical care, due to the associated comorbidities with which they present. The aforementioned nomenclature does pertain to chronological age.These are often characterised by the nonspecific presentation of a condition, which may be managed by a holistic approach.

In elderly patients, there are many diverse conditions, with various associated co-morbidities seen. Killinger (2012: 2) stated that the common co-morbidities, which accompany elderly patients are arthritic changes, spinal stenosis, osteoporosis, organ dysfunction (e.g. heart, lung and prostate) and pathologies, such as cancer, metabolic syndrome. Common conditions that are often seen in elderly individuals in South Africa are non-communicable conditions such as hypertension and type

two diabetes, dementia, kidney/ gallstones, congested obstructive pulmonary disorder, heart disease, joint disorder, psychological disorder, stroke and epilepsy (Gerber et al, 2016: 300 and Lopes Ibanez-Gonzalez et al, 2014: 1). In primary care, a screening focuses on functional ability rather than medical symptomatology in elderly people (Bayer 2011: 45). In primary healthcare, the assessment of an elderly individual is done holistically, rather than by the symptoms with which an elderly patient would present (Bayer 2011: 46). According to the public health response to ageing, WHO prioritises the elderly individuals' functional capacity and abilities (Fougere *et al.* 2018: 1).

Chiropractic is defined as the diagnoses, treatment, management and prevention of neuromuscular disorders and the effects of these disorders, in general and the nervous system (Chiropractic Association of South Africa (CASA) 2020). The chiropractic scope of practice includes therapies such as spinal manipulative therapy, electro modalities (such as transcutaneous electrical nerve stimulation therapy, inferential current therapy and ultrasound), exercise, nutritional counselling, dry needling and fall prevention strategies which are all beneficial in the prevention and treatment of musculoskeletal pain (Boghozian 2015: 9-12; Gliedt *et al.* 2012: 146).

Globally, chiropractic students spend their early years in tertiary education studying basic science modules, after which they progress to more clinically orientated work, with the anticipation that they will learn how to apply this knowledge and make reasonable clinical decisions during their clinical practicum phase (Innes *et al.* 2018: 1). The modules in chiropractic education consist of a theoretical component and practical component, in which students must learn how to apply this knowledge in a clinical setting (McGregor and Giuliano 2012: 14).

Future chiropractic students represent the next generation of chiropractic professionals (Gliedt *et al*. 2012: 146). However, chiropractic students find it difficult to transition from theoretical knowledge to its application in a clinical setting (Beck *et al.* 2009: 20). Therefore, when considering clinical decision making, a student must consider several factors, including the clinical presentations, the results of the investigations, patient values, the patient's medical history and their family's medical history and the patient's psychosocial circumstances, to form a clear clinical picture of the patient's lifestyle (Moyo *et al.* 2019: 16).

Educators in healthcare institutions are challenged to provide case-based, real-world experience to students when considering the diagnosis and treatment of patients with intricate and rare conditions (McGregor and Giuliano 2012: 14). McGregor and Giuliano (2012: 15) also stated that the best evidence based features, with regards to effective learning, are the following:

- Providing feedback.
- Repetitive practice.
- Curriculum integration.
- Range of difficulty for simulations.
- Multiple learning strategies used.
- Clinical variation captured.
- Controlled environment.
- Individualised learning.
- Defined learning outcomes.
- Simulator validity.

1.2 CONTEXT OF THE STUDY

South Africa is classified as a developing country (Bakari 2017: 2); therefore, poverty within the country still exists as there are increases in the population and the rates of unemployment. According to Shlisky *et al.* (2017: 17), the population of the elderly in developing countries is projected to triple by 2050. As stated by the South African National Census of 2011, the number of elderly individuals has increased from 2.8 million in 1996 to 4.1 million in 2011 and the proportion of elderly individuals increased from 7.1% in 1996 to 8.0% in 2011. These projections show that the older population will continue to increase and by 2030 there will be approximately 7 million elderly individuals in South Africa. This increase has a profound effect on the infrastructure, health care systems and socioeconomics of a country (Buckinx *et al.* 2015: 1).

According to the South African National Census of 2011, inequalities among the elderly continue to be racially skewed, with black and coloureds elderly individuals being the poorest, while the majority of the white and indians elderly are better off financially (Lehohla 2011: v). Lehohla (2011: v) reported that the white elderly presented higher socioeconomic status compared to black and coloured elderly individuals with a representation of 80.7% and 8% respectively. Therefore, due to the existence of diversity within South Africa, each elderly patient often presents differently with respect to musculoskeletal complaints.

The relevant literature showed that healthy ageing varies according to each individual (Tavares *et al.* 2017: 878). Elderly patients often have a co-occurrence of chronic diseases, which makes their care, specifically their use of medications, a challenging task (Giardini *et al.* 2018: 1003). Therefore, in a healthcare system it is in the best interest of healthcare professionals to deal with new challenges with a more holistic approach (Giardini *et al.* 2018: 1004).

Elderly patients in the Africa often experienced healthcare challenges, such as unfair healthcare provision related to a main diagnosis, which in turn leads to an inefficient appointment system, a longer waiting time, the apparent disinterest of staff in the patient's health problems and transport problems with respect to getting to a facility (Charlton 1998: 1). According to Nabalambaa and Chikoko (2011: 1), ageing is correlated to long-term physical disabilities, mental disabilities and chronic conditions. The management of such disabilities and chronic conditions require resources, such as financial and human support (Nabalambaa and Chikoko 2011: 10). In developing countries, the elderly population are more prone to contract dreaded diseases, such as cardiovascular disease, hypertension, diabetes mellitus, human immunodeficiency virus/ acquired immunodeficiency syndrome (HIV/AIDS) and respiratory diseases (Nabalambaa and Chikoko 2011: 2).

Professions within the healthcare system need to provide high quality services to the public (Innes *et al.* 2017: 1). The range of complementary and alternative medicine (CAM) includes chiropractic, homeopathy, naturopathy, acupuncture, massage therapy, yoga, herbal medicine and Unani Tibb medicine (Zollman and Vickers 1999: 693; Ernst 2000, 1133; Walker *et al.* 2017: 2). Chiropractic care is one of the most frequently utilised form of CAM therapies used by elderly individuals (Dougherty *et al.* 2012: 1). Complementary alternative therapies include a broad

range of new approaches to prevent and/or treat numerous medical illnesses and symptoms (White *et al.* 2011).

In South Africa, chiropractic students need to obtain a master's degree in Chiropractic in order to register as a practitioner with the Allied Health Professions Council of South Africa (AHPCSA), under Act 63 of 1982. The Durban University of Technology (DUT) Chiropractic Day Clinic (CDC) serves as a training clinic for future chiropractors (DUT Chiropractic Handbook chiropractic handbook 2020: 18). This allows an opportunity for registered master's chiropractic students to gain the necessary clinical experience they need (Lishchyna and Mior 2012: 162). The DUT CDC allows the public to attend the clinic at reasonable rates. The registered master's degree chiropractic students are taught a module in the fifth year of their studies which covers the management of elderly patients in a holistic manner.

Clinical education is a combination of practical and theoretical components, which is vital in molding a student's clinical skills (Moghadam *et al.* 2017: 208). Moghadam *et al.* (2017: 208) mentioned that, based on studies conducted on physiotherapy students in Iran, it was ascertained that some of the clinical educational challenges are: limited theoretical and practical knowledge; an inability of students to perform in a clinical environment; the clinical instructor has limited knowledge or experience in the field; inability of the clinic to provide adequate equipment; insufficient clinical experience for students; and a lack of assessments of theoretical and practical knowledge.

There is limited research exploring a chiropractic student's educational challenges. Thus, exploring the experiences of the registered master's degree chiropractic students in the management of elderly patients will increase the knowledge and clinical skills of students during their clinical practicum and will decrease the challenges faced in private practice.

1.3 A BRIEF BACKGROUND OF THE DUT CDC

As stated in the DUT chiropractic handbook (2020: 18), the DUT CDC is in a prime location between the CBD and the residential areas of Durban, with easily available transport facilities and it is attended by culturally diverse individuals from the public sector. The DUT CDC is a teaching clinic which is part of an academic institution.

The DUT chiropractic handbook (2020: 18) stated that the registered master's chiropractic students are responsible for diagnosing, treating and managing patients within the scope of chiropractic care, under the guidance and supervision of the qualified chiropractors employed by the DUT. The clinic works on an appointment basis, with the operational days and times being Monday to Friday from 08h00 to 18h00.

1.4 RESEARCH PROBLEM

According to Tavares *et al.* (2017: 878), the term healthy ageing is defined as a delay in the consequences of a dreaded disease during the ageing process; it is positively associated with the maintenance of health in an advanced age. The elderly population is expanding and living longer with multiple associated chronic conditions (Tkatch *et al.* 2016: 1). Fougere *et al.* (2018: 2) stated that the early recognition of conditions and appropriate interventions for the elderly population will reduce their functional decline and decrease hospitalisation and institutionalisation. This indicates that the government of South Africa should prioritise of the needs of elderly patients to prevent an increase in the health challenges encountered in the future (Kaphle *et al.* 2014: 34).

The outcomes from the South African National Census of 2011 suggest that the government needs to devise integrated programmes to improve the quality of life of poor, elderly-headed households, mediated by the provision of free basic services, such as health care, utilities and housing.

There is a paucity of literature about the elderly population in developing countries such as South Africa and how chiropractic students manage individual patients. Thus, this study would assist chiropractic institutions of learning and their students and provide further understanding on the management of the elderly population in practice.

1.5 AIM OF THE STUDY

The aim of this study was to explore the experiences of registered chiropractic master degree students in the management of elderly patients presenting to the DUT CDC.

1.6 RESEARCH QUESTIONS

1. What are the experiences of registered master's degree chiropractic students when managing elderly patients?
2. What challenges do registered master's degree chiropractic students face in the management of an elderly patient?

1.7 STRUCTURE OF DISSERTATION

- Chapter one gives the introduction and background to the study, along with the aim of the study and research questions.
- In chapter two, the relevant literature pertaining to the topic is extensively described.
- Chapter three presents the research methodology.
- Chapter four presents the results of the interviews conducted.
- Chapter five discusses the results obtained, and compares them to previous relevant studies.
- Chapter six gives the recommendations, limitations and concludes the study.

1.8 SUMMARY OF THE CHAPTER

Chapter one has presented the background to the study, along with the study aims, objective and the significance of the study, as well as an outline of the thesis. The next chapter will discuss the literature pertinent to this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter will provide an overview of the literature pertaining to the various factors that influence an elderly patient. It will then describe clinical experiences of registered master's chiropractic students in the management of an elderly patient. The research engines and search tools used for the literature review were Science Direct, PubMed, Google Scholar and ResearchGate.

2.2. THE ELDERLY POPULATION GLOBALLY

According to Voumard *et al.* (2018: 2), geriatric medicine is defined as the study of the diagnosis, treatment and prevention healthcare conditions in elderly patients. Geriatric medicine focused on the risk factors surrounding the prevention, assessment and management of specific health conditions in the elderly. This includes an emphasis on the physical, mental, social and spiritual dimensions of life (Voumard *et al.* 2018: 2).

The United Nations (UN) defines an elderly person as an individual aged 65 years and older (Scherbov and Sanderson 2019: 6). Tucker and Buranapin (2001: 2417s) and Kaphle *et al.* (2014: 34) reported that the number of elderly patients, 60 years and older, are increasing rapidly worldwide. Kaphle *et al.* (2014: 34) discusses that the World Health Organisation (WHO) has estimated that the proportion of the world's elderly population will be doubled from about 11% in 2000 to 22% by 2050. Studies show that there were approximately between 200 to 600 million older individuals (60 years and older) in the years 1950 and 2000 respectively, and it has been forecasted that there will be nearly two billion elderly individuals globally by the year 2050 (Noroozian 2012: 1).

The term healthy ageing is strongly associated with the maintenance of a well-lived healthy age individual. According to the WHO, active ageing plays a great role in

the optimum continuous opportunities related to health, safety and participation to improve the quality of life in the elderly (Bierhals *et al.* 2015: 811).

Mahishale (2016: 139) reported that females have a longer life expectancy in comparison to their male counterparts due to lifestyle habits such as diet, occupational exposures, smoking and violence. Fabbri *et al.* (2012: 6) explained that the ageing process is a risk factor towards chronic conditions, therefore, an approach to slow down or prevent chronic conditions affecting elderly individuals is required.

2.3 THE ELDERLY POPULATION IN THE CONTEXT OF AFRICA

Doron *et al.* (2016: 4) mentioned that the elderly population in the African continent is expected to increase from approximately 1.1 billion in 2014 to approximately 1.6 billion in 2030. Elderly individuals are required to have more comprehensive and multi-disciplinary care that requires the biopsychosocial approach to the different aspects of health related to the elderly (Kelly *et al.* 2019: 1).

According to Doron *et al.* (2016: 5) and Kelly *et al.* (2019: 1), it is well established that Africa is on the edge of significant ageing processes as a result of elderly individuals often having a decreased physiological reserve and associated to have more complex and chronic multi-morbidities. More attention needed to be directed to future factors such as various patterns of disability, morbidity and mortality in a regional context (Gutiérrez-Robledo 2002:M162).

Kelly *et al.* (2019: 2) stated that elderly individuals received social assistance from the state in the form of a state pension (Grant or South African Social Security Agency (SASSA)) and are able to seek out free primary public health care if needed, they also have access to free secondary and tertiary care in cases of emergencies. However, the characteristics of healthcare is determined by both the patients' position in terms of their social and economic status. This determined a patient's access to physical and cognitive capabilities and networks such as the level of education in the healthcare system (Kelly *et al.* 2019: 2). The population of elderly individuals had been described by the UN as one of the most particular demographic events of the 20th century and a significant population challenge in the 21st century (Ameh *et al.* 2014: 1). Acquired immune deficiency syndrome (AIDS) is a huge

epidemic in the African continent that affects several countries (Doron *et al.* 2016: 12). Within the African continent, the elderly population play an important role for the younger generation by supporting their grandchildren after their children have been affected by AIDS (Doron *et al.* 2016: 12-13; Aboderin and Beard 2015: e9-e10). Additionally, the growth of the elderly individuals in developing countries in 2013 was approximately 60 million and according to the forecast, by 2030, it is the expected to increase to approximately 103 million. By the year 2050, the age of an African female will increase to 70.8 years and men to 67 years (Doron *et al.* 2016: 14-15). They are populating in the background of poverty, vast diversity and profound injustice (Gutiérrez-Robledo 2002: M167).

2.4. THE ELDERLY POPULATION IN THE CONTEXT OF SOUTH AFRICA

Africa includes many different societies and regions with the African continent being divided into four different regions i.e. East Africa, West Africa, North Africa and South Africa (Doron *et al.* 2016: 6). Gerber *et al.* (2016: 299) reported on the quality of life and the functional ability in the elderly population, with the emphasis that the elderly population takes majority of the increase in the future developing population of South Africa. South Africa is still classified as a developing country (Sayef 2017: 2); therefore, poverty within the country still exists as there is an increase in the population and the rates of unemployment. This puts a profound effect on infrastructure, healthcare and socioeconomic systems. There is a known disproportion that exists between the private health sector and the public health sector in terms of accessibility to medication and availability of facilities (Meyer *et al.* 2017: 2).

The South African healthcare system remains under a “stressed institution”, as there was a shortage of staff members in the healthcare facility, improper guidance and lack of resource placement (Kelly *et al.* 2019: 2). Srikantiah (2015: 1) identified factors that influenced the elderly populations quality of life are socioeconomic and age-related diseases. As elderly patients often have co-occurrence of chronic diseases which makes their care more challenging as one must specifically consider the use of their medications (Giardini *et al.* 2018: 1004). Kelly *et al.* (2019: 2) mentioned existing literature had shown that more attention should be paid to the

public and private healthcare systems of the elderly population. In terms of the appropriate healthcare decisions and treatment towards an elderly individual one needs to understand the functional ability and the quality of life (Gerber *et al.* 2016: 301).

South Africa is a country in which transcultural and language barriers exist and it compromises the healthcare facilities (Naidoo 2014: 425). According to Hussey (2013: 190), the quality of healthcare services and the ability to access it is often compromised in South Africa due to the existence of language barrier. The National Health Act (Act 61 of 2003) stated in subsection (1) that the requirement of a healthcare professional is to provide high quality care to an individual and the practitioner has to use a language which the individual understands. Van Rosse *et al.* (2016: 52) explained that precautions for the safety of patients is to prevent adverse effects and provide quality healthcare services.

2.5. THE ELDERLY POPULATION

Kaur *et al.* (2014: 1) expounded that the percentage of elderly population have been increasing globally as there has been a decline in fertility, in mortality and sustained improvement in survival. Life expectancy is 78 years old in developed countries and 68 years old in developing countries (Mahishale 2016: 138). Oyetunde *et al.* (2013: 151) reported on Nigerian nursing students attitude towards the caring of an elderly patient, they stated that due to the increase in the elderly population, there are several chronic health problems with which the elderly individuals have to cope with.

There are a variety of changes that occur within the body with age, which includes changes in appearance, such as wrinkled skin, gradual decrease in height, loss of muscle leading to weight loss and loss of bone mass; gradual reduction in sexual activity (andropause in men and menopause in women) and decrease in the function of most systems, such as cardiovascular, neurological, renal and pulmonary, along with a decrease in immune and endocrine functions (Mahishale 2016: 139; Gerber 2016: 298). Therefore, there is a decline in the physical well-being of the elderly individuals, which leads to a loss of independence (Kaur *et al.* 2014: 1). Adebusoye *et al.* (2011: 5-6) highlighted that the commonly diagnosed conditions in the elderly

are eye problems, hypertension, musculoskeletal, mental health and diabetes mellitus.

Mahishale (2016: 139), stated that the ageing process occurs in the interaction between the injury and repair of cells and the balance between cell death and cell replacement, in order to maintain organ integrity. Topinkova (2008: 6) mentioned that in the elderly population it is prevalent to have the common characteristics of disability and frailty, both of which are multi-morbid and have similar pathophysiological processes.

2.6. MUSCULOSKELETAL CONDITIONS IN THE ELDERLY

Musculoskeletal conditions are known as musculoskeletal pathologies or disorders affecting the musculoskeletal system over an acute (less than three months) or chronic (more than six months) period of time (Verhagen *et al.* 2012: 335).Connelly *et al.* (2006: 1) and Verhagen *et al.* (2012: 335-336), described that the musculoskeletal conditions consist of the following:

- Back pain (musculoskeletal and sports injuries).
- Crystal arthritis (gout and calcium pyrophosphate diseases).
- Inflammatory arthritis (rheumatoid and seronegative arthropathies).
- Metabolic bone diseases, musculoskeletal injuries (including sports' injuries).
- Osteoporosis.
- Osteoarthritis.

Elderly patients often presented with symptoms, such as pain, discomfort, and dysfunction in bones, joints or muscles, which affect the surrounding soft tissue structures (Verhagen *et al.* 2012: 335). However, elderly individuals experience pain at a higher level as their body react differently to these stressors due to the alteration in their physiological reserve (Karp *et al*. 2008: 111). Elderly individuals try to maintain their integrity and independence as much as possible. Therefore, musculoskeletal healthcare is significant for the elderly population as their functionality and mobility are important for activities (Briggs *et al.* 2018: 366).

An elderly patient who presented with musculoskeletal conditions is generally accompanied by co-morbidities, such as osteoporosis, accompanied by compression fractures; cancer from other sites; bone tumours; organ dysfunction, which mimics back pain, such as pain from the prostate, and heart, lung and/or spinal stenosis, which is the narrowing of the vertebral canal (Killinger 2012: 5). Due to the associated pathologies in elderly patients, they should be consulted about alternative treatment protocols and the risks involved in treatment procedures, as their clinical presentation is complex (Gorduysus 2016: 38). Hence, Killinger (2012: 1) argues that one of the challenges often faced when treating an elderly patient is formulating an appropriate and accurate diagnosis.

A practicing chiropractor, to make an accurate diagnosis, needs to consider all factors, such as polypharmacy, cognitive issues and increased co-morbidities or chronic illness that are often associated with an elderly patient (Killinger 2012: 5). Hence, a student should be wary that cardiac events can mimic musculoskeletal pain (Killinger 2012: 5). Elderly patients are not fragile to touch; they just need more care and patience in their management (Gorduysus 2016: 38).

De Sousa *et al.* (2017: 82) described the ageing process as physical, psychosocial and biological changes and, therefore, healthcare professionals need to provide high quality individual comprehensive care and develop a holistic approach.

2.7 MODIFICATION OF A MEDICAL CONSULTATION IN AN ELDERLY PATIENT

2.7.1 The Importance of History Taking in Elderly Patients

A medical history should consist of information pertaining to a current complaint, a patient's past medical history, allergies, and immediate family history for a suitable diagnostic and therapeutic diagnoses (Lindner *et al.* 2015: 1). The key to taking a successful history is to use open-ended questions and not ask leading questions to the cause of the complaint (Wieling *et al.* 2015: 278).

An elderly patient often presented in an atypical manner in response to an illness and, therefore, a multi-dimensional approach to an elderly patients' physical should be considered (Elsawy and Higgins 2011: 48). A comprehensive geriatric assessment tool used by clinicians is to consider the complicated, related health

issues that are multi-disciplinary and multi-dimensional and considered into singular diagnosis and management (Welsh *et al.* 2013: 292). Therefore, an elderly patient's medical history is time consuming because of multi-morbid conditions (Lindner *et al.* 2015: 1-2).

Practitioners tend to take an approach that includes the patient's functional and cognitive ability, physical health, psychosocial and environmental circumstances (Elsawy and Higgins 2011: 48).

2.7.2 Physical Examination of Elderly Patients

There are multiple tools that have been developed for the assessment of an elderly patient (Dotan *et al.* 2011: 215). Owusu and Berger (2014: 750) explained that the development of a comprehensive geriatric assessment focuses on the functional status, psychosocial status, associated co-morbidities, mental health and nutritional status of an elderly patient. Haring *et al.* (2014: 1) elaborated on the importance of a physical examination and that it raises concern if medical students have deficiencies and limitations in performing a physical examination.

Elsawy and Higgins (2011: 2) described that a physical examination should be specific to each elderly patient, by focusing on key components such as visual, hearing acuity, nutritional status and cognitive function. Sayma and Williams (2016: 92) mentioned that the clinical requirements a medical student acquires for clinical practical components is limited to the following:

- The ability to perform an efficient physical examination on a patient and gaining clinical skills.
- The ability to answer clinically case-based questions in relation to a patient's experience of their condition.
- Clinical cases are constructed to promote learning and clinical experiences through understanding the purpose of physical examination procedures.

Haring *et al.* (2014: 1) described that if there are limitations in adapting a physical examination, it is questionable whether quality care will be provided.

2.8 ASSOCIATED CO-MORBIDITIES IN THE ELDERLY POPULATION

Amarya *et al.* (2018: 5) and Maguire and Slater (2013: 310) explained that the ageing process is associated with numerous declines in the physiology of an individual. The two theories associated with the ageing process are the programmed theory and error theory. The programmed theory is composed of a decline in the biological alteration in homeostasis and the natural human body defences. The error theory explains the progressive damage to the human anatomy due to environmental hazards (Maguire and Salter 2013: 310).

When dealing with an elderly patient, a clinician should often consider a different approach in the history and physical examination as there are associated co-morbidities (Killinger 2012: 5). The management of elderly patients needs to be structured to fulfil the demands of high-quality care for the elderly population (Woo, Leung and Lau 2009: 552).

The elderly ageing process includes a physiological change that causes a decrease in the reaction to stressors (Rastogi and Meek 2013: 38). The elderly population often present with a decrease in sight and hearing due to the ageing process, which leads to an increase in the risk of falls, improper decision making, and adverse medication effects (Jaul and Barron 2017: 5). Cognitive decline in an elderly individual is often triggered by genetic or environmental factors, which leads to a risk of dementia (Comijs *et al.* 2011: i117).

In modern times, patients often focus on the internet to self-diagnose and prepare themselves before seeing a practitioner (Luger et al. 2014: 1).

It is important to distinguish between the psychological and physical causes of musculoskeletal pain so that the aetiology is managed rather than the site of the pain (Woo, Leung and Lau 2009: 552).

The elderly population often use over the counter drugs and there has been a lack of sufficient health knowledge on the adverse effects of medication that could lead to death (Cybulski *et al.* 2018: 624). The elderly population is faced with psychological impacts, which may lead to social isolation and limit the mobility of elderly individuals to gain access to physical infrastructure (Gorman *et al.* 2019: 11).

Gorduysus (2016: 39) recommended that the treatment outcome towards an elderly patient should not be altered due to his or her limited life expectancy. Furthermore,

Doughtery *et al.* (2012: 2) stated that spinal manipulative therapy (SMT) does not cause adverse effects in the elderly population, who specifically had co-morbid conditions, such as osteoporosis, anticoagulant therapy and spinal stenosis. Srikantiah (2015: 1) explained that co-morbidities and age-related changes would alter the clinical presentation in which certain conditions present.

2.8.1 Osteoporosis in the Elderly

Osteoporosis is a pathological condition that affects both elderly men and women. Osteoporosis (OP) and sarcopenia are conditions which are often found in elderly individuals (Paolucci *et al.* 2016: 177). Cosman *et al.* (2014: 2359) mentioned that OP is a 'silent' disease which is characterised by the loss of bone mass, deterioration of bone tissue, disruption of the bone architecture, increased risk of fractures and decreased bone strength. There are several factors that cause age-related bone loss, such as decreased levels of sex hormones and insulin-like growth factor-1, drug side effects, and nutritionally lacking vitamins and minerals, such as vitamin D (Banu 2013: 850).

The diagnostic assessments which are used to clinically test for and diagnose OP are the dual energy x-ray absorptiometry (DEXA) scan, bone mineral density (BMD) measurement and the measurement of height (Cosman *et al.* 2014: 2360).

The normal range of a bone mineral density (BMD) test in an individual is -1 to 1 (Bernabei *et al.* 2014: 202). A bone mineral density (BMD) level) is measured by a T score. If the T score is greater or equal to -2.5 SD (standard deviation), this is indicative of OP (Paolucci *et al.* 2016: 177).

Elderly individuals are often at greater risk of debilitating postural changes due to several factors such as the loss of functional muscle motor units and the high prevalence of OP (Paolucci *et al*. 2016: 178).

2.8.2 Hypertension in the Elderly

Hypertension (HTN) is a common clinical condition and a major associated risk factor for cardiovascular disease and strokes in the elderly population (Bielecka-Dabrowa *et al.* 2011: 174; Reule and Drawz 2012: 478). Hypertension may lead to an increased risk in cardiac conditions, stroke, chronic kidney insufficiency and dementia (Lionakis *et al.* 2012: 135). Lionakis *et al.* (2012: 135) stated that the physiology of blood pressure (BP) is determined by the cardiac output which is the

rate at which blood flows and the resistance of the blood vessels to blood flow. The resistance is mainly produced in the arterioles and is known as systemic vascular resistance.

When measuring BP in an elderly individual, during a physical examination, it is best to do at least two measurements once the patient is comfortable and settled for at least five minutes. The BP should also be measured with the patient standing for one to three minutes to evaluate for postural hypotension or HTN, which is particularly important in the elderly due to their large arteries stiffening with age, age-related decrease in the baroreflex and autonomic dysregulation (Bielecka-Dabrowa et al.2011: 175; Banach and Aronow 2011: 255).

2.8.3 Diabetes Mellitus in the Elderly

Elderly individuals who are diagnosed with diabetes mellitus have a higher risk of developing functional disability, premature death and associated conditions, such as HTN, coronary heart disease and strokes, when compared to those elderly individuals without diabetes (Anon. 2016: S81). There are two forms of diabetes: mellitus (DM), which is known as type one, and type two (Miller and DiMatteo 2013: 422). Type one DM is described as an autoimmune destruction of insulin, whereas type two DM results from reduced insulin sensitivity and secretion and it is associated with obesity and hypertension.

Diabetes mellitus is a chronic illness that requires continuing multi-disciplinary medical care, and consistent patient self-management education and support to prevent acute complications and to decrease the risk of long-term complications (American Diabetes Association 2013: s11). The key management for DM includes having a healthy eating pattern; complex dietary restrictions with optimal macronutrients; daily insulin injections; frequent eye examinations; self-monitoring of glucose levels (daily or several times per day); regular physical activity and often pharmacotherapy (Miller and DiMatteo 2013: 423; Evert *et al.* 2014: S125). The importance of physical activity in a diabetes mellitus patient improves glucose absorption, which in turn increases their insulin resistance (Ellapen *et al.* 2019: 40).

2.8.4 Parkinson Disease in the Elderly

Parkinson disease (PD) is a common neurodegenerative disorder that is particularly common among elderly individuals (Morris *et al.* 2010: 281; Gazewood *et al.* 2013:

267). James Parkinson first medically described PD as a neurological syndrome (Jankovic 2018: 368; Goetz 2011: 1). Parkinson disease is pathologically described as the degeneration of the dopaminergic neurons in the substantia nigra of the brain and the development of Lewy bodies in the residual dopaminergic neurons (Gazewood *et al.* 2013: 267).

The cardinal clinical manifestations of PD are difficulty in performing motor skills, such as turning in bed or getting up from a chair, resting tremors, rigidity, bradykinesia and gait dysfunction (Jankovic 2018: 368; Gazewood *et al.* 2013: 267). The non-motor clinical features of PD consist of autonomic dysfunction, pain and sensory disturbances, mood disorders, sleep impairment and dementia (Jankovic 2018: 369). The management of the motor and non-motor features should have a careful physical examination of whether the symptoms are a side effect of the medications or if it is related to the progression of the disease itself (Varanese *et al.* 2010: 1). The management of PD should be tailored for each individual patient (Varanese *et al.* 2010: 1).

2.8.5 Alzheimer's Disease in the Elderly

The most common form of dementia in elderly individuals is Alzheimer's disease (AD) (Zheng and Koo 2006: 1; Sadigh-Eteghad *et al.* 2015: 1). Alzehimer's disease is the most prevalent brain impairment disease that affects the elderly population over the age of 65 years (Zhang *et al.* 2011: 1). The pathophysiology is an accumulation of extracellular neurotic plaques and intracellular neurofibrillary tangles. It is the non-physiological depositions alternated with normal neuronal condition that occurs in the cortex and hippocampus (Zheng and Koo 2006: 1; Zhang *et al.* 2011: 1; Sadigh-Eteghad *et al.* 2015: 1-2).

Dementia is a decline in memory and other cognitive functions that impact the activities of daily living in elderly individuals (Bittner *et al.* 2010: 2-3; Langa 2015: 1). An elderly individual's intellect, social skills, personality and memory are compromised by this disease, which eventually leads to a reduction in the quality of life and life expectancy of an individual (Sadigh-Eteghad *et al.* 2015: 1).

One of the important clinical features of AD is that there is a subtle onset of memory loss, which is followed by a slowly progressive dementia over a course of several years (Bittner *et al.* 2010: 3; Zhang *et al.* 2011: 1). The non-pharmacological

treatment for prevention of AD in the ageing process are lifestyle changes and dietary and chemical compounds (Mendiola-Precoma 2016: 8). The lifestyle changes include physical activity, exercise and mental challenges that helps prevent cognitive decline, an increase of neuronal density and managing sleep problems and behaviours (Uriri-Glover *et al.* 2012: 26).

Dietary supplements, such as vitamins B6, B12, C, D and E and folate, have a role in the prevention of AD and slow down the decline in neuropsychiatric symptoms (Mediola-Precoma 2016: 9; Epperly *et al.* 2017: 776). Chemical compounds, such as alcohol and a low consumption of red wine, decreases the risk of dementia (Mendiola-Precoma 2016: 9).

2.8.6 Falls in the Elderly Population

As an elderly individuals age, they are prone to cognitive impairment as they experience injuries to the head, neck and pelvis (Siracust *et al.* 2011: 335). The definition of a fall is an unintentional and unexpected domestic accident, which is due to unsteadiness or a loss of balance in an elderly individual (Haung *et al.* 2012: 360; Fhon *et al.* 2012: 929). Karlsson *et al.* (2013 cited in ID 2010: 3) and Pasquetti *et al.* (2014: 222) state that the high risk of fall injuries increases the cost of healthcare and the most common injuries are hip fractures and dislocations; strokes; cerebral or visceral haemorrhage; traumatic pain syndromes; functional and stability limitations; soft tissue contusions and increased death rates. Elderly people are also at risk of falls due to their increase in medication, which also causes iatrogenic complications (Haung *et al.* 2012: 361).

Extrinsic factors of falls include environmental hazards such as rugs, slippery or uneven floors, electrical cords and unsuitable footwear (Karlsson *et al.* 2013: 748; Tomas-Carus *et al.* 2019: 36). According to Tomas-Carus *et al.* (2019: 35), an early identification of the risk factors in the cause of falls will help prevent adverse effects, such as fractures, dislocations, traumatic injuries, strokes and haemorrhages in elderly patients. Postural stability is controlled by the following muscular groups and joint movements: tibilialis anterior (ankle dorsiflexion), gastrocneumius (ankle plantarflexion), hamstrings (knee flexion) and quadriceps (knee extension) (Orr 2016: 185). Any factors that are limited will affect the strength of the muscle, which will have an inverse effect on the balance performance. Furthermore it implicates

greater adverse effect of the weakness in the muscular in the elderly population leads to lateral instability (Orr 2016: 185).

2.8.7 Polypharmacy in Elderly Patients

Calderón-Larrañaga (2012) cited in Tinetti *et al.* (2004: 2870) and Dagli and Sharma (2014: i) defined polypharmacy as administering multiple drugs, taken daily, to an individual for chronic conditions. In the elderly population, multiple drugs cause adverse effects due to the ageing process slowing the metabolic system down and a decrease in drug clearance (Dagli and Sharma 2014: i). This causes difficulty in the management and treatment of the elderly population (Calderón-Larrañaga 2012: e822).

The elderly population have limited knowledge in regards to polypharmacy and its adverse effects (Fletcher *et al.* 2012: 867). Elderly patients who are complex are seen by several specialists, in which there may be a lack of communication between the specialists, interactions between the prescribed medications and the adverse effects (Calderón-Larrañaga 2012: 823).

2.9 CHIROPRACTIC TREATMENT FOR MUSCULOSKELETAL CONDITIONS

Johnson *et al.* (2008: 397) reported that the central importance of chiropractic treatment is to focus on the ability of the body to heal itself. Chiropractic healthcare has a holistic view with a focus of evaluating musculoskeletal conditions and conservative treatment (LeFebvre *et al.* 2012: 2). Woolf and Pfleger (2003: 647) explained that musculoskeletal conditions have a major impact on a population, the healthcare systems and social care systems.

Mead and Bower (2002: 52) mentioned that patient centeredness is a great part of a primary healthcare professional's medical decisions but there is limited literature on good doctor-patient communication. Say and Thomson (2003: 542) explained that newly qualified healthcare practitioners are often faced with challenges that include:

- Having to gain the trust of a patient.
- Determining the treatment procedures required for a patient.

- Considering the patient's preferences.
- The risk of contradiction between the practitioner's and patient's guidelines.

Research showed that throughout a medical student's studies, they eventually develop a self-regulated learning which is beneficial towards a student's diagnostic and clinical skills (Cho *et al.* 2017: 9). When there are limited clinical skills and practical knowledge in clinical decision making, it impacted the management of an elderly individual (Torkshavand *et al.* 2020: 4). The purpose of professional practical training is to benefit the development of a career and prepare students to have the ability to apply the knowledge they have attained (Iucu and Platis 2012: 4228-4229). According to Lepore and Yau (2013: 1), the best way for a healthcare student to gain knowledge on a disability, is through learning and being part of a clinical setting, and to fully understand how disability impacts an individual's life.

Cambron *et al.* (2007: 11), on patient perception of chiropractic treatment for primary cared disorders in the United States of America, stated that doctors of chiropractic (DC) are trained within their course of study to be able to diagnose and treat multiple musculoskeletal disorders. Musculoskeletal disorders include more than 150 diagnoses that disturb the locomotor system, and most are characterised by pain and a decline in physical functioning (Briggs *et al.* 2018: 366). Individuals who live with musculoskeletal pain have their lifestyles affected and this has an impact on their activities of daily living, mobility, functionality and social independence, altered sleep patterns and they are more prone to disability (Fritz *et al*. 2011: 331; Boghozian 2015: 8).

The core practice for chiropractors is the musculoskeletal system, with the focus on the spine (Hestbaek and Stochkendah 2010: 1). There is supervised practical training for chiropractic students to perform spinal manipulative therapy (SMT) on one another to make them competent for administering SMT to a patient during the clinical practicum phase (Stainsby *et al.* 2016: 138).

Chiropractic focuses on holistic management that includes components of physical, emotional and psychosocial factors. Gleberzon (2001: 167) stated that conditions successfully treated by chiropractic care in the elderly are radiculopathies; dislocations of small joints (for example the sternoclavicular joint); diffuse idiopathic

skeletal hyperostosis; rotator cuff injuries and thoracic outlet syndrome. Osteoarthritis affects an elderly patient's daily activities as there is a restriction of joint function and mobility, which inhibits the process of healing the articular cartilage (Nakajima 2017: 122). Myofascial pain is characterised by a trigger point which is a localised palpable tender area in muscle fibres (Lisi *et al.* 2015: 1283). McKenney *et al.* (2013: 522) described fascia as a continuous tissue within the body that when stretched in one area, causes pain and restriction in another area of the body, as the pain does not follow a typical referred pain pattern in myofascial pain syndrome.

Chiropractors focus on an approach named maintenance care (Leboeuf-Yde and Hestbaek 2008: 1). Leboeuf-Yde and Hestbaek (2008: 2) explained that the maintenance care linked to chiropractic has two parts: secondary care that focuses on the prevention of causes and tertiary care which focuses on maintaining patients at their appropriate health level. LeFebvre *et al.* (2012: 2) expounded that the basic musculoskeletal conditions and irregular postural syndromes are treated by chiropractors using four broad categories of therapeutic interventions demonstrated in the table below.

Table 1: Model of chiropractic care

Spinal manipulation and mobilisation	Soft tissue massage and manipulation	Physical rehabilitation and exercise prescription	Nutritional and dietary advice

Source: LeFebvre *et al.* (2012: 2)

Maiers *et al.* (2015: 335) highlighted that when illustrating any form of treatment to a patient, the practitioner has to outweigh the balance between the advantages and disadvantages of care. Hawk *et al.* (2017: 218) explained that in providing the best care towards the elderly population, the chiropractor needs to understand both the safety and effectiveness of chiropractic care.

For a student to apply the knowledge they have gained, they need to first understand what it is used for, when to apply it and be able to evaluate the outcomes of it (Carstensen *et al.* 2020: 2).

Newly graduated nurses illustrate difficulties when transitioning from a student to a working healthcare professional (Otiz 2016: 19). The challenges are the following:

- Poor communication skills with other healthcare professionals.

- Lack of professional confidence.
- Lack of clinical experiences.

Over the past decade, the chiropractic profession has also embraced evidence based practice (EBP) into the profession (LeFebvre *et al.*, 2012:75). The key question of EBP success would be whether or not it has translated into the changes in clinical practice (Schneider *et al.* 2015:2). Research has shown that the elderly population has a higher chance of harm from healthcare treatment due to general decline in function and mobility, competing co-morbid conditions and prolonged recovery time (Maiers *et al.* 2015: 335).

2.9.1 Spinal Manipulation

There are many different types of manual treatments that physical therapists can utilise to treat musculoskeletal conditions, including soft tissue myofascial release, muscle energy techniques and high-velocity low-amplitude manipulation (Nadler 2004: 56). High-velocity and low-amplitude manipulative technique is a component of chiropractic manipulative treatment (Nadler 2004: 57; Hurwitz 2012: 648). The cost of spinal manipulation is lower and more effective in treating headaches, neck pain and low back pain (Haavik *et al.* 2017: 1). Chiropractic spinal manipulation is described as a specific articular manipulation with specific anatomical contacts to the human structure and it includes short or long-term leverage procedures (Stainsby *et al.* 2016: 1; Passmore and Descarreaux 2012: 698).The desired response is improvement of motion restriction (Nadler 2004: 57).

Hawk *et al.* (2012: 465) mentioned, spinal manipulation has been reported to be efficient in the treatment of acute/chronic low back pain, cervicogenic headaches and painful conditions in extremity joints. Chiropractic spinal manipulation is a fundamental aspect of chiropractic training and there is a fair amount of time spent on teaching the techniques and safety of it (Stainsby *et al.* 2016: 139).

There are different types of categories of manipulative techniques, such as Maitland, Gonstead and Diversified (Triano 2001: 122). A few of the common conditions treated by SMTs are acute and chronic low back pain, radicular pain, neck pain and primary headaches (Hurwitz 2012: 651).

Hawk and Cambron (2009) cited Reid and Rivett (2005: 5), that spinal manipulation has an adverse effect in causing cervicogenic dizziness. As an individual ages, the

changes to the physiological system often affect the treatment that they require (Maiers *et al.* 2015: 336; Kessler *et al.* 2014: 81) and this should be considered in the elderly population whose bones are more brittle and can fracture easily under stress (Boskey and Coleman 2010: 1334). Regarding prescribing spinal manipulation to an elderly patient, the practitioner should consider and remember the complexities when treating the elderly and their responses (Roberts and Wolfe 2012: 21). It is, therefore, important for a practitioner to explain the adverse effects and potential risks before providing manual therapy (Swait and Finch 2017: 2).

2.9.2 Dry Needling

Soft tissue myofascial techniques are used in addressing myofascial restriction and should be considered as an adjunct to exercise and postural training (Nadler 2004: 57). According to Shah *et al.* (2015: 2) and Ziaeifer *et al.* (2013: 299), a myofascial trigger point is a hyperirritable spot that occurs from trauma to the tissue. This trauma causes a release of chemicals, such as acetylcholine, which is released from motor endplates that causes a contraction trigger point. Other chemicals are bradykinin, serotonin, histamine and potassium ions, which cause activation of the nociceptors at Group IV sensory afferent terminals, which develop into a nociceptive pain of the myofascial trigger point.

A trigger point is classified into two categories: an active and latent trigger point. An active trigger point is known as a trigger point that refers pain when at rest (Unverzagt *et al.*, 2015: 403). A latent trigger point is a spontaneous trigger point that restricts movement and causes muscle weakness (Ziaeifer *et al.* 2013: 299). An active and latent trigger point generates dysfunction and allodynia (Dommerholt 2011: 223; Calvo –Lobo 2017: 64). An individual presented with a decreased range of motion; local pain; pain which follows a typical pattern and a twitch response, when the muscle is stretched or palpated (Gattie *et al*. 2017: 133). This myofascial pain is a complex form of neuromuscular dysfunction that consists of both motor and sensory abnormalities, involving the central nervous systems and peripheral nervous system (Shah *et al.* 2015: 2).

The causes of myofascial trigger points are incorrect postures, perhaps sustained while working on a computer, and sudden injury, causing the muscle to respond, such as a whiplash (Tough and White 2011). A trigger point can be treated using

dry needling (TrP-DN), which is also referred to as intramuscular stimulation (IMS). It is an invasive procedure in which an acupuncture needle is inserted into the muscle and skin (Dommerholt *et al.* 2006: 228; Boyles *et al.* 2015: 276). The skin is a multi-functional organ that has a protective function (Firooz *et al.* 2012: 1).

Physical therapists around the world practice TrP-DN as part of their clinical practice and use the technique in combination with other physical therapy interventions to treat myofascial trigger points (Dommerholt *et al.* 2006: 224). Dry needling does not replace other manual physical therapy techniques but is useful in facilitating a rapid reduction of pain and a return to function (Dommerholt 2011: 223).

The benefits of dry needing as a treatment protocol for myofascial trigger points are a reduction in pain and tenderness in the upper extremities, lower extremities, trunk and neck regions and enhanced mobility (Boyles *et al.* 2015: 292; Gattie 2017: 133). Brady *et al.* (2014: 139) explained that the mild adverse effects of dry needling are bleeding, hematomas and pain. The moderate to severe adverse effects include fainting, headaches, nausea, pneumothorax and forgotten needles which need further medical care (Brady *et al.* 2014: 135; Boyles *et al.* 2015: 277).

There is limited evidence regarding invasive physical therapy techniques in the elderly population (Calvo-Lobo 2017: 64).

2.9.3 Electrotherapy

Kasat *et al.* (2014: e562) stated, the techniques used in physical therapy are to provide pain control. To understand how electrotherapy relieves pain, one needed to understand how electrotherapy influences the imbalances of the autonomic nervous system (ANS). There are two key parts of the ANS are the parasympathetic (rest and healing) and sympathetic nervous system (flight/fight/stress) (Armstrong 2016: para. 5 line numbers 1-4). There are several electrotherapy modalities used in clinical practice by physical therapists, such as transcutaneous nerve stimulation (TENS), therapeutic ultrasound, low-level laser therapy (LLLT) and pulsed electromagnetic field therapy (PEMF). The purpose of electrotherapy devices in physical therapy is to decrease pain, increase blood circulation and block nerve conduction (Page *et al.* 2016: 6).

Liu *et al.* (2019: 1) explained that an electrotherapy device consists of two parts: the electronic control unit, which generates a stimulus current, and electrodes to transfer the current through the skin, to stimulate the sensory nerves.

Knee osteoarthritis is the most common chronic joint disease in individuals 65 years and older (Bennell *et al.* 2011: 2; Mascarin *et al.* 2012: 1). Lui *et al.* (2019: 1) stated that electrotherapy is applied at a low current of (0–100 mA) for pain relief, to stimulate the skin's sensory nerves and interfere with the pain signal transmission when used in individuals with knee osteoarthritis. The types of electrotherapy used in knee osteoarthritis are therapeutic ultrasound, which is an electro modality that uses sound waves to generate heat over the painful area and TENS, whereby electrodes are placed on the painful area of the body and low voltage electrical impulses are transmitted (Mascarin *et al.* 2012: 2; Yegin *et al.* 2017: 187-188). The use of LLLT has been used to treat and manage pain for the musculoskeletal conditions with which an individual presents (Tascioglu 2004: 254; Youssef *et al.* 2016: 116).

A traction recliner/executive chair is used to produce a sense of relief for patients that present with low back pain or neck pain (Bass 2010: para. 1 line 39-42). Traction therapy is applied by reducing pressure on discs or nerves to relieve pain and recover joint function (Park *et al.* 2014: 527). Lee and Evans (2001: 102) stated that two types of traction forces, sustained or intermittent, can be applied manually or by machines. Traction was the most common conservative treatment for low back pain (Park *et al.* 2014: 527).

2.9.4 Cryotherapy and Heat Therapy

Nadler *et al.* (2004: 395) expounded, specialised nerve endings, called nociceptors, are activated in response to tissue injury. These nociceptors transmit nerve signals that travel through the spinal cord to the brain, where the pain sensation is recognised. Chronic pain is a multi-dimensional phenomenon which consists of pain intensity, pain related disability and the onset of pain (Korff *et al*.1992; Treede *et al.* 2015). Heat and cryotherapy are used to treat musculoskeletal injuries to the bone, muscle, tendons, and ligaments (Nadler *et al.* 2004: 395). Cryotherapy is the application of a cold substance that is applied to a painful region, to decrease the harmful receptive information, which is transmitted from the afferent nerve fibres to

the spinal cord, which then decreases the behavioural reaction to pain and spinal olfactory cells (Nadler *et al.* 2004: 396; Gong *et al.* 2011: 107).

Cryotherapy research in the elderly population is limited. However, a study conducted by Giemza *et al.* (2014: 13-14) on lumbar spine pain in elderly males, shows that the use of cryotherapy in the elderly population is safe and improves the healing effect of lower back pain.

Heat therapy provides an analgesic affect and decreases muscle tonicity by increasing the blood flow to facilitate tissue healing by supplying oxygen, nutrients and protein to the site of injury (Nadler *et al.* 2004: 397; Edeer and Tuna 2012: 100-101). Barry *et al.* (2005: 1572) stated that elderly individuals use medication as a last resort and alternate with rest and hot and cold therapies to decrease their chronic pain. The literature on the effects of heat therapy on pain in the elderly population is limited (Edeer and Tuna 2012: 101).

2.9.5 Massage

Massage is defined as a treatment protocol where clinicians uses their hands to manipulate the soft tissues of the body to improve blood circulation, relieve pain and increase a range of motion and to promote movement of active and passive joints (Puszko 2013: para. 8 line number 2 and 3; Anon. 2015 para. 3 line number 10*)*.

Massage therapy has been assessed and found to be effective for various painful musculoskeletal conditions (Preyde 2000: 1815). The different types of massage are effleurage stroking; petrissage-kneading; tapotement/vibration; friction; pressure; sports massage and spa massage (Lund 2000: 638; Sherman *et al.* 2006: 1). Sherman *et al.* (2006: 2) and Farber and Wieland (2016: 1) stated that massage treatment is used for reducing pain, enhancing an athletics performance, helping the body and overall well-being. Massage therapy used on elderly individuals helps promote healthy living, decrease pain and increase energy levels (Anon. 2015 para. 2 line number 6; Puszko 2013: para. 12 line 2).

2.9.6 Nutritional Advice

Nutrition is an important factor in the healthcare of elderly individuals (Wells and Dumbrem 2006: 67). Primary and secondary causes of malnutrition can often be diagnosed during a physical examination of elderly patients (Wells and Dumbrem

2006: 67; Baker 2007: s150; Zhou *et al.* 2015: 1). Elderly patients have an increased risk of malnutrition due to the increase of protein undernutrition, compared with other adult populations (Wells and Dumbrem 2006: 67). Elderly individuals often have associated multiple comorbidities that contribute to overall nutritional compromise (Wells and Dumbrem 2006: 69; Endevelt *et al.* 2009: 357).

During a nutritional assessment for elderly individuals, clinicians need to be knowledgeable in the physiology of ageing, cognitive impairment, weight loss, weight gain, protein undernutrition and vascular risk factors, malnutrition during hospitalisation, and general dietary recommendations (Wells and Dumbrem 2006: 70; Endevelt *et al.* 2009: 357). The nutritional advice given to elderly patients needs to consider the individual's cultural background and personal lifestyle choices, beliefs and preferences and should respect the individual's wishes and willingness to change (Connor 2003: 76).

2.9.7 Home Education for an Elderly Patient

Sharifirad *et al.* (2014: 22) explained the importance of communication between a patient and healthcare professional. Hume and Tomsik (2014: 112) mentioned, one ensures a patient understands the processes of home education that is required of them helps to improve a patient's results. Patient participation involves being a part of the decision-making process and the preferred process of exercises (Longtin *et al.* 2010: 54).

Sharifirad *et al.* (2014: 22) and Longtin *et al.* (2010: 54) mentioned, the difficulties of communicating with a patient are the following:

- There is a communication barrier when healthcare professionals use specialised medical terms.
- A healthcare professional explains the bouts of information too quickly and the patient is unable to process it in that timeframe.
- The patients' lack of knowledge disables them to be able to participate in the conversation.

Healthcare professionals should incorporate a teach-back technique and return demonstration techniques that provide information to a patient to evaluate the patient's level of understanding of their healthcare decisions towards their conditions

(Hume and Tomsik 2014: 113). Taking into consideration a holistic approach in terms of managing a patient's rehabilitation is important (Lepore and Yau 2013: 1).

Whitehead and Blaxton (2017: 1069), Siemonsma *et al.* (2018: 2) and Muramatsu *et al.* (2015: 684) explained the long-term and daily life benefits of exercise for physical and mental health. Whitehead and Blaxton (2017: 1069-1070) stated that the benefits of exercise in the elderly population are improved functional and cognitive abilities, decreased mortality and the maintenance of daily activities, such as climbing stairs.

2.10 THE CHIROPRACTIC PROGRAMME AT DUT

2.10.1 Chiropractic Profession

The word chiropractic is of Greek origin and defines treatment by hand. The term chiropractic is used as an adjective and a noun, similar to the word 'pharmaceutical'. Chiropractic was developed into a separate, less invasive and natural discipline or profession (Chapman-Smith 1996: 109; Globe *et al.* 2016: 1; Voglee 2018: 17).

Accreditation requirements within the chiropractic profession focuses on the student and practitioner learning outcomes within the Doctor of Chiropractic Degree Programmes (DCP) and chiropractic internship programs (internship). This prepares graduates and future graduates to serve as caring, competent, patient-centred and ethical primary health care professionals (Accreditation Manual 2018). The profession has grown significantly over the past few decades, until it was deemed necessary to create a legislation governing the practice of chiropractic and continue to strive for high standards of practice, including promoting the use of evidence-based guidelines (Gliedt *et al.* 2015: 7; Henderson 2012: 632). In most countries, the chiropractic profession has a legislation that is recognised and a separate chiropractic law that regulates the practice of chiropractic care (Chapman-Smith 1996: 110).

2.10.2 Chiropractic Profession in South Africa

Clinical training in a profession serves to bridge the gap between theory and practice by providing students with real-world situations (Voglee 2018: 7). The fundamental principle of chiropractic is that an individual's nervous system is connected to an

individual's health state and that a disturbance to the nervous system will impair normal bodily functioning, resulting in a decrease in the body's ability to resist diseases (Voglee 2018: 17). In 1989, chiropractic education was offered for the first time in South Africa at the Technikon Natal, which is now known as the Durban University of Technology (DUT). In 1993, chiropractic education was offered at Wits Technikon (now known as the University of Johannesburg). Accreditation for the chiropractic courses began in 2008 and the courses gained international accreditation in 2010 (Voglee 2018: 19; CASA 2020).

2.10.3 Chiropractic Course Requirements

Chiropractic colleges teach undergraduate theory and practical applications for the chiropractic management of a wide array of patients (Todd *et al.* 2014: 14). The focus of undergraduate education is to produce competent graduates as healthcare providers, who can implement evidence-based practice and common sense, in order to meet the expectations associated with safety and effectiveness (Innes *et al.* 2018: 2).

The chiropractic course offered at the DUT is an academic chiropractic programme consisting of both theory and practical components which span a minimum of five years of full-time study, after which a master's degree in chiropractic is obtained (Voglee 2018: 18; DUT Handbook 2020: 6). To register for the chiropractic course an undergraduate student needs to obtain the following in their national higher certificate:

Compulsory Subjects
English (first additional language); HG: D and SG: B Mathematics; HG: D and SG: B Life orientation (NATIONAL SENIOR CERTIFICATE RATING OF 4) Senior certificate: HG: D and SG: B (HG: HIGHER GRADE, SG: STANDARD GRADE) AND/OR Physical sciences / Life sciences; HG: D and SG: B Another two 20 credit subjects (only one of the two can be another language)

No more than two language at the senior certificate; HG: D and SG: B National senior certificate rating of 4 and Senior certificate HG: D and SG: B

Figure 1: Minimum requirements for entry into the chiropractic course (DUT Handbook: 2020: 15)

LeFebvre *et al.* (2012: 3) stated that, an accredited institute is one in which the curriculum includes components of basic science courses (e.g. anatomy, biochemistry and physiology), clinical science courses (e.g. laboratory practical's and diagnoses, radiographic practical's and diagnoses, orthopaedics, neurology, and nutrition) and clinical intern experiences.

The following are the chiropractic course subjects offered in the chiropractic course at the DUT (DUT Handbook 2020; Ganesh 2017: 45):

YEAR ONE:

1. **SUBJECTS:** Gross Anatomy IA and IB, Biological sciences, Physiology IA and IB, Chemistry, Physical science, Philosophy, Histology, Cornerstone, Chiropractic principles and practices I, Cultural diversity OR Information communication technology literacy and skills, Issues of gender and society within healthcare OR isiZulu for Health Care Professionals I.
2. **DEGREE OF PRECLINICAL EXPOSURE:** First year students undergo physical examination by master's students at the DUT CDC.
3. **LEVEL:** Undergraduate.

YEAR TWO

- **SUBJECTS**: Diagnostic Imaging I, Gross Anatomy II, Physiology IIA and IIB, Biochemistry, Immunology, Parasitology and Communicable Diseases, General Pathology, Chiropractic Principles and Practice II, Clinical Anatomy, Sociology OR Leadership and supervisory development, Hands with meaning/Introduction to sign language OR Values in the workplace.
- **DEGREE OF PRECLINICAL EXPOSURE:** None.
- **LEVEL:** Undergraduate.

YEAR THREE

- **SUBJECTS:** Diagnostics IA and IB, Systemic Pathology IA and IB, Psychopathology, Clinical Chiropractic and Biomechanics I, Diagnostic Imaging II, Chiropractic Principles and Practice IIIA and IIIB, HIV and communicable diseases OR Entrepreneurial edge, Reflections on Quantitative Thinking or Equality and Diversity.
- **DEGREE OF PRECLINICAL EXPOSURE:** Observation of B.Tech students "Appraisal and assessment of patients in a public hospital".
- **LEVEL:** Undergraduate.

YEAR FOUR: BACHELORS DEGREE IN TECHNOLOGY: CHIROPRACTIC (BTCHRI)

- **SUBJECTS:** Diagnostics IV, Chiropractic Principles and Practice IV, Clinical Biomechanics and Kinesiology IV, Clinical Chiropractic IV, Radiology IV and Research Methods and Techniques I.
- **DEGREE OF PRECLINICAL EXPOSURE:** Clinical mentoring and assessment.
- **LEVEL:** Undergraduate.

YEAR FIVE: M.TECH: CHIROPRACTIC

- **SUBJECTS:** Clinical Biomechanics and Kinesiology V, Clinical Chiropractic V, Chiropractic Principles and Practice V, Research project and dissertation (1st Registration) and Practice Management and Jurisprudence.
- **DEGREE OF PRECLINICAL EXPOSURE:** Clinical exposure at the DUT CDC and clinical assessment.
- **LEVEL:** Postgraduate.

Whillier *et al.* (2014 cited Marcy 2001: 2-3) discuss that learning is a habitual manner in which a student gathers, processes, interprets, organises and thinks about material or gains skills. Students in their undergraduate years of the chiropractic course need to acquire psychomotor skills in order to deliver the myriad of different forms of therapy chiropractors offer for patient care (Macanuel *et al.* 2005: 47). The registered master's degree chiropractic students treat headaches; muscle pain and spasms; sinusitis; whiplash injuries; neck pain; mid-back pain and low back pain;

upper/lower extremity pain and disorders; arthritis; sports related injuries and recreational injuries (DUT 2018).

2.10.4 Elderly Education in the Chiropractic Course at DUT

Hashemiparast *et al.* (2019: 399) explained, the gap in theoretical knowledge attained and the application of it in a clinical situation, is often difficult for healthcare students. An OSCE (observation structured clinical examinations) is an examination that consists of a set of questions that are case-based and marked by an independent clinician that requires the careful attention and organisation of a student. The importance of practical knowledge is to assist student's understanding, development of practical skills and the application of them (Said *et al.* 2014: 4848).

The elderly population plays an important role in the demographic, economic, social and public healthcare difficulties faced in the world (Zvarev 2013: 57). An important factor in the discovery of a disease, and its risk factors, is finding a significant treatment for it (Thagard 2005: 60). Medical textbooks are valuable in a healthcare student's study as they provides a vast range of information (Tez and Yildiz 2017: 550).

The registered master's degree chiropractic students must complete the subject Clinical Chiropractic V in their fifth year of study. This subject consists of a theoretical and practical component. The theoretical component consists of two modules: one being geriatrics and paediatrics and the other component known as cases (DUT 2020: 46). The practical component consists of orthopaedic testing.

A study that was conducted at the DUT focused on the attendance of the elderly patients at the CDC, emphasising the importance of practical experience gained during clinical years and how it prepares the registered master's degree chiropractic students for the management of elderly patients in private practice (Schirmer 2019: 3). Schirmer (2019: 9) mentioned that, with the increase in growth of elderly individuals, more emphasis should be placed not only on the educational framework but more importantly on the clinical training for elderly patients.

Gonzales *et al.* (2010: 221) explained the concern towards medical healthcare professionals and their negative attitude portrayed towards the elderly population.

2.11 CLINICAL EXPERIENCES OF CHIROPRACTIC STUDENTS

Chiropractic students spend their first two years in tertiary education learning basic science subjects, after which they progress to more clinically orientated work, with the expectation that they learn how to apply this knowledge and make reasonable clinical decisions during the clinical practicum phase of their studies (Innes *et al.* 2018: 1).

According to a study about chiropractic students' experiences of professional training in an educational healthcare environment, chiropractic students often gain their clinical experiences from outsourced patients that attend the campus-based clinics (Palmgren and Bolander Laksov 2015: 8). Chiropractic students need to consider their own education, experiences and specific expertise, including training at undergraduate and postgraduate level, to be the foundation of all clinical decision-making (Amorin-Woods *et al*. 2016: 2).

Weurlander *et al.* (2019: 1046) described the components that affect a student's performance when delivering patient care as a feeling of uncertainty in the management of a patient due to a gap in knowledge and skills; finding different clinical settings a challenge and struggling to separate their emotions in a clinical setting.

Hecimovich and Volet (2012: 2) explained that an internship plays a more significant role compared to other learning experiences, such as lectures and practical laboratory work. The repetitive practice of students' clinical skills allow them to feel more prompted and confident in their clinical approach (Weller *et al.* 2012: 2).

Rathban *et al.* (2012: e95) conducted a study on pharmaceutical students in America and established that introducing clinical practice earlier in the course was beneficial to the students' clinical skills and patient care.

Innes (2017: 1) explained that students should have a flexible approach, be open-minded and avoid a purely technical approach when dealing with patients. During a student's tertiary experience and education, building a student's confidence comes through clinical exposure (Hecimovich and Volet 2012: 2).

Healthcare students should develop methods to manage their emotions, resulting in being able to handle difficult clinical situations and decrease exhaustion and

sluggishness, and therefore improve a students' performance and care towards a patient (Doulougeri *et al*. 2016: 2).

Chen *et al.* (2015: 9) stated healthcare students need to develop an empathic approach in the management of an elderly patient. A study of pharmaceutical students shows that their communication skills should be sufficient for them to be able to care effectively for an elderly patient (Estus *et al.* 2009: 5).

Hecimovich and Volet (2011: 5) explained that through clinical performances a student builds up their professional confidence, which aids in their psychomotor skills, patient communication and clinical skills. According to Subramanian and Thomson (2017: 269) and Gruppen *et al.* (2018: para .3 lines 5-7), a student's personal experiences and perceptions, general quality of life and learning experiences impact the state of the learning environment. The integration of practical work allows students to learn when, where, why and how to apply the knowledge gained (Dyrbye *et al.* 2011: 1131).

2.12 EVIDENCE-BASED PRACTICE IN PHYSICAL THERAPY

Ilic (2009: 659) stated that the primary aim of evidence based practice (EBP) is to assist health professionals in guiding their decisions. Evidence based practice has become the principal responsibility of a clinician to search for the best evidence and integrate it with his or her clinical expertise, to provide the best care for his or her patient (Sherin 2014: 1).

"Evidence based practice is defined as using conscientious, explicit, and best current evidence to diagnose and manage a patient" (Sackett *et al*. 1996 para. 2 lines 1-5; Thomas and Eaves 2015: 261).

Despite the increase in the awareness of EBP, there still remains a large gap between this appreciation the actual uptake and application of EBP in clinical settings (Schneider *et al.* 2015; Sherin 2014: 1). There are five important steps followed during evidence base practice (Johnson 2008: 169).

According to Johnson (2008: 169-170), the five steps are as follows:

- Step one entails a detailed improvised question being asked that will help enhance patient and clinical care. It means using carefully chosen words as the question would be used in the search of information from the available literature.
- Step two accounts for trying to find the optimal evidence from literature sources that can answer the question, taking into account that not all questions can be answered, as well as being able to search through literature and take out important, unambiguous and relevant information.
- Step three applies the best evidence-based information found to match the knowledge and clinical skills, with high regard to patient care and the clinical setting.
- Step four applies the new information with the quality of patient care and clinical environment, considering the patient's values and morals and implementing it into the clinical decision making.
- Step five evaluates the influence of the evidence-based information and if it could be used for future clinical procedure practices.

2.13 CLINICAL SKILLS OF HEALTH STUDENTS

As a chiropractic student enters his or her clinical practicum phase, he or she tends to experience bouts of overwhelming emotions. These are feelings of excitement, anxiety, nervousness, drive and confidence. However, psychological outlines play an important role in determining an individual's human behaviour, both positively and negatively (Innes *et al.* 2017: 1).

According to Sobhi-Gharamaleki and Rajabi (2010: 1819), the WHO stated that the development of life skills in a healthcare professional includes the:

- Ability to make effective and professional relationships.
- Ability to communicate and problem solve.
- Ability to make righteous decisions through means of critical thinking.
- Ability to handle one's self emotions and the emotions of others.
- Ability to adapt in different clinical settings.

Emotional intelligence is described as how well an individual handles their emotions in order to advance in life (Bastian 2005: 1135; Mattingly and Kraiger 2019: 140). Khir *et al.* (2018: 38) expounded that when students have self-leadership and high emotional intelligence, it helps them to maintain a state of harmony during a difficult situation. A study done on nursing students in the United Kingdom explained that students need to differentiate their emotions from patients' emotions in order to make knowledgeable and critical decisions and to prevent poor decisions and actions with respect to patients' healthcare (Por *et al.* 2010: 855).

Schutte *et al.* (2007: 923) and Khir *et al.* (2018: 40) explained, a student who has a higher emotional intelligence has a greater ability to absorb information and is less likely to react with moodiness and anxiety disorders.

The importance of chiropractic education is to enhance a student's professional confidence with respect to the competency of patient communication skills and clinical physical skills (Hecimovich and Volet 2009: 151).

Chiropractic teaching institutes have science-based educational programs (Orlin *et al.* 2013: 138-139). Baraz *et al.* (2015: 2) stated that a clinical learning environment may have a negative effect on the clinical experiences for students. The negative effects are:

- Time consuming and energy draining.
- An increase in the financial strain on educational systems.
- A cause mental, familial and educational problems for students.
- The compromise in the quality of patient care.

The intolerance of the uncertainty of a student intern could also be a psychological factor (Innes *et al.* 2017: 2). Confidence is defined as a belief that one will act in an effective manner and is expected to play a critical role in how a student intern makes clinical decisions, utilises his or her clinical skills and communicates with his or her patients (Hecimovich and Volet 2009: 152). Innes *et al.* (2017: 2) stated that external circumstances, such as the academic curriculum, educational facilities and staff are not solely responsible for graduate attributes.

2.14 IMPORTANCE OF CLINICAL INSTRUCTORS

O'Rae *et al.* (2017: 88) stated that the role of a clinical instructor is to provide a supportive learning environment, increase awareness of the curriculum and the application of theory and practical education to real life situations for clinical students. A competency-based assessment is used by clinical instructors to evaluate the knowledge and the application of clinical skills of students (Falender and Shafranske 2012: 134). Meyer *et al.* (2016: 445) describe caring clinical instructors as individuals who play an interactive role in the development of students' clinical skills and provide encouraging and lenient guidance.

A study by Hussein and Osuji (2017: 23) about nurses elaborated that the purpose of educators is to provide students with the relevant clinical information and present real-life clinical conditions and teach them how to apply the theoretical knowledge to clinical training.

2.15 SUMMARY OF THE CHAPTER

In present times, CAM therapy is the most utilised form of non-surgical treatment and management in the elderly population. Chiropractic treatment is a component of CAM therapy. Elderly individuals who present with neuromusculoskeletal conditions seek out chiropractic treatment and management. South Africa is a diversified nation in which the elderly population is growing rapidly, which will impact on healthcare facilities in the future.

The literature has shown that during their clinical practicum, chiropractic students need to consider the different ethnicity and external challenges (polypharmacy and co-morbidities) related to elderly individuals.

The literature has shown that chiropractic students have the ability to accurately manage and appropriately diagnosis and treat elderly individuals during the clinical practicum.

This study on the experiences of registered master's degree chiropractic students in the management of elderly patients during their clinical practicum will help build much needed evidence in the literature in the treatment of elderly patients, clarify the awareness to the special needs of elderly patients, improve the quality of

treatment in the elderly population and emphasis that registered master's degree chiropractic students can treat musculoskeletal pain more effectively and efficiently.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter discusses the methodology of the study and the design was used implemented. It clarifies various aspects of the research plan, including the study setting, sample size and the study population; the development of the interview guide used; the process of data collection; the selected method of data analyses and the ethical considerations.

3.2 STUDY DESIGN

The study was qualitative in nature within an interpretivist paradigm. The aim of qualitative research is to provide extensive insights, information and an interpretation of the nature of reality. This is in comparison to quantitative research (Korstjens and Moser 2017: 271). A qualitative study design solely focuses on the similarities and the differences proposed in the descriptive characteristics of a qualitative data analysis (Graneheim *et al.* 2017: 29). In contrast to quantitative data, a qualitative study design gives further information and knowledge of the research (Korstjens and Moser 2017: 271).

An interpretivist paradigm is a method used for gaining knowledge and an understanding of the core reality of the life an individual, with a focus on his or her behaviour, experiences, perspectives and emotions (Thanh and Thanh 2015: 4). Manual therapists often focus on the use of quantitative research to gain information. The usage of qualitative research paradigms during practice within the Chiropractic profession is to develop a more comprehensive knowledge base when understanding a patient and gives one an indepth understanding (Petty *et al*. 2012: 267). The methods used for data collection in a qualitative study design is associated with interviews and observation of the study documents that can be conducted on a group or individual (Marzano, Vegliante and Angelis 2015: 0410; McGrath *et al.* 2018: 1). With use of qualitative approaches it would help practitioners further understand themselves and patients (Petty *et al*. 2012:273). For

this study, the researcher used an interpretivist paradigm to explore understandings of participant experiences when managing an elderly patient (Thanh and Thanh 2015: 24).

3.3 STUDY LOCATION

The study location was at the Durban University of Technology (DUT) Chiropractic Day clinic in which a clinic room was pre-booked. The DUT CDC has been operational since 1993 and is situated in the Berea area, in Durban, South Africa (Thoresen 2006: 17). The DUT CDC is one of the two academic chiropractic teaching clinics in South Africa,the second clinic is located at the University of Johannesburg (UJ) in Gauteng which provide a service to the general population (Schirmer 2019: 40). The researcher obtained permission from the Research Director at the DUT to allow for students to participate in the study and the Clinic Director of the CDC to the use the premises **(Appendices 2a and 3a).**

3.4. POPULATION

The study sample was 12 fifth year registered master's degree chiropractic students who were clinically active for a minimum of four months at the DUT CDC. There were 24 fifth year master's degree Chiropractic Therapy students in the aforementioneded population. Participants were not coerced to participate in the study, which accounted for the 50% voluntary participation. This study sample meets Terre-blanche et al. (2008:94) minimum standard.

3.5. PARTICIPANT RECRUITMENT

The researcher approached suitable participants and explained the purpose and nature of the study. The researcher provided the participants with a letter of information and informed consent (**Appendices 4 and 5**). An interview was then arranged with those who expressed an interest in participating. Participation in the study was purely voluntary and there was no incentive offered as stipulated in the letter of information and informed consent (**Appendices 4 and 5**).

3.6. SAMPLE TECHNIQUE

The researcher used purposive sampling, which is a sampling technique whereby the researcher's own judgement was used to choose the participants for the study (Robinson 2014: 29). Participants were identified by obtaining a list of the students who had been clinically active for more than four months at the DUT CDC from the clinic administrative staff. A final list of possible participants was then constructed, from which, the researcher contacted the participants telephonically to explained the purpose and nature of the study and establish if they were interested in participating.

3.7. SAMPLE SIZE

The minimum number of research participants required for the study was 10. Vasileiou *et al*. (2018: 3) stated that the sample populationof a qualitative study cannot be determined a priori as it is contingent on the developing theoretical categories. Data was collected until data saturation was obtained, and, therefore, the total number research participants who participated in the study was 12. It has been shown that there is efficacy and effectiveness in using similar sample sizes as there are lower demand in costs and greater speed of collecting data (Oppong 2013: 203). A similar population size was used in a study on the perceptions of new graduate chiropractors in their management of paediatric patients in the eThekwini Municipality the research used purposive sampling to select the the sample population (Frederick 2020: 32)

Data saturation is often proposed as an essential methodological element within qualitative research in health sciences (Saunders *et al.* 2018: 1894). Saturation in qualitative research is defined as a coding process in which no new codes or themes occur in the data collected (Urquhart 2013: 194). Therefore, a researcher would be factually confident when data saturation was reached, as to the degree in which the no new data does not repeat what has been expressed in the previous data (Saunders *et al.* 2018: 1895).

3.7.1 Inclusion Criteria

- Students who were registered for their fifth year of a Chiropractic master's degree and who were clinically active for a minimum period of four months at the DUT CDC.

3.7.2 Exclusion Criteria

- Participants who were not willing to sign the informed consent form (**Appendix 4**).
- Chiropractic Therapy students who were in their fifth year but did not complete their four month clinical exposure at DUT CDC.
- Chiropractic Therapy students who were in their first to fourth year of study at DUT
- Chiropractic Therapy students who were not registered with DUT

3.8 RESEARCH INSTRUMENT

Demographic data were obtained using a demographic data sheet (**Appendix 6a**). The research instrument used in this study was a semi-structured interview guide (**Appendix 6b**), which was used to obtain information from the fifth year registered master's chiropractic participants during their clinical practicum at the DUT CDC.

There are different types of semi-structured interviews and each evaluate existing knowledge and the recognition of new knowledge (McIntosh and Morse 2015: 1). Semi-structured interviews solely focus on an individual's response (McIntosh and Morse 2015: 2). The process of the semi-structured interview was structured in order to determine and document the different types of management protocols; the prognosis of treatment towards elderly adults; the response of the registered master's degree fifth year chiropractic students and the amount of time spent with an elderly patient (Hawk *et al.* 2017: 226). The semi-structured interview was designed to obtain the management information pertaining to the elderly patient's co-morbidities, chief musculoskeletal complaint, referrals and number of follow-up visits and toward patient education (Dougherty *et al.* 2012: 1).

3.8.1 Developing an Original Research Instrument

Semi-structured interviews are conducted to gain knowledge of an individual in relation to an experience or the phenomenon that they have encountered (McIntosh and Morse 2015: 1). The conversation between the researcher and the interviewee consists of open-ended questions in the form of a semi-structured interview guide (Cridland *et al.* 2015: 78). The advantage of open-ended questions is that they are

often used to discuss many topics; they are modifiable, before or during the interview; they can convey empathy and build trust; they generate rich data and they allow for the understanding of participants' viewpoints, as well as their perceptions.

However, the disadvantage of open-ended questions is that they tend to be difficult to administer to a large sample group; there is a potential for respondent bias and socially desirable responses; the responses may be superficial, not in-depth, or non-comparable; it is difficult to analyse responses to open-ended questions and the at times there needs to be modification of the interviews to fit the developed themes (Harrison 2001: 333; McIntosh and Morse 2015: 2).

Qualitative research interviews are preferred when the researcher tries to understand the interviewee's subjective perspective of a phenomenon, rather than generating generalizable understandings of large groups of people. For example, a qualitative interview may lend itself well to exploring a patient's experience of illness or a clinician's conceptions of learning in the workplace (McGrath *et al.* 2018: 1002). Therefore, when structuring this research instrument, it was important to consider if the interviewer (who was also a student) was familiar or unfamiliar with clinical context, and thus she may have used her knowledge about the clinical environment, and thereby allowing the interviewees to discuss clinical issues more in-depth than if the interviewer was unfamiliar to the clinical context (McGrath *et al.* 2018: 1003).

Within the DUT CDC, the clinical learning environment has its own unique instructional offerings and standard operating procedures, and, therefore, it was decided that the researcher should create an interview guide with questions relevant and specific to the experiences of managing elderly patients at the DUT CDC (Ganesh 2017: 31-32).

3.8.2 Examples of Key Questions Used in Previous Similar Studies

1. How is the educational environment experienced at different points in time? (Palmgren and Bolander-Laksov 2015: 2).
2. Please describe how your clinical experiences have contributed to or enriched your understanding of chiropractic in terms of knowledge, skills, clinical application and leadership, specifically referring to your capacity to diagnose, treat and manage patients? (Ganesh 2017: 104).

Table 2: Facets of clinical experiences and questions

Question number	Facet of clinical experiences	Question
Question one	Perceptions of undergraduate training in preparation of the demands associated with managing an elderly patient	What are your attitudes towards the formative chiropractic training in preparing you for the demands of treating an elderly patient?
Question two	Elderly patient care in terms of management and the clinical environment	Can you describe the important perceptions that you have encountered during your management of an elderly patient?
Question three	Highlights of managing an elderly patient during the clinical practicum	Has there been any positive highlights in your experience of managing an elderly patient during the clinic practicum thus far?
Question four	Challenges and obstacles when managing an elderly patient during the clinical practicum.	Have you encountered any special challenges or obstacles when managing an elderly patient during the clinical practicum?
Question five	Suggestions to improve or enhance the management of an elderly patient during the clinical practicum for the future.	Do you have any suggestions to enhance or improve the experience associated with managing an elderly patient during the clinical practicum?

3.9 DATA COLLECTION PROCESS

3.9.1 Pilot Study

A pilot study is a study done on a smaller scale and it has several purposes such as testing a study procedure, validating tools and recruitment estimation (Arain *et al.* 2010: 1). The research process of conducting a pilot study consists of discovering if the research questions are understandable; having the initial interview questions reviewed by a knowledgeable individual within the field of study; progressing to the pilot interview and reporting any corrections to the interview guide (Majid *et al.* 2017: 1075).

A pilot study was conducted on two newly graduated chiropractors after obtaining ethical approval for the study. The pilot study was done to determine the participants understanding of the questions. These participants in the pilot study were not included in the main study.

There were recommended changes to the data collection tool (**Appendix 6b**). The corrections of the pilot study in question one were that the word “opinion” was added to question one and in question two, the word “aspect” was added to the question with removal of “do you feel the DUT CDC is well equipped to accommodate the necessary infrastructure for these students”.

3.9.2 Main Study

Participants decided on the time and the date of the interview. The researcher sent a text message reminder to each participant on the morning of their interview, detailing the time and venue of the interview. The researcher then explained the research to the participant so that they understood the purpose and use of the interview. Participants were thereafter requested to sign an informed consent form (**Appendix 4**) and read the letter of information (**Appendix 5**).

Before conducting the interview, the demographic data of the participants were obtained (**Appendix 6a**). Semi-structured interviews using an interview guide (**Appendix 6b**) were used to conduct the interview with each of the research participants.

Each participant was handed a copy of the interview guide so they could follow as the interview proceeded. Once the interview commenced, all participants were informed that all procedures from that point forward were to be audio recorded.

The participants were assured that they could withdraw from the interview should they have felt uncomfortable at any point. They were assured that the information obtained would be kept confidential. Only the researcher and research supervisors had access to the data obtained.

The research questions were then asked and the participant was given sufficient time to answer each question. The semi-structured nature of the interview allowed for additional probing questions to be asked by the researcher as the interview progressed.

3.10 DATA ANALYSIS

After the data were collected through audio recordings, the data were then transcribed verbatim into a Microsoft® Word document.

Thematic analysis was used to analyse the transcripts from the interview.

Only the researcher and researcher supervisors had access to the data that were collected. The data were then analysed using Tesch's eight steps of thematic analysis (Creswell 2009: 186).

These steps involved:

- Reading through the transcripts to get a general impression of the collected data.
- Writing down margin thoughts that emerged from the data.
- Making a list of all topics. Similar topics were clustered together. These topics were preliminarily organised as major topics, unique topics and leftover topics.
- Abbreviating topics, as codes, were written next to the corresponding segments in the data. Any other topics or codes that emerged were also written next to appropriate segments of the text.
- The most descriptive wording for the topics wasused and were they turned into sub-categories.
- Grouping together of the related topics and emerging list of categories.
- Preliminary analysis of data by assembling data that belong to each category from which themes would emerge.
- Existing data was re-coded.

3.11 ETHICAL CONSIDERATIONS

Ethical considerations are important in a research study for the protection of the research participants (Arifin 2018: 30). In a qualitative research study, ethical considerations need to be addressed as there is human interaction (Haines 2017: 220).

3.11.1 Ethical Approval

Ethical approval for this study was obtained from the Institutional Research and Ethics Committee (IREC) of the DUT (Ethics Reference Number: 075/19) (**Appendix 1**).

3.11.2 Autonomy

Autonomy is a principle that consists of understanding, intentionality and not being influenced by other individuals in self-determination decision making (Jahn 2011: 225). An explanation of the purpose of the study, risks and benefits, methods to ensure confidentiality, the voluntary nature of the study and the right of the participant to leave the study at any point were done prior to the interview commencing. The participants gave their informed consent before they were enrolled into the research study. All of the participants were able to make their own decisions without influence or coercion and no form of enticement or incentive was offered in exchange for participation. The participants were at liberty to withdraw from the study at any point, before or during the interviews. The principles of autonomy were stipulated in the letter of information provided to each participant (**Appendix 5**).

3.11.3 Non-maleficence

Non-maleficence is defined as a principle to not inflict any action of harm (Jahn 2011: 225). Participants were not harmed in this study. This was emphasised to participants in the letter of information (**Appendix 5**).

3.11.4 Beneficence

Beneficence is a principle that provides an action of benefits to an individual and balances the aspects of benefits and risks towards an individual (Jahn 2011: 225). This study benefited the master's degree chiropractic students and the chiropractic programme as it has aimed to provide a greater insight into the experiences and challenges of registered master's degree chiropractic students in their management of elderly patients. By doing so, the research findings, wherein challenges were identified by the study, can be implemented to improve aspects of the chiropractic education about the elderly at DUT.

3.11.5 Justice

The principle of justice entails the equal distribution of benefits, costs and risks among individuals (Jahn 2011: 225). Justice was taken into consideration as there was no discrimination in terms of age, gender or ethnicity in participant recruitment for this study, ensuring fairness. The researcher ensured that none of the participants were exploited or disempowered by the research process.

The participants were free to exercise their choice of their continued involvement in the study (Kaye *et al.* 2015: 141). Every participant included in this study was given a fair and equal chance to express their views and opinions.

No personal or identification details were made available on transcribed documents. To ensure privacy, all the data collected in this study have been stored in a safe facility at the DUT Chiropractic Department for a period of five years and thereafter they will be destroyed by means of deleting all files on the usb storage device and the of all paperwork will be shredded.

3.12 TRUSTWORTHINESS

Lincoln and Guba (1985) (cited in Loh 2013) developed clear guidelines to ensure validity and reliability in qualitative research. These guidelines consist of credibility, dependability, conformability and transferability.

3.12.1 Credibility

Credibility ensures confidentiality in the truth of the research findings was to ensure that there was no disclosure of information during this study and the correct interpretation of the data collected (Byrd and Winkelstein 2014: 248; Korstjens and Moser 2018: 121).

Credibility establishes whether the research findings represent plausible information drawn from the participants' original data and if it is a correct interpretation of the participants' original views. Korstjens and Moser (2018: 122) stated that investigator triangulation involves the researcher and the research team (supervisor and co-supervisor) in addressing the organisational aspects of the study and the process of data analysis.

To ensure credibility in this study, letters of informed consent were issued to the participants. Participation was voluntary and the registered master's degree chiropractic students could withdraw from the interview process if they wished to do so. Reliable research methods utilised in previous qualitative research were utilised during this research process.

3.12.2 Transferability

Transferability refers to the degree in which the results of qualitative research can be transferred to other contexts or settings with other respondents (Korstjens and Moser (2018: 122). The researcher facilitates the transferability judgment by a potential user through thick description. (Korstjens and Moser 2018: 121) stated that transferability concerns the aspect of applicability. To achieve transferability in this research, a description of the participants and research process enabled the reader to assess whether findings were transferable to their own setting (Korstjens and Moser 2018: 122).

3.12.3 Dependability

Dependability involves the researcher's evaluation of the findings, interpretation and recommendations of the study, such that all are supported by the data as received from the participants of the study (Korstjens and Moser 2018: 122).

The dependability provides the stability of findings over time. Korstjens and Moser (2018: 121) explained the strategy needed to ensure dependability is known as an audit trail, tracking the research procedure. In this study, this enabled the research supervisors to study the transparency of the research data.

3.12.4 Conformability

Conformability is the degree to which the findings of the research study may be confirmed by other researchers and is not an individual's interpretation of the data (Korstjens and Moser (2018: 122). Conformability is concerned with establishing that data and interpretations of the findings are not figments of the inquirer's imagination, but clearly derived from the data.

Korstjens and Moser (2018: 123) mentioned that conformability concerns the aspect of neutrality. The researcher needed to secure the inter-subjectivity of the data. The

researcher listened and relistened to the voice recordings to ensure that the interpretation was based on preferences and viewpoints.

3.13 SUMMARY OF THE CHAPTER

This chapter explained the research protocol used in this study and clarified how the research was conducted and analysed. The findings of this study will be presented in the next chapter.

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.1 INTRODUCTION

This chapter presents the results obtained from the thematic analysis of twelve semi-structured interviews with the registered master's degree, DUT, fifth year students of 2019 who participated in this study.

4.2 GENDER, AGE AND ETHNICITY OF THE PARTICIPANTS

The age, gender and race of the participants (n=12) is outlined in table 3. The majority of the participants in the study were females (n=8; 67%) and the remainder of participants were males (n=4; 33%). There was a diverse ethnic range that participated in the study with five Indian participants (42%), four white participants (33%), two African participants (17%) and one Coloured participant (8%). The age group of participants was between 23 to 29 years of age and the mean age of the participants was 25 years. Standard deviation of the age of the participants is 1.91

Table 3: Age, gender and the ethnicity of the participants

Participant	Age	Gender	Ethnicity
1	26	Female	Coloured
2	24	Male	White
3	23	Female	Indian
4	27	Female	Indian
5	24	Female	Indian
6	24	Female	White
7	25	Male	Indian
8	24	Female	White
9	23	Female	African
10	29	Male	White
11	26	Female	Indian
12	25	Male	African

4.3 THE MAIN THEMES, SUB-THEMES AND SYNOPSIS

There are five main themes and associated sub-themes that emerged from the interviews. These are presented in Table 4 together with their synopsis. Each theme is interrelated and comprehensively contribute to the ideas resulting from the registered master's degree chiropractic students in their management of elderly patients during their clinical practicum. The narratives of the participants were transcribed verbatim.

Table 4 Themes, sub-themes and synopsis

Themes	Sub-themes	Synopsis
Attitudes and opinions towards the management of an elderly patient	• **Students emotions and reactions** • **Theoretical gap** • **Practical gap** • **Clinician limitations**	The chiropractic students often engage with elderly patients during their clinical practicum. The emotions and reactions of the students have implications on the outcomes of a consultation. The chiropractic curriculum consists of both theoretical and practical knowledge which allows the future chiropractic graduates to obtain comprehensive experience that will help in decision making in private practice. The theoretical and practical components evaluates a chiropractic students' knowledge, skills and attitudes that have been acquired throughout the chiropractic process. A clinical instructor plays a significant role in the performance of the student's clinical decisions. The chiropractic students are consistently interacting with the clinic instructors. There are often times where students are restricted with time when it comes to recapitulating information of their treatment and management of their patients. Therefore, it is essential to discuss the various factors that affect the experiences, limitations and knowledge of chiropractic students during their clinical practicum.
Important aspects of the management towards an elderly patient	• **Home education for an elderly patient** • **Elderly patients conflicting problems (financial and associated co-morbidities**) • **Student expectation of the treatment of an elderly patient** • **Student preparedness towards the treatment of an elderly individual**	The chiropractic students are taught the importance of rehabilitation in the treatment and management protocol of a patient. However, elderly patients can be inconsistent due to the factors that implicate the process of their treatment and management. The factors often have to do with their lack of understanding or memory deficiency. The chiropractic students learn a geriatric module, that consists of learning the physiology of ageing and how elderly patients present with different co-morbidities that helps them in the preparation of treating and managing elderly patients. In essence, it is important to explore the basis of the chiropractic geriatric and rehabilitation modules and the effectiveness of how they have equipped the students in treatment and management during their clinical practicum.
Positive aspects of managing an elderly patient	• **Elderly patients' expectations, emotions, and experience regarding their treatment** • **The prognosis based on the response of treatment received by an elderly patient**	The chiropractic students had become acquainted in the treatment and management of the elderly patients. This added to their expertise in their clinical skills, which allowed them to get familiar with and produce the best outcome for the patient. Elderly patients do play an important role in their own treatment and management. Even though the treatment and management may be efficient, the mental state of an elderly patient in and their emotions towards the outlook of their treatment and management play a major role.

Table 4 Themes, sub-themes and synopsis Continued.

Themes	• Sub-themes	Synopsis
Challenges faced during the management of an elderly patient	• **History taking from elderly patients** • **Modification of the physical examination for elderly patients** • **Modification of treatment protocols for elderly patients** • **Comparison of elderly patients to other population groups**	Taking a history of patients plays an essential role in the outcome of their treatment and management. Many of the chiropractic students experienced that the majority of elderly patients became distracted or confused while they were obtaining information from them. The chiropractic students learnt a holistic approach towards treating patients during their clinical practicum. Often students go into a clinical setting for the first time and are not all able to adapt to any situation. There were difficulties in transitioning into the clinic environment and there were situations where they felt they lacked practical knowledge. The students need to be able to see the common differences they had noticed between the elderly patients and the other age groups they had encountered. They elaborated that they were able to facilitate diverse treatment programmes towards an elderly patient without any difficulties in comparison to other age groups.
Suggestions to improve the chiropractic clinical practicum	• **Advice to future students** • **Practical training**	In the DUT programme, all chiropractic students will get to experience or be involved in the management of elderly patients. Post management of elderly patients, chiropractic students believed that future students should manage the elderly timeously and have a warm demeanour towards them. The practical components of the chiropractic curriculum play a fundamental role in the development of a chiropractic student's skills. The module on elderly patients teaches students about the physiology and the conditions that the elderly population is affected by. The majority of the chiropractic students agreed on the lack of knowledge with regards to the elderly population and this decreased their ability to be completely confident in their management of an elderly patient. In their opinion, many of the chiropractic students suggested that the resources need to be revaluated to improve this module.

4.3.1 Theme One: Attitudes and Opinions towards the Management of an Elderly Patient

This theme contained four categories, elicited from a range of questions asked to the participants during the interviews. The participants elaborated that during the management of elderly patients, their opinions and attitudes placed emphasis on the emotions towards the management of elderly patients; the theoretical gap; practical gap and the limitations a clinician faced during the management of an elderly patient.

4.3.1.1 Students Emotions towards the Management of an Elderly Patient

The participants elaborated that it is vital to have practical experience when it comes to treating and managing an elderly patient as that would enhance and improve their

clinical experience. A few of the participants felt as if elderly patients should be consistent with their treatment and management to have a better outcome. The participants discussed the importance of their views towards the management of elderly patients in the following statements:

"They are very reliant on me and I think that is the major issue because I can only do so much and also you have to put in part of it- I feel like in the management of them, they don't do a part of it. They don't help themselves. I do not mean to sound rude and mean because they are old. But they do not help themselves. Yes, you have your grandparents that is a different relationship obviously I feel like we do not have that experience and especially the elderly lectures that we do in the module is not enough to give us that experience that we would need." (Participant 5)

"I would suggest: I feel like we do a lot of background and basis when it comes to an elderly patient. But you never get to the point of actually doing an adjustment or like I have said knowing how many treatments or if they should get maintenance treatment or how you should change rehabilitation programmes. I do not think we get taught the practical things enough." (Participant 6)

"I feel like the more elderly patients I see in clinic, the more better I get with management and it also helps with my confidence so I know if I have already seen three elderly patients like let's just say four times then I have another elderly patient come in; I feel like I'm a lot more confident in going in with my approach to that patient. So, I definitely think it gets better with practice for sure." (Participant 8)

"It is a positive feeling that you feel inside, not only knowing that you only treating normal people that have similar problems, musculoskeletal problems and also that you have the skill so that you can help the elderly patients with different skeletal problems." (Participant 12)

“I would say I have been enlightened and I do understand elderly patients more and in terms of knowledge. I feel like the module that we had learned has equipped me with the knowledge part of having to treat and manage an elderly patient. The only positive thing I would say to be very honest is that obviously I am getting experience it is not like I would not be able to work with elderly patients. I can tolerate it. I am forced to see these patients in clinic, I cannot turn them away. But at the same time, it is not something I have enjoyed. But the fact that it has provided me with experience to say that once I have seen the patient, I would know how to handle the elderly patient. How to treat them and manage them.” (Participant 9)

‘’They may be challenging which I like but there are challenges and difficulties. Maybe it comes with practice. It can be frustrating when you feel like you getting nowhere because you trying to do your best, and the patient is not able to do their part and they trying too they not doing enough or doing it correctly.” (Participant 10)

4.3.1.2 Theoretical Gap in the Management of Elderly Patients

The majority of the participants expressed their views that they do not have enough theoretical knowledge when it comes to treating and managing an elderly patient. The participants described the theoretical knowledge as limited and they said that they should be exposed to elderly education earlier in the chiropractic course. Having only one module on elderly patients only provides the foundation of the management which is required for elderly patients. When the participants were asked about the theoretical component of the elderly module, the following views were expressed:

“I feel like there is a base on terms on how to treat. So, I feel like we have enough knowledge in terms of treating elderly patients. However, I do not think it is sufficient. I kind of think that we need to be exposed to more information and in terms of care as well as more exercises. Because it tends to differ from your normal average individual.” (Participant 1)

"With regards to the theory of it, uhm I think that I would have preferred that we should have done the physiology of ageing and stuff a lot earlier in the course, may be third or fourth year. After you have done first and second year physiology. I would have liked that fifth year I feel like it should have included an in-depth lecture or discussion on how to actually interact with elderly people. Because their consults are very different from younger patients not just in the fact that they talk a lot. I think if I recall correctly it's kind of drills the diagnostic aspect of conditions and diseases. So yeah, I do not feel like the knowledge was lacking. Because we have done general pathology in third year, diagnostics in third year and fourth year." (Participant 2)

"Insufficient knowledge. I feel like I treated maybe about four elderly patients this year, which were all over the age of 70 years and the last one was 85 years old and I feel like we know textbook things. I feel like one module of geriatrics and paediatrics is not even one whole module it is half a module. Because the other part is other things. It does not give you enough clinical information. It does not give you face to face information and how to treat a patient and how to be with a patient, bedside manner with a patient. Even if you could tell / say how to approach an elderly patient in writing, but it is like when we do paediatrics, we have a baby there and how to do things. But we do not have an elderly patient there to actually do it." (Participant 4)

"I don't think we get taught enough to treat an elderly patient. Because we get taught elderly patients present in different ways and that it is complicated and that is where it stops and a lot of elderly patients, like that are struggling to walk, that cannot do the same rehabilitation. So, I don't think it is adequate enough." (Participant 6)

"I feel like the training we received for chiropractic for the elderly are quiet beneficial, we have been advised on how we are supposed to approach an elderly patient, be aware of the cancers and arthritis, just the general changes and the biomechanics to be aware of when we treat them and there is a lot more care involved and how you approach them in a different manner. It is mostly to do with the fact that changes can be very slow and I have to be aware of certain things that I cannot change like

example: stroke patients, you can help them with certain types of pain but there is a lot that you cannot help with like the side effects of the stroke that they had." (Participant 7)

"Okay so how it has helped me. First of all when you learning about the elderly it is all about understanding with an elderly patient as compared to a normal everyday patient and that knowledge has taught me that elderly patients may present with one pain but also at the same time there is a whole collective aspects that they also have. So, it is not directly one pain. Yes, we have the knowledge of an elderly patient and how they present. My answer to that is it would be more beneficial to us if we could see more elderly patients to experience and have that skill." (Participant 12)

"We very briefly cover the most important stuff/things with regards to the elements that are most commonly seen in the elderly patient. Look considering its only part of one module and there is not enough space, time or credits available. They do a lot with what space they have. But I feel like that is not extensive enough considering the multifaceted aspect of geriatric medicine. What I have learnt in the last five years, I will probably be better prepared for example: draw from third year posture and gait and information then fourth year nutrition and rehabilitation and then fifth year musculoskeletal conditions and the diagnostics of it and then be able to treat these things. I sometimes miss the mark and I think it will come with practice." (Participant 10)

4.3.1.3 Practical Gap in the Management of Elderly Patients

The clinical practicum of healthcare students is a critical aspect of their career. When the participants were asked to emphasise the clinical practical aspect of the elderly module, there were conflicting views on the knowledge that was gained and the clinical application of the knowledge. The views towards the practical aspect were as follows:

"So, I would not say we have had adequate training when treating an elderly patient. Because if you look at it from manipulation or adjustment perspective. Like we have done so many different adjustments just for lumbar or thoracic spine or cervical

spine for instance. But with regards to learning mobilisation in elderly patients where most of the adjustments are contraindicated. So yes, I do not think we have focused on mobilisations as much as we have for adjustments, just range of motion, mobilisation for the spine-cervical spine and specifically the drop pieces." (Participant 2)

"In all honesty I do not think we have been prepared enough. Because we come into a clinical situation. Yes, elderly patients according to the notes you take more time. This is our first year in clinical training. We do not realise the amount of time needed and how distracted they get. I am sure there should be a mock-up if there need be when you come in." (Participant 4)

"The application of the knowledge and skills. I, myself/we do not have the skills to apply what I know. But I have that knowledge. Like I know it. I know what to expect and what to see. I just do not know how to apply it to an actual elderly patient. Because we not going to be learning anymore things here. Our academic syllabus is over. But we have to see more to experience it and there is no way that they can give you only elderly patients just so that you can experience it. But I feel like I need to see more elderly patients." (Participant 5)

"Management is adequate knowledge, what you receive in the elderly module is no. So I was just thinking now that I have a patient with severe osteoarthritis and severe scoliosis and I think and important aspects that we should know in the management of a patient is in the elderly how often are you supposed to see them, how often can you see them and what should you be doing for them and we do not get taught this. They need to enhance and improve the experience with what we get taught or actually the experience we get from treating them." (Participant 6)

"I think practically we don't get taught enough. So, I feel like an objective structured clinical examination (OSCE) and competencies there should be sections for like how to treat elderly patients. You do have that elderly patient that comes in but I feel like

we not guided enough so I think we should definitely get taught a lot more practical stuff like the basic things like how to move a patient, I definitely think we should get taught more about." (Participant 8)

"Yes, we do have the knowledge but in terms of the skill. I think we still need to have a better exposure when treating an elderly patient. It is hard to know if we have the right skill to treat an elderly patient. Because you do not see as enough elderly patients in this clinic. It would actually be more beneficial to us if we could see more elderly patients to experience and have that skill." (Participant 12)

"But having to treat those patients from the beginning of the year and only starting the elderly programme in that year means by the time we get to the end of that year. We are learning about stuff we should have already known before we started treating elderly patients. The perfect example: I had no idea what nystagmus looked like, I knew what it was academically but I have never seen it in a patient and the first time I thought I had seen it, I explained to the clinician and they said no, that's not it. It is a spasm that is the kind of thing." (Participant 10)

"I haven't really had a challenge with treating elderly patients. Why I say that? It is because it is only what I may have thought could have it like if they had an underlying pathology, where I had to refer them out. So, it was not anything more necessarily that I could do. Just practicing here takes a lot from you. Just knowing that you know you cannot do everything." (Participant 11)

4.3.1.4 Clinical Instructor Limitations

During the semi-structured interviews, the participants delineated that they were limited to a clinical instructor and they did not have enough time to engage in further information from a clinical instructor's experience or point of view in a clinical setting. The participants described their emotions towards their interaction with the clinical instructors in the management of elderly patients. Two of the participants responded as follows:

"The elderly patients consults are very different from younger patients. It is not just the fact that they talk a lot but a lot of them do take different kinds of medication for blood pressure and then I take their blood pressure and it is like 156/98mmHg and a lot of the clinicians are not guiding you as to what you should do, especially if there is a lot of people standing behind you, waiting to see a clinician and there is only one clinician on duty and you have an in-depth case to discuss with them and you really need advice and sometimes that is not always the case, that you would get that time or advice that you need for that specific patient. So yeah that is also an aspect that could be addressed." (Participant 2)

"You rushed back and forth with the clinician. It is really disheartening when you feel as if you left out certain things. We do not actually know what we are looking for even though if something comes up as scary. We freak out a little, when you go to a clinician and be like please help, we do not know what this actually sounds like in a clinical setting like here and I do not really understand what is going on. There are clinicians who are really helpful and knowledgeable as they guide you in the right direction, but then you get the odd individual that does not help you or does not know how to help you." (Participant 4)

4.3.2 Theme Two: Important Aspects of the Management of an Elderly Patient

While speaking about the management of elderly patients, the participants' interview responses often referred to the important aspects of home education for an elderly individual, their emotions and preparedness towards the treatment and management towards an elderly patient and the conflicting issues that are associated with an elderly patient during their management.

4.3.2.1 Home Education for an Elderly Patient

The participants narrated the significance of home education given to the elderly patient at a consultation. However, the feedback received elaborated that many factors associated with the elderly affect the home education process, such as the elderly person's home situation itself, the detriment of their memory and inadequate participation in the home education. The participants explained the concepts of home education in the terms of managing an elderly patient as follows:

"Your treatment protocol will change. Because if an elderly patient loses balance and you give them exercises that requires them to stand, then it is also going to lead to more harm. It also maybe will assist in terms of looking for a different diagnosis that could be linked that may change your treatment protocol completely." (Participant 1)

"I have found that with elderly patients in regards to the management, a lot of it actually has to do with rehab and not a lot of them want to do rehab or actually do the rehab when you give them exercises or stretches to do. What I have noticed is that a lot of my patients live in elderly homes and the staff there, according to the patients are not willing to help them do their stretches in the morning or in the evening and I feel like that was an important aspect. Trying to get them to do it on their own, but firstly just trying to get them to do it or to at least try to understand the importance of it." (Participant 2)

"You would give them like if they have a headache-they should also check their blood pressure, have they eaten, have they been sitting in the sun all day or are they focusing on something else and stressing themselves out. By eliminating things that they know. Teaching them what can make their blood pressure high or what aggravates their blood pressure or headaches. Advice would be to exercise. Primarily to look at their living conditions and when we give them tools as to how their management tools and home exercises are, they are actually able to get up from their beds comfortably or their chairs." (Participant 4)

"Elderly patients tend to forget that is the main area is that you will tell them, if you are going home to do either stretches or for example: apply a heat bag. They will tell you 'yes yes I would' but then at the follow up, have they done what you actually ask them to do, then there is sometimes where they would be like 'no I forgot'... When you explain something that you wanted them to do or they doing it according to their own understanding and at the same time it is not the way you were expecting the patient to be doing the whole management." (Participant 12)

“I would say in the management that it can be very tricky because you cannot give them a lot of things all at once. Especially when it comes to treating. One- they not going to remember every single one of them. Two- They probably would not even have the strength or capacity to do all those things compared to an 18 year old.” (Participant 9)

“I learnt that I need to start writing down my take home stuff for them and just like step by step because they tend to forget, or they forget how to do it exactly. So just making little lists saying this is what I want you to do whenever you remember when you do it. It is the small little things.” (Participant 10)

“I had a patient that was paralysed from the down. I showed him a lot of lifestyle changes just to help him without getting any bedsores or just moving around just trying to strengthen the muscles that do work for him. So, in that aspect it was quite important with managing that patient in a particular manner.” (Participant 11)

4.3.2.2 Elderly Patients and their Associated Co-Morbidities

The participants elaborated on the importance of the co-morbidities related to the management of elderly patients. The students still felt nervous of what they could possibly miss in the management of elderly patients. There were similar responses in the conflicting problems encountered in the management of elderly patients as seen below:

“*A lot of the cases are where a patient has been mismanaged to an extent where they have six or seven other diseases and they are taking different medications for the same condition and it is impossible to address even two of those aspects during a three hour visit. You get to a point where you have to make a decision whether you going to address every single thing with the thoughts at the back of your mind. So, you kind of move towards deciding to deal with their pain and their symptoms.*” (Participant 2)

“Due to polypharmacy an individual could misdiagnose an elderly patient. With the management and treatment, I have learnt with a few that they so much more willing to try. With treatment protocols and the demands of the elderly patient. It is taking into consideration the medication, because I know there are some individuals that do not carry around a list of medication that they take and at times when we treating them and we do not know if they have taken their medication and their blood pressure is sky rocketed or it is managing them adequately but we doing the best that we can.” (Participant 4)

“*The challenge is how chronic their conditions are. How long do they have it? They do not just have one or two complaints, but having many complaints and being quite negative and saying ‘I am just getting old’, it is just what it is. It has not affected my treatment towards them, I still treat them the same way as they have those challenges.*” (Participant 6)

“*Because of the extensive history that they have in regard to hospitalization, injuries and the changes of how they react to medication that they on and we have to be aware of the medication that they are on. We have to be aware of their memory and their state and who they are, who they live with and their nutrition. We have to be aware of certain red flags and they can be much hidden as well, I think that is really all I have noticed when it comes to an elderly patient.*” (Participant 7)

“*Elderly patients are fragile. It is not just only this is my pain here; they are incorporating everything else that causes them to have the pain. They also include their social aspects into it so it is not like fix me here, so I just want to go with this. So, they have to explained what is happening so I know I can spend a lot of time with the patient also certain treatments and procedures do not usually work for them (the elderly) as best as you would like.*” (Participant 12)

“*Yes, there was a lot of challenges with an elderly patient. The first thing is the comorbidities that they present with, you know it is just too much. From diabetes*

mellitus, hypertension, hypercholesterolemia, some come in with heart conditions, then they on certain medications which it makes it more impossible for me to treat, then there is arthritis which means they have pain everywhere. Because an elderly patient seldom comes in with a problem that will say that I have pain in my right knee it will be like I have pain in my knee and my other knee as well the pain then it comes to my back. There is a lot of comorbidities, a lot of things that work together which makes it a little harder for you to treat." (Participant 9)

"*Well again it is going back to if you have to consider the fact for example: Parkinson's is significantly common and Alzheimer's in terms of elderly patient. We cover those very well, but we cover them later in the year. Because you start worrying about did, I miss any red flags. I find it as a positive difficult and there are others like polypharmacy, dementia, financial restraints those are huge challenges in this field of patient care. Because there is so much going on and it is easy to miss something or overlook something and you have to be careful not too and it is tedious to constantly go back and be like you not missing anything.*" (Participant 10)

"*A lot of them are quite depressed about their illnesses itself that you as the student will notice a change and they do not see the change in. As much as there is a change. So, it is a lot to do with their mind-set. A lot of patients were on medications for years and just because of musculoskeletal issues and now they off their medications which makes them feel a lot better and so I have a good response from my patients and they very compliant and I do see a different with them. It is unfortunate with a lot that we could not help because of the underlined pathologies, they still come in for chiropractic treatment regular together with other professionals.*" (Participant 11)

4.3.2.3 Student Expectation of the Treatment of an Elderly Patient

The majority of the participants did not have any ill feelings towards the management of elderly patients. The participants felt they needed to be more involved in the management of elderly patients. The participants had the reassurance from the module they had studied and their practice in clinical settings,

that they did have the ability to manage elderly patients. The following expresses the participants' encounters that they had experienced during their treatment protocols of elderly patient:

"In clinic you learn how to manage a patient using modalities and when you go out into practice, you may not have that and then you faced with those challenges. The whole idea of the university is to produce the best students possible and I do not think that happens when there are certain adjustments that are contraindicated and all you get told is to use ultrasound or use modalities I feel like that is what is being indirectly conveyed to students by giving advice like that." (Participant 2)

"In terms of management. I have done similar management for the patients. Because most of them presented with musculoskeletal issues. All of the responded well for treatment and I do feel like the way we were taught has prepared for dealing with elderly patients but there are life skills you need to learn when dealing with them. Sometimes they respond favourably to your treatments and sometimes they have one or two side effects like muscle soreness as well as delayed muscle soreness. But I found that it is not that difficult to manage an elderly patient." (Participant 3)

"Because elderly individuals you need to do that rolling protocol where sometimes it is not just what you do it is how you do it and how you speak to the elderly individual. I am one of those basic individuals where, when an individual comes in with a headache, we going to look at the basic things like what attributes to a headache and lower back pain for example. I am not that treatment person that will go over and beyond a patient's comfort zone. I will go bare minimum and see if that works and then gradually as the pain reduces or it does not reduce, add other treatment methods and that has actually helped quite a lot with patients." (Participant 4)

"Like whilst I'm treating elderly individuals at clinic, so I am like here do this and let me do it with you so that you know it is not hard and they just have to do a little. But then even that little bit is not done. Because when my patient came back, and I asked her 'did you apply ice' and she said 'I didn't have time, or I didn't have any ice. So when she comes back in again she is in more pain so I am like you did not do anything that period of time, which is a week-long so you did not do anything that I told you to do, so obviously there is going to be a reoccurrence quicker." (Participant 5)

"So also the fact that you can also help them and it changes your skills to benefit an elderly patient and that is also a positive aspect and it encourages you and it gives you a set of reward, like you not only helping your average patients. You can also reach other demographics and aged groups and you can actually modify your techniques to bring happiness to the elderly patient as well." (Participant 12)

"Because I have said that I have had a lot of elderly patients and you need to spread the treatments out. I do not have that patience personally and you have to be patient. So, I would not say that all of those things I really like, is a positive." (Participant 9)

4.3.2.1

4.3.2.4 Student Preparedness towards the Treatment of an Elderly Patient

The participants responded favourably towards their preparedness of the management of elderly patients. The participants hoped that the experience that they had attained was sufficient to aid the management of an elderly patient. However, they stated that the majority of their skills were the strengths that they had developed in their life. The views of the participants are stated below:

"Yes, I do feel like I would be able to handle elderly patients when I have my own private practice. As I said there are life skills that I would need to develop based on each patient, example: a wheelchair patient, then you get someone who is fit and healthy or an elderly patient who is very sickly and that cannot move. I will have to

adapt myself, but the knowledge behind elderly patients I feel like I am quite comfortable and quite confident." (Participant 3)

"In all honesty, no I do not feel prepared at all as adequately as I should. Primarily due to cause we do not see as many elderly individuals in the clinic. When we go to do community service it was at Ubantu, it was purely elder individuals and being put in that position was slightly more enjoyable. Because you had individuals you could treat and that were willing to get the treatment and you have things like electrical modalities because these are things that we could work with because these elder individuals do not have these things." (Participant 4)

"No, I do not feel prepared to manage an elderly patient. I feel like if I had to qualify in this moment right now, I do not think that in private practice that I would be confident to treat an elderly patient by myself. Because I do not think I have enough clinical skills or clinical experience. I do not think I have seen enough of elderly patients to treat one by myself. Like here in clinic it is okay because I know okay there is a clinician there." (Participant 5)

"Yes, I do feel like it has prepared me for managing and treating elderly patients. I feel confident to work with elderly individuals when I go into practice and I do not think they would be a problem. With regards to the diagnosis and managing elderly patients. We have given a good understanding of what to look for with regards to them like we generally have to start with, having a good idea of what is happening to their systems and then having a good understanding of what their income is like, what they may be experiencing at home so that we know how to approach the." (Participant 7)

"Yes, I definitely think I am prepared. I think working in the clinic like if we just did the academics than definitely not. But working in the clinic and engaging practical experience. It definitely has taught me a lot and I feel like after my sixth year, most

likely one and half years working in the clinic. I will be confident enough to go out into private practice." (Participant 8)

"Yes, I do feel that way as just as I was saying I do feel competent with things. I have experienced myself not just things I have been taught. Like the things I tell my patients, the patient's responds to those are the things that are going to work together properly. To allow me to be competent enough when I leave here. I will not feel scared or intimidated I know what to do. Maybe I will learn more tricks when I'm done. But I feel right now if I would get an elderly patient in practice, I will be totally okay with it." (Participant 9)

"I think based on the limitations of the programme they do, do a lot. But I think in a perfect world for us chiropractors we need the ability to do what medical students do, they in hospitals from the beginning to the end. They see the pathologies for everyday for five years and when they finished that they then get to work for two years. I think that we learn a lot, but we do not get to see enough of these pathologies to deem competent to go into private practice." (Participant 10)

"They have prepared us. We spend a lot of time learning about the elderly and we get a lot of practice with it here at clinic and outside at different community events. So it has taught us a lot about the different conditions that come with and elderly patient and some of the normal changes with aging and that can also sort of contribute to one of the conditions they suffer with and how we manage them. It has I feel pretty confident when I'm with my elderly patients." (Participants 11)

4.3.3 Theme Three: Positive Aspects of Managing an Elderly Patient

The students described the prognosis of their management of an elderly patient and how they had to adapt their treatment and management protocol accordingly. The participants also highlighted that many elderly patients engaged in their views towards the management they received.

4.3.3.1 Elderly patients, Expectations and Experience Regarding Their Treatment

From the clinical experiences that the participants gained during their consultations with elderly patients, they perceived that elderly patients were very appreciative of the management the students gave to them. Two of the participants felt that the entire progress of the consultations solely depended on the elderly patients' attitudes towards their management. The participants expressed both the positives and negatives they experienced, as seen below:

"So, the most important things that I have noticed are just my patient's well-being, the way that the patient sees themselves and themselves in respect to the world and how they feel to themselves. Uhm as well as their general demeanour. Things like are they disheartened about life, are they suicidal, are they positive. How is that mind-set going to help them in general processing of things and if they actually going to have a positive outcome of the treatment. By reducing their pain or movement they are so much more grateful. We here to understand and educate them and give them the tools and when they walk out, and they smile or give that really awkward hug to say that because they are so much grateful." (Participant 3)

"I think after all that I treated was a good prognosis. It is the idea of you here, you going to sort this out for me, and I do not have to do anything else. Thereafter, they would have a flare up with pain and then my patient went to take her sisters medication. Because and I was like 'come now' like she had two-three days of no pain, because she was feeling all great and then the following day, she took it for two days. She did not take it for the third day and then she just suddenly had a flare up of pain and then she complained that everything was sore." (Participant 5)

"I have received it from other patients as well. But I do find it quiet common in the elderly patients is that: how do I put it, they can be quiet bossy and demanding at times where let's say they have received specific treatment from a prior chiropractor or physiotherapist so therefore they expect the exact same and let's say I do not have that same approach. It does affect your management." (Participant 8)

"It really just depends on that patient. You see the progress, you will see an increase in range of motion, you will see that there is not many limitations but for them it's like they not getting better. It is more mentally challenging thing that they not getting better. So, it just depends on their attitude and just trying to change that around and once you feel like that, they are worth it, and we try and help them then they get along better. Once the attitude changes, you actually see their physical wellbeing. It helps them mentally and physically to improve themselves." (Participant 11)

"This has a lot of factors that come into play. So, you might be treating one specific area of their pain and they might be better but now you have to incorporate new areas that we have not touched on. For them everything works as a whole. Like fix me now. Fix everything." (Participant 12)

4.3.3.2 The Prognosis Based on the Response of Treatment Received by an Elderly Patient

The participants explained both their positive and negative attitudes that they encountered during their management of elderly patients. The majority of the participants had beneficial outcomes, even though the prognosis was slower than what they have experienced with other patients, as reflected below:

"A lot of them have responded well. So you kind of have to prepare beforehand and know what you going to say to them and how you are going to say it, especially with ones that have hearing loss and cannot see so you cannot give them written stuff. So, you have to physically do it, like I use the teach back method I explain something to them, and I ask them to show me what I have told them. When you do your orthopaedic testing, the test have resolved and you're functional testing has improved but they still say that their pain is at the same level." (Participant 2)

"I think I had my first elderly patient in April 2019, which was quiet soon into us starting clinic and being in the clinical setting for the first time and managing patients. I was terrified but when I saw the outcome of being patient and perseverance into

getting the patient from a 10/10 to a 1/10 and telling them that they do not have to come back for treatment or continued care that to me was the most positive highlight that I could a patient respond well to treatment, to see them being able to move and not being in pain anymore." (Participant 3)

"Management is something that I struggle with and honestly it is the most uncomfortable. Because they come up with all of these different things, they fall, they wobble, their medication that may just have an awful affect and having this knowledge to help them holistically is a bit upsetting." (Participant 4)

"This older individual was finding it difficult to get out of bed and now can get out of the bed that is a big improvement/ major improvement. Because it is a major part of what they are doing in the day. Because they not doing anything else in their day, you can improve parts of their day/ daily living, you feel like uhm, I have accomplished something and they are very sweet and they are nice to you." (Participant 5)

"There has been good prognosis and there has also been prognosis that were slow like there has not been as much recovery as I would have expected, they do know that they need to be worrying about their problems and they would come back. They put effort in taking care of themselves." (Participant 7)

"I just think overall treatment and management with elderly patients is a bit slower and also like the complaisance is not so good because you will ask them did you do this and did you put an ice pack on and they will be like 'no I was too sore' or like did you go for your walk 'no I was too tired' so it is just like things like that kind of slows down your management. However, I think after my second elderly patient I learnt a lot and now I know I need to change my treatment and management protocol." (Participant 8)

“That patient that I have been seeing in the clinic have responded. They have seen some responses from the time I have saw them, initially to the follow up. They have said that they have been responding but like I have mentioned for them, they say they might feel okay today and at the second follow up, they might say no that they not feeling better or okay anymore.” (Participant 12)

“The first time I had an elderly patient. I obviously did not know what I was getting myself into, so I gave them a lot of things at once. So, the patient came back in even more pain cause imagine they were sedentary all this time and I gave all these activities to do, then he came back with even more pain. I was like maybe I need to reduce the amount of exercises that I give him to do so after I started spreading it out. He started responding positively towards the treatment and management”. (Participant 9)

“Some of them very well, where some of them not so good for example: one lady could only come in twice- she had relief but I did not know much more of that and she has not come back to the clinic at all for the rest of the year, she just cannot afford too. But it seems good. Other ones have been consistently and seemingly they are happy with the progress that they made. Well I am happy with the progress that they made. The ones who have been consistent have made a difference.” (Participant 10)

“I have had a lot of shoulder patients with adhesive capsulitis where they would not even be able to reach up and comb their hair. It really depressed them because they could not do just normal activities like cooking and making their beds was an issue and within a few treatments and stuff they were pain free and range of motion. They were able to comb their hair, cook, make their beds and bake. With just strengthening and stretching and stuff they did not have any reoccurrence. So, I have had a quiet good positive feedback from my patients despite them being older and having degenerative joint conditions in them.” (Participant 11)

4.3.4 Theme Four: Challenges Faced During the Management of an Elderly Patient

The approach in the management of an elderly patient varies from each student. The chiropractic belief is that each elderly patient needs to be treated uniquely and according to the case with which they present and, hence, there is no set management protocol towards an elderly patient. The students described the best approach that they had encountered upon a consultation with an elderly patient.

4.3.4.1 Case History Taking of Elderly Patients

The participants explained that they found the history taking of an elderly patient to be time consuming and unfavourable, as they struggled to get the necessary information from elderly patients. They felt that elderly patients' memory deficits, as well as their emotions, played a big role in the history taking. These were the comments that the participants had towards the history taking in the management of an elderly:

"So, with clinical experience, elderly patients do not report every detail. They think that it is a normal ageing process. So it has actually made me become more aware of actually probing and asking further questions in terms of like oh no, I just lose my balance occasionally but that is normal with ageing so then I will ask can you recall when it happens when you lose your balance. So, in that regard it is a more holistic approach, you just have to sift out the important details, just in order for something that you are looking for. So yes, that does take a whole lot of time." (Participant 1)

"I feel what was a challenge was the patient withholding information due to fear and being judged by the student so in facing those obstacles, I had to make the patient feel comfortable enough around me to get them so that they could be opened enough so that I could get to the bottom of the problem and treat them accordingly." (Participant 3)

"They are nicer than other people like they like making conversation and conversation which can be a good thing or a bad thing, cause, they make a good

conversation. They want to know more about you. They want you to speak to them, so it is nice and then some of them do not want to speak to you, then like the entire time is quiet, because it is awkward. But then when they are talkative they want to know about you and your family and where you from, what you studying and how you want to go out and where you want to practice and they will give you their aspect and their children and grandchildren." (Participant 5)

"So first of all you have to listen to their story and also have a little bit of empathy and sympathy towards their story that they are old they do not have family, they do not have money at this age or the retirement- pension fund. So, you have to treat the whole psychological aspect of the elderly patient and not just the physiology aspect." (Participant 12)

"A few of them have taught me that I have to delve down deeper of what they eating and trying to apply that in dietary kind of thing and knowledge we have developed because for example: I have had an elderly patient that is a vegan and she does not get enough protein she knows she does not but she does not know where to get it from. So, you have to offer advice and help them work to find things that they like to eat that, and you can incorporate it into their diet and is feasible for them." (Participant 10)

"It just depends on what exactly the patient comes in for or with because each patient is different. It is just with an elderly patient that we have been taught to take more time like the case history itself gives us a lot more information from that. So you need to explain to them about a condition or breaking the news to them also with them you need to be like very straight forward and say listen this is what you have, this is what you need to do in order to benefit yourself in order to obtain optimum health and just making sure that they compliant with it and explaining the need for them to get the treatment or nutrition, help or change in diet. Just explain the necessity as to why you are doing it." (Participant 11)

4.3.4.2 Modification of the Physical Examination for Elderly Patients

The participants learnt that the physical examinations they performed were not as straight forward for the elderly as how they were taught during their undergraduate years. They established that they had to alter and clinically apply themselves in different clinical situations, in order to get the most accurate and ultimate diagnosis/es for the elderly patient. The participant's views are presented below:

"They take a lot of work. They have taken a lot of work. They are always nice to engage with. They always have something positive to say. So, my patient came in severe pain so with the orthopaedic test you have to also take into consideration the pain. Yes, you want to perform all the orthopaedic test to get the most accurate diagnosis with the case history. So yes, there are times where you have to alter the way that you test. So yes, that can sometimes be challenging because you not always going to get a true positive." (Participant 1)

"So, with my elderly patients I have also scheduled more time for them. Because they are not as quick with moving around, they also need a lot of assistance getting onto the bed whether it is the examination bed or the treatment bed. The challenges I have encountered were definitely decreased mobility of the patient. There were times where I would have to get a foot stool for the patient to get onto the bed. Because they were physical incapable to do so. Also, the patients require a lot of help and assistance and time towards it. There were physical challenges in tiredness, giving the person time to rest after doing something like an orthopaedic test." (Participant 3)

"Then also in the room when I am doing the physical examination, getting my patient onto the bed and then I needed to get the stepper before and I did not think of this first hand because she is quite short and she could not move around. Like moving my patient into different positions and trying to get them to try and do somethings in a systematic way, where they have to move the least. I think that has been the major thing for me because like I did not think she would need a stepper or do all the orthopaedic test prone". (Participant 5)

"So, the very first thing I have noticed when treating an elderly patient is you need to have a lot of patience. They require a lot of attention and they require a lot of patience. Because you need to actually listen to them, and you know sometimes because of the normal physiology that occurs with ageing. They tend to take longer with certain things like understanding and just talking and relying information to you. I would say in the management that it can be very tricky because you cannot give them a lot of things all at once." (Participant 9)

"It's just them wanting to speak. It is also them getting from the bed to chair or doing any of the physical examination. You want to take your time and realise that they not going to be quick with those things. Other than that treatment is fine." (Participant 11)

4.3.4.3 Modification of Treatment Protocols for Elderly Patients

The participants had to understand that although many elderly patients presented with similar musculoskeletal conditions, each one of them required individual and idiosyncratic treatment and management plans that the participants had to provide to be suitable to each individual patient uniquely, according to the clinical situation with which they presented. The participants found this to be a growing challenge towards their clinical preparation. The participants discussed the importance of the modification of their treatment protocols towards the elderly patients as follows:

"I had two patients where I went home after treatment and kind of collected articles and watched different kind of videos and scanned previous work that we covered and like in third year and fourth year. So, getting advice from different clinicians and the different videos that I watched kind of formed a picture of how I wanted to perceive this patient. The thing I did different was the way I handled myself in the clinic room - where I was not as formal (I cannot describe it), more socially trying to connect to them on their level. Just trying different treatments, not controversial treatments. Just modifying treatments that we have been taught to suit this patient. I think students also need to have a clear understanding or picture of an elderly patient that they would be seeing in clinic." (Participant 2)

“So, you have to be quite slow and clear and not use complicated terms when you talking to the patient. It is about how you approach the patient. So clinical experience and time management was a big factor that I found and also you have to be quite slow and speak clearly. But treating you have to be quite gentle in your approach, slow in your approach. You have to explain things in layman’s terms so that they can understand what you are doing and the benefits of it.” (Participant 3)

“The effect on the management and treatment I had with elderly patients. So like some of the test I could not do because I did not know how to place them and I would have to get some guidance from the clinician on what I should do or what was the best way to position them So I think in terms of management. I do not think we learnt how to manage them in a way that is suitable for them and not just the way we do it in a certain way and how we want to do it in that way.” (Participant 5)

“But I do not think we get taught enough as to how to treat elderly patients and how to adjust your treatment program. So, for instance I had this patient that came in and she complained of like just general stiffness and she said it felt like rigor mortis. But the clinician said it is just because she is old, so she just has to stretch. I was like okay. I feel like we do not have enough experience and I just think we do not get taught enough. So I had never used the impulse adjuster, so I used that, uhm a lot of traction which I do not usually use A LOT of stretching which I just give as exercises for other patients but I do it for the older ones.” (Participant 6)

“I think my treatment and management is good, uhm... Sometimes I find that the patients think I am too vigorous and harsh. So, I definitely had to take a step back. You know so that definitely taught me a lot. It also taught me that I have to try and explain to them and you can see that they are not happy about that… uhm… so that can sometimes be challenging. But the main thing is to treat them holistically.” (Participant 8)

"If you are doing certain adjustments and also you do not want to put in - if you thrust, you not putting much force into the elder patients as you would to a normal patient. So, it is kind of that mind-set that I also have to be vigilant where there is an elderly patient. I remember I have had an elderly patient and they need their time, cause, they do 'how can I put this' like tasks. So you have to ask them if they really, really do understand what you talking about can you show me, can you understand what I have just told you and you can see if they actually understand that but they are doing something different." (Participant 12)

"I find that frustrating under the circumstances and the approach that you take you have to be softer, ever so slightly change it and there is ligament laxity for example: rheumatoid arthritis. It is kind of the same principle, you cannot use these techniques that you have learnt that is so effective, and you have to try another way to achieve the same thing that can be challenging." (Participant 10)

"I have also had a lot of elderly patients where I could not do a lot of chiropractic treatment it was more soft tissue therapy with them but just in terms of their conditions itself that was just relevant enough so not everyone was the same and each condition with each of the treatments you just modify to with what works best for that patient." (Participant 11)

4.3.4.4 Comparison of Elderly Patients to Other Population Groups

The participants compared their elderly patients to much younger patients. They felt that they presented completely different in comparison to one another and, therefore, they felt that younger patients were more compliant to what they had to say, as opposed to elderly patients. The views of the participants towards this are described below:

"You gonna sort this out for me and I don't have to do anything more, even though that is what all the patients want, I feel like younger patients are more likely to go

and do it and maybe it is because they do not have time or they do not have anyone to help them do stuff." (Participant 3)

"So, I find with the management of elderly patients obviously it is a lot slower, a lot more complex. Because if you trying to give management advice. Let's say management exercises to a thirty-year-old and other management protocols. But with an elderly patient it is literately two exercises that it is. So, the progress is a lot slower and you see results a lot slower." (Participant 8)

"Elderly patients are different from treating like your normal regular patients. Because the elderly patient they come with difference compared to your normal. But for them their different is the normal." (Participant 12)

4.3.5 Theme Five: Suggestions to Improve the Chiropractic Clinical Practicum

Participants were asked to discuss what they had learnt in their experiences of the management of elderly patients and what their advice would be to the chiropractic programme.

4.3.5.1 Advice to Future Students

The participants felt as if the clinical practicum of managing elderly patients helped them to know the bare minimum of what to expect when treating an elderly patient. Furthermore, the participants emphasised their own emotions towards the management of an elderly patient. The participants focused on the positive outcomes of the management protocol towards elderly patients. The participants expressed their views as follows:

"With the experience you will realise that you need to know more. Like I think the module forms a good base, but I know that I need to go and look for more information in order to effectively treat an elderly patient." (Participant 1)

“It is about how you approach the patient so clinical experience and time management was a big factor that I found and also you have to be quite slow and speak clearly and not use complicated terms when speaking to them. For the newcomers into clinic, assisting them on and off the beds, being patient and allocating more time towards them and not getting frustrated if the patient does not understand them.” (Participant 3)

“My advice to students coming to clinic is not to get disheartened because of elderly individuals. But I would really to see more elderly individuals. I know that there has been research with elder individuals, houses like Tafta and Hospice houses where there were talks about doing a wellness day or something to give the elderly individuals that would be a really awesome experience to go in and see what they going through.” (Participant 4)

“The advice I would give to students is probably put some effort into seeing elderly patients. So that they would be a good idea. Okay look you get a bit of explanation and small differences that you notice with elderly patients because most of them will come through with experience and I guess that they just have to try and see elderly patients before they’ve finished with clinic.” (Participant 7)

“I think people need to learn, I know I had to learn how to do this, like just take a step back and be like look this is completely different patient, things need to be slower, you need to treat them holistically. Because you cannot just think okay they have a cough. It is considering what do they wear, are they climbing stairs all day, just talk to your patient.” (Participant 8)

“Obviously, we know that management plays an important role in the actual treatment so I would say that it does affect the treatment negatively. Because it takes longer and sometimes you just want your patient to get better faster so, it does take longer in that sense. Because you need to spread out your treatment and

management protocols and everything that you would want to do. Because you cannot give it all at once." (Participant 9)

"It takes a lot of time when you trying to see three patients in a day and the little afternoon that we are here. But putting aside time and letting them talk to you constantly through the treatment. They like it and appreciate it and that is special for me. They feel less sore and that they have someone to talk too and someone's trying to help them that is nice." (Participant 10)

"The main things are to be kind towards your elderly patient and that you have to be patient. You need to understand what they are going through could be chronic and for many years it takes a lot time for them to adapt to the change. You have to explain a lot to them, also explain that they may not see changes overnight and also explain that you won't be treating a particular condition." (Participant 9).

"So I feel like it is up to the student, whilst they still in the clinic to actually get as much information and knowledge they can about treating the elderly patients and actually getting the elderly patients and also maybe different clinicians to come in and observe to see that the way they managing a patient is correct or not. It is just taking the knowledge and just going out and applying it. Because what you learn is different to how you actually apply the knowledge." (Participant 12)

4.3.5.2 Practical Training

The participants expressed their views that the clinical practical application and preparedness towards the management of an elderly patient is insufficient, as they are not exposed to many cases when managing an elderly patient. They felt as if the practical aspect towards an elderly patient needs to be addressed. Their views are as follows:

"Improve or enhance the more practical experience with elderly patients. We should also have some talks and demonstrations regarding that, not to make the patient

feel uncomfortable but to help us and expose us to all the factors we need to take into account, when dealing with an elderly patient someday in our private practice and how you handle a patient and how you establish a patient report, how you treat and approach a patient." (Participant 3)

"The elderly portion of it should be more in-depth in terms of clinic. You only going to see what comes in you cannot see more elderly patients. I think we should do mock patients, like get elderly patients that are willing to come in to help us, an elderly patients view on how they want to be treated and just so that you know how to interact with them and maybe in the module, have more/ get more experience type of information not just clinical information, what you going to find, how you going to interact with elderly patients, how to communicate." (Participant 5)

"The module of the elderly population should be changed. The actual practical side to it. There should be more of and small things like elderly patients that are in wheelchairs or silly things like someone that struggles to lie on their stomach. Because they have like a down hump or whatever, we didn't get taught to do." (Participant 6)

"I think it would be a good idea if you had been taken to a let's say elderly age home where we would have screened, taken proper examinations for a certain number of elderly patients to get a good idea of what it is like for them to be living in those areas, as well as what we should be expecting in the elderly that come to us. Because it is not very often that you get many elderly individuals that come into the clinic. With the module just make an effort even if it is a small community service or going to an old age home and all of that." (Participant 7)

"I think our third year in diagnostics they should start introducing cases so like in fifth year we have a subject called cases, in fourth year I think even they should start introduction to more case based theory questions where for example: they use elderly patients because if you think about here in the clinic and private practice a

lot of the patients are elderly patients so I feel like we do not focus enough on elderly patients." (Participant 8)

"So, I think the major thing when it comes to the elderly patient in terms of our programme is that we need to add a practical component into it. This is what it looks like, this is what we see it like. Come let's go look at a patient at an old age home. See what they present with and explain to you- why they present that way and not just learn from a book. "I am not going to sit down and try to understand the clinical practical application of it, tendencies and the different ethical issues of it. But in a perfect situation. It would be really nice to have practical involvement with elderly patients throughout the year under supervision." (Participant 10)

*"There will be the suggestion to just talk to them about what are the improvements, having a day strictly for elderly patients to come in just so that we can actually treat them and also get the exposure and the experience that one needs to see in elderly patients coming to clinic. Maybe to have a session or a day where we just go to the elderly patients, who have been treated by chiropractic students and maybe just sit them down and just talk to them, to see how their experience has been with chiropractic students." (*Participant 12)

4.4 SUMMARY OF THE CHAPTER

The themes have shown that the chiropractic students had a general overview of how elderly patients present and the management towards them. The chiropractic students had similar responses on how to manage an elderly during their clinical practicum. In terms of the practical knowledge and experience, the participants in this study explained that they lacked clinical experience in the management of elderly patients and, therefore, their confidence was reduced. With regards to the theoretical components of elderly patients, the participants responded that there were difficulties in their application of their theoretical knowledge to the clinical setting. The chapter that follows describes these findings with those from relevant literature.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 INTRODUCTION

This chapter discusses and interprets the findings of the study in the context of the clinical experiences in the management of the elderly patients by the fifth year registered master's degree chiropractic students during their clinical practicum. There were only twenty-six registered master's degree chiropractic students. A small sample size in qualitative research is used to capture the fundamental case orientated analysis (Vasileiou *et al.* 2018, cited in Sandelowski 1996: 525). As a result, the recommended participants were 10. However, data was collected until data saturation and there were 12 participants in total.

5.2 OVERVIEW OF THE RESEARCH DISCUSSION

The aim of the study was to explore the clinical experiences of the registered master's degree chiropractic students in the management of elderly individuals during their clinical practicum. Five main themes were identified:

Theme One: Attitudes and opinions towards the management of an elderly patient.

Theme Two: Important aspects of the management towards an elderly patient.

Theme three: Positive aspects of managing an elderly patient.

Theme four: Challenges faced during the management of an elderly patient.

Theme five: Suggestions to improve the chiropractic clinical practicum.

The themes as well as subthemes are interpreted and discussed below.

5.3 THEME ONE: ATTITUDES AND OPINIONS TOWARDS THE MANAGEMENT OF AN ELDERLY PATIENT

The emotional aspect of an individual plays a vital role in the outcome of a treatment procedure. The registered master's degree chiropractic students experienced bouts

of emotions in the first year of their clinical practicum. The registered master's degree chiropractic students, under the guidance of a clinical instructor, had to apply the theoretical and practical knowledge that they gained throughout their studies. In order to make an accurate diagnosis and treatment protocol towards an elderly patient, they would have to apply the knowledge they gained in different clinical situations. The participants were asked to discuss their experiences and guidelines towards the management of an elderly patient during their clinical practicum.

The general responses of the participants described that they felt as if they lacked clinical experience, with limited practical knowledge of an elderly patient. Several students suggested that there should be more interaction between students and elderly patients to gain adequate results during their management.

5.3.1. Students' Emotions towards the Management of Elderly Patients

In this study, the majority of the participants highlighted their lack of practical knowledge towards the management of an elderly patient. This is consistent with Schirmer (2019: 3), who elaborated the importance of practical knowledge and how it influenced the management of an elderly individual.

Weurlander *et al.* (2019: 1046) conducted a study on final year medical students and describes that student emotions and patient care is influenced by components of a clinical setting and personal factors. Despite the recognition of how a student's emotions can have negative impacts on their clinical skills, the literature in terms of students' emotions impacting the delivery of care to a patient is still limited (Doulougeri *et al*. 2016: 8).This is congruent with the results of this study, as the participants expressed that their emotions were sometimes overwhelming in treating a difficult patient, which in one case left a student with uncertainty in his or her management skills towards the patient.

Gonzales *et al.* (2010: 250) conducted a study on the attitudes of medical students in Washington towards an elderly individual and concluded that socialising medical students with community-elderly individuals had some positive effects. The participants in this study emphasised that the lack of interaction and limited clinical experience with the elderly patients negatively influenced their clinical skills, knowledge and self-confidence.

Weller *et al.* (2012: 2) explained the importance of a student's emotions and personality uplifts a student's feelings of being prepared or ill-prepared towards patient care. The nursing students in Egypt had developed many difficulties because of a decrease in clinical experiences (Gaber *et al*. 2019: 1104). Rathban *et al.* (2012: e89) explained that the necessity of clinical experiences which helped with the development of a student's self-assured, professional demeanour; the ability to adapt in difficult clinical situations and the perspective and interpretation of real world experiences. This correlated with this study as the participants felt fear and nervousness towards the choice of management in an elderly patient, owing to the fact that the geriatric module was only implemented in the clinical practicum year. This made patient education, treatment, and management difficult.

According to the participant's opinion elderly patients are very dependent on the student for the outcome of their treatment, however, the general response received was that there is a lack of involvement from the elderly patients in the clinical education of their management.

The participants described that the lack of clinical experience and practical knowledge as a factor that disarranges the management protocol prepared for an elderly patient. Say and Thomson (2003: 542) explained the importance of taking into consideration a patient's preference in a skilful decision making. The participants of this study had mixed emotions going into private practice as they felt as if they had limited elderly patient interaction during their clinical practicum, which influenced their self-confidence and healthcare decisions in the management of elderly patients.

5.3.2. Theoretical Gap in the Management of Elderly Patients

Healthcare education is meant to equip a healthcare student with the understanding of how diseases present and the ability to make an accurate diagnosis of that disease is present and how to manage it accordingly (Thagard 2005: 47). The registered master's degree chiropractic students learn a module focusing on the elderly which includes the physiological changes, the pathophysiology of conditions with the associated comorbidities and the management of the common musculoskeletal conditions with which they present. The participants of this study expressed their unanimous view that the theoretical module of how to manage

elderly patients taught them the general basis for each individual, but the knowledge obtained was limited in comparison to the experience of how an elderly patient presents in real life.

Tez and Yildiz (2017: 550) stated that medical textbooks are important in medical training but it is a disadvantage when a student recites the information, rather than understanding how a patient will present in front of them. The participants expressed that the knowledge gained on an elderly individual was overwhelming and challenging to process as they had to study all the information on the elderly population in a split module and within a year.Hashemiparast *et al.* (2019: 405) conducted a study on nursing students in Iran and establishes that, due to the lack of a supportive learning environment, students were unable to apply the theoretical knowledge attained to a clinical setting during their studies. This agrees with the results of this study and the existing literature, that there is a gap within the theoretical knowledge and application of it, thereby impacting a student's management towards an elderly patient.

5.3.3 Practical Gap in the Management of Elderly Patients

The literature suggests that practical knowledge is a crucial aspect in clinical training. This study has shown that the participants' responses were that they had gained limited practical knowledge during their studies of the elderly population. Participants stated that they were limited in the manner of how to apply the theoretical knowledge of elderly patients to a clinical training environment. Practical training plays a vital role in the studies for healthcare professionals as it assists a student to specialise in a field of interest (Iucu and Platis 2012: 4228-4229).

A healthcare student should understand the essentials of how a condition alters the daily activities of the elderly individual (Lepore and Yau 2013: 1). Research shows that throughout medical students' studies, they are required to have strategic methods of learning and develop competent clinical skills for their future of practicing and meet the needs required for optimal and minimal risks towards patient care (Cho *et al.* 2017: 9).

Torshavand *et al.* (2020: 1) describe that during the academic and clinical preparations, resources in the healthcare profession should include social and educational environments for students to gain the ability to provide high quality

healthcare. Therefore, this study has shown that when a student lacks practical knowledge and the application of theoretical knowledge, their clinical decision making and patient management is in doubt.

Practical training for chiropractic students on spinal manipulation is a great way to assess a student's performance and evaluate competence (Descarreaux *et al.* 2006: 144). Participants acknowledged the importance of practical training during their studies; however, great emphasis was placed on the limited skills they acquired to manage an elderly patient. This concern is confirmed by Ortiz (2016: 23), in a study performed on newly graduated nurses, who stated that without having the ability to apply the knowledge to a clinical setting, it creates a lack of confidence in their future profession. This casts doubts over a student's ability to make clinical decisions in private practice.

In order for a student to achieve the best learning outcome through their duration of studying, the student needs to be able to integrate the knowledge into different scenarios and be able to actively participate in discussions (Carstensen *et al.* 2020: 2).

The participants stated that there was a lack of practical training towards the management of elderly patients. They suggested that the chiropractic programme should include an OSCE, based on the common conditions found in an elderly patient. Majumder *et al.* (2019: 388) described that an OSCE has proven to be reliable in testing a student's affective, cognitive and psychomotor skills.

5.3.4 Clinical instructor limitations

Clinical instructors are expected to support healthcare students during their clinical training to develop and build them into future professional practitioners (Harvey *et al.* 2019: 1). The participants in this study were allowed to be tested by any clinical instructor during the clinical practicum. This made the clinical instructors aware of the competency of the clinical skills that the participants obtained. Falender and Shafranske (2012: 134) explained that competency is associated and accredited with clinical training; it helps with the development of a profession.

The participants of this study detailed the importance of the clinical instructors. The chiropractic students gained the opportunity to strengthen their clinical skills through various clinical experiences with the interaction of patients and clinical instructors.

The participants explained that limited interaction between the clinical instructors and students was a disadvantage to the students as clinical knowledge is helpful and required for private practice. Meyer *et al.* (2016: 445) reported that nursing students in South Africa, have poor relationships with their clinical instructor that leads to a student being unable to make critical decisions and there is a loss of interest in learning which impacts their clinical experience. It is evident that this affects the clinical decisions made by newly qualified healthcare professionals in the future (Meyer *et al.* 2016: 445). The shortcomings of this limited knowledge affected the student's management towards an elderly patient, due to the lack of extra information by the clinical instructors, which could have been helpful for students that were in difficult clinical situations.

5.4 THEME TWO: IMPORTANCE ASPECTS OF THE MANAGEMENT TOWARDS AN ELDERLY PATIENT

When it comes to diagnosing an elderly patient, the participants' responses agreed that students should take into account that an elderly patient often presents with associated co-morbidities. The responses of this study show that standard treatments of elderly patients with musculoskeletal conditions should consider the associated co-morbidities to ensure the most beneficial healthcare is provided. The participants explained how they had to think carefully about the effects and side effects of their management. Each participant's response discussed the complexity of the various aspects experienced when managing an elderly patient.

5.4.1 Home Education for an Elderly Patient

An important aspect in managing elderly patients is taking into consideration the education of physical therapy. Longtin *et al.* (2010: 53) defined that patient participation is an acquired factor, as it limits healthcare errors. An individual who self-treats and self-monitors his or her healthcare conditions and fully understands the appropriate instructions, will improve his or her quality of medical care. However, as an elderly individual's age increases, his or her mental health and physical health deteriorates. The participants of this study incorporated home education as a form of management for their elderly patients but majority of the provided feedback was that they often had to change their approach when managing an elderly patient.

Likewise, every form of rehabilitation should be suitable to that individual's lifestyle and environment (Lepore and Yau 2013: 2).

The participants focused on adopting a holistic approach. A holistic practitioner complies with the general principle of considering a patient's current complaint, past trauma with respect to their current compliant and how the psychological views and needs of a patient impacts their current complaint (Ventegodt *et al.* 2006: 2061-2062; Papathanasiou *et al.* 2013: 2).

A similar attitude was portrayed by the participants, who had positive feedback with regards to home education during their management protocols. This is in context Park *et al.* (2016: 478) elaborated that factors that influence physical activity in the elderly patients to help reduce the risks of cardiovascular diseases, chronic hypertension, diabetes and obesity.

Lee and Lin (2010, cited in Mead and Bower 2002: 59) explore the importance of patient centeredness and the psychosocial benefits to patient centeredness in healthcare facilities. Participants in this study elaborated that elderly patients often come in with an expectation that the outcome of one treatment will heal their chronic pain. The participants explained that patient education is poor in the elderly population due to a lack of understanding the importance of what is required of them. The lack of compliance leads to treatments being prolonged.

The participants acknowledged challenges in the modification of the management towards elderly patients. The responses stated that elderly patients are uncompliant, inaccessible to the physical surroundings where they reside and that the associated co-morbidities are deliberating to daily life activities, which limits the rehabilitation process. As an elderly patient often presents with a disability in comparison to younger individual, a healthcare professional often must consider the disadvantages that affect the activities of daily life in the elderly population.

Participants compared the relation between the management of elderly patients and younger patients, stating that elderly patients do not have the strength and capacities to do physical training, such as exercises, on their own to improve their healthcare. Similarly, the attitudes towards the comparison of elderly patients with disabilities and younger patients with disabilities differ when compared to a study

done by Lepore and Yau (2013: 1), as children with disabilities integrate management protocols to be modified to achieve the benefits of healthcare.

Rossi *et al.* (2013: 78) mentioned that the focus on the growing elderly population is to improve the importance of the management towards elderly patients to limit dependency and disability through efficient physical therapy programmes. The participants' responses to the management of elderly patients are consistent with literature that explains the significant benefits and challenges of home education for the elderly population.

5.4.2 Elderly Patients Conflicting Problems (Financial and Associated Co-Morbidities)

The interviews of the registered master's degree chiropractic students revealed a common understanding of how associated co-morbidities affect management protocols. The participants recognised that many of the elderly patients underlying conditions were treated with polypharmacy.

Some of the participants raised their views about the elderly patients' financial situations and the language barrier that elderly patients experience. A participant expressed that a language barrier was a challenge for them in communication information to an elderly patient. Hussey (2013: 190) stated that a language barrier leads to miscommunication between the patient and the practitioner, as patients prefer to communicate in their home language. A medical professional is required to have effective verbal communication to gain a professional patient relationship. The patient needs to be provided with information of their condition, the treatment options and the outcome (Hussey 2013: 191). Participants conveyed that it is difficult to communicate with a patient who does not understand what is being mentioned. A language barrier is considered to be a risk to a patient's safety (van Rosse *et al.* 2016: 52). As South Africa is a diversified nation, a language barrier exists and, therefore, there is often poor communication between a patient and the practitioner (Benjamin *et al.* 2016: 74), as patients prefer to communicate in their home language.

The participants discussed the effects of polypharmacy and how it often leads to the mismanagement of an elderly patient and a possible missed diagnosis. Maher *et al.* (2014: 3) expounded polypharmacy has a medication count of five and more

medications taken all at once. The participants concern about polypharmacy on an elderly patient were the adverse effects and how detrimental it was to the elderly patient's health. Maher *et al.* (2014: 3) explained that the adverse effects of polypharmacy comes with a financial challenge for elderly patients, as well as drug interactions leading to a decrease in functional capacity and multiple elderly syndromes, as many elderly patients take large quantities of dosages of medications for a single diagnosis (Calderón-Larrañaga *et al.* 2012: e821).

Fletcher *et al.* (2012: 864) investigated the incorrect use of medication and how it poses a risk on elderly patients with chronic conditions such as diabetes mellitus, cardiovascular disease and psychiatric illnesses. Dagli and Sharma (2014: 1) and Beuscart *et al.* (2019: 1) emphasised that, due to the incorrect prescriptions or increased dosages in the pharmaceuticals, elderly patients should be evaluated every month to eliminate or increase dosages in medications that are required for chronic conditions and assess the safety of the medications and drug interactions. The use of pharmaceuticals in elderly patients is an advantage and disadvantage. The participants provided their views and their concerns to improve the management toward elderly patients despite the challenge of polypharmacy as they were aware of the effects or adverse effects that polypharmacy had on elderly patients management.

5.4.3 Student Expectations of the Treatment of Elderly Patients

The perceptions of the treatment toward an elderly patient were positive, judged from the responses received in this study. The participants provided input that they did have expectations towards their treatment protocols for elderly patients and that it required the knowledge gained through their studies and the development of their life skills. The participants described that the extent of their treatment was also influenced by elderly patients' expectation of the treatment.

In this study, the participants emphasised the use of life skills towards the management of an elderly patient.

Life skills are a group of skills and abilities to react to a life situation that may be formed by conflict situations and environments (Sobhi-Gharamaleki and Rajabi 2010: 1818). The determining factors of decision making with respect to a patient's well-being and healthcare consisted of emotional intelligence which is the interaction

between cognition and emotion (Schutte *et al*. 2007: 922). Emotional intelligence is essential for problem solving skills, individual discrimination and to monitor one's self-emotions (Bastian *et al.* 2005: 1136). The participants expressed that the balance of emotional intelligence has prepared them to deal with different types of elderly patients and develop the life skills that they could adapt to different treatment protocols for how each elderly patient presented.

Por *et al.* (2010: 859) explained that nursing students who paid attention to their emotions and were able to control their emotions in a difficult situation were able to adopt a strategic way of dealing with stress. This is in keeping with the responses from participants in this study as the participants took into consideration the different types of treatments that work for each elderly patient. Khir *et al.* (2018: 37) stated importance of controlling one's self-leadership and emotional intelligence prepared a student to deal with the challenges faced after tertiary level. The participants perceived that having emotional intelligence and the development of life skills enhanced their confidence in the management of elderly patients.

5.4.4 Student Preparedness towards the Management of an Elderly Patient

The interviews demonstrated that the participants gained efficient life skills to prepare them for the management of an elderly patient. The participants indicated that with the educational and life skills they developed, they were able to adequately manage an elderly patient. They explained that their lack of experience with an elderly patient in a non-clinical environment was often a challenge. Participants underlined that chiropractic students are limited with their clinical training in hospitals. Orlin *et al*. (2013:138) explained the nature of how many specialised health staff learn about evidence-based medicine, modern diagnostic procedures and management of patients in a hospital setting with respect to musculoskeletal pain

The medical professionals in hospitals have vague, insufficient experience and comprehension in relation to the chiropractic profession (Orlin *et al.* 2013: 139). Primary care and other healthcare professionals refer patients to chiropractors as chiropractors focus on physical functioning and pain management. (Salsbury *et al.* 2018: 150). Orlin *et al.* (2013: 142) explained that chiropractors should treat

functional based problems, whereas medical healthcare practitioners should focus on structural lesions.

Baraz *et al.* (2015: 1) stated that a clinical environment provides students with the opportunity to develop their own professional individuality. The participants justified that due to the limited interactions with elderly patients, they felt as if they had inadequate clinical skills and experiences to manage an elderly patient in private practice. Hence, in this study, it appears that it is challenging for master's degree chiropractic students to manage an elderly patient as there is limited interactions with elderly patients in different clinical environments.

5.5 THEME THREE: POSITIVE ASPECTS OF MANAGING AN ELDERLY PATIENT

It is important to understand the management of an elderly patient and to consider their views and opinions. The participants in this study elaborated on how some of their elderly patients had a preference in the management that they required and how they had to adjust their treatment protocols to ensure the needs of the patient were met and that elderly patients received the required preference of management. The participants explained that elderly patients' emotions often play a role in the outcome of the management.

5.5.1 Elderly Patients' Expectations, Emotions and Experience Regarding Their Treatment

In this study, the participants reported that elderly patients showed gratitude toward the management they received. The participants explained that during the interactions with elderly patients, they discovered that a patient's emotions contributed to the outcome of the consultation. Comijs *et al.* (2011: i111) revealed that if an elderly patient experiences any type of life stressors, such as depression and schizophrenia, loss of a relative or severe illness, it had a negative impact on their emotional state of mind.

The role of mental challenges should be acknowledged in the management of elderly patients. The participants accentuated that it is significant to question about suicide in the elderly population. In this study, the participants clarified that they were in disagreement with the method of the internet as a tool and over the counter

medication for self-treatment and diagnosing, as elderly patients often developed an idea of how they should be managed without the consideration of the adverse effects on their health. An elderly individual may have difficulties in self-diagnosing as their physical signs and symptoms are complicated (Luger *et al.* 2014: 1). This puts additional tension on the students regarding their management protocol for an elderly patient as elderly patients believe in self-diagnosing and the usage of over the counter medication (Luger *et al.* 2014: 1).

Due to the lack of financial stability, elderly individuals in South Africa do not have adequate access to healthcare facilities (Kelly *et al.* 2019: 2) and, therefore, elderly patients lack education in the usage of internet tools and over the counter medication as a healthcare protocol (Cybulski *et al.* 2018: 632). A study by Luger *et al.* (2014: 9) concluded that the use of the internet in the elderly population leads to misdiagnosis and disruption of a planned out cognitive management. This study shows the management an elderly patient requires that one takes into account the challenges in an elderly patient's history, physical examination and management plan instead of an internet treatment plan.

5.5.2 The Prognosis Based on the Response of Treatment Received by an Elderly Patient

The participants stated that the responses they received when managing an elderly patient were both positive and negative. The participants who had received a positive outcome when managing an elderly patient, elaborated that the process of the management was prolonged over a period. Furthermore, Rastogi and Meek (2013: 38) revealed that there are challenging factors, such as a decrease in functional capacity, physical demeanour and cognitive abilities that need to be taken into consideration to provide efficient pain management for elderly patients.

The prognosis of the management protocol toward an elderly patient are often questionable, as there is an association with physiological abnormality and pathophysiology of conditions which increases the consequence of death (Jaul and Barron 2017: 5). The management of elderly patients should be treated consistently. Ineffective management and poor outcome in an elderly patient arise from poor attendance for healthcare. This is in correspondence with the response received from one participant, who expressed that the outcome of his or her management

toward an elderly patient was uncertain. This has been problematic, as elderly patients are often faced with financial burdens and lack of transportation (Gorman *et al.* 2019: 11). This affects the ability of elderly patients to access the management required to treat their musculoskeletal conditions. Hence, some of these participants had a negative attitude toward the management outcome of elderly patients.

5.6 THEME FOUR: CHALLENGES FACED DURING THE MANAGEMENT OF AN ELDERLY PATIENT

During the interview process, it was noted that the basic management protocols were adapted to be suitable for an elderly individual. It was important for the participants to understand that the management of elderly patients need to be in line with the fundamental principles of an elderly patient. The participants understood that a consultation with an elderly patient often differed to younger patients and they had to consider and pay attention to the subtle details that they may have ignored with other adults. It was highlighted in chapter four that the participants changed their straightforward thought process to broaden their critical thinking abilities to provide the best management outcome toward an elderly patient.

5.6.1 History Taking from an Elderly Patient

History taking is an important aspect in diagnosing and managing any patient. The associated comorbidities in an elderly patient often complicates the clinical decision and procedures. There are many risk factors mentioned in this study that affect an elderly individual. Therefore, the participants stated that taking a case history from an elderly patient was a challenge. The participants explained how they had to take a holistic approach when taking a history from an elderly patient.

The participants reported the some of the challenges they experienced when taking a history from an elderly patient was that the elderly tended to share limited details in relation to the presenting complaint; they focused on irrelevant details that were not related to the complaint and they tended to withhold information, possibly due to the normal ageing process, or they were afraid to know the exact cause. This is congruent with a study by Tomas-Carus *et al.* (2019: 35), on the risk factors that contribute to falls in an elderly patient and how the associated risk factors and

comorbidities when reaching an accurate diagnosis should be considered. This is challenging for clinicians and researchers as every detail is important.

Participants elaborated on how an elderly patient explained that a loss of balance is a normal factor to them, but in fact it contributed to a major aspect of the history. This is in agreement with Tomas-Carus *et al.* (2019: 35), who highlight that an increase in age, sensory loss, pain and diminished physical function are associated risk factors in an elderly patient. It is acknowledged that communication is the most important part for the development of the doctor-patient relationship. Wieling *et al.* (2015: 277) stated that history taking is a principal diagnostic tool in developing competent clinical skills. The participants in this study elaborated that history taking in elderly patients has taught them how to manage their time in consultations, increased their confidence and the ability to understand elderly patients better.

5.6.2 Modification of the Physical Examination for an Elderly Patient

The participants of this study explained that they found it challenging to conduct an accurate physical examination on elderly patients. Sayma and Williams (2016: 91) mentioned medical students sometimes forget what is required perform an adequate physical examination. The elderly patients often presented in a lot of pain or were experiencing stiffness or limited range of motion and were unable to perform any of the necessary tests. This was a disadvantage to the participants, as they were unable to perform the test needed to match the history with which the elderly patient presented. Haring *et al.* (2014: 1) stated that a physical examination provides important information in making an accurate diagnosis.

An elderly patient assessment involves past medical history, current medications, presenting complaint, nutritional status, family medical history and a review of systems (Elsawy and Higgins 2011: 50). The feedback received in this study solely focused on how elderly patients required extra time to understand what is required of them and process the information being said to them. Participants emphasised that it was demanding to alter and complete a physical examination in order to connect it with the history obtained from an elderly patient.

Sayma and Williams (2016: 92) formulate that physical examination on real life patients is an important aspect to promote effective learning for clinical practice. The

participants felt unprepared for the alterations required from them to examine an elderly patient and provide an adequate diagnosis.

5.6.3 Modification of Treatment Protocols for Elderly Patients

Participants in this study encountered challenges in their management protocols toward the elderly population. The participants elaborated that the knowledge they gained to provide treatment of elderly patients was limited. Therefore, the participants felt as if they were unable to provide adequate treatment of elderly patients. The participants found themselves doing research to gain additional information to provide treatment that would not go beyond the elderly patients' comfort levels.

De Sousa *et al.* (2017: 81) stated that the ageing process is part of the developing society prodigy, elaborating that healthcare professionals need to develop a confident treatment protocol that considers the diminishing factors of the physiological and psychological factors in the elderly population. This correlates with the views as the participants in this study believed that in order to understand the elderly population, they had to consider a different approach that had to be unique to each individual.

Hawk *et al.* (2012: 560) explained that doctors of chiropractic follow three evidence based practice principals to promote healthcare diseases and the prevention outcome in any patient. The following principals are:

- The ability to make adequate clinical decisions based on best evidence research from newly published literature.
- The practitioners with the clinical experience and expertise developed.
- The patient's preference.

It is important to correct the management protocols in a population group and modify the treatments required for an individual patient. In response to the modification of treatment protocols toward an elderly patient, the literature has emphasised that there is a paucity in the knowledge on how to modify treatments for an elderly patient. The participants described that the elderly population do not always present with a simple history or with an isolated condition. They always had to consider that majority of the elderly population present with associated comorbidities. The participants understood that they had to formulate a management plan based on the

causative factor for the presenting complaint in order to provide high standard care for the elderly population.

5.6.4 Comparison of Elderly Patients to Other Population Groups

The literature has explained that regular physical activity is part of intensive lifestyle interventions for elderly patients to decrease diabetes type two, risk of Alzheimer's disease and reduce inflammation (Lee *et al.* 2015: 352; Whitehead and Blaxton 2017: 1062; Muramatsu *et al.* 2015: 684).

The participants described that elderly patients are not as compliant as younger patients. The participants had to be patient and be able to explain the management information and home education in great detail so an elderly patient could comprehend and perform the exercises and home education correctly, without causing any harm to themselves.

The instances of chronic pain between older adults and younger adults influences the overall health status (Wittink *et al.* 2006: 161; Karp *et al.* 2008: 112). The responses of the participants emphasised the importance of considering an elderly patient's abnormal is their normal and focusing on how to manage them accordingly.

As explained by Karp *et al.* (2008: 111) an elderly individual's physiological, psychological, and environmental homeostasis are altered due to the ageing process. The participants in this study utilised the tools they had learnt in their clinical experiences to assess elderly patients with the presenting complaint and treat the patient based on the findings of the case history and physical examination. The participants understood that the treatment progress for elderly patients would be of longer duration. This allowed for professional growth of participants during their clinical practicum.

5.7 THEME FIVE: SUGGESTIONS TO IMPROVE THE CHIROPRACTIC CLINICAL PRACTICUM

The participants described that there should be more interaction with elderly patients during their clinical practicum. Consequently, due to the limited practical interaction with elderly patients, the participants felt a lack of confidence in managing elderly patients in private practice. The participants suggested that the geriatric module

should include a more detailed practical component to improve their skills in managing elderly patients. The participants highlighted that future students need to be patient and understand that the management with an elderly patient requires a lot of time and often with elderly patients, they would have an independent approach to each individual patient.

5.7.1 Advice to Future Students

The participants of this study highlighted that managing an elderly patient does not present with what is learnt in a textbook. After interactions with an elderly patient, they emphasised that they had to adapt their emotions and demeanour towards an elderly patient. Research has shown that empathy and attitude affect the quality of healthcare provided to a patient (Chen *et al.* 2015: 9). The participants explained that they had learnt to pay attention to the little positive outcomes when managing an elderly patient and understood that the longevity of their management protocols in comparison to other patients they had engaged with.

Cosco *et al.* (2019: 2) elaborate that with the increase in the elderly population, it is essential to covey the evolving needs of an elderly patient. Chen *et al.* (2015: 9) statedd that students who increased their interactions with elderly patients had an impact in the future care that they will provide to elderly patients. The participants shared their concerns to the limitation of practical experience and knowledge with elderly patients. The participants' advice to the future students was to always try to see extra elderly patients in clinic or at community events to help them gain the confidence they would need to manage elderly patients.

Estus *et al.* (2010: 3) explained that active learning on elderly patients was a great source for students. Students were able to distinguish the outcome and reason of real-life situations with an elderly patient, this had an increase in their confidence and understanding on the age-related physiological changes and pathophysiological conditions. Estus *et al.* (2010: 7) revealed that the elderly patients were impressed by the pharmacological students' knowledge and caring nurture. This correlates with the data obtained in this study. The participants felt that with an increase in managing elderly patients during their clinical practicum, they would feel more comfortable and improve their interactions with elderly patients when they are in private practice.

5.7.2 Practical Training

Practical training is a key component in the education of healthcare students as it increases their confidence and knowledge (Chaghari *et al.* 2017: 27). The participants in this study discussed the relevance of practical knowledge and how limited practical knowledge disheartened the participants in their management of elderly patients. Heiskanen *et al.* (2016: 225) describe that real-world learning experiences can increase the knowledge of interactive and practical competencies. This allows an individual to acquire self-assurances in their practical educational component. Said *et al.* (2014: 4847) stated that the practical component attained in students' educational experience increases a student's ability to understand how to apply theoretical knowledge to real life situations. This coincides with the response from one of the participant's, with regards to the practical component of managing an elderly patient. The participant explained that there are several methods and techniques which could be utilised to expand the practical knowledge and application to clinical setting.

Practical examinations consist of the competency to the application of theoretical knowledge, communication skills and acknowledgement of the patient's safety. Botterman *et al.* (2016: 621) explain the importance of communication with patients and how a practical medical plan is crucial in the management of a patient. The participants felt that a pre-examination or practical examination of elderly patients would strengthen their application of knowledge in the management toward an elderly patient. The participants discussed that having a practical component in the geriatric module would improve their motivation and understanding of the concepts in the management they require.

Dyrbye *et al.* (2011: 1134) described that medical students found that advanced hands-on clinical training reduced the anxiety and allowed them to overcome the practical knowledge hurdle. The participants in this study felt that it was very challenging to manage multi-diagnosed elderly patients and facilitate the required treatment techniques. While a discussion of the practical values and thereof was explored in this study, it is interesting to note how most participants expressed a desire for greater inter-professional interactions with elderly patients in clinical and non-clinical environments.

5.8 SUMMARY OF THE CHAPTER

The participants expressed similar views with regards to the management of an elderly patient. Each participant explained the importance of knowing how an elderly patient presents and their associated comorbidities. Therefore, each elderly patient is unique and should be managed individually. The participants of this study explained that it was challenging to manage an elderly patient with their own limited practical knowledge and the application of their clinical skills. The participants discovered that the management of elderly patients is peculiar and complex and, therefore, integrating the management of elderly patients holistically is a key aspect of the profession.

CHAPTER SIX

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

This study was aimed at addressing the clinical experiences of the registered master's degree chiropractic students in the management of elderly patients during their practical curriculum. This chapter discusses the research questions, the strengths and limitations of the study, the conclusions drawn from the study and the recommendations based on the findings of the study.

6.2 RESEARCHER POSITIONING

As a chiropractic student, the researcher was able to understand and empathise with the responses of the participants. The researcher was familiar with the clinical experiences of the participants during the management of elderly patients in their clinical practicum. This enabled effective interactions with the participants and therefore influenced comprehensive interpretations of the data.

6.3 SUMMARY OF THE STUDY

The aim of this study was to identify the factors that affected the clinical experiences of registered master's degree chiropractic students in the management of elderly patients. The responses received from the participants to the interview questions have been explained in detail in chapter 4 and chapter 5.

6.3.1 Research Question 1: What are your attitudes and opinions with regards to the formative chiropractic training in preparing you for the demands of treating an elderly patient?

The participants recognised that the chiropractic training they received on elderly patients gave them the basic knowledge and background on how to manage elderly patients. The participants expressed that they felt as if they were prepared and able to manage elderly patients. However, due to the limitations of practical knowledge

and experience on management of the elderly patient, the participants felt that they were disadvantaged. They described that there were several challenges that occurred during the management of the elderly population.

6.3.2 Research Question 2 (Probe): What are your views regarding the management of elderly patients in preparing you for the demands of managing elderly patients during the clinical practicum? How have your patients responded to your treatment protocol? Do you feel as if your chiropractic practicum has prepared you for managing an elderly patient in private practice after you have completed all requirements?

The participants explained that they had a basic theoretical knowledge regarding the management of an elderly patient. They propagated that the theoretical knowledge they acquired during their degree focused on how an elderly patient presented, as opposed to the application of the theoretical knowledge in a clinical situation. The participants explained the importance of acquiring practical skills and how to apply the theoretical knowledge to an elderly patient in a clinical setting. The participants elaborated that the elderly patients had responded fairly well to their treatment protocols.

6.3.3 Research Question 3: Has there been any positive highlights in your experience of managing an elderly patient during the clinic practicum thus far?

The participants in this study mentioned that, in relation to management of an elderly patient, the experience required them to combine their life skills and the theoretical knowledge of what had been taught to them to get a positive outcome in their treatment protocols. The participants explained that when they managed an elderly patient, they realized that they had to often change their approach as to how they treated they elderly patient, especially as each elderly patient presented differently. The participants highlighted that they had to be consistent with their management protocols but, when an elderly patient expressed emotions of gratitude towards them, it played a great role in their professional growth.

6.3.4 Research Question 4: Have you encountered any special challenges or obstacles when managing an elderly patient during your clinical practicum?

The participants of this study expressed that the challenges they encountered during their clinical experiences in the management of an elderly patient taught them how to improvise their clinical skills in a consultation. The greatest challenge the participants experienced were the associated comorbidities with which an elderly patient presented and their associated polypharmacy, and, therefore, the participants established that the diagnosis and management towards the elderly patient was difficult. The participants explained that, due to elderly patients not being compliant to their home education advice, their management protocols were prolonged.

6.3.5. Research Question 5: Do you have any suggestions to enhance or improve the experience in managing an elderly patient during clinical practicum experience as a registered master's degree chiropractic student?

In this study, the participants explained that the module on elderly patients should include a practical component that consisted of talks and presentations on elderly patients on how to improvise their clinical skills, improve their interactions with elderly patients (visiting of community clinics or hospitals) and how to manage different elderly patients (spinal manipulative therapy, rehabilitation and soft tissue therapy). They expressed that their advice would be to enable students coming into their clinical practicum to learn from older students' experiences that they encountered during their clinical practicum. The participants elaborated on how the future students coming into their clinical practicum should focus on their practical skills, manage their time in their consultations with elderly patients and be empathetic and patient towards them.

6.4 STRENGTHS OF THE STUDY

This study contributes to the future registered master's degree chiropractic students entering their clinical practicum. The researcher had the opportunity to acquire detailed responses from the participants on the factors that affected their clinical experiences in the management of elderly patients during their clinical practicum. While this study focused on the clinical experiences of the management of elderly

patients, some aspects of this study gained insights into the knowledge and the skills acquired in the course of managing elderly patients and the application of the elderly module to a practical environment during students' clinical practicum. Furthermore, the study population was first time clinical practicum registered master's degree chiropractic students which will prove valuable to future chiropractic students as they would be able to visualize, interpret and apply the clinical experiences with respect to managing elderly patients.

6.5 LIMITATIONS OF THE STUDY

This study was done at the DUT CDC. There were 24 registered master's degree chiropractic student. The findings of the study are limited to the participants of this study. The sample size was twelve, which is low but this is in line with sample sizes for qualitative research. The factors resulting in the management of elderly patients in this study may not be extrapolated to a wider context in terms of other parts of South Africa and internationally.

The pilot study the newly graduated Chiropractorsprovided practitioner insight and clinical experience with an elderly patient, however, interviewing an academic would have provided curriculum insight such as scaffolding of the education in regards to horizontal and vertical academic and practical development within the Chiropractic degree.

6.6 RECOMMENDATIONS

The chiropractic programme is responsible for addressing and ensuring that chiropractic students are competent in the theoretical knowledge of managing an elderly patient, the application of clinical skills and the challenges they may experience during the management of an elderly patient. Therefore, it is important for the registered master degree chiropractic students to primarily focus on the information they are taught about elderly patients throughout their chiropractic training and conduct adequate research on the challenges faced in the management of an elderly patient.

6.6.1 Recommendations for the Chiropractic Programme at the Durban University of Technology

1. Post-qualification guidance on the management of elderly patients should be incorporated into the master's year to prepare students for the management and challenges of an elderly patient in private practice.
2. The chiropractic department should discuss the introduction of an elderly patient module earlier in the chiropractic course.
3. The elderly patient module should incorporate a more detailed practical component, case base studies and talks and presentations focused on the clinical skills required and challenges faced in the management of an elderly patient.
4. The chiropractic department should engage with the Department of Health with a view of creating access to chiropractic students who are doing their clinical practicum into the public healthcare institutions.

6.6.2 Recommendations for First Time Registered Master Degree Chiropractic Students

1. Ensure extra time is scheduled for appointments with elderly patients.
2. Always be patient with elderly individuals and explain information clearly and simply to ensure the elderly patient can comprehend and interpret the information being given to them.

6.6.3 Recommendations for Further Research

5. A study on this topic should be conducted at the other chiropractic school in South Africa, the University of Johannesburg, as this will prepare the first time registered master degree students there on the clinical experiences of the management in an elderly patient. This can result in a comparison between the two institutions.
6. Further investigations on the management of elderly patients by complementary and alternative practitioners can be done.
7. A study should be conducted on newly graduated chiropractors on the challenges they face during the management of elderly patients in private practice.

8. A comparative study at the University of Johannesburg, reviewing the registered masters degree chiropractic students perceptions on the practical training from both South African instituitons of higher education

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APPENDICES

Appendix 1: DUT Ethical Clearance

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: lumkhed@dut.ac.za
http://www.dut.ac.za/research/institutional_research_ethics

www.dut.ac.za

19 November 2019

Ms K Naidoo
19 Salkot Cresent
Merewent
4052

Dear Ms Naidoo

The clinical experience of registered masters chiropractic students in the management of elderly patients during their practicum
Ethical Clearance number **IREC 075/19**

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

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

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

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 Standard Operating Procedures (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 2a: Letter of Permission to the Gatekeeper Permission Committee

[25/03/2019]

Request for Permission to Conduct Research

Dear Prof K J Duffy

My name is Kimone Naidoo, a Chiropractic student at the Durban University of Technology. The research I wish to conduct for my Masters dissertation; involves Clinical experiences of registered masters degree chiropractic students in the management of elderly patients during their practicum.

I am hereby seeking your consent to conduct research at the Durban University of Technology Chiropractic Day Clinic

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 my supervisor, Dr D. Varatharajullu, Email: desireev@dut.ac.za

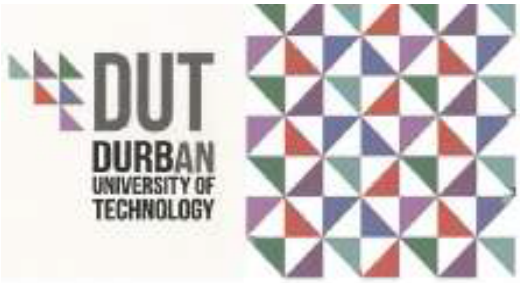
Thank you for your time and consideration in this matter.

Yours sincerely,

.....

Kimone Naidoo
Durban University of Technology
Cell number: 081 018 3885
Email address: kimone.naidoo27@gmail.com

Appendix 2b: Approval Letter from the DUT Research Director



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

19th August 2019

Ms Kimone Naidoo
c/o Department of Chiropractic
Faculty of Health Sciences
Durban University of Technology

Dear Ms Naidoo

PERMISSION TO CONDUCT RESEARCH AT THE DUT

Your email correspondence in respect of the above refers. I am pleased to inform you that the Institutional Research and Innovation Committee (IRIC) has granted full permission for you to conduct your research "The clinical experience of registered masters chiropractic students in the management of elderly patients during their practicum" at the Durban University of Technology.

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

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

Kindest regards.
Yours sincerely

PROF KEVIN DUFFY
ACTING DIRECTOR: RESEARCH AND POSTGRADUATE SUPPORT DIRECORATE

Appendix 3a: Letter of Request of Permission from the HOD of Chiropractic

[12/08/2019]

Request for Permission to Conduct Research

Dear Dr O Connor

My name is Kimone Naidoo, a Master Degree Chiropractic student at the Durban University of Technology. The research I wish to conduct for my Masters dissertation involves The clinical experience of registered masters chiropractic students in the management of elderly patients during their practicum.

I am hereby seeking your consent to conduct research at the Durban University of Technology Chiropractic Day Clinic.

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 on 0810183885 or kimone.naidoo27@gmail.com. Thank you for your time and consideration in this matter.

Yours sincerely,

Kimone Naidoo
Durban University of Technology

Appendix 3b: Granted Permission

MEMORANDUM

To : Prof Adam, Chair of the IREC

From : Dr L. O'Connor, Acting HOD Chiropractic

Date : 27 August 2019

Re : Permission to conduct research in the Department of Chiropractic

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Permission is hereby granted for the following student to conduct research in the Department of Chiropractic for the research project detailed below:

Student	:	**Ms Kimone Naidoo**
Student number	:	21411622
Research title	:	*The clinical experience of registered master's chiropractic students in the management of elderly patients during their practicum*

Should you have any queries kindly contact me using eth details below.

Yours sincerely,

Dr L. O'Connor
Acting HOD
Department of Chiropractic
Tel. 031 373 2923
email: lauraw@dut.ac.za

Appendix 4: Letter of Consent

Statement of Agreement to Participate in the Research Study:

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

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

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

Kimone Naidoo	_____	_____
Full Name of Researcher	**Date**	**Signature**

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

_____	_____	_____
Full Name of Legal Guardian (If applicable)	**Date**	**Signature**

Appendix 5: Letter of Information

Thank you for agreeing to participate in this study.

Title of the Research Study: The clinical experience of registered master's chiropractic students in the management of elderly patients during their practicum

Principal Investigator/s/researcher: Miss Kimone Naidoo (B: Tech: Chiropractic).

Co-Investigator/s/supervisor/s: Supervisor: Dr D. Varatharajullu (M. Tech: Chiropractic), Co-supervisor: Prof M.N. Sibiya (D Tech: Nursing).

Brief Introduction and Purpose of the Study: The management of registered master's chiropractic student on the geriatric population has not been well documented in South Africa. Furthermore there are many geriatric patients that often have untreated musculoskeletal pain associated with co-morbidities that are detrimental to their lifestyle. Therefore the aim of this study is to explore the knowledge, experience, perception and expectation of chiropractic master degree students in the management of geriatric patients presenting at the DUT CDC.

Outline of the Procedures: You are kindly requested to participate in an interview session that will be conducted by the researcher. The interview will be undertaken at the place and time that is convenient to you. The interview session will take between 20 minutes to 30 minutes. Permission is sought to record the interview for record

purposes.

Risks or Discomforts to the Participant: There are no foreseeable risks or discomfort by participating in this study.

Benefits: This study will add new knowledge so that future chiropractors can treat musculoskeletal pain more effectively and increase the quality of life in the geriatric population.

Reason/s why the Participant May Be Withdrawn from the Study: You are free to withdraw for the study at any given time without any form of penalty.

Remuneration: There is no remuneration for participating in the study.

Costs of the Study: There is no cost associated with participating in the study.

Confidentiality: All answers are confidential and will not be linked to your participation. The informed consent form, demographic data and interview answers will be kept in separate sealed boxes.

Research-related Injury: There is no anticipated risk of injury.

Persons to Contact in the Event of Any Problems or Queries: Please contact Miss Kimone Naidoo on (081 018 3885.), Supervisor- Dr D. Varatharajullu ōn (031-373 2533) or the Institutional Research Ethics Administrator on 031-373 2375. Complaints can be reported to the DVC of research, innovation and engagement Prof S Moyo on 031-373 2577 or moyosdut.ac.za

Appendix 6a: Demographic Data for the Interview Participants

Participant Code: 

Date of interview: ……..…….

SECTION A: DEMOGRAPHIC DATA

1. Age: …….
2. Gender: ……...…
3. Race: ……

Appendix 6b: Interview Guide

SECTION B: INTERVIEW QUESTIONS

1. **What are your attitudes in regard towards the formative chiropractic training in preparing you for the demands of treating an elderly patient?**

   Probes: Please describe how your clinical experiences have enlightened or contributed to your understanding of chiropractic in terms of managing an elderly patient with regards to knowledge, skills, clinical application and leadership, specifically referring to your capacity to diagnose, treat and manage elderly patients?

2. **Could you describe the important perceptions that you have encountered during your management of an elderly patient?**

   Probes: What are your views regarding the management of elderly patients in preparing you for the demands of managing an elderly patient during the clinical practicum? How have your patients responded to your treatment protocol? Do you feel as if your chiropractic practicum has prepared you for managing an elderly patient in private practice after you have completed all required qualifications? Do you feel the DUT CDC is well equipped to accommodate the necessary infrastructure for these individuals?

3. **Has there been any positive highlights in your experience of managing an elderly patient during the clinic practicum thus far?**

   Probes: What are the positives aspects of managing an elderly patient during your clinical practicum?

4. **Have you encountered any special challenges or obstacles when managing an elderly patient during your clinical practicum?**

   Probes: Have you experienced any challenges or obstacles in your management of an elderly patient during the clinical practicum? Please elaborate.

5. **Do you have any suggestions to enhance or improve the experience in managing an elderly patients during clinical practicum experience as a registered master degree chiropractic student?**

   Probes: Please elaborate highlight your views on any components of the management of an elderly patient during your clinic practicum that could be improved or enhanced in order for future registered master chiropractic students to benefit an infinite experience?

Appendix 7: Editor's Certificate

Helen Bond
IMPELA EDITING SERVICES
impelaediting@gmail.com
079 395 5873

26 August 2020

CERTIFICATE

Kimone Naidoo

kimone.naidoo27@gmail.com

Dear Kimone

Thank you for using Impela Editing Services to proofread your Master's dissertation entitled, "*The clinical experience of registered master's chiropractic students in the management of elderly patients during their practicum.*"

We have proofread for errors of grammar, punctuation, spelling, syntax and typing mistakes. We have formatted your work according to DUT Chiropractic departmental guidelines and checked the references according to DUT Harvard guidelines (this means checking the formatting).

Please note that Impela Editing does not accept any fault for changes made to a document after emailing the final draft and issuing a certificate.

I wish you the very best in your submission and what I am sure will be a promising career.

Kind regards

Helen Bond (Bachelor of Arts, HDE)

Appendix 8: Plagiarism Report

FILE	K._NAIDOO_THESIS.DOCX (162.59K)		
TIME SUBMITTED	26-AUG-2020 01:24PM (UTC+0200)	WORD COUNT	35481
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Masters dissertation

ORIGINALITY REPORT

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SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	pdfs.semanticscholar.org Internet Source	%2
2	Submitted to Mancosa Student Paper	<%1
3	Submitted to University of Zululand Student Paper	<%1
4	www.statssa.gov.za Internet Source	<%1
5	openscholar.dut.ac.za Internet Source	<%1
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7	www.tandfonline.com Internet Source	<%1
8	www.ncbi.nlm.nih.gov Internet Source	<%1