PERCEPTIONS OF NEW GRADUATE CHIROPRACTORS IN THEIR MANAGEMENT OF PAEDIATRIC PATIENTS IN THE ETHEKWINI MUNICIPALITY

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Declaration

This is to certify that the 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is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources).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.

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Dedication

“Do not be afraid, for I am with you. Do not be discouraged, for I am your God. I will strengthen you and help you. I will hold you up with my victorious right hand.” (Isaiah 41:10)

I dedicate this dissertation to all those who truly and faithfully supported me, especially to Cameron, for his love and always believing in me.

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Abstract

Background

Chiropractic is the most frequently utilised complementary and alternative medicine therapy by children and adolescents worldwide. Evidence suggests that childhood health and lifestyle can impact on the health and quality of life in adulthood. The chiropractic care of paediatric patients should therefore be considered as a viable, conservative approach to the holistic management of children. The chiropractic management of paediatric patients is still however surrounded by controversy, from the public and other healthcare professions, largely due to the lack of scientific research in this field. With the adoption of evidence-based practice, it is imperative that the chiropractic profession remain dynamic, continually exploring, questioning and researching the elements that contribute towards effective chiropractic paediatric treatment and management. This study endeavours to provide a new viewpoint from the perspective of new graduate chiropractors on their confidence and competence with regards to paediatric patient management, which are aspects, regarded by multiple studies, as vital elements of successful patient management in the healthcare sector. The findings of this research can provide a greater understanding of the methods which can be implemented in order to foster knowledge, skill and overall confidence during tertiary education, with respect to the field of chiropractic paediatric training.

Aim of the study

The aim of the study was to assess the perceptions of new graduate chiropractors in their management of paediatric patients in the eThekwini Municipality.

Methodology

A qualitative, explorative, descriptive research design was utilised for this study. A purposive sample of 10 new graduate chiropractors in the eThekwini Municipality were interviewed. Their perceptions with regards to their paediatric patient management were obtained through semi-structured interviews. Eight key questions, relating to chiropractic paediatric patient management and paediatric educational training, were used to

encourage the discussion. The data collected were stored electronically and then transcribed. The transcripts were then coded and analysed by the researcher to identify categories and subcategories. Interpretation of the coded data thereafter occurred, utilising the themes and sub-themes previously identified by the researcher.

Results

Four main themes were identified in the study, namely self-perception of confidence, knowledge and skill in paediatric patient management; exposure and training received in the chiropractic course; challenges encountered in paediatric patient management; and further enhancement of paediatric patient management. Participants expressed a lack of confidence and competence with regards to their management of the paediatric population. A strong correlation was exhibited between their perceived lack of skill in paediatric treatment and management and increased referral rates for this patient category. Participants stated that their lack of exposure to paediatric patients during the chiropractic paediatric curriculum in the course, negatively impacted on their diagnostic and orthopaedic assessment skills, as well as their ability to facilitate treatment to this age group. Participants identified areas of enhancement in the chiropractic paediatric component of the chiropractic programme. A variety of obstacles encountered by new graduate chiropractors were discussed, including parental satisfaction and influence on paediatric treatment; communication and time management skills; uncooperative patients and lack of competence and confidence with regards to paediatric patient management. Methods to improve paediatric assessment and treatment were then highlighted and discussed further.

Conclusion

This study is the first in South Africa to assess the perceptions of new graduate chiropractors in their management of paediatric patients. These perceptions were based on a variety of factors such as self-perceived competence, self- confidence, professional education and continued professional development, as well as practitioner experience. While new graduate chiropractors acknowledged the beneficial aspects of the chiropractic paediatric component of the chiropractic programme, they provided constructive feedback and recommendations for further enhancement of the chiropractic paediatric

curriculum in the chiropractic course. The lack of exposure to paediatric patients prior to private practice was highlighted as a key factor that negatively impacted on new graduate chiropractors' confidence to assess, treat and manage this patient population. Therefore, it is recommended that the findings of this research be utilised by the Durban University of Technology's Chiropractic Department in order to enhance the quality of their chiropractic paediatric curriculum.

Keywords: Chiropractic, education, new graduate chiropractors, paediatric patients, perceptions.

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GLOSSARY OF TERMS

Auxiliary treatment

Auxiliary treatment, in the context of this research, refers to an additional form of care provided in conjunction with spinal manipulative therapy. An example of auxiliary therapy would be cryotherapy.

Chiropractic

A healthcare profession specialising in the diagnosis, management and prevention of disorders of the neuromusculoskeletal system, by utilising manual procedures (World Health Organisation, 2005).

Complementary and Alternative Medicine

A collection of healthcare professions which are not part of a country's mainstream healthcare system (Carey *et al*., 2005).

Diagnosis

The identification of the cause of an illness (The Free Medical Dictionary, 2016).

Knowledge

The understanding, or familiarity with a situation, subject or place etc. (The Free Medical Dictionary, 2016).

Manipulation

A manual technique that involves the delivery of a controlled force to an identified segment of joint dysfunction, to achieve a therapeutic effect by stimulating the neuromusculoskeletal system (World Health Organisation, 2005).

New Graduate Chiropractor

For the purpose of this research, a new graduate Chiropractor is defined as a graduate having received their Master's Degree and obtaining five years of less of employment (Bhatia, 2015).

Paediatric Patient

For the purpose of this study, a paediatric patient is anyone up to and including the age of 18 years old (Children's Institute, 2016).

Perception

The identification, organisation and interpretation of sensory information, which are unique to an individual, and relates to the way that an individual feels regarding a particular topic (Williams, 2014: 1).

Treatment

The process of receiving medical care for an injury or illness (The Free Medical Dictionary, 2016).

Understanding

The process of comprehension and assimilation of knowledge (Oxford English Dictionary, 2015).

ABBREVIATIONS AND ACRONYMS

AHPCSA	Allied Health Professions Council of South Africa
ASRF	Australian Spinal Research Foundation
CASA	Chiropractic Association of South Africa
CCEI	Councils on Chiropractic Education
CHE	Council of Higher Education
DUT	Durban University of Technology
ECCE	European Council on Chiropractic Education
e.g.	Example
i.e.	In other words
IFC	Interferential Current
KZN	KwaZulu-Natal
NIP	Neuro-Impulse Protocol
OSCE	Objective Structured Clinical Examination
SA	South Africa
TENS	Transcutaneous Electrical Nerve Stimulation
UJ	University of Johannesburg
USA	United States of America
Via	By means of
Vs.	Versus
WHO	World Health Organisation
X-RAY	Radiograph

CHAPTER 1 ORIENTATION TO THE STUDY

1.1 INTRODUCTION AND BACKGROUND

Chiropractors focus on the relationship between the structure and function of the body and the manner in which that relationship affects the preservation and restoration of health (Vallone, 2018: 1478-1479). The chiropractic profession not only focuses on the diagnosis, treatment and prevention of mechanical disorders of the neuromusculoskeletal system in adults and paediatric patients, but chiropractors are also highly valuable and appropriate resources in injury prevention, postural correction, work-place safety, nutritional counselling and stress management (Hart, 2016: 48). Chiropractors predominantly utilise manual therapies, including spinal and soft-tissue manipulation, however, a variety of auxiliary modalities, such as transcutaneous electrical nerve stimulation (TENS) and ultrasound, can also be included in overall patient care (Hart, 2016: 48). When necessary, collaboration or referral to other healthcare specialists such as medical practitioners and paediatricians can form part of the chiropractor's management strategies (Alcantara et al, 2010: 621).

Chiropractors in South Africa are viewed as family practitioners, treating a variety of patients ranging from infants to the elderly population (Lee, Li & Kemper, 2000: 401). The chiropractic treatment of paediatric patients is still considered a controversial area of chiropractic management due to lack of scientific research in the field (French et al, 2010: 1-4). Mounting evidence suggests that childhood health and lifestyle can impact on health and quality of life in adulthood, therefore, the chiropractic provision of spinal and musculoskeletal care in paediatric patients must be recognised as an integral aspect of a holistic healthcare approach to children (French *et al*., 2010: 1-4).

Chiropractic is the most visited complementary alternative medicine (CAM) by paediatric patients globally (Ferrance & Miller, 2010: 1). Paediatric visits comprise of musculoskeletal and non-musculoskeletal conditions, ranging from torticollis, traumatic injuries, neck and back pain, to respiratory disorders, attention deficit disorder and Bell's palsy (Ferrance & Miller, 2010: 1). Enhancing the development of knowledge and confidence is therefore of importance to the newly graduated chiropractor, in order to assess and manage the aforementioned conditions and

efficiently explain management protocols and outcomes to the patient, parents or legal guardians.

A better comprehension of quantity and quality of knowledge and confidence in treatment of paediatric patients, will assist tertiary training institutions to enhance their curriculum and training (Hecimovich, 2009: 1).

Chiropractic education in South Africa consists of five years of pertinent clinically relevant education and practical training at the Durban University of Technology (DUT) or the University of Johannesburg (UJ). The academic programme spans over a five year period of full-time study, with an additional year contributing towards the chiropractic students' internship. The first three years of undergraduate training provides the future chiropractor with an extensive foundation based on traditional medical subjects, with particular emphasis on developing diagnostic skills. A combination of lectures, tutorials, laboratory and clinical work constitute the basic instructional pattern. The latter two years of the programme focuses on holistic patient care with particular attention on neuromusculoskeletal disorders. The fifth year encompasses a theoretical component combined with clinical experience, and the sixth year of the programme, constituting a chiropractic student's internship. The Allied Health Professions Council of South Africa (AHPCSA), a statutory body that all South African chiropractors and chiropractic students must register with, oversees and regulates the internship programme.

The paediatric component of the course is introduced as a component of the clinical chiropractic module and is completed within the fifth year of the chiropractic academic programme at the DUT. The learning outcomes for the course include the following:

- Familiarity and understanding of the history taking, evaluation, diagnosis and treatment of the standard paediatric conditions.
- Knowledge of the numerous modalities utilised to evaluate and, if appropriate, to treat the paediatric patient.
- Understanding of the rehabilitation principles applied to paediatric patients.
- Knowledge of paediatric nutrition.
- Familiarity and correct application of exercise prescription and emergency protocols in the paediatric population (Varatharajullu, 2017: 4).

This research, thus, endeavours to provide an insight into new graduate chiropractors' perceptions of their management of paediatric patients, with emphasis on their knowledge, confidence and skill in paediatric patient management. The research has been conducted with new graduates, with the aim of eliminating clinical experience, which contributes to perception and knowledge consolidation. The outcomes of the study can provide a premise for the understanding of methods in which confidence, knowledge and skill can be further enhanced during tertiary education.

1.2 PROBLEM STATEMENT

Paediatric patients are different to adults and, therefore, cannot be treated in the same manner (Davies, 2000: 1). There are a multitude of factors which must be taken into consideration with regards to the management of paediatric patients (Allen-Unhammer, Wilson & Hestback, 2016: 1). The chiropractic programme provides opportunities and educational methods which are aimed at fostering knowledge, confidence and skill when managing paediatric patients, however, there is a paucity in the literature with regards to a new graduate chiropractor's perception of timeous referral of paediatric patients, as well as their perceptions with regards to their own management of paediatric patients and aspects of improvement in their paediatric management protocols.

1.3 AIM OF THE STUDY

The aim of the study was to assess the perceptions of new graduate chiropractors in their management of paediatric patients in the eThekwini Municipality area.

1.4 OBJECTIVES OF THE STUDY

The objectives of the study were to:

- Explore the perceptions of new graduate chiropractors in their management of paediatric patients.
- Investigate challenges that new graduate chiropractors experience when managing paediatric patients.

- Determine areas of improvement in the chiropractic management of paediatric patients.

1.5 RESEARCH QUESTIONS

- What are the perceptions of chiropractors with regards to paediatric patient management?
- Does a new graduate chiropractor understand when to manage a paediatric patient himself or herself and when to refer to other health care specialists?
- What aspects, if any, would new graduate chiropractors want to improve in their management of paediatric patients?
    - Are there aspects that new graduate chiropractors suggest the chiropractic paediatric programme incorporate or adjust, in order to improve the quality of paediatric education and therefore paediatric care?

1.6 RATIONALE FOR THE STUDY

Chiropractors provide safe and efficient therapeutic interventions to paediatric patients, as an alternative treatment option compared to drug and surgical interventions (Vallone, 2018: 1478-1479). Chiropractors are the most sought after CAM providers for children and adolescents, with paediatric visits to chiropractors encompassing a variety of musculoskeletal and non-musculoskeletal disorders (Ferrance *&* Miller, 2010:1). According to Vallone *et al*. (2010: 1-2), the utilisation of Chiropractic care for paediatrics is increasing, however, there exists a lack of research with regards to the perceptions of chiropractors in their management of paediatric patients.

Chiropractic paediatric management includes, but is not limited to, nutritional and exercise advice, rehabilitation protocols, paediatric manipulation, soft tissue therapies and appropriate referral to other healthcare providers (Vallone *et al*., 2010:1-2). Due to the variance in the anatomy and physiology between adults and children, the management of paediatric patients must be modified and age-appropriate (Davies, 2000: 1-7). A paediatric patient cannot be viewed as a “little adult” and as a result of

an immature skeletal system, constant bodily dynamic changes, congenital defects and developmental disorders; doubt can be created in new graduate chiropractors over certain illness presentations and their management (Mortazavi *et al*., 2011: 1095-1100).

Chiropractors managing paediatric patients must also take into consideration that children under the age of 12 years are considered to be minors with respect to their consent for healthcare and issues concerning guardianship, and matters such as privacy and informed consent must be considered at every consultation (Maharaj, 2017: 1). The management and treatment of children is thus multidimensional, with a variety of factors which need to be considered (Vallone *et al*., 2010: 1-2). Chiropractic clinical education prepares the chiropractic student to assess, manage or co-manage paediatric patients; however, there is a lack of research pertaining to the perceived standard of education received in the paediatric course taught at Master's degree level to prepare future chiropractors in their management of paediatric patients. By assessing the perceptions of new graduate Chiropractors, with regards to their knowledge, confidence and skill in paediatric management, areas of improvement in paediatric educational development and training can be identified (Hecimovich, 2009: 1).

Todd, Carroll, Russel and Mitchell (2017: 14-19) concluded that there is an increase in perceived preparedness for paediatric practice with an increase in the total number of paediatric patients managed, hence this research was conducted with new graduate chiropractors, with the aim of eliminating the factor of experience, which contributes to the development of knowledge and perception. New graduate chiropractors are defined as graduates, having received their master's degree and obtaining employment for five years or less (Bhatia, 2015: 1).

Conclusions drawn from this research can provide a greater understanding of the methods in which confidence and knowledge can be fostered during tertiary education. The increase in the utilisation of chiropractic treatment for a variety of paediatric conditions warrants scientific evidence to support the successful chiropractic management of paediatric disorders (Homola, 2010: 1). There exists a gap in research, nationally and internationally, with regards to new graduate chiropractors' perceptions with regards to their management of paediatric patients, which this research aims to address. This study will benefit the chiropractic programme as it

endeavours to provide a greater insight into the perceptions of new graduate chiropractors in their management of paediatric patients and, by doing so, the research findings can be utilised to provide recommendations to the DUT chiropractic programme with respect to the field of paediatric chiropractic training.

1.7 SIGNIFICANCE OF THE STUDY

With the adoption of evidence-based practice, the chiropractic profession must remain dynamic, continually exploring, questioning and researching what constitutes effective chiropractic treatment and management (Vallone, 2018: 1). Chiropractic is the leading CAM therapy for children and adolescents, with research indicating that paediatric visits comprise 8% to 11% of all chiropractic visits worldwide (Alcantara *et al*., 2010: 621). Research in the field of chiropractic paediatric education, however, is sparse, globally and in South Africa. This study endeavours to address the paucity in the literature, by exploring the perceptions of new graduate chiropractors in their management of paediatric patients in the eThekwini Municipality.

By conducting the research with new graduate chiropractors, experience which is a pivotal contributor towards perception and knowledge enhancement is eliminated, thus enabling for the conclusions drawn from the study to provide critical insight into the chiropractic paediatric component of the chiropractic programme's benefits, as well areas of improvement at DUT. The study, thus, endeavours to benefit the chiropractic programme by providing recommendations to the DUT with respect to the paediatric component, with the aim of enhancing the quality of paediatric educational training, and therefore the overall paediatric patient care, which benefits both chiropractors and their patients.

1.8 OUTLINE OF THE THESIS

CHAPTER 1:

This chapter serves as an introductory chapter to the study and outlines the research aims, objectives, research questions, rationale for the study and significance of the study.

CHAPTER 2:

This chapter includes an extensive review of the literature pertaining to the study. Herein, components of the study will be expanded upon and discussed in detail.

CHAPTER 3:

The methodology utilised in the research will be elaborated upon in this chapter, outlining the procedures utilised from the start to the end of the research process. The research model and design will be explained in detail.

CHAPTER 4:

This chapter includes a presentation of the findings of the study.

CHAPTER 5:

The results of the study are elaborated upon and interpreted in this chapter. The relevance of the results is emphasized with relation to the research aims and objectives.

CHAPTER 6:

This chapter comprises of the summary and conclusions of the research. The limitations and recommendations of the research are also elaborated upon further.

1.9 SUMMARY OF THE CHAPTER

This chapter served as an introductory chapter to the study. The background to the research, research problem, study aim and objectives, research questions, rationale of the study, structure of the dissertation and an outline of the upcoming chapters were elaborated upon. The next chapter outlines the available literature pertaining to the study.

CHAPTER 2 LITERATURE REVIEW

2.1 INTRODUCTION

This chapter explores the literature pertaining to the chiropractic management of paediatric patients and highlights the gap in the literature pertaining to new graduate chiropractors perceptions in their management of paediatric patients. The sources utilised in the literature review were accessed from Google scholar, PubMed and Science Direct.

2.2 DESCRIPTION AND SCOPE OF CHIROPRACTIC

Complementary and alternative medicine (CAM) utilisation has increased substantially in the past several decades, with chiropractic accounting for the greatest number of CAM visits and remaining the largest CAM profession in the United States of America (USA), comprising of approximately 70 000 members (LeFebvre, Peterson & Mitchell, 2012: 1). In South Africa (SA), there are approximately 700 registered chiropractors, which comprises 26% of all professionals registered with the Allied Health Professions Council of South Africa (AHPCSA) (CASA, 2016:4). The AHPCSA regulates the chiropractic profession and all chiropractors that practice in SA must register with the AHPCSA in terms of the AHPCSA Act 63 of 1982 (CASA, 2016:4-5). Chiropractors are, therefore, licensed primary-contact providers and are trained to evaluate, diagnose, conservatively treat and refer patients in their management of neuro-musculoskeletal disorders (LeFebvre *et al*., 2012:2).

In a recent survey, patients presenting to chiropractors in S.A, the USA and Switzerland presented chiefly with low back pain, pelvic injury/pain, leg pain and neck pain with or without related arm pain or headaches (Johl, Yelverton & Peterson, 2017: 522). The scope of practice with regards to chiropractic varies worldwide across different countries, however, most chiropractors utilise an assortment of manual therapy techniques with an emphasis on manipulative procedures of the spine and extremities (Johl *et al*., 2017:521). Chiropractic therapeutic interventions for musculoskeletal and postural syndromes include, but are not limited to, joint adjustments and mobilisation; soft tissue manipulation, encompassing massage

therapy; exercise prescription and rehabilitative therapy, with activity modification; nutritional counselling; therapeutic modalities and strapping/taping (Johl *et al*., 2017:521).

2.3 CHIROPRACTIC IN THE CONTEXT OF SOUTH AFRICA

Chiropractors in SA are primary care providers and governed under the AHPCSA (AHPCSA 2014:4). In accordance with the AHPCSA ACT, ACT 63 OF 1982, AS AMENDED ('THE ACT'), Section 2 of the Act provides that a practitioner may:

i) Diagnose and treat or prevent, physical and mental disease, illness or deficiencies in humans;

ii) Prescribe or dispense medicine; or

iii) Provide or prescribe treatment for such disease, illness or deficiencies in humans.

In SA, chiropractic is utilised to treat a wide variety of conditions such as back pain, headaches, neck pain, fibromyalgia, extremity syndromes and infantile colic, to name a few (Salehi *et al*., 2015: 1). The chiropractic treatment techniques emphasise manual therapy, including manipulation aimed at addressing and alleviating the subluxation (Salehi *et al*., 2015: 2). In order to restore and preserve the health of the neuro-musculoskeletal system, chiropractors utilise a variety of techniques, such as diversified (which is the most utilised technique in SA), Gonstead, activator, sacro-occipital and active muscle release techniques (Johl *et al*., 2017: 521).

2.4 SCOPE OF CHIROPRACTIC WITH REGARDS TO PAEDIATRICS

2.4.1 Paediatric Visits to Chiropractors

In SA, chiropractors are holistic family practitioners (Hart, 2016: 48). A substantial component of this CAM therapy is made up of the chiropractic management of paediatric patients (Ferrance and Miller, 2010: 2). A paediatric patient is defined as any infant, child or adolescent up to 18 years of age (Children's Institute, 2011: 6). In the management of paediatric patients, chiropractors treat conditions that are both musculoskeletal and non-musculoskeletal in nature (Alcantara *et al*., 2008: 25). The

main cause of paediatric visits to chiropractors include a wide variety of non-musculoskeletal disorders, consisting of respiratory disorders (27%), allergies (15%), skin conditions (6%), gastrointestinal disorders (6%) and preventative care (5%) (Davies, 2000: 7). The musculoskeletal conditions include sport or traumatic injuries, torticollis, juvenile arthritis, neck and back pain, as well as headaches (Vallone *et al*., 2010: 1-2). The less common conditions worldwide, that present to a chiropractor's office, include attention deficit disorders (ADHD), autism, asthma, depression, influenza, Bell's palsy, dysmenorrhea and premenstrual syndromes (Ferrance and Miller, 2010: 1).

Chiropractors provide safe and efficient therapeutic interventions to paediatric patients, as an alternate treatment option to chemical and surgical interventions, which aim to alleviate symptoms, without first addressing and correcting the cause of the problem (Vallone, 2018: 1). The foundation of health is dependent on the structural, chemical and emotional balance of a patient and although drug and surgical interventions may, in the short-term, save lives, long-term amelioration is dependent on addressing all of the aforementioned founding principles of health (Vallone, 2018: 1).

2.4.2 Biomechanical Dysfunction in Paediatric Patients

Chiropractors correct biomechanical dysfunction by utilising a variety of techniques such as manipulation and soft tissue therapy. Biomechanical dysfunction often presents as a result of a subluxation (Australian Spinal Research Foundation, 2018: 1-2). The Australian Spinal Research Foundation (ASRF) (2018: 1-2), defines a subluxation as "A diminished state of being, consisting of a state of decreased coherence, altered biomechanical and neurological function as well as altered adaptability."

The increased elasticity of the joints, greater head to body ratio and immature articulating elements, predispose the paediatric patient to injury. Multilevel spinal injury can occur as a result of the reduced capacity of an immature spine to deal with loading forces, as compared to an adult (Mortazavi *et al*., 2011:1095).

During foetal development, the foetus undergoes internal and external stimulus and can experience space limitations during growth, which can adversely affect the neuromusculoskeletal system (World Health Organisation, 2008: 6). A traumatic birth

process may also contribute to biomechanical changes, leading to dysfunction (Mortazavi *et al*. 2011:1095).

During neonatal growth and development, factors such as maternal and environmental stress, feeding, and sleeping positions can contribute to neuromusculoskeletal conditions (Hubbard, Wolf & Stellwagen, 2007: 51). External factors such as medications, toxins, accidents and injuries during active periods can compromise the health of a developing musculoskeletal system (WHO, 2008: 6-7).

It may be possible to single out a specific cause of a vertebral subluxation complex, however, in reality, chiropractors will deal with a number of different factors, which after identifying, they must effectively teach and counsel the parents, as well as their child (Davies, 2000: 7). Congenital defects, genetic variance among paediatric patients, developmental disorders and an immature musculoskeletal system undergoing constant dynamic change are also of great significance in the chiropractic management of a paediatric patient, due to the potential for uncertainty that these elements are prone in creating.

2.4.3 Techniques Utilised in the Treatment of Paediatric Patients

In a survey on paediatric care by chiropractors in SA, the majority of participants (95% n=106 responses) reported that they treat paediatric patients of the most common age group consisting of seven to 17 year olds (Sommerville, 2016: 31).

A third of the participants (32%) reported having no additional training, apart from their university syllabus. A smaller percentage (27%) of the participants indicated that they had completed additional paediatric training (Sommerville, 2016: 48).

The treatment protocol most commonly used was reported to be spinal manipulative therapy (SMT), touch and hold technique and mobilisation for the age groups zero to 12 months (Sommerville, 2016: 55). Treatment protocol of both age groups of 13 months to six years and seven to 17 years included SMT, mobilisation and diversified technique (Sommerville, 2016: 49).

Spinal manipulative therapy is the most common treatment approach used to treat paediatric patients, with the use of supportive treatment, such as advice on exercise, diet, posture and soft tissue manipulation (Alcantara *et al*., 2010:621-626). Electrotherapy modalities, dry needling, heat, ice, ischaemic compression and

massage are also utilised by chiropractors in the management protocol of paediatric patients (Hawk *et al*., 2016: 158-168).

Internationally, there are a wide variety of manipulative techniques that are adopted in the treatment of patients. A study conducted by Alcantara *et al*. (2010: 621-626) with USA, European and Canadian chiropractors, revealed that techniques utilised in the treatment of paediatric patients ranged from the diversified technique (87%), activator methods (67%), Thompson technique (60%), cranial-sacral technique (40%), Gonstead technique (32%), sacro-occipital (29%) and chiropractic biophysics technique (13%). Furthermore, many chiropractors were reported to encompass more than one technique in their treatment protocol of children (Alcantara *et al.,* 2010: 621-626).

In SA, chiropractors are trained in the diversified technique, with only a minority of chiropractors adopting the use of neuro-impulse protocol (NIP) in the treatment of paediatric patients. This technique is currently only taught in external courses, outside of SA (Davies, 2012).

2.4.4 Considerations and Challenges Encountered in Chiropractic Paediatric Patient Management

Practitioners encounter a variety of intellectual and cognitive difficulties concerning paediatric patient participation in medical decision-making; this is combined with parental concern for the welfare of their child, which exposes the chiropractor to ethical challenges when making medical decisions (Parsapoor *et al*., 2014: 241-248).

Prior to any healthcare intervention and administration, informed consent and/or parental consent must be gained. All diagnoses, procedures and associated risks must be explained to the patient and their parents or legal guardians (Hawk *et al*., 2016: 165). This is mandatory by law, in order for an informed decision to be reached by the aforementioned individuals (Chiropractic Board of Australia, 2014: 13).

Infants and toddlers cannot communicate verbally and are frequently uncooperative during the consultation, hence proper communication with the parents or legal guardians is essential (Davies, 2000: 1-4). This aspect further requires special consideration during the paediatric consult, as extracting relevant clinical information and physically examining a paediatric patient requires age-appropriate communication skills and practical experience (Damm *et al*., 2015: 1).

Furthermore, the significant developmental, physiological, anatomical and psychological differences between an adult and a paediatric patient may affect the appropriateness and outcome of any healthcare intervention administered (Hawk *et al*., 2016: 165). The structure and function of a child's neuromusculoskeletal system is less rigid and more flexible than that of an adult, which presents unique challenges and considerations to the chiropractor with regards to the type of intervention utilised (Davies 2000:1-4). Hawk *et al*. (2016:164) suggest that when treating a paediatric patient with manual procedures, the following factors should be considered:

- Joint flexibility and smaller stature: paediatric patients exhibit greater flexibility and lesser muscle mass, hence gentler and lighter manual force must be applied.
- Patient preferences: the needs and comforts of the child must be considered when manipulation and soft tissue techniques are performed.

A chiropractor must also be well informed on a wide variety of information such as immunizations, healthy behaviour and lifestyle, sleep cycles and substance use (Hawk *et al*., 2016:165). It is the responsibility of the chiropractor to provide evidence-based, credible information to the patients and/or parents or guardians of the patient, or refer patients to such sources. This requires a continuous appraisal of relevant literature (Dogruer, 2011: 606), as well as a network of reliable, knowledgeable healthcare practitioners (Vermeir *et al*., 2015: 1257-1267). These factors may create confusion and pose challenges to new graduate Chiropractors, without years of extensive experience, practical expertise or defined healthcare networks, and hence the onus lies on the chiropractic profession to counteract these challenges, by identifying any areas of improvement in Chiropractic educational systems and to aid in an improved transition into the world of paediatric practice.

2.5 SOUTH AFRICAN CHIROPRACTIC EDUCATION AND TRAINING

There are two institutions in SA which provide chiropractic education and training (CASA, 2016: 23) which are the Durban University of Technology (DUT), since 1989, and the University of Johannesburg (UJ), since 1994 (CASA, 2016: 23). All South African chiropractors graduate with a Master's degree that requires approximately six

years to complete and is a pre-requisite to full registration with the AHPCSA, in accordance with the AHPCSA act, ACT 63 OF 1982 (CASA 2016:23). The Master's programme is inclusive of a five year, full-time academic component which focuses on clinically relevant education and practical application. The fifth and sixth years focus on fostering clinical and practical expertise at the universities' onsite clinics (DUT, 2018: 1-2).

2.6 THE DURBAN UNIVERSITY OF TECHNOLOGY CHIROPRACTIC EDUCATION AND TRAINING PROGRAMME

The chiropractic programme at the DUT is divided into three parts, with a separate qualification for each, as specified in **Table 2.1**. Although a student successfully completes the National Diploma and Bachelor of Technology components, a Master's in Technology qualification is only awarded after the successful completion of academic, research and clinical requirements (DUT, 2018). This is regulated by the professional board's (AHPCSA) requirements, Act 63 of 1982, with specific reference to Regulations R629, Government Gazette No 11221 of March 1988.

Table 2.1 Course Structure of the DUT Chiropractic Programme

Qualification	Year
N.Dip: Chiropractic	1 to 3
B.Tech: Chiropractic	4
M.Tech: Chiropractic	5

N. Dip Chiropractic = National Diploma: Chiropractic;

B. Tech Chiropractic = Bachelor of Technology: Chiropractic;

M. Tech Chiropractic = Master's in Technology: Chiropractic

Adapted from Department Rule Book (2019)

2.6.1 An Overview of the Course Content of the Chiropractic Programme at DUT

The initial two years of the N.Dip: Chiropractic consists of traditional medical subjects (e.g. Physiology, Anatomy and Medical microbiology). The final year incorporates more clinically relevant subjects (e.g. Diagnostics III and Systemic pathology). There is also a shift towards the incorporation of core chiropractic subjects, such as Chiropractic Principles and Practice III, which introduces spinal adjustment techniques and chiropractic theoretical constructs (DUT, 2019: 15-30). Chiropractic students do not receive any paediatric specific theoretical or clinical training in the N.Dip component of the chiropractic programme at DUT.

The B.Tech: Chiropractic spans over a one year duration and serves to introduce preclinical modules and training. The Chiropractic Principles and Practice IV module incorporates and refines manipulation and rehabilitation techniques. The Clinical Chiropractic IV subject comprises of the following components: mechanical low back pain, headaches and an overview of organic diseases, with a practical component comprising of spinal orthopaedic testing. Clinical Biomechanics IV introduces radiographic procedural techniques and interpretation of both spinal radiographs. Other components promoting clinical and practical education include:

- Hospital visits: the students visit a public hospital weekly, whereby the history and physical examination of patients are completed and the findings reported to the accompanying clinician. A hospital report is then done, encompassing a summary of the patient encounter.
- The observer programme: students are required to observe three new patients, ten spinal and three extremity cases. These cases are handled by the Master's students and are inclusive of the history taking, physical and regional examinations, along with the treatment protocol followed.
- Mock patient assessments: at the completion of the observer programme, B.Tech students are required to complete three case evaluations on 'mock patients,' without any treatment performed on these patients.

The Master's in Technology: Chiropractic course comprises of the first clinical year, with an incorporated theoretical component. The theoretical component consists of clinically orientated modules and practical components. The core chiropractic subjects are again split into modules. Chiropractic Principles and Practice V comprises

adjustment and rehabilitative techniques, specific to the extremities. Clinical Biomechanics and Kinesiology V encompasses an overview of extremity pathologies and their management. The subject also consists of a practical component focusing on clinical radiology. The topics covered in Clinical Chiropractic V include: the pregnant patient, geriatric patient and paediatric patient; assessment and patient management; case reviews with attention focused on sinister pathologies; chiropractic patient care (clinical practiculum); a practical orthopaedic component, comprising of the examination of the extremities; practice management, and jurisprudence covers topics pertaining to office management such as accounting, financing, purchasing and leasing. Jurisprudence concerns general medical and health legislation, the AHPCSA acts, rules and regulations, board decisions and requirements. The research project and dissertation consists of the production of a thesis. The clinical component consists of patient care at the DUT Chiropractic Day Clinic, and satellite clinics, as well as sport and community service events.

The DUT trains students to utilise the diversified technique, which is briefly described along with other commonly practised chiropractic techniques in SA in **Table 2.2** below. In addition, chiropractic education and practical training in SA incorporates a holistic 'mixer' approach, as compared to a reductionist 'straight' approach (Senzon, 2014: 25-48). These approaches refer to two very different philosophical models that have long since been a source of disrepute in the chiropractic profession worldwide (Keating *et al*., 2005: 1-10). Mixer chiropractors utilise manipulation, along with various diagnostic and therapeutic interventions, to restore and maintain neuromusculoskeletal health, in comparison to straight chiropractors who strictly adhere to the notion that vertebral subluxations (VS) are the cause of various diseases and hence, in order to restore health and proper function, the VS must be detected and corrected (Senzon, 2014: 25-48).

Table 2.2 Summary of the Common Chiropractic Techniques Utilised in SA

Chiropractic Technique	Description
Diversified	The most commonly used technique in SA, which encompasses a high-velocity, low amplitude trust into a dysfunctional articulation.
Activator	A handheld, recoiling instrument that delivers a low force, site-specific thrust to a dysfunctional joint.
Thompson	A table with several 'drop piece' segments that aid the thrust, while minimising the force utilise for the delivery of the adjustment. This technique is a variation of the diversified technique.
Craniosacral	Manual therapy which involves applying a force over a prolonged duration to correct cranial segmental dysfunction.
Gonstead	This technique encompasses a high velocity, low amplitude thrust to correct joint dysfunction, along with radiograph and temperature analysis, to aid in clinical evaluation.
Sacro-Occipital techniques	This is a category system of analysis and treatment to alleviate dysfunction.
Chiropractic biophysics	A combination of manual techniques, drop tables, hand-held instruments, exercise and traction used to correct segmental and postural dysfunction.
Neuro-Impulse Protocol	Regulated force applied to a specific area via the utilisation of finger pressure and vectors to correct subluxation. This technique is commonly practised on the paediatric population, either singularly or in combination with other techniques.

Adapted from Alcantara *et al*., (2010: 621-626)

The South African chiropractic qualification is internationally recognised (CASA, 2010: 24). The chiropractic programme is accredited nationally via the Council of Higher Education (CHE) and the AHPCSA (CASA, 2016). Accreditation internationally occurs via the Councils on Chiropractic Education International (CCEI), through the European Council on Chiropractic Education (EECE, 2018). Due to the adaptation of evidence-based care practices and greater healthcare accountability, chiropractors must be able to efficiently perform in a competitive healthcare system (Hawk *et al.*, 2016: 1-3). The responsibility rests with the educational institution to ensure that their students meet the criteria for standardised quality control, hence there is an on-going need to evaluate and improve the quality of educational training and practice of South African chiropractic students.

2.7 PAEDIATRIC EDUCATION AND TRAINING AT DUT

Chiropractic specialisation in the field of paediatrics is currently not available at DUT, with the majority of paediatric courses only being available outside of South Africa (Cawood, 2015:14). The geriatric and paediatric course, which is part of the chiropractic programme at DUT, is incorporated into the Clinical Chiropractic V module and introduced in the fifth year of the academic programme. These two components are taught simultaneously over two semesters (a 32 week duration). The lectures consist of one theory session, held two periods per week, with practical sessions incorporated into the theory lectures. There are no tutorial sessions for this subject. The paediatric module serves to familiarise students with the following:

- The assessment, diagnosis and treatment of visceral pathology in the paediatric patient.
- The modalities utilised in the assessment of paediatric conditions.
- Rehabilitation principles pertaining to children.
- Paediatric and pregnant patient nutrition and exercise prescription.

The paediatric section of the Clinical Chiropractic V module serves as an introduction to paediatrics, with an emphasis on evidence-based care, as the majority of notes for this section comprises of articles. Students are encouraged to consult the latest journals, books and internet sources for additional information.

The topics covered in the paediatric section of the course include:

- Identification and definition of paediatrics, paediatric education and the age ranges as they pertain to paediatric patients.
- Neonatal history taking and physical assessment, with attention to the vital and neurological examinations.
- A complete spinal examination, including observation, static and motion palpation, as well as spinal development and asymmetry.
- The neonatal orthopaedic examination, with emphasis on congenital hip dislocation and idiopathic scoliosis identification.
- Developmental milestones in the paediatric patient.
- Common paediatric conditions treated by chiropractors (e.g. infantile colic and basic skin conditions).
- Paediatric vaccinations.
- Child abuse.

The assessment criterion is grounded in demonstrating competency in the aforementioned topics. The theoretical component is assessed via three theory tests, comprising 70% of the year mark for the subject, with the remaining 30% contributed by the practical component. The year-end examination for the subject consists of two separate theory papers and a practical examination. The overall minimum mark for passing Clinical Chiropractic V is 50%, in each of the theoretical and practical components respectively. The paediatric component constitutes 50% of the final Clinical Chiropractic V mark, along with the cases which contribute the additional 50% towards the final mark (Varatharajullu 2017:5-9)

Improving the quality of education can improve confidence and skill level in new graduate chiropractors, which will allow them to confidently interact with paediatric patients and their parents, as well as motivate more research to be conducted in the field of paediatrics, focused on improving chiropractic paediatric management skills and treatment procedures. Anrig and Plaugher (2013: 2) stated that "one adjustment in a child is worth fifty in the adult". Chiropractic education should, therefore, ensure a strong foundation before the handling and treating of a paediatric patient. A chiropractor should be provided information that will foster clinical excellence, encourage dialogue and research among academics and researchers and be a source that is credible and reliable for those seeking information on the efficacy and appropriateness of chiropractic care for infants and children, as well as parents (Anrig *et al*., 2013: 5).

2.8 THE CONCEPT OF PERCEPTION

Perception consists of recognising and interpreting sensory information, as well as the individual’s response to that information (Williams, 2014: 1). Perceptions are specific to each individual, as a psychological process that occurs as a result of an individual's interpretation of stimuli through the five senses of taste, touch, smell, sight and hearing (Williams, 2014: 1). Perception also relates to how a person feels about a topic, which can be connected to their opinions, emotions and past experiences and hence variance is exhibited amongst individuals (Landauer and Rowlands, 2001: 1).

Perception consists of three stages, i.e. selection, organisation and interpretation respectively (The Perception Process, 2010:1-3). Selection is the first stage of

perception and is the process whereby an individual selects stimuli through their senses to focus on. This determines what information holds the individual's attention. Organisation is the second stage of perception and consists of mentally arranging stimuli in order to understand their meaning. Interpretation, the third stage of perception, consists of deriving meaning from selected and organised data (The Perception Process, 2010: 1-3).

According to The Perception Process (2010: 1-4), the following general factors influence perception.

External factors

- Intensity: the greater the intensity, the greater the likelihood of it being perceived.
- Size: the bigger an object, the higher the probability of it being perceived.
- Motion: a moving object attracts more attention than a stationary object.
- Contrast: greater contrast increases the likelihood of perception.
- Repetition: a recurring object has a higher probability of being perceived.
- Familiarity and novelty: familiar objects in new settings, and vice versa, attract higher attention.

Internal factors

- Learning and education: these factors influence the selectivity of perception as individuals tend to engage in rational processing, which is relates to information that they know.
- Personality: this factor also influences the selectivity of the individual in a confronting circumstance or situation.
- Motivation: the greater the need for a sense of accomplishment, the more attentive an individual will be to the relevant circumstance.

According to Zadra and Clore (2012:676-685), further influences on perception include:

- Socioeconomic influence: occupation and gender influence these factors.
- Psychological influence and affective-state: emotion, affect and judgement.
- Physiological influence: relating to bioenergetic information, health, fatigue and an animal's biological cycle.

Differences in perceptions amongst individual new graduate chiropractors can result from a variety of factors, which include, but are not limited to, differences in experience, education, emotion, motivation and physician satisfaction, personality, competency, practitioner expectations and cultural background (Mosadeghrad, 2013: 210-220). These factors will now be further elaborated upon.

2.8.1 Experience and Education

Perception is strongly influenced by experience, which causes a person to focus on specific information and interpretations, as well as to organise this information in certain ways (Landauer *et al*., 2001: 1). Experience is defined as a collection of acts or activities from which an individual may gain knowledge, opinions and skills (Oxford Dictionary, 2015). Experience can cause a person to have certain expectations or preconceptions, especially when combined with education. This is demonstrated when conversing with another person; one would decipher each word by the sounds and motion coming from the speaker's mouth, as well as interpreting the meaning of the preceding words, the topic of the conversation and the knowledge of the language (Snyder *et al*., 2015: 594). With repeated exposure to an object, person or circumstance, familiarity is established, which influences the perception of the subject (The Perception Process, 2010: 1-3).

Chiropractic care is frequently utilised internationally, by adults and children, for the treatment of musculoskeletal conditions. The developing neuromusculoskeletal system of a paediatric patient is far more flexible and complex than that of an adult patient and hence consideration must also be given to the variation in the physical, psychological and emotional response to chiropractic care. Experience and skill are needed to extract relevant clinical information from a paediatric patient during history

taking, utilising age-appropriate language to actively engage and relax the child during the consultation (Vermeir *et al*., 2015: 1257-1267).

Chiropractic education and training should aid the chiropractor in compiling a thorough case history, focusing on the family and health care history; concurrent heath care or medication; developmental milestones; diet; sleep; physical activity; injuries and previous trauma. Parents and legal guardians also play a role during a paediatric consultation, especially in the case of infants who cannot verbally communicate, and regarding issues pertaining to informed consent.

Informed consent and parental consent must be gained prior to a clinical consultation with a paediatric patient. Informed consent warrants that all procedures, diagnoses and questions be explained or answered in an age-appropriate, understandable manner, with possible risks and other available treatment options also made available. This requires skill, experience and adequate knowledge on the part of the chiropractor (Hawk *et al*., 2016: 163-165).

Recent studies conducted by Todd *et al*. (2017), in Rarotonga in the Cook Islands, utilising chiropractic students from New Zealand, and Monrouxe *et al*. (2014), in the USA, showed that the lack of experience and exposure to paediatric patients negatively impacted on students' perceived confidence and competence when managing the patient population. Students reported an increased level of preparedness to assess and manage paediatric patients after a trial of clinical placement, which allowed students to interact to a greater extent with the younger paediatric age group. Howells *et al*. (2006) further highlighted the importance of greater practical experience during tertiary education in order to prepare students sufficiently to assess, diagnose and treat paediatric patients in private practice.

Experience is further utilised when selecting a management strategy for a paediatric patient. A chiropractor can choose to solely manage a paediatric patient, co-manage with another health care professional or refer to another health care provider or specialist. These strategies require that the chiropractor acknowledge the limits and benefits of his or her own treatment, and possess the experience and skill of conducting a thorough age-appropriate physical examination, with appropriate referral, when pathology outside the scope of chiropractic care is discovered. This

constitutes the best evidence-based management strategy to utilise for a paediatric patient (Hawk *et al*. 2018:163-165).

A variety of considerations that must be taken into account prior to treating a paediatric patient with manual procedures include:

- Genetic variance and congenital abnormalities (Mortazavi *et al*., 2011: 1095).
- Patient stature and habitus: modifying biomechanical force in proportion to patient size.
- Structural development: modifying the manual procedure to accommodate the developing skeleton.
- Joint flexibility: the chiropractor must consider the increased flexibility and lesser muscle mass of paediatric patients, utilising gentler forces during manual procedures.
- Patient preference: adaptation of the manual procedure to support the needs and comfort of the patient.
- Prior response to manual therapy (Hawk *et al*., 2018: 163-165).

Research demonstrates that prior experience and substantial education would draw a chiropractor's attention to these areas due to greater competence and confidence and thus influence the perception process (The Perception Process, 2010: 1-4).

2.8.2 Emotions, Motivation and Physician Satisfaction

Emotions strongly influence an individual's perception of his or her environment, circumstance or situation (Zadra & Clore, 2012: 676-685). Emotion is defined as an involuntary physiological response to an object or circumstance, based on physical state and sensory information (Zadra & Clore, 2012:676-685). Traditionally, visual perception and emotion were considered separate domains, however, research has demonstrated that emotions influence how and what an individual sees, and vice versa. Regarding emotional states, for example, sadness can alter the perception of the steepness of a hill, causing it to appear far steeper in comparison to when an individual is happy. These findings suggest that the perception of spatial layout is influenced by non-optical factors, such as emotion, feelings and attitudes (Zadra & Clore, 2012: 676-685).

Emotions impact on an individual's perception of details, also known as local perception and perceptions of wholes or global perception. Studies demonstrate that negative emotions, such as stress, narrows attention, and positive emotions, such as happiness, broadens attention (Zadra & Clore, 2012: 676-685).

Research utilising the Kimchi test has concluded that when happy or sad moods are induced in participants, participants in a happy mood tend to adopt a global perception style, whereas participants in sad moods employ a local perceptual style (Zadra & Clore 2012:676-685).

Research utilising the Navon procedure, measuring the reaction times to large or small letters, concluded that a positive affect can empower, and hence a negative affect can inhibit, a global or local view, depending on which is dominant in a given circumstance (Zadra & Clore 2012: 676-685).

Emotional information thus transcends the moment because emotions, unlike moods, are a reaction to objects that do not need to be physically present. Emotions can thus serve to inform a chiropractor's decisions about a variety of circumstances with long- and short-term implications, for both the new graduate chiropractor and the patient (Zadra & Clore, 2012: 676-685).

Vigilance and attention are also influenced by emotion. Vigilance is defined as alert watchfulness or close and continuous attention. Vigilance and attention are vital to a chiropractor's skill set in order to exclude any contra-indications to manual therapy, which could exist, or refer to another healthcare provider in cases that fall outside the scope of chiropractic care (Hawk *et al*., 2018: 163:165).

Closely related to emotion; motivation and bioenergetic information are also demonstrated to alter perception. Motivation refers to the willingness of action or an incentive for performing an action (Oxford Dictionary, 2015). Motivation and job satisfaction are important factors in the delivery of high quality healthcare to patients. In a recent study, healthcare professionals identified nine organisational factors that they believed influenced their motivation and hence their job satisfaction. These factors were salary, work environment, co-workers, management, organisational policies, job security, recognition, job identity and opportunities for promotion (Mosadeghrad, 2013: 210-220).

Bioenergetic information concerns the flow and transformation of energy within an animal's body and between an animal and its environment. This information influences the perception of an organism's spatial layout. Numerous studies demonstrate that distances appear greater when metabolic energy is low, such as when fatigued, in poor physical condition or anticipating greater energy expenditure. These studies promote the concept of a physiological influence on perception (Zadra & Clore, 2012: 676-685).

Clore and Huntsinger (2008: 676-685) proposed that the affect-as-information hypothesis assigns a value to whatever seems to be causing it. Affect, with regards to this research, relates to representations of personal value which can be neurological, cognitive, expressive, experimental or behavioural. Research demonstrates that an individual's evaluation of an object largely reflects information from their own affective reactions, for example, in a social encounter, an imperative factor in the evaluation of other individual's or objects is commonly the feelings that they elicit.

Affect is, in summary, crucial to good judgement and decision-making. The reviewed studies have indicated that affective feelings influence judgements related to life satisfaction, culpability, risk, physical space and mortality. Affect influences not only judgement and decision-making, but also how people process information. These influences are observed across a variety of tasks, such as problem-solving and stereotyping, and therefore, make the understanding of the influence of affect vital to the health care industry (Clore & Huntsinger, 2008: 676-685).

2.8.3 Clinician Personality

Personality is defined as a set of qualities that is distinctive to a certain person or an assumed role or manner of behaviour (Oxford Dictionary, 2015). Personality judgements happen rapidly when people are introduced to new people. First impressions are made based on any information that is available within milliseconds of meeting a stranger. Research on the effects of personality on perception has provided evidence to support the Shifting-Standards Effect, as well as social projection (Winship & Stocks, 2016: 27-36). According to the Shifting-Standards Effect, during the impression-formation process, people utilise an individual's group membership as a standard to judge the individual (Winship & Stocks, 2016: 27-36). Assumptions and conclusions can be drawn about a person when they identify with a certain social

group, for example a cheerleader or a chess player. Assumptions are made regarding what the individual's general mood and personality traits should be (Winship & Stocks, 2016: 27-36).

This is a notable finding as it provides a better insight into how individuals, including practitioners, perceive other people, such as their patients. Studies have also revealed evidence to support social projection, which is projecting one's own personality traits onto other individuals. Social projection occurs when a person consciously or unconsciously considers other individuals to be similar to them or otherwise project onto other people what they know about themselves. This also occurs when two traits correlate in an individual's own personality and the individual assumes that those traits correlate in another individual, hence projecting their own personality structure onto others. Social projection has also been revealed to exist for other knowledge states as well, such as goals, needs, sexual intent and transient drive states, for instance hunger (Winship & Stocks, 2016: 27-36).

A clinician's personality, therefore, affects the quality of medical services. Good rapports with patients are established utilising clinician personality traits, such as intelligence, helpfulness, confidence, respect and reliability. These characteristics help the clinician to build a good relationship with the patient, which in turn, helps gain the patient's trust and cooperation in the treatment process.

Research involving medical doctors in private and public healthcare sectors concluded that there is a link between physician attitude and communication with the patients and the physician's income (Mosadeghrad, 2013: 210-220). In public hospitals, doctors' communication skills are not linked to their income, thus, doctors are not motivated to improve their communication skills. The study further concluded that doctors' personal problems and family life also influence their behaviour and the quality of medical services rendered (Mosadeghrad, 2013: 210-220).

In relation to the Shifting-Standards Effect, a patient's personality and character also influences the interaction between the clinician and the patient. Research on medical doctors and the factors affecting medical service quality concluded that physicians adjust their communication method based on patient socio-demographic factors, for example an explanation of the treatment process differs when explaining it to an adult in comparison to a child.

Patients who are polite and eloquent motivate the physician to continue the examination further in comparison to those who are uncooperative and grumpy. This can constitute an area of concern in paediatric management as children are frequently uncooperative and restless during a consultation (Davies, 2000: 1-4).

Physicians asserted that a patient's recognition of their efforts motivated them to maximise their efforts, however, neonates and young children cannot verbally communicate which makes it difficult to gage patient satisfaction (Davies, 2000: 1-4).

In summary, patient personality and behaviour affects the attitudes and perceptions of the practitioner and impacts on the quality of service provided by the practitioner (Mosadeghrad, 2013: 210-220).

Interpersonal and communication skills are also two essential qualities that constitute the professional character of a practitioner. These attributes have a greater impact when dealing with the paediatric population as the manner in which the practitioner informs the parents/guardians about their child's disease, impacts greatly on further doctor-patient and doctor-care-givers relationships. If the practitioner exhibits good interpersonal and communication skills, the parents/guardians become his/her partners in the management of the child's illness, increasing the likelihood of a good clinical outcome. Despite age, socioeconomic and education level, communication with the paediatric patient and their family is essential, to obtain trust and gather critical clinical information regarding the patient's illness from the medical history, which a practitioner without these attributes would have missed (Marginean *et al*., 2017: 1-2).

2.8.4 Competency

Competency is defined as meeting the specified qualifications to perform a task (Asfani *et al*., 2016: 416-419). Due to the significant difference between adults and children, a physician who deals with paediatric patients must make adaptations to the healthcare encounter, as well as the delivery of therapeutic interventions. Many of the skills required in order to attain the qualification of a certified paediatric doctor of chiropractic overlap with those of a general doctor of chiropractic (Hewitt *et al*., 2016: 110-114).

These skills include:

- Possessing adequate knowledge and understanding of the physiology, psychology, anatomy, neurology and developmental stages with respect to the paediatric population.
- The ability to identify common and unusual disease presentations in a child.
- The skill and ability to perform an age-appropriate assessment of the paediatric patient.
- Formulate a differential diagnoses based on patient history, examination and relevant diagnostic studies.
- Formulate a management plan, inclusive of treatment, referral to/or co-management with other healthcare specialists.
- Deliver competent, skilful and safe chiropractic care modified to the specific needs of the paediatric population.
- Function as a primary contact, portal of entry chiropractic practitioner.
- Display high ethical and professional standards, with regards to all aspects involving the care of paediatric patients and professional practice (Hewitt *et al*., 2016: 110-114).

A student must demonstrate competence in the aforementioned skills, during their internship, when dealing with paediatric patients. A student's competence can be measured by observing how well they perform in terms of task finalisation based on their expertise. Competence can be influenced by numerous factors, involving the teachers/instructors, as well as the student and the environment (Asfani *et al*., 2016: 416-419).

Student factors may comprise of the following:

- Self-regulated learning: consisting of selecting, arraigning or creating their own advantageous learning environment and planning themselves in the learning process.
- Communication skills: discussing and sharing ideas with the teacher and other students to facilitate the transfer of information.

- Student achievement motivation: motivation is demonstrated to improve student performance, hence increasing student motivation will produce an increase in performance.
- Learning satisfaction: research has shown that when students are satisfied with what they learn, their interest in learning is also increased, hence increasing their academic achievement (Asfani *et al*., 2016: 416-419).

Teacher/instructor factors comprise of the following:

- Teaching performance: research has concluded that teaching performance is the most influential factor in a student's achievement. It provides reinforcement to students, therefore improving motivation and hence learning achievement.
- Adequate guidance: this factor is demonstrated to help develop a positive attitude towards learning and good study habits.
- Experience and competence: research has demonstrated that experienced teachers have a higher impact on student achievement, in comparison to less experienced teachers (Asfani *et al*., 2016: 416-419).

Environmental factors include:

- Proper facilities and infrastructure: these factors are demonstrated to produce a positive influence on the effectiveness of the teaching and learning process.
- Parental guidance: academic achievement has been shown to increase with positive support from parents.
- A positive classroom environment: this factor supports the students' learning activities, hence increasing learning achievement (Asfani *et al*., 2016: 416-419).

Competence impacts directly on perception as it consists of interpreting information, as well as formulating a response to that information, in order to allow an individual to perform a task adequately and properly. Competence, therefore, is an essential factor to consider when investigating a person's perception.

2.8.5 Practitioner Expectations

Expectation is defined as the act or state of awaiting an event or that which is expected or looked forward to. Expectations have a profound impact on the way people perceive the world. Humans are "anticipatory systems", forming predictive models of

themselves and the environment, to allow for quick and robust analysis of incoming data. These expectations can prepare the sensory cortex of the brain for processing and increase the perceptual sensitivity for expected stimuli. Research has concluded that individuals rely the most on prior knowledge when expectations are reliable and the stimulus is not precise or clear. Individuals rely more strongly on the sensory input when expectations are weak and the stimulus is reliable (deLange *et al.,* 2018: 1-3).

The implications for expectations in the healthcare sector lies in the recognition of situations, which is central to practical reasoning. A fundamental component of becoming an expert practitioner depends on how the practitioner retains past experimental learning, background skills and practices. Practitioners utilise prior knowledge and expectation in order to function effectively in emergency situations. Expectations help doctors to plan disease and recovery trajectories, as well as treatment protocols, and changes to those treatment protocols, where necessary. Expectations, if held rigidly, however, may cause subtle deviations from the norm to be overlooked, thus causing habitual responses to rule inappropriately. These expectations can be formed from caring for paediatric patients with similar conditions. A practitioner must remain aware of the influence of prior expectations on their perception of a patient or situation by continuous assessment, evaluation and validation of the patient, diagnoses or situation with which they are presented (Benner, Hughs & Sutphen, 2018: 102-104).

2.8.6 Cultural Background

Culture is defined as a mixture of beliefs and behaviour that define the values of social groups and communities (Oxford Dictionary, 2015). Visible and non-visible signs of culture exist. Visible signs are inclusive of language, rituals, food and dress. Non-visible indicators consist of reactions to physical space, control of emotions, notions of modesty and time perception. Practitioners and patients come from a variety of cultural backgrounds and, consequently, there exists the possibility to unintentionally offend a patient by misunderstanding a cultural viewpoint (Ohana & Mash, 2015: 423-934).

Language differences can cause gaps in understanding and perception. Although a doctor is fluent in one language, it may be the patient's second or third language, hence allowing room for possible misinterpretations to occur during the consultation

(Mosadeghrad, 2013: 210-220). Confusion can also occur when trying to communicate with the younger paediatric population, who may misunderstand, are uncooperative or are unable to efficiently communicate with the practitioner (Hawk *et al*., 2016: 164-166). A translator, in this case, can help to reduce the possibility of a misunderstanding on behalf of the patient; however, caution must be exercised when using parents or family of the patient who could possibly influence or inhibit the discussion (Ohana & Mash, 2015: 423-934).

Culture plays a vital role in the management of an illness. With regards to the patient's overall health, culture may, in some cases, heighten risk. Paediatric patients or their parents may, for example, not adhere to conventional treatment, have different opinions with regards to the cause of their illness or delay the decision to seek advice regarding their health as a result of cultural influence. Further influences of culture on healthcare include consulting with traditional healers before consulting with a medical professional, fasting and eating rituals that could have detrimental effects to recovery and overall function, gender difference and levels of family influence on patient care (Ohana & Mash, 2015: 423-934). The utilisation of a practitioner's knowledge and skills in order to provide optimal, effective healthcare for a culturally diverse patient base is, therefore, of importance.

These practitioners are termed "culturally competent", which includes an awareness of a patient's and a chiropractor's social and cultural background and implementing strategies and skills with a focus on culturally appropriate healthcare interventions. Practitioners' perceptions and culture can impact their willingness and ability to respond to specific requests for care in elective situations. Lack of cultural competence can impact on patient safety and health outcomes in numerous ways, including patient misunderstanding of their treatment protocol, ordering inappropriate and unnecessary tests, repeat hospital admissions and misdiagnoses, among others (Ohana & Mash, 2015: 423-934).

Practitioners can promote cultural competence by practising in the following manner:

- Awareness of the impact of individual cultural values and potential biases on the interaction with paediatric patients and their families from different cultures.
- Showing understanding towards different beliefs and values.
- Adapting practice styles, where necessary, to meet the needs of children.

- Collaboratively working with diverse populations in a respectful manner.
- Adopting and implementing inclusive medical practices.
- Continuing to learn about culture and cultural influence on practitioners, paediatric patients and their families.

Chiropractors have the opportunity to be the pioneers for cultural competence among healthcare professionals because of their unique position within the healthcare system. A practitioner's perception is influenced by their own and their patients culture, which in turn influences the perceived quality and safety of medical care provided to paediatric patients (Ohana & Mash, 2015: 423-934).

2.9 SUMMARY OF THE CHAPTER

Chiropractic is the most visited CAM therapy utilised by paediatric patients, however, a lack of scientific evidence with regards to successful treatment of paediatric patients is constantly noted throughout the literature (Ferrance & Miller, 2010: 1). Proof of treatment success relies heavily upon chiropractors themselves, which directly relates to their confidence, attitudes, perceptions, skill level and education, which are all needed to successfully treat a paediatric patient (Ferrance & Miller, 2010: 1). The following chapter highlights the methodology utilised to design and execute this study.

CHAPTER 3 RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter will elaborate upon the research methodology utilised in this study, with emphasis applied to the data collection and data analysis techniques.

3.2 RESEARCH DESIGN

A research design is a comprehensive planning process utilised to collect and analyse data to produce a greater understanding of a given topic (Abutabenjeh *et al*., 2018: 238). The general research process consists of three primary stages, which are providing a question for examination; collecting data in order to answer a question and presenting an answer to the question (Abutabenjeh *et al*., 2018:238).

A qualitative, exploratory, descriptive research design was utilised for this study. A qualitative paradigm was best suited to this research study as it aimed to explore a topic, understand phenomena and answer questions by analysing, categorising and making sense of unstructured raw data (Houghton *et al*., 2013: 12-17).

3.2.1 Qualitative Research

Qualitative research provide results that are true to the participant and their experiences and is not restricted to set questions, thus producing information which is rich and dense in nature (Houghton *et al*., 2013: 12-17). Qualitative research is useful in order to gain a thorough understanding of human behaviour with the aim of exploring and describing the quality and nature of how people experience, understand and behave, which aligns with the aim of this study. A multitude of factors prompted a qualitative approach to this study. Qualitative methods are utilised to answer questions about experience, meaning and perception from the viewpoint of the participant (Hammarberg *et al*., 2016: 499). These types of data are not amenable to counting or measuring, hence a quantitative approach would not have been useful to this study.

The qualitative research technique utilised semi-structured interviews in order to gain further insight into new chiropractic graduates' perceptions in their management of paediatric patients in the eThekwini Municipality, with participants being able to

provide an institutional perspective and background information. This would not be possible when utilising a quantitative approach, as those data are not easily isolated and defined (Hammarberg *et al*., 2016: 499).

3.2.2 Exploratory Research

Exploratory research occurs when an area of interest or a concept is identified and the researcher attempts to investigate further to understand the concept (Williams, 2007: 67). An exploratory design was utilised in this research study as the aim of the study focused on investigating and understanding the perceptions of new graduate chiropractors in their management of paediatric patients in the eThekwini Municipality.

3.2.3 Descriptive Research

Descriptive research was used as an adjunct to explorative research, whereby concepts could be expanded upon to determine meaning and using what is already known to better understand related concepts (Williams, 2007: 67). This research design, therefore, allowed for the researcher to explore and interpret concepts, as well as identify relevance and meaning from collected data.

3.3 RESEARCH SETTING

The research setting is defined as a place where data are collected (Mbambo, 2009: 39). The research setting should be one where the participants feels comfortable and refers to their natural environment. Participants for the study were sourced from the eThekwini Municipality, which is located on the east coast of SA in the province of KwaZulu-Natal (KZN). The total municipal area spans 2297 km^2 and is inhabited by approximately 3.5 million people (South Africa, Department of Infrastructure, 2012: 16).

The majority of inhabitants consist of Black (71%), Indian/Asian (19%), White (8%) and the Coloured (2%) population. The majority of the population consists of individuals between the ages of 15-24 years (South Africa, Department of Infrastructure 2012:16).

3.4 POPULATION SIZE

The research population refers to the entire group of people from a particular organisation from which participants will be selected (Kumar, 2014: 1). The research population for this study comprised of new graduate chiropractors, who have graduated from the DUT. The total number of chiropractors that graduated from the DUT in the eThekwini Municipality within the five year period is estimated to be 121 new graduates, averaging approximately 24 DUT chiropractic graduates per year (Drake, 2019).

3.5 SAMPLING PROCESS

When conducting research, it is often difficult to include an entire population of people sharing a common condition or characteristic, hence only a part of this population, termed the 'sample population', is included in the study. In order to generalise the research findings and reduce bias, the sample population must represent the whole population, with the least possible error and without substitution or incompleteness (Elfil *et al*., 2017: 52). The process of generating a sample population from the whole population is termed the 'sampling process' (Elfil *et al*., 2017: 52).

In order to select the sample, the researcher utilised purposive sampling, which is a sampling technique whereby the researcher's judgement is used to choose the participants in the study (Dudovskiy, 2016: 1). Participants were identified by obtaining a list of all chiropractors from the AHPCSA website. New graduate chiropractors from the DUT were then identified with the aid of the research supervisor. A final list of possible participants was then constructed, from which participants were contacted telephonically to gauge eligibility for the study and obtain permission to conduct the research at the participant's place of employment.

3.6 SAMPLE CHARACTERISTICS

3.6.1 Inclusion Criteria

- Participants who are registered with the AHPCSA.

- Participants who are practising in the eThekwini Municipality and have graduated from the DUT.
- The participant must be a chiropractic graduate having received their Master's degree and having obtained approximately five years or less of practice experience.

3.6.2 Exclusion Criteria

- Participants who do not provide consent to participate.
- Participants who have completed additional paediatric educational courses.

3.7 SAMPLE SIZE

The minimum number of participants required for this study was 10.The saturation point was reached at six participants in this study, however a further four participants were interviewed in order to confirm saturation. Saturation is a criterion used for discontinuing data collection and is the gold standard by which purposive sampling sizes are determined. Data saturation is reached when no additional information is found to develop properties of the category or the point in coding when there is a lack of new codes emerging in the data (Saunders *et al*., 2017: 4). The researcher is empirically confident that the data are saturated when there is a continuous repetition of similar instances (Saunders *et al*., 2017: 4).

3.8 PARTICIPANT RECRUITMENT

The researcher and research supervisor utilised a list comprising of chiropractors registered with the AHPCSA, in order to select possible participants for the study, in accordance with the inclusion and exclusion criterion of the study. Possible participants were then contacted telephonically and the researcher explained the purpose and character of the study. Interviews with interested new graduate chiropractors were then set. Remuneration of one Continuing Education Unit (CEU) point, towards participants' Continuing Professional Development (CPD) was awarded for participation in the study as stipulated in the letter of information (**Appendix 2**). This incentive was awarded by the registrar of the AHPCSA. Upon successful

completion of the interview, an email confirming participation in the research was sent to the participants, which was stored in the event of a computer generated audit.

3.9 RESEARCH TOOL

A semi-structured interview guide was utilised as the instrument of choice in this study (**Appendix 4**). According to Artino *et al*. (2014: 436-474), it is recommended to use published, pre-validated interview guides as research tools, in order to save time, resources and improve the validity of the research. Due to the fact that each health science programme has adopted unique instructional offerings and standard procedural protocols, and that variance is exhibited among the universities that offer the chiropractic course, the researcher developed an interview guide with specific questions pertaining to the perceptions of new graduate chiropractors. No pre-existing interview guide, therefore, was utilised or adapted completely for this research study (**Appendix 4**).

The questions used in the interview guide exhibited similarity to those of other studies investigating medical personnel perceptions' within the scope of their clinical practice (**Table 3.1**).

Table 3.1: Examples of Key Questions Used in Comparable Studies

Reference	Key questions
Monroux *et al*. (2014)	• How prepared do you feel for clinical practice?
Todd *et al*. (2017)	• Do you feel prepared for clinical practice with children?
Evans (2013)	• In your practice, when would you send for a radiographic examination of a paediatric patient? • What are some of your considerations before treating a paediatric patient with manual procedures?

A condensed summary of questions utilised in the interview guide are provided in **Table 3.2**.

Table 3.2: A Summary of the Eight Main Questions Utilised in the Interview Guide

Question number	Question	Facet of new graduate perception
Question 1	What are your perceptions, with regards to paediatric patient management?	Viewpoint of the new graduate with regards to their preparedness and confidence in managing a paediatric patient.
Question 2	Do you feel, as a new graduate chiropractor, that you are adequately knowledgeable in order to diagnose a paediatric patient?	Paediatric patient care in the clinical environment and appraisal of the present available educational resources pertaining to the paediatric field.
Question 3	Would you be interested in attending a post-graduate paediatric course? Please elaborate.	Interest in pursuit of post-graduate paediatric education.
Question 4	Do you feel that you fully understand when to manage a paediatric patient yourself and when you should refer to other health care specialists?	The ability to identify serious underlying pathology and refer as appropriate.
Question 5	Describe the most challenging aspects regarding paediatric patient treatment and management.	Obstacles and challenges encountered during paediatric patient management in the practice setting.
Question 6	What aspects, if any, would you want to improve in your management of paediatric patients?	Desire for the enhancement of paediatric diagnostic and therapeutic services.
Question 7	In your opinion, what do you think was the most useful aspect that you learnt regarding paediatrics in chiropractic that has helped you manage or treat paediatric patients in private practice?	Elaborate on the theoretical grounding and clinical experience received that has assisted in the provision of competent and comprehensive paediatric patient management.
Question 8	Are there aspects that you suggest the chiropractic paediatric programme incorporate, or adjust, to improve the quality of paediatric education and therefore paediatric care?	Suggestions to enhance the quality of paediatric education for the future.

3.10 PRE-TESTING OF THE DATA COLLECTION TOOL

Pre-testing of the data collection tool is a pre-research study done, on a smaller scale, in order to evaluate the research instrument, before utilising it for the main study (Shuttleworth, 2015: 65). Pre-testing of the semi-structured interviews was performed to test the set of research questions. The pre-testing of the data collection tool was conducted on two new graduate chiropractors. No changes were suggested to the research instrument, as participants indicated that the interviews were comprehensive and relevant. These participants were not included in the main study. The data obtained during the pre-testing of the tool were not used as part of the data analysis.

3.11 DATA COLLECTION PROCESS

Semi-structured interviews utilising an interview guide (**Appendix 4**) were conducted with each of the research participants. Each participant decided on the time, date and venue of their interview (where their place of employment was based). The semi-structured interviews were conducted, with the researcher having properly explained the research context to the participants so that they understood the purpose and use of the interview. A letter of information (**Appendix 2**) and consent (**Appendix 3**) was provided to the participants which was read, signed and returned to the researcher. The participants were then reminded that the interview would be voice recorded. The participants were assured that they could withdraw from the interview should they feel uncomfortable at any point and that the information obtained will remain confidential. A set of research questions was then asked and the participants were given 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. After the interview, the interviewees were thanked and again reassured of confidentiality.

Confidentiality was enforced by allocating each participant a code. The duration of the interviews varied, dependent upon individual responses, however, the average duration was approximately 15 minutes.

3.12 DATA ANALYSIS

Creswell. (2013: 13) outlined that qualitative data are analysed in three phases, namely transcription, analysis and interpretation:

- Transcription occurred after listening to voice recordings from the interviews verbatim. The transcriptions and voice recordings were then rechecked in order to ensure accuracy.
- Transcripts were then coded and analysed in order to identify categories and subcategories.
- The coded data were then interpreted, utilising the themes and subthemes that were identified by the researcher. In order to reduce bias, the research supervisor then cross-checked these interpretations.

The voice-recorded interviews were transcribed verbatim. The data collected were then presented to the research supervisor in the form of transcripts and voice-recordings and checked for any mistakes that may have occurred during the transcription process. The researcher then read through the interviews multiple times, in order to initiate the coding process, by gaining familiarity with the interviews (Creswell, 2013: 13).

A code is a construct that is generated by the researcher that symbolises and attributes interpreted meaning to each individual datum in order to detect patterns, generate categories, themes, concepts or derive meaning from the data (Saldana, 2013: 4). The codes generated from the analysis of the data were then re-checked by the research supervisor and grouped together, according to similarity and regularity, which contributed to pattern formation and hence facilitated the development of categories (Saldana, 2013: 4).

These categories contained clusters of coded data and thus were further refined into subcategories. Major categories were then comparatively analysed and subdivided into themes. A theme is a phrase or sentence that identifies what a unit of data means and functions as a way to categorise data into a focal topic that arranges a group of recurring ideas (Bernard, 2011: 338).

Conclusions or assertions were then formulated when similar themes were clustered together (Saldana, 2013: 175-176). The conclusions drawn were then re-evaluated by the research supervisor in order to reduce bias and maintain validity and reliability during the study (Houghton *et al*., 2013: 12-17).

3.13 ETHICAL CONSIDERATIONS

3.13.1 Ethical Approval

Ethical approval for this study was provided by the Institutional Research and Ethics Committee (IREC) of the DUT (Ethics Reference Number: REC 133/18) (**Appendix 1**).

3.13.2 Ethical Principles

Each participant read the letter of information (**Appendix 2**) and signed the informed consent (**Appendix 3**) before the commencement of the interview. The participant's place of employment was utilised for the interview as specified in the letter of information (**Appendix 2**). Participants' personal details were omitted to ensure confidentiality and professionalism. The transcripts and recordings were only accessed by the researcher, supervisor and co-supervisor. The transcribed data have been placed in the chiropractic department archive and will be stored for five years, after which it will be destroyed. Participation in the study was voluntary. The following four ethical principles were further taken into account:

3.13.3 Autonomy

Autonomy refers to the capacity to make a non-coerced, informed decision (Houghton *et al*., 2013: 12-17). Participants had freedom from external control and were able to make their own decisions, with the freedom to express their own opinions. Participants were free to withdraw from the study at any point in the interview process, as stipulated in the letter of information (**Appendix 2**).

3.13.4 Non-Maleficence

Non-maleficence refers to the careful attention of the researcher to ensure no harm or risk is imposed upon the participant (Houghton *et al.,* 2013: 12-17). No participants were harmed during the study as stated in the letter of information (**Appendix 2**).

3.13.5 Beneficence

Beneficence refers to the obligation of the researcher to prioritise the welfare and minimise any harm to the participants (Houghton *et al*., 2013: 12-17). Participants were ensured confidentiality and anonymity before and after the interview process, which was acknowledged on the behalf of the participant by signing the informed consent document (**Appendix 3**). This study aimed to benefit the chiropractic programme as it aimed to provide a greater insight into the perceptions of new graduate chiropractors, in their management of paediatric patients, and, by doing so; the research findings can be implemented to improve the quality of chiropractic paediatric education at the DUT.

3.13.6 Justice

Justice refers to the participants' rights to equitable and impartial treatment (Houghton *et al*., 2013: 12-17). No discrimination was exhibited towards participants as each participant had an impartial opportunity to voice their opinions and the right to provide or withhold information. The privacy of the participants was ensured by omitting the participants' particulars on the transcribed documents and storing the electronic data on password protected devices, which were only accessible to the researcher.

3.14 TRUSTWORTHINESS

The trustworthiness of qualitative data is established by utilising Lincoln and Guba's four criteria which are credibility, transferability, dependability and confirmability (Morrow, 2005: 250-260).

3.14.1 Credibility

Credibility refers to internal consistency and how rigor in the research process is ensured. (Morrow, 2005: 250-260). Credibility in this study was ensured by the following:

- A letter of informed consent was issued to participants, participation was voluntary and the chiropractor was free to discontinue the interview process if they wished to do so.
- Reliable research methods previously utilised in qualitative research was utilised during the research process.
- Data were collected until the point of saturation occurred.

3.14.2 Transferability

Transferability refers to the limit at which the reader can generalise the conclusions of the research to their own context (Morrow, 2005: 250-260). It is viewed equal to external validity or generalizability (Gasson, 2004: 98).

To ensure transferability in the study, the following methods were utilised:

- The research context was provided to the reader.
- Aspects of the research process, such as the duration of data collection, methods of data collection, duration and amount of collection sessions and exclusion criteria, were provided to the reader.
- The number of participants, as well as researcher-participant relationships, were provided to the reader in order for the reader to decide how the findings could transfer (Gasson 2004:98)

3.14.3 Dependability

Dependability refers to the manner in which the research is conducted and should be consistent, as well as repeatable, as often as possible (Morrow, 2005: 250-260). Dependability was accomplished by:

- Tracking the research design.
- Keeping an audit trail, that is, a meticulous chronology of the study's activities and processes, possible influences on analysis and data collection, emerging themes and categories.
- The audit trail was then examined by the supervisor and co-supervisor.

3.14.4 Conformability

Conformability refers to the acknowledgement that research is never completely objective (Morrow, 2005: 250-260). Conformability is based on the researcher adequately linking together the data, analytic processes and conclusions in a manner whereby the reader can confirm the adequacy of the findings (Gasson, 2004: 93). Conclusions should represent the phenomenon being researched, rather than the beliefs of biases of the researcher (Gasson, 2004: 93). Conformability was accomplished in the study by:

- Keeping an audit trail.
- The maintenance of subjectivity.
- The recognition of the limitations of the study and their possible effect on the outcomes of the research.

3.15 SUMMARY OF THE CHAPTER

The research processes and methodology utilised in this study were explored in depth in this chapter. Ethical considerations and methods of ensuring validity and reliability were expanded upon, along with their relevance to the study. The following chapter includes a presentation of the findings of the study.

CHAPTER 4 PRESENTATION OF RESULTS

4.1 INTRODUCTION

The results obtained from the analyses of 10 semi-structured interviews obtained from newly graduate chiropractors in the eThekwini Municipality are presented in this chapter. The age, gender, number of months in private practice and approximate number of paediatric patients treated by the chiropractors in this study are shown in **Table 4.1**.

Table 4.1: Selected Demographic Data of the Participants

Participant	Age	Gender	Number of months in private practice	Approximate number of paediatric patients treated
1	32	Male	36	100
2	30	Female	36	20
3	29	Male	10	20
4	26	Male	8	95
5	26	Female	30	15
6	29	Female	11	30
7	25	Female	7	1
8	28	Female	30	20
9	28	Female	12	20
10	25	Female	17	10

4.2 MAJOR THEMES

After analysing the data, the following four themes were identified:

Theme 1: Self-perception of confidence, knowledge and skill in paediatric patient management.

Theme 2: Exposure and training received in the chiropractic course.

Theme 3: Challenges encountered in paediatric patient management.

Theme 4: Further enhancement of paediatric patient management.

The four main themes and associated sub-themes that emerged from the data are presented in **Table 4.2**.

Table 4.2: Overview of the Emergent Themes and Sub-Themes

Theme 1	**Self-perception of confidence, knowledge and skill in paediatric patient management**
Sub-theme 1.1	Confidence and knowledge in the management of different paediatric age categories.
Sub-theme 1.2	Inter-professional relationships and referrals to other chiropractors/healthcare specialists.
Theme 2	**Paediatric exposure and training received in the chiropractic course**
Sub-theme 2.1	Experience in the diagnostic and orthopaedic assessment of a paediatric.
Sub-theme 2.2	Experience in paediatric patient adjustment and auxiliary treatment protocol.
Sub-theme 2.3	Beneficial aspects learnt during the chiropractic paediatric course.
Sub-theme 2.4	Additional sources of information utilised to facilitate greater knowledge consolidation during the chiropractic paediatric course.
Sub-theme 2.5	Recommended areas of improvement in the chiropractic paediatric course.
Theme 3	**Challenges encountered in paediatric patient management**
Sub-theme 3.1	Parental satisfaction and influence on treatment protocol.
Sub-theme 3.2	Communication barrier with the younger paediatric population.
Sub-theme 3.3	Uncooperative paediatric patients.
Sub-theme 3.4	Time management.
Sub-theme 3.5	Knowledge, confidence and practical experience in paediatric patient management.
Theme 4	**Enhancement of paediatric management**
Sub-theme 4.1	Improvement in paediatric assessment.
Sub-theme 4.2	Improvement in paediatric treatment.
Sub-theme 4.3	Continuation of professional development in paediatrics.

4.3 PRESENTATION OF THEMES AND SUB-THEMES

The results of the study, along with the themes and sub-themes that emerged from the analysis of the interviews, are presented. The four themes that were derived from the study are presented in **Table 4.2.** Relevant excerpts from the transcripts are provided to substantiate the results.

4.3.1 Theme One: Self-Perception of Confidence, Knowledge and Skill in Paediatric Patient Management

Participants voiced their belief that they were lacking in confidence and knowledge with regards to their paediatric patient management. A strong correlation was exhibited between self-perceived skill in paediatric management and the referral rate of paediatric patients.

4.3.1.1 Confidence and Knowledge in the Management of Different Paediatric Age Categories

Participants expressed a lack of confidence and knowledge when managing the younger paediatric population, especially children that could not converse with the chiropractor. The participants stated that:

"*Ok so with paediatrics I generally draw a line in my own head, with whether the patient can talk or not…So, we're generally looking at the age of, and I'm talking about if they are talking sentences, so let's talk about four or five years old, younger than that, uhm, it's what I generally refer to as paediatrics. Uhm, when I began, I was not confident in treating paediatrics. I had I-I believe, I had the knowledge that I could apply, but actually treating paediatrics of that age, is uhm, especially infants, uhm, I don't feel exposed enough. So, I'll explain that for you. In the clinic, the youngest patient I ever had, I think, was like ten. I never saw an infant in the clinic and then I came into practice. So, I was perfectly fine with treating children that could move, talk, express what they were sore with, where I could use Diversified techniques, that's very important to me."* (Participant 1)

"I don't think so hey (with regards to being knowledgeable to diagnose a paediatric patient). *I think with infants, probably not, uhm… With like slightly older kids that can talk, then yes, because obviously you can get a feel of like asking them what sort of*

pain it is and where they feel the pain. Obviously with infants we wouldn't know that because they just cry all the time…" (Participant 2)

"… but it is difficult to treat uhm, those below the age of ten years, but anyone above the age of ten, those with sort of an understanding of what benefit they are going to get after seeing a doctor, they are more understanding. Even the communication with them is quite easy. Uhm, I am not adequately knowledgeable to diagnose a paediatric patient, because you see like let me give you an example, with new-born babies, they are not saying a word, they are just crying… So it's very difficult for me to feel what exactly is happening." (Participant 3)

"I would say up until the age of probably ten, (participant pauses) *ten and older, I think I'm quite adequate in dealing with, but I think when you start getting to the real paediatrics, sort of your few month-old babies to your few years old, I don't think from varsity that we are prepared for that. I would say the younger patients, under ten, it's very, very difficult to diagnose accurately and say a 100% without getting a referral to a specialist to confirm."* (Participant 4)

"Ok, regarding paediatric patients, uhm, with uhm, neonates and very small children, I don't think that, uhm, we are adequately prepared to manage those types of paediatrics. Adolescents and you know teenagers and stuff like that; it's much easier, because you get a better grasp. You are able to engage with the patient better, uhm, and those cases are easy to manage because you are able to, uhm, get more information and you are able to examine the patient more efficiently. So, in the neonate and younger patient group, I don't think that you are adequately prepared to diagnose, because there's so much that goes into it." (Participant 5)

"Not really (with regards to being adequately knowledgeable to diagnose a paediatric patient). *Uhm, like for example, sometimes when they come in- if you have a five-year-old coming in and saying that they have a headache… Headaches in a five-year-old are not something that is common. So, I wouldn't try to diagnose it." (Participant 8)*

"… I'll only see a paediatric patient once or twice, just because I do know that because of the sensitivity if their nervous system, they will respond favourably quite quickly, compared to an adult and so, if there aren't any changes by the second visit, I would rather refer because of my lack of confidence." (Participant 6)

4.3.1.2 Inter-Professional Relationships and Referrals to Other Chiropractors /Healthcare Specialists

Participants expressed a need to seek advice from more experienced chiropractors and refer to other healthcare specialists and chiropractors in the management protocol of a paediatric patient. The participants stated the following:

"So, in my very first experience of a young paediatric patient was seven days old, where I couldn't very well use Diversified technique as they are used in adults. So what I did was, I picked up the phone, spoke to two practitioners that have been in practice for over ten years and when I saw there was a booking for later that day, I went in and got some insight…" (Participant 1)

"Quite often, if I really don't know what's wrong, I probably would refer them to Dr Kateland because that is who we were taught, er, like paediatrics from and she is quite good at what she does. It's just completely different from what we do, so, I don't feel that I have the skills to do what she does, so… I'd probably just refer." (Participant 2)

"I think we can't work in isolation, especially with babies. As I said earlier, I often wait for the diagnosis from the paediatrician first, to say that the baby has infantile colic and that the parents are er, you know, seeking alternatives." (Participant 5)

"So, I like to refer to a paediatrician, just for a second opinion." (Participant 8)

"I have good relationships with the general practitioners on the Bluff, around the area where I am. So, uhm, I do have a nice referral base with them and I do send babies out, if they need it." (Participant 10)

"So, quite often when I do see someone, I do refer them to a healthcare specialist, depending on their needs. So, I work with sort of a multidisciplinary team. So, we've got biokineticists, physiotherapists and even other chiropractors that I refer to, if I am not getting the results that I would like to see. I normally refer them off to another chiropractor to double check…" (Participant 4)

4.3.2 Theme Two: Paediatric Exposure and Training Received in the Chiropractic Course

Participants were asked to comment on the lecturing and training received during the chiropractic paediatric curriculum. Diverse opinions were expressed, however, general

discontent was exhibited towards the level of diagnostic and therapeutic training, as well as lecturing style and the content of the theoretical component in the curriculum.

4.3.2.1 Experience in the Diagnostic and Orthopaedic Assessment of a Paediatric

The participants were of the opinion that there was a substantial paucity in the practical experience of diagnostic and orthopaedic assessment taught in the chiropractic paediatric course. The following excerpts substantiate this statement:

"We didn't know how to, I'll say look at, consider, diagnose and treat a paediatric patient, other than what we had already been taught with the standard patient and adult." (Participant 1)

"I just think in terms of going forward and trying to treat with consistency, it would be better for us to learn how to assess paediatrics a little better." (Participant 2)

"More time, more practicals, uhm, a little bit more focus on paediatrics. I found personally, that it was one of those subjects that was very basic and brushed over at varsity. It was pretty much, "Here's the book, go and learn it and then we'll test you on that." There were no practical aspects. I think the only practical stuff we did were the reflexes in varsity and even those were your basic-basic sort of test. So, I definitely think we need to go into more detail, sort of know more conditions regarding actual paediatrics. So, we didn't even do paediatric x-rays or any diagnostic imaging…" (Participant 4)

"I think that the grounding you get in your training for chiropractic is not sufficient, because when I did paediatrics as a course, I never actually examined a live patient. It was all theory and it's not a subject that you can learn in theory simply because, when you have that baby in front of you and you are trying to treat or examine that child, it is a whole different ballgame and it's not equitable to the theory that you learn. Uhm, so there is there was very little practical experience, uhm, even with just holding a child, you know, what to do and how to manage that patient." (Participant 5)

"It's all well and good knowing the different conditions, but it's when they (a paediatric patient) *is in front of you, that you need to apply yourself. So if the programme could improve the application of theory, I think that would go a long way."* (Participant 6)

"I don't remember a lot of the stuff that we learnt in paediatrics, uhm, just because I never got the chance to use it. Uhm, so, yes, there again it moves into more of the practical stuff." (Participant 7)

"I would say that, uhm, the geriatrics and paediatrics course done at DUT was uhm, not one that prepared me sufficiently to diagnose in private practice." (Participant 9)

4.3.2.2 Experience in Paediatric Patient Adjustment and Auxiliary Treatment Protocol

The participants expressed the need to incorporate frequent practical sessions, focusing on paediatric adjustments and auxiliary treatment protocols in the chiropractic paediatric curriculum. Generally, participants voiced the opinion that there was a void in their capability of adjusting and performing auxiliary treatment to paediatric patients, which impacted on their willingness to treat this population in private practice.

The participants stated the following:

"So if somebody had to train me in the activator techniques for infants, or even just in general, then I could get an activator…" (Participant 1)

"I mean adjustments we do- what three years of adjustments, before we get into clinic and actually see patients regularly. Where, to be honest with you, the first time I adjusted a paediatric- this is talking under ten-years-old- was probably my last week in clinic. So before getting into private practice, I probably adjusted one true paediatric patient. So, I don't treat any kid younger than five…" (Participant 4)

"I would like to know better and to have more experience in actually physically treating the patient. It is completely different to what we learn and uhm, I haven't really had too many babies, but the ones that I have had; it was a bit challenging, because I'm asking myself, "Am I doing anything for this child?" I am not confident enough in those techniques of, you know, adjustments, uhm, on a paediatric patient." (Participant 5)

"…if it's (an Activator tool) *something that would be useful in diagnosing or offering therapeutic services to a paediatric patient, then more information would be required. Uhm, similarly to how extensive information is provided about TENS, the benefit and how to use it, IFC, the benefit and how to use it, demonstration and education on dry needling…"* (Participant 6)

"When I first treated a three-year-old, I felt very nervous, because they feel fragile and we don't have much practice in clinic and neither did we have any practicals treating paediatrics." (Participant 8)

"So, uhm, the course that we did, obviously was not sufficient in order to treat a paediatric patient sufficiently. Uhm, and then obviously modifying your treatment, form how you would treat an older patient, to how you would treat a baby. I would say that there's a lot that would need to be modified and if you are not confident in that case, you're going to be less inclined to want to treat those patients." (Participant 9)

4.3.2.3 Beneficial Aspects Learnt During the Chiropractic Paediatric Course

Diverse opinions were expressed with regards to the most beneficial aspect learnt during the chiropractic paediatric programme, which provided assistance in the treatment and management protocol of paediatric patients in private practice. These participants were of the opinion that their theoretical grounding received during the paediatric course was most useful in the management and provision of therapeutic services to paediatric patients. The following responses reflect these disparities:

"Red flag conditions… What the standard infant behaviours are… Learning the standard measures and also learning what is required in terms of, uhm, in terms of… What is the word? Informed consent on the paediatric patients' side as well as assent on the side of the child, by their parents. So, consent, because I wasn't aware of that before we did the paediatric course. Uhm, also I think the rule- I will use the expression "the rule of thumb"- is that in paediatric cases, one adjustment in a child is worth ten in an adult, as a general guideline. Uhm, it helps a lot because you don't need to see children as often for an issue." (Participant 1)

"… I think that we have really good theory grounding, it's just that we lack the practical aspect." (Participant 10)

One participant expressed that although the theoretical constructs taught did impact positively on paediatric management, there was still paucity in the theoretical grounding of the paediatric curriculum.

"The most useful aspect… I think a point I mentioned earlier, is that a paediatric patient reminds you of the natural state of the body, uhm, and brings you back to the fact that the body was designed to heal itself. So, if the patient is not responding favourably quite early on, it is then the best to refer uhm, and we discussed that at length at one

of the lectures with Dr Kateland back in the day. Uhm, other than that… No, I do think that we were quite limited resource wise. Uhm, there weren't any other textbooks that were provided or recommended, other than that sort of coursework structure in the form of a booklet that we received." (Participant 6)

Five of the participants held the opinion that the practical component of the paediatric curriculum was the most beneficial aspect in preparation for paediatric assessment, management and treatment. All participants also expressed the need for frequent practical sessions, with greater focus on diagnostic assessment and paediatric adjustment techniques. Discontent was voiced overall regarding the limited content and scarcity of the paediatric practical component. The following excerpts support this:

"I think what helped, was we had Dr Kateland and she was a trained paediatric chiropractor. So, we were able to see the things that she did and she showed us different techniques and we realise that you don't have to do much in order to feel a difference and now I see that in practice as well." (Participant 8)

"In paediatric lectures, obviously, you learn everything about their reflexes and orthopaedic tests and all of that, so that is obviously the most useful in managing, uhm, paediatric patients…" (Participant 7)

"I think well, in my year the paediatrics course was very theoretically based. There were very little practical components, but subsequent to that, when I was finishing up my research, I attended other classes and they were more practically orientated, were there were kids brought in. We were doing examinations on kids and you know, just looking at the body type and the way to manage a paediatric patient and I think that was the most interesting bit for me. It was not my class, so I wasn't very heavily involved, but just to observe that and to see the difference in just learning something in theory and then actually applying it. Uhm that was very interesting and uhm, certainly beneficial, but I didn't have enough of that." (Participant 5)

"I think the whole systematic approach has definitely been probably the best thing for me going forward, because quite often you pick up stuff that, if you didn't do it, is actually the cause of pain." (Participant 4)

"I think what was nice, was that Dr Kateland also often brought her kids. Obviously they weren't babies, but we had a chance to uhm, motion palpate them and feel what

normal spines felt like. They were like toddlers at the time, I think. So that was really nice, to have that hands-on experience…" (Participant 2)

The following participants voiced that there was no component of the paediatric curriculum that they felt attributed to their clinical management of the paediatric population. Two of the participants stated that:

"There is nothing that really comes to mind (participant laughs) in this case, er, because as I said it's- there is nothing that I really found to be that useful…" (Participant 9)

"Honestly, I haven't come across anything that requires the implementation of that knowledge." (Participant 3)

4.3.2.4 Additional Sources of Information Utilised to Facilitate Greater Knowledge Consolidation During the Chiropractic Paediatric Course

Mixed responses were obtained from participants on the utilisation of additional sources of information during their paediatric course, in order to foster greater knowledge consolidation and understanding in the field of paediatrics. The majority of participants reported no additional sources, other than the structured coursework. Of the participants who reported utilisation of additional sources of information, these sources were mainly in the form of print and social media, chiropractic seminars and observations of other chiropractors and healthcare specialists. These participants reported no utilisation of additional learning material other than the structured paediatric curriculum. The participants stated the following:

"*Er, during University, no, not really. I would say the most we got was our book. That was basically all we had to work off*." (Participant 9)

"*We weren't really given any other additional sources…*" (Participant 8)

"*Uhm, I don't think I had any additional sources. I never read up on research, uhm, I didn't have any extra textbooks or anything like that*." (Participant 7)

"*No I do think that we were quite limited resource wise. Uhm, there weren't any other textbooks that were provided- recommended, other than the sort of coursework structure in the form of a booklet that we received*." (Participant 6)

"*I don't know if there was anything*." (Participant 2)

The following participants reported the utilisation of additional learning material to aid a greater understanding of paediatrics.

"*So, I remember doing geriatrics and paediatrics and finding journal articles there and Google. Yes, just the internet and other chiropractors who helped me*." (Participant 10)

"I think that there were certain seminars set up with paediatric specialists, either chiropractors in the discipline or uhm- I spent quite a lot of time in Albert Luthuli hospital, in the paediatric intensive care unit (ICU) and that is where I leant the most." (Participant 5)

"*There was a textbook… It was in the library or somewhere, that I had read back in varsity and that sort of gave me the whole systematic approach*." (Participant 4)

"*YouTube videos, uh and observations. That was helpful*…" (Participant 1)

4.3.2.5 Recommended Areas of Improvement in the Chiropractic Paediatric Course

Participants provided suggestions that could enhance the quality of paediatric education, and therefore overall paediatric care, by chiropractors. The responses were diverse and emphasised various aspects to foster knowledge, confidence and skill in paediatric patient management. An early introduction to paediatric care was popular amongst some participants. This is substantiated by the following excerpts:

"If adequate time was given to teaching NIP for children, uhm… Actual practical aspects... That would have been great…" (Participant 1)

"… The curriculum is done in our final year as a very quick module, where I felt like I got a very cursory understanding of paediatrics and the rest I had to learn, sort of, on my own." (Participant 5)

"Instead of doing so much in one year, maybe just span it over two years." (Participant 8)

"A bit more time can be put into it and I don't think it should be just reserved for fifth year." (Participant 9)

The majority of participants expressed discontent with regards to the lecturing style and content. The participants' recommendations focused on the paediatric course being undertaken by a chiropractor who specialises in paediatrics, or having a variety

of chiropractors/healthcare specialists share their experience and knowledge, enriching the course with diverse paediatric skills and techniques from which the young professional may choose. The participants stated that:

"Something, er, needs to change… Either the teaching… So were taught these Gonstead listings and what not, I would like to learn a way of assessing a child (Participant pauses) *well not I would like to learn, I think it's important that what is taught is a way of assessing a child in a Diversified manner."* (Participant 1)

"… I think you need to have different uhm, approaches to paediatrics. So, the NIP is great. I find it interesting, but we need to have like different people, who treat paediatrics differently, so that you can see what works for you because with all chiropractors, you adapt to what is comfortable for you." (Participant 2)

"So I think the varsity needs more of a specialist, uhm, and lecturer. Someone that actually treats adolescents and children on a regular basis and that has years of experience. So, we can't just rely on one person's sort of opinion and speciality. We need to have someone that has practise for five years, someone that has practised for four years…" (Participant 4)

"… Paediatrics should be undertaken, by a person who has a specialist interest in paediatrics, where they treat these types of patients on a daily basis in private practice. It is very difficult to have, you know- and this is no fault of the lecturers themselves- but to have someone who has actually never treated a paediatric patient or has very little experience treating a paediatric, uhm, lecturing to you. So because it is such a specialised area, there should be people who have a special interest and uhm, the chiropractic Department should consider getting paediatricians to come and do a few talks and demonstrations for the, you know, the theory part of it and then chiropractors who are interested in paediatrics, to do the more practical side of it." (Participant 5)

"…If chiropractors, such as those that I'm in contact with now with years of experience in paediatrics, who define themselves as paediatric chiropractors, if they were the ones that could either be the lecturers or come around for workshops or seminars. I think it is important to get such information from people with clinical experience, with what it is that they teach. Uhm, which I don't think has always been the case with the current lecturers." (Participant 6)

"People who have extensive experience in paediatrics, it would be nice for them to come and share their experiences with paediatrics." (Participant 7)

"I think we need more people that are experienced to lecture. So, even if it is not on a full time basis, just once a month to have Dr Kateland come in and speak about what she has done. You know, just some people with more experience in the field, would be better." (Participant 10)

The majority of participants suggested an increase of practical sessions in the paediatric curriculum, with emphasis on the congruency between the theoretical component and its practical application, with regards to adjustment techniques and paediatric assessments. The following excerpts support this:

*"… If we are going to be taught in a Gonstead-come-NIP manner, then we need to be taught management in that manner." (*Participant 1)

"I definitely think more hands-on experience." (Participant 2)

"I think we definitely need more practical aspects of it. So I think in class we need children there for us to actually examine them. We cannot just use a doll that doesn't respond the same way as a real human does. That is like learning to adjust a er, boxing bag, the whole time." (Participant 4)

"There is not enough promotion of paediatric care in, uhm, the practical level when you are training." (Participant 5)

"… If the programme could improve the application of theory, I think that would go a long way." (Participant 6)

"I think that a lot more practicals with the little ones would obviously be very beneficial." (Participant 7)

"Just more practice, more repetition…" (Participant 8)

"Dr Kateland's child that came in one time, I think things like that should be more frequent. We should try and get some volunteers to come in, uhm, in your lecture, so that you have actual one-on-one time." (Participant 9)

"We definitely- I sound like a stuck record- we definitely need more practical experience." (Participant 10)

The following participants were of the opinion that the introduction of visits to paediatric clinics/shelters could enhance the development of knowledge, confidence and diagnostic skills, in the management of the paediatric population.

The participants stated the following:

"I mean there is a lot of paediatric clinic around, even if it is not to adjust, it is just to practice doing the diagnostic examinations on and motion palpation." (Participant 10)

"I think if there was uhm, a baby home or shelter with- a baby home would be more of the neonates and if it was a shelter then we could have all the age groups from three-years-old right the way through to 18 or 21 years old. I think if there was a partnership of some sort, collaboration with something of that nature, I think that would help in the exposure of paediatric patients to students." (Participant 6)

"I think if the chiropractic Department can liaise with any paediatric hospitals or any paediatric department at hospitals, so that we get to have a look at- we have hands-on er, education with little kids, rather than just practising on mannequins." (Participant 3)

The promotion of paediatric treatment in the clinic and in the public sector, in order to promote exposure of chiropractic students and young professionals to paediatric patient care, was recommended by the following four participants:

"Uh, and then also I think that a lot more needs to be done with er, educating the public that paediatric patients can be treated well by chiropractors. A lot of people do not know that, and I think that is part of the reason why we do not get as many paediatric patients as we would like. Uhm, and yes, the more paediatric patients that we see, the more comfortable we would be with treating them going forward…" (Participant 9)

"I feel that we should all have the opportunity to treat paediatric patients. We do not get that many in clinic. I am not sure what it is like now, but we didn't all get that opportunity. So I think it would be nice for us to get that opportunity before we qualify." (Participant 8)

"If there was a way to get more paediatrics into the clinic, uhm, that would be great, but then maybe it has to do with the knowledge of parents in that area. Maybe there isn't good knowledge on paediatric, uhm, chiropractic and that is why they do not come to the clinic." (Participant 7)

"Even if there was a pre-requisite within the requirements of the clinic… You have "X" amount of new and "X" amount of follow-ups and that is great, but a little more categorised so that you see a fair- whatever that looks like- share of paediatric patients by the time you are then, uhm, qualified." (Participant 6)

Two participants were of the opinion that more focus should be placed on the identification and assessment of "Red Flags" i.e. the detection of serious underlying pathology in the paediatric curriculum. These participants stated that:

"So I definitely think that we need to go into more detail, sort of know more conditions regarding actual paediatrics." (Participant 4)

"… More repetition, uhm, red flags especially…" (Participant 8)

4.3.3 Theme Three: Challenges Encountered in Paediatric Patient Management

Participants were of the opinion that parental satisfaction and influence on patient treatment, the communication barrier with younger paediatric patients, uncooperative patients and time management, presented unique challenges to their treatment and management protocols.

4.3.3.1 Parental Satisfaction and Influence on Treatment Protocol

Many participants reported that parental satisfaction and influence on the treatment protocol presented a challenge when managing paediatric patients. The following excerpts substantiate this statement:

"I would certainly say that the challenges are uhm, number one; the parents. The parents bring them to you because they do not know what is going on. They trust that you have the knowledge and experience, but they are also very controlling and they- not all of them, some of them- have said, "Can you do this?" And "Can you do that?" They interfere…" (Participant 1)

"So I think that is really a challenging one, with people knowing what we do first of all and then the general management of them to come back for follow-ups. Mothers generally, once the baby is happy, then they disappear. They come back when the baby is screaming and not for their follow-ups in-between." (Participant 10)

"Uhm, I guess getting the mother involved as well with the treatment, uhm obviously is quite challenging you know, getting the mum to hold the baby right and all those sorts of things. Uhm, management, you also er, depend a lot on the parent and that

the parent is doing their job properly and bringing the kid for their consults and all those sorts of things. So you do really have to depend on the parent, uhm, to follow the treatment protocol correctly." (Participant 7)

"… The child would come in with their parents and there is a lot of fear and uncertainty as to what, you know, is going on and they generally require a lot of reassurance for the child. So sometimes that is a bit of a challenge, because it is not always so straightforward, where you can say, you know, this is a uhm, purely musculoskeletal case or something like that." (Participant 5)

"So in your pain management, dealing with parents who are a little bit pushy sometimes to get their kid back out to the sports field and you also got those, where mummy loves the child very much and doesn't want the child to do any activity whatsoever, when they should be doing proper rehab." (Participant 4)

4.3.3.2 Communication Barrier with the Younger Paediatric Population

The inability to communicate effectively with the younger paediatric population, i.e. neonates and toddlers, presented an obstacle to effective paediatric patient management. This is supported by the following excerpts:

"It is difficult, er also that the child cannot convey what pain they feel or uhm, where it is sore or why they are crying." (Participant 1)

"So, quite often, you've got to have mum sitting on the table, sort of helping out or examining them while they are sort of latched on to mum. So trying to communicate through the parents to the actual kids themselves." (Participant 4)

"… Uhm, you know, all babies are different and just being able to negotiate with that child…" (Participant 5)

"… They cannot talk, uhm, they cannot tell you, "This is sore" or "That is bothering me" …" (Participant 7)

4.3.3.3 Uncooperative Paediatric Patients

Uncooperative paediatric patients were reported to present a major challenge to new graduate chiropractors. This statement is supported by the following narratives:

"Some other challenges, uhm, obviously when the child does not want to rotate the head to the left and they decide to move to the right…" (Participant 1)

"With kids, they are often not interested or willing to participate with certain examinations." (Participants 4)

"The crying, the screaming, the running away, the kicking and whatever else that you have to deal with." (Participant 7)

"… Sometimes they do not want you touching them and sometimes they get impatient and they do not want to sit for too long, so you have to be quick in whatever you do. So I think that is the hardest thing, especially in your younger patients." (Participant 8)

4.3.3.4 Time Management

Participants reported that time management during paediatric consults was challenging, generally due to the possibility of underlying systemic pathology requiring a more thorough physical examination. This is supported by the following excerpts:

"I generally block off more time for a paediatric case because I don't know what I'm going to see. I generally do an extremely complete workup, er, all sort of systems testing as much as possible…" (Participant 1)

"There are a lot more conditions, the consults are a lot longer and more difficult, rather than in an adult where you can just focus on the patient themselves. With paediatrics you've actually got to focus, you've got to check mum, dad, brother and sister on each patient because there are a lot more systemic conditions that I've noticed, when dealing with paediatrics." (Participant 4)

"… There are certain red flags and uhm, things you need to consider in younger patients if they present with things like back pain, it could be more serious. So you have to be very thorough in your clinical examination." (Participant 5)

4.3.3.5 Knowledge, Confidence and Practical Experience in Paediatric Patient Management

Some participants were of the opinion that their lack of knowledge, confidence and practical experience presented a challenge in their treatment and management protocols in paediatric patients. These participants stated that:

"I think the challenges in the beginning were certainly uhm, lack of practical ability to treat a musculoskeletal problem in a very young child." (Participant 1)

"I think also just, uhm, like confidence because we haven't had that experience with holding babies and knowing how to work around them because they are obviously very wriggly…" (Participant 2)

"… In the neonatal and infant population, it is certainly just being able to hold the child and treat them at the same time." (Participant 5)

"The most challenging aspect… Having no sort of experience or practice…" (Participant 6)

"Uhm, the lack of knowledge, I would say is the biggest thing." (Participant 9)

4.3.4 Theme Four: Enhancement of Paediatric Patient Management

The majority of participants expressed a desire to enhance their management of paediatric patients. Popular areas of improvement included paediatric assessment, treatment protocols and post-graduate paediatric course attendance.

4.3.4.1 Improvement in Paediatric Assessment

Participants expressed a desire to improve their assessment skills of paediatric patients, with particular focus on their communication, diagnostic and time management abilities. Generally, the participants stated that practical courses, notes, journal articles, toys and interaction with other practitioners could aid in enhancement of their assessment skills. The following excerpts support this:

"A practical type of course, I guess, if there were extremely to the point notes, not overly academic or something, but extremely to the point notes which outline the basic procedure in a paediatric, then yes, I would say some form of short notes would help." (Participant 1)

"Number one; er, I would say I should be able to communicate with them effectively… Number two; if I could just get training on the management of paediatric patients." (Participant 3)

"I think it would just be being able to handle children better. This is in the younger population obviously. Being able to cope, uhm, with the various aspects that go into a case and also to be confident enough, you know, to make a functional diagnosis." (Participant 5)

"Uhm so diagnostics is obviously a very important one. So identifying exactly what the problem is…" (Participant 9)

"More equipment stuff, nice paediatric stethoscope and baby scale and those kind of things." (Participant 10)

4.3.4.2 Improvement in Paediatric Treatment

Four of the participants voiced a need to improve the provision of therapeutic services to paediatric patients. The following narratives support this statement:

"I think one is infant adjusting techniques that are congruent to my own adjusting techniques. I don't practice NIP. Uhm, I've never been taught how to practice NIP. A lot of neonatal and, uhm, paediatric chiropractors use NIP, so I would like to learn some further that can be in some sort of Diversified manner to treat paediatrics." (Participant 1)

"You actually need to physically get there, actually do the adjustments and rehab with them rather than just throwing information at them." (Participant 4)

"I would like to know better and to have more experience in actually physically treating the patient…" (Participant 5)

"Uhm, I guess you could one of those little activator guns…" (Participant 7)

4.3.4.3 Continuation of Professional Development in Paediatrics

Five participants expressed a desire to enhance their paediatric management by attending post-graduate paediatric courses. These participants stated that:

"I will most definitely do a post-graduate paediatric course. I just think that having a course that is specific to paediatrics, uhm, where they teach you like the tricks and the in-depth sort of thing about paediatrics… Uhm and even yes, the extra tests that you can do on paediatrics. Then I think I'd be a bit more comfortable with paediatrics." (Participant 7)

"So I definitely think that it (a post-graduate paediatric course) *would be of great use, just because it is not great having been in the system for so many years and then coming out, all you want to do is be confident. I know a lot of practitioners that say the real learning take place when you are actually in practice, outside of university, and I get that, but I think it is important to have a certain level or at least a pre-requisite of a*

confidence base. So, I do think that a paediatric course would be highly valuable." (Participant 6)

"So I definitely would be interested in doing a paediatric course, but hopefully something that would be more hands-on and practical as opposed to a theoretical, you know, lecture or talk on how to manage paediatrics, because uhm, I don't feel that is going to be beneficial." (Participant 5)

"Definitely I would love to because that would also give me, number one; confidence in managing all aspects of er, children. If I am adequately knowledgeable- if I can have enough information, it will boost my confidence and treatment to those little kids." (Participant 3)

"Yes, I definitely think that I would, because we are approached by a lot of paediatric patients, I mean uhm, parents of paediatrics and things like that…" (Participant 2)

Two participants voiced no desire to attend a post-graduate paediatric course, due to the course duration, no specific interest in paediatric management and the willingness to refer to more experienced or specialised paediatric chiropractors. The following narratives substantiate this:

"I am not really interested in paediatrics under ten. So the younger sort of kids, I refer out. I don't feel that I'm qualified and educated enough or have the willingness to go and do that, to provide ethical treatment to them. So I want the best for my patients. I'd rather send them to someone who specialises in that, who has ten-fifteen years of experience. To be honest, going and studying again for another Masters, I think at this point in my life, I'm not ready to do another whole five years of studying plus work, plus private life and research again. I'm still interested in sport and everyday chiropractic. I don't personally have an interest really in paediatrics- young, infantile paediatrics…" (Participant 4)

"No I wouldn't. Not really. I've learnt what I needed to from other practitioners who I have spent time with since my graduation. Paediatrics is not a particular field that I feel like going into. Uhm, I've got many other niches that I enjoy. Many others such as; family practice, geriatrics, sport, scoliosis… Uhm a lot of niches and I don't feel particularly drawn to paediatrics." (Participant 1)

The following three participants divulged mixed opinions in response to post-graduate course attendance. Their responses focused on the cost and availability of paediatric courses in S.A. The participants stated the following:

"I would, uhm, but they are usually quite expensive. So that is one of the reasons why I have not." (Participant 8)

"Uhm, so I would be interested in attending a course, however in terms of cost and availability in S.A, in that case, uhm, I might have to take a second thought at that. Especially if it is out of the country, simply because of the cost factor, but yes, if there was one available locally, I would be willing to attend." (Participant 9)

"It would be lovely; however most of them are ridiculously expensive…" (Participant 10)

4.4 SUMMARY OF THE CHAPTER

The findings of the study were presented in this chapter. Each theme and associated sub-theme was substantiated by excerpts from the interview transcripts. The following chapter discusses the finding of this study.

CHAPTER 5 DISCUSSION OF RESULTS

5.1 INTRODUCTION

In this chapter, the results of the study are interpreted and discussed. It has been established that there is a deficit in the literature investigating the perceptions of new graduate chiropractors in their management of paediatric patients in general. Despite the fact that Todd *et al*. (2017) demonstrated that students' preparedness to practice was correlated with variability in age and volume of patient exposures, it has received little attention, with no current South African studies providing an appraisal of chiropractic paediatric education. Due to this fact, constructing a comparative critique of similar relevant studies, pertaining particularly to chiropractic paediatric education, was a challenge. Hence, this discussion utilises literature adapted from various studies on other health profession disciplines.

5.2 OVERVIEW OF THE RESEARCH DISCUSSION

The aim of this study was to investigate the perceptions of new graduate chiropractors in their management of paediatric patients in the eThekwini Municipality. Four main themes were identified:

Theme 1: Self-perception of confidence, knowledge and skill in paediatric patient management.

Theme 2: Exposure and training received in the chiropractic course.

Theme 3: Challenges encountered in paediatric patient management.

Theme 4: Further enhancement of paediatric patient management.

The themes and sub-themes are discussed below and are substantiated by pertinent literature.

5.3. THEME ONE: SELF-PERCEPTION OF CONFIDENCE, KNOWLEDGE AND SKILL IN PAEDIATRIC PATIENT MANAGEMENT

It is imperative to gauge new graduate chiropractors' perceptions of their confidence, knowledge and skill level, with regards to paediatric patient management, in order to determine the effectiveness of the chiropractic paediatric programme in preparing graduates to manage and treat paediatric patients in private practice. Participants were asked a variety of questions exploring the aforementioned aspects. In general, participants expressed a deficit in knowledge and confidence with regards to their paediatric patient management, especially in the younger paediatric population. A strong correlation existed between participants' perceived lack of skill in paediatric patient management and eagerness to refer to other chiropractors and healthcare specialists.

5.3.1 Confidence and Knowledge in the Management of Different Paediatric Age Categories

The participants expressed a general lack of confidence and knowledge when managing paediatric patients under the age of ten years. This deficit in confidence and knowledge was attributed to the inability of this paediatric age group to adequately converse and cooperate with the chiropractor. These findings were congruent with the findings of observational studies investigating the communication between paediatricians and children (Marginean, 2017). Similarly, Todd *et al*. (2017) and Monrouxe *et al*. (2014) concluded that the perceptions of chiropractic students in their preparedness for clinical practice with children younger than ten years of age was negatively affected by their lack of confidence and clinical exposure in the US and New Zealand. The study conducted by Todd *et al*. (2017) involved the placement of chiropractic students from New Zealand into a clinical setting in Rarotonga and is comparable to SA in that the paediatric module is also reserved for the fifth year of the curriculum in New Zealand.

Although some of the principles of a paediatric examination are similar to an adult examination, the pattern of disease, approach and content of the examination are very different. Sambrook (2014) emphasised that doctors managing paediatric patients should also have sufficient knowledge of normal developmental milestones, routine examinations and normal findings in children of different age categories. Wheeler *et*

al. (2000) and Jatana (2012) found that a lack of knowledge and preparedness in paediatric management, with particular focus on emergency protocols, was demonstrated in physicians and paediatricians.

In order to overcome this void in confidence and knowledge in paediatric patient management, Todd *et al*. (2017), Burford *et al*. (2014) and Jatana (2012) recommended that the following guidelines be implemented in the paediatric education and training of healthcare professionals:

- Frequent clinical exposure to paediatric patients under ten years of age.
- Clinical placement programmes aimed at fostering clinical experience and confidence in undergraduates.
- Proper training of healthcare providers and their office personnel in paediatric emergency management.

The expansion of confidence in patient communication and knowledge begins during a medical professional's tertiary studies. The chiropractic profession highlights good communication as an essential tool in eliciting a thorough patient history, as well as informing and educating a patient. The application of knowledge provides proper diagnostic and effective treatment protocols, which positively affects patient outcomes (Hecimovich, 2009:157). Chiropractors, therefore, rely vastly on knowledge and patient communication, be it verbal or non-verbal, in all patient consultations (Hawk *et al*., 2016:164-165). Hecimovich (2009) emphasises the importance of further research into methods of evaluating and increasing a new graduate chiropractor's knowledge and confidence during tertiary education.

5.3.2 Inter-Professional Relationships and Referrals to Other Chiropractors/Healthcare Specialists

Participants expressed a desire to seek counsel from chiropractors who had more years of experience in the private practice setting, with an expectancy of greater knowledge, skill and overall care of referred paediatric patients from these chiropractors. A strong correlation was noted between self-perceived skill in paediatric management and an increase in the referral rate of paediatric patients to experiences chiropractors or other healthcare specialists, such as paediatricians. These findings are similar to Barnett *et al*. (2011), in which the rationale for referral among primary

care practitioners and specialist practitioners were investigated. Practitioners chose to refer mainly based on the perceived clinical expertise of their colleague, however, a variety of reasons for referrals to specific practitioners arose, such as:

- Positive interaction and feedback reported by the patient.
- Good communication between the practitioners.
- The practitioner being available in the local vicinity or hospital.
- The willingness of the practitioner to share patients' medical records.
- Previous referrals from the practitioner.
- Patient access to the practitioner.

Clinical expertise, positive patient experiences with the practitioner and good communication between healthcare specialists were the three of the highest ranked responses for reasons to refer to a colleague. These factors reflect the strong tendency of practitioners to think of their referral colleagues as the most capable practitioners within their professional network. Vermeir *et al*. (2015) further emphasised the importance of inter-professional communication and recommended that communication skills between healthcare professionals should feature more frequently in undergraduate and post-graduate training.

5.4 THEME TWO: PAEDIATRIC EXPOSURE AND TRAINING RECEIVED IN THE CHIROPRACTIC COURSE

A variety of opinions were voiced regarding the lecturing and training received, as well as exposure to paediatric patients during the chiropractic paediatric course. General dissatisfaction was exhibited towards the level of diagnostic and therapeutic training, as well as lecturing style and content of the theoretical component in the curriculum. The subthemes discussed in this section are experience in the diagnostic and orthopaedic assessment of a paediatric patient; experience in paediatric patient adjustment and auxiliary treatment protocol; beneficial aspects learnt during the chiropractic paediatric course; additional sources of information utilised to facilitate greater knowledge consolidation during the chiropractic paediatric course, and recommended areas of improvement in the chiropractic paediatric course.

5.4.1 Experience in the Diagnostic and Orthopaedic Assessment of a Paediatric

The consensus held amongst participants was that the chiropractic paediatric course lacked in providing practical experience in the diagnostic and orthopaedic assessment of a paediatric. According to the participants, this lack of practical experience negatively affected their assessment, diagnostic skill, treatment and management of paediatric patients in private practice. Participants recommended that new stategies be implemented to improve the application of theory and provide greater exposure to paediatrics in structured, frequent practical sessions.

These findings are aligned with those of Howells *et al*. (2006) and Todd *et al*. (2017) research conducted on chiropractic students which concluded that greater exposure to paediatric patients during tertiary educational programmes, impacted positively on student preparedness to assess, diagnose and treat the patient population in private practice. Howells *et al*. (2006) further concluded that multiple, consistent practical sessions reinforce effective behaviours and help build on prior knowledge. This conclusion is congruent to the recommendations suggested by the participants of this study. The researcher does however acknowledge the legalities and challenges faced by the chiropractic paediatric programme in attaining consent for the use of paediatrics for class demonstrations and practical sessions. It is therefore recommended that specific sports and community service events, focusing on paediatric patients, be incorporated into the chiropractic curriculum to allow for students to interact to a greater degree with paediatric patients while raising awareness of the appropriateness of chiropractic care in the community.

5.4.2 Experience in Paediatric Patient Adjustment and Auxiliary Treatment Protocol

The study found that participants held negative perceptions in performing adjustments and auxiliary treatment, such as the utilisation of an activator gun on paediatric patients, due to a lack of frequent practical sessions and exposure to paediatrics during their chiropractic paediatric course. These negative perceptions impacted on their willingness to treat paediatric patients in private practice. A strong correlation was again noted between the participants' lack of confidence and their lack of practical expertise in dealing with paediatric patients during the post-graduate phase of the

chiropractic course. These findings were analogous to Todd *et al*. (2017) and Hecimovich *et al*. (2009) who found that students' confidence in their treatment and management skills of paediatric patients improved with greater practical exposure to paediatrics during clinical placement and community outreach programmes.

Boysen *et al*. (2016) discovered that after integration of senior fifth and sixth year chiropractic students into a more practically orientated service learning programme, the confidence and competence levels of these students increased. Valuable practical experience such as these may therefore help students enhance their chiropractic, clinical and communications skills for future consultations with paediatric patients in private practice.

5.4.3 Beneficial Aspects Learnt During the Chiropractic Paediatric Course

Conflicting views were expressed by participants regarding their opinion of the most beneficial aspect learnt during the chiropractic paediatric course, which aided their treatment and management protocol of paediatric patients in private practice. A minority of participants felt that the theoretical component received during the paediatric course, was the most beneficial in the management and provision of therapeutic services to paediatrics. One participant stated that although the theoretical grounding provided in the course proved useful, there were still areas of improvement that needed to be implemented in order to enhance the learning experience and the practical application of theoretical constructs. These findings were in contrast to those of Howell *et al*. (2006), which concluded that didactic teaching is ineffective and knowledge of skill alone does not influence behaviour. The study investigated the consultation skills of medical practitioners, which included practitioners' communication abilities, assessment and diagnostic techniques, as well as treatment skills, and concluded that these are acquired most effectively by practice, analysis and rehearsal.

The majority of participants held the consensus that although limited in content and actual paediatric exposure, the practical component of the paediatric programme was the most useful aspect in their preparation for paediatric assessment, treatment and management in private practice. Discontent was expressed, however, on the frequency and consistency of the practical sessions that they attended in the chiropractic paediatric curriculum. These findings are congruent with those of Todd *et*

al. (2017), Boysen *et al*. (2016) and Hecimovich *et al*. (2009) that emphasised the positive impact of practical experience and repetition, as well as paediatric exposure, on students' clinical competence.

Two participants held the opinion that no aspect learnt during the chiropractic paediatric course was beneficial to their treatment and management of paediatric patients. These opinions could be contributed to the vast time lapse between the acquisition of theoretical knowledge and practical competence and its application on paediatric patients. The participants frequently expressed that there was a lack of exposure to paediatric patients in the Chiropractic Day Clinic and thereafter, as previously stated, an eagerness to refer paediatric patients to more experienced chiropractors and healthcare specialists, instead of utilising their competence and knowledge to facilitate treatment protocols themselves.

5.4.4 Additional Sources of Information Utilised to Facilitate Greater Knowledge Consolidation during the Chiropractic Paediatric Course

Students are encouraged to utilise additional sources of information, apart from the structured coursework, in order to facilitate greater understanding and knowledge consolidation in their academic studies (Dogruer, 2011:606). Mixed opinions however, were obtained from participants, with the majority of participants reporting no use of additional sources of information during their paediatric course. The participants stated that they were not prescribed additional learning material, such as textbooks or internet sources. These findings are in contrast to those of Apuke & Iyendo (2018) and Dogruer *et al*. (2011) which found that a substantial amount of university students utilised additional sources of information, with particular use of internet resources, for the following reasons:

- To promote self-learning and enhance peer learning.
- To improve examination preparation.
- In order to conduct research on multiple, diverse topics.
- To widen their scope of reading and learning.

Of the participants who did report a use of additional learning material, said that these sources were mainly in the form of print and social media, chiropractic seminars and observations of chiropractors and other healthcare specialists. These findings are

supported by Sahin *et al*. (2010) who emphasised the use of the internet in the classroom and educational setting, to enable access to multiple resources, such as journal articles and e-books, as well as information sharing. Gikas and Grant (2013) further concluded that the utilisation of social media provided a platform for interaction, collaboration and communication with colleagues, which improved students' learning and inquisition abilities.

Alshahrani *et al*. (2017) found that the use of additional sources of information to aid learning positively impacts students' academic self-confidence and self-reliance, as well as student-lecturer connectedness. Taking this into consideration, the following suggestions are proposed in order to encourage the use of additional external sources of information:

- Lecturers should recommend credible online and print media as possible sources of further knowledge enhancement.
- Tertiary institutions need to guide students towards the use of open access resources, such as e-conferences, e-theses and e-journals, as restricted access resources may dissuade the student due to possible financial constraints.
- There should be a promotion of easier access to databases, such as Wiley and Elsevier, in order to decrease reliance on Google and Google scholar. This also allows students to explore other related scientific research to enhance their own research and learning.
- Proper and uninterrupted internet access should be available at all tertiary institutions.

The DUT library allows students access to textbooks, online theses and journal articles. The university also provides students with free internet. The utilisation of these resources by chiropractic students to enhance their learning, however, may be hindered due to the time constraints placed on students by the demanding fifth year curriculum and ineffective studying techniques, such as not allocating adequate study time to each subject. The encouragement of students, therefore, to consult these available additional sources of information, can lead to the enhancement of the quality of their academic research as well as substantially improve their learning experience (Apuke & Iyendo, 2018: 28).

With regards to the chiropractic paediatric course, additional sources of information, such as the use of the DUT library and internet access, could ignite further interest and specialisation into the field of paediatrics, enhance the quality of paediatric research, as well as improve the academic performance of students in the subject.

5.4.5 Recommended Areas of Improvement in the Chiropractic Paediatric Course

Participants were asked to provide any suggestions that could enhance the quality of education provided in the chiropractic paediatric course. A variety of responses were provided by the participants, which highlighted a multitude of aspects related to the amelioration of knowledge, confidence and skill in paediatric patient management.

An earlier introduction to the paediatric component of the chiropractic course was reported as potentially beneficial in allowing for a greater time to be spent on paediatric practical sessions and theoretical grounding. Participants expressed a desire for the paediatric course to span over a two-year duration, instead of being reserved just for the fifth year curriculum, in which they felt as if they receive only a “cursory” understanding of the subject.

The findings of this study are similar to those of Hassel and Ridout (2018), Smith *et al*. (2015) and Murtagh (2010), which determined that university students expressed a desire for greater contact time with lecturers in order to gain a better understanding of the subject. The DUT curriculum is currently under restructuring, allowing for the paediatric module to be incorporated into the fourth year curriculum. This will permit greater time to be focused on the paediatric component, allowing students more contact time with the lecturer and the opportunity for more exposure to paediatric patients in the clinic.

Dissatisfaction regarding the lecturing style and content was expressed by the majority of participants. Asfani *et al*. (2016) highlighted that lecturing quality is among the most influential factors on student achievement and performance. The study further noted that lecturers with greater experience have a higher impact on student achievement than those less experienced. The participants of this study proposed that the paediatric course be undertaken by a chiropractor who specialises in paediatrics, with a more diversified approach, in keeping with the techniques taught at DUT overall, or have a variety of chiropractors, or other healthcare specialists, share their knowledge and

experience with the students, in order to introduce diverse skills and paediatric techniques which the young professional can employ and modify to suit their individual preferences and patient needs. The introduction of guest lectures by healthcare specialists such as paediatricians has been implemented into the DUT chiropractic paediatric course in recent years. It is recommended that these lecturers by specialists in the field of paediatrics continue and increase in frequency in order to expose students to a variety of assessment and adjustment techniques.

Nagoba and Mantri (2015) stated that the success of an educational system relies substantially on the quality of the lecturers, which consequently depends on an effective teaching and learning process. The continuous academic development of lecturers is therefore crucial, in order to stay abreast of the latest findings in their subjects and improve the quality of their teaching (Nagoba & Mantri 2015:180). Pozarnik *et al*. (2009) further concluded that universities should replace the rigid traditional lecture-based teaching and integrate a more student-orientated concept. This student orientated concept of teaching should encourage active learning with practical diverse methods and resources, monitoring of student learning and provision of appropriate feedback, as well as the formation of challenging goals and assignments.

The need for integration of frequent, consistent practical sessions, with emphasis on the congruency between the theoretical and practical component of the paediatric curriculum, was constantly expressed by the participants in this study. Participants emphasised the need for greater exposure to paediatric patients and practice of assessment procedure and adjustment techniques on this age group.

The disparity between the theoretical component and its practical application was described by researchers in various healthcare professions, including emergency healthcare (Michau *et al*., 2009), the medical profession (Habbal *et al*., 2007) and nursing (Maben *et al*., 2006). According to Hell *et al*. (2008), the incongruence between theoretical knowledge and practical application can affect professional competence and lead to difficulties in the progression from a student to a novice healthcare professional. It is, therefore, recommended that methods be implemented to allow for greater exposure of students to paediatric patients.

Some participants suggested that the introduction of visits to paediatric clinics or shelters into the paediatric curriculum, could aid in the amelioration of knowledge, confidence and diagnostic skills in paediatric patient management. These findings are similar to Todd *et al*. (2017) and Porter *et al*. (2013) that recommended the inclusion of clinical placements and community outreach programmes into the paediatric curriculum, whereby students experience higher paediatric patient volumes and variability patients. These studies concluded that students' perceived confidence and competence in paediatric patient management increased with increased practical exposure to paediatrics. In the South African context however, obtaining access to paediatric patients at paediatric shelters and clinics can pose a significant challenge. Parents and guardians, who retain their legal right over their child or ward respectively, need to be consulted regarding permission for chiropractic students to assess and treat any potential paediatric patient and this is not always possible.

Lastly, participants recommended the promotion of paediatric treatment in the Chiropractic Day Clinic and public sector, as a method of increasing the exposure of students and novice chiropractors to paediatric patient care. Cawood (2015) found that parents lacked substantial knowledge and understanding with regards to the utilisation of chiropractic treatment for paediatric patients in the eThekwini Municipality. Parents were particularly concerned regarding chiropractic treatment protocols, the outcome of the treatment and the cost factor associated with chiropractic care. The proper promotion of chiropractic treatment and management of paediatric patients would, therefore, be beneficial in order to increase the awareness among the parents and guardians of children and infants on the appropriateness of chiropractic care for paediatrics. This would in turn positively impact on the number of patients encountered in chiropractic practices. It is recommended that the CASA also implement strategies to increase the national awareness of the chiropractic treatment and management of the paediatric population.

Due to the stringent advertising guidelines enforced by the AHPCSA, pertaining to Act 63 of 1982, as amended, the concept of promotion of paediatric care by chiropractors may encounter challenges. The research, therefore, recommends that more paediatric orientated sports' events and community service outreach programmes be targeted and initiated, in order to promote the concept of chiropractic management of paediatric

patients to parents and members of the South African community, which would benefit the chiropractic profession and potential future paediatric patients nationwide.

5.5 THEME 3: CHALLENGES ENCOUNTERED IN PAEDIATRIC PATIENT MANAGEMENT

The obstacles and challenges encountered in the management of paediatric patients by new graduate chiropractors are highlighted and discussed. The five main challenges voiced by participants included: parental satisfaction and influence on treatment protocol; the communication barrier with younger paediatric patients; uncooperative patients; time management, and confidence and competence in paediatric patient management.

5.5.1 Parental Satisfaction and Influence on Treatment Protocol

Participants were of the opinion that parental satisfaction presented a challenge to their management of paediatric patients. Participants reported that the perceived standard of care that a parent believed their child to have received was crucial to the continuation of care and adherence to the treatment protocol. These findings are similar to those of Lipstein *et al*. (2010), which determined that parental satisfaction and their decision-making was influenced not only by the practitioners' treatment and standard of care, but also the change in the health status of their child, prior knowledge and personal factors. Participants also highlighted the tendency of patients to try and influence the treatment protocol. This is in alignment with the findings of Damm *et al*. (2015), which concluded that the doctor-parent-child interaction is frequently dominated by the parents/guardians, who tend to interfere with the doctor-child relationship. A passive role is hence advocated to the child. The doctor-patient consultation, however, is the foundation for health interventions regardless of the age of the patient, therefore, it is recommended that the practitioner build a trusting relationship with the child or adolescent in order to improve information transfer and foster an active, autonomous role for paediatric patients during consultations.

5.5.2 Communication Barrier with the Younger Paediatric Population

The inability to communicate effectively with the younger paediatric patient population was reported by participants as a challenge to their assessment, treatment and

management protocols of paediatric patients. In particular, the inability of neonates and toddlers to express their cause and region of pain, as well as trying to communicate via the parent to the child, was reported to cause a barrier in effective doctor-patient communication during the consultation.

Damm *et al*. (2015) reported similar findings when assessing the communication between paediatricians and paediatric patients. The study found that without the child's input, an understanding of the character and severity of the child's pain is cumbersome and complex, making it difficult to relieve that pain effectively and safely.

Levetown *et al*. (2008) reported that children should be coached to actively develop their role as a healthcare partner. It is, therefore, suggested that practitioners enable paediatric patients to enquire about their health concerns, exchange relevant information, as well as participate in the creation of and follow through of treatment regimes.

5.5.3 Uncooperative Paediatric Patients

The lack of cooperation on the behalf of the younger paediatric population presented one of the foremost challenges to new graduate chiropractors' management of paediatric patients. These findings were in contrast to those of Vermeir *et al*. (2015) and Marginean *et al*. (2016), which determined that ineffective practitioner communication skills and the inability to establish good doctor-patient relationships, were the leading obstacles to efficient paediatric patient management. This may be due to the chiropractic profession focusing largely on manual therapy, which requires greater physical contact and patient cooperation in the treatment and management regime.

5.5.4 Time Management

The study found that participants struggled with the concept of time management during paediatric consults. This was attributed to the possibility of underlying systemic and genetic pathologies, which require a more detailed physical examination and workup. Greater time is, therefore, allocated to paediatric consultations in comparison to adult consultations. Turner *et al*. (2009) concluded similar results and highlighted the indirect negative impact of inefficient time management skills on doctor-patient-parent communication and the establishment of doctor-patient relationships. It is further highlighted by the researcher that uncooperative paediatric patients, poor case

history elicitation skills, especially when communicating with both the parent and child, and lack of practical experience in handling and treating paediatric patients may also contribute to inefficient time management skills on the behalf of new graduate chiropractors.

5.5.5 Knowledge, Confidence and Practical Experience in Paediatric Patient Management

Participants felt that their lack of sufficient knowledge, confidence and practical expertise impacted negatively on their treatment and management protocols of children. This also prompted quicker referrals to more experienced practitioners in the field of chiropractic and other healthcare specialities. Todd *et al*. (2017) and Hecimovich (2009) reported similar results when investigating the knowledge, confidence and practical experience of chiropractic students in the New Zealand and the USA respectively. Hecimovich (2009) further recommended that methods be implemented to foster confidence and competence in chiropractic educational programmes. In the fourth year chiropractic curriculum at DUT, public hospital visits allow for the students to engage with patients at the hospital, with a small percentage of those patients comprising of paediatrics due to the restricted access to the paediatric ward of the hospital. Community service events and sports' events allow for greater interaction with paediatric patients during the fifth and sixth year curriculum. These events, however, largely target the adult population and therefore can be enhanced by focusing on more paediatric orientated events and initiatives.

5.6 THEME FOUR: ENHANCEMENT OF PAEDIATRIC PATIENT MANAGEMENT

The desire to improve the standard of management of paediatric patients was expressed by the majority of participants. Popular areas of enhancement consisted of the following: paediatric assessment, treatment protocol and post-graduate course attendance.

5.6.1 Improvement in Paediatric Assessment

The study found that 50% of the participants interviewed voiced a desire to enhance their assessment skills of paediatrics, with emphasis on patients under the age of ten

years old. Participants emphasised the need to improve their communication, diagnostic and time management abilities. In general, the participants felt that practical courses, notes, journal articles, toys and interaction with other practitioners, could facilitate the enhancement of their assessment skills.

These areas of improvement are similar to those found by Todd *et al*. (2017) and Boysen *et al*. (2016), which determined that chiropractic students were eager to improve upon their communication and diagnostic skills when managing paediatrics. Todd *et al*. (2017) further concluded that these aspects were significantly ameliorated following increased practical exposure to paediatric patients during external clinical placements. Vermeir *et al*. (2015) and Damm *et al*. (2015) further determined that paediatricians also desired to enhance their communications skills with paediatric patients and their parents. These studies suggested that methods and opportunities to foster high quality communication skills with paediatrics, and their parents, be implemented as early as the undergraduate curriculum.

5.6.2 Improvement in Paediatric Treatment

The need for amelioration of paediatric treatment protocol was voiced amongst participants, with emphasis on their adjustment techniques and auxiliary therapeutic modality utilisation. These findings are similar to those of Spigelblatt (2002) which found that after conducting a cross-sectional survey on 1200 Canadian chiropractors, that the majority of participants desired to enhance their training and treatment pertaining to paediatrics. The chiropractors further stated that they received informal training in paediatric care by attending conferences, personal communication with colleagues and reading journals pertaining to paediatric care.

5.6.3 Continuation of Professional Development in Paediatrics

The majority of new graduate chiropractors who were interviewed stated that the attendance of post-graduate courses would be very beneficial in enhancing their paediatric patient management. These participants felt that a paediatric course would aid in improving their knowledge, confidence, orthopaedic assessment and treatment protocols of paediatric patients. The desire to attend post-graduate courses in order to improve practitioner competence and confidence was found by a variety of researchers in various healthcare professions, including medicine (Zweigenthal,

Marques & London, 2016), nursing (Gunawan *et al*., 2018) and radiographers (Du Plessis *et al.*, 2012).

Some participants divulged mixed opinions in response to the attendance of a post-graduate course. These participants expressed an interest in attending a post-graduate course, however, voiced apprehension due to the high cost and lack of local availability of these courses in SA. Similar findings were found in a study conducted by Cobbing *et al*. (2016) on physiotherapists, which determined that apart from the cost and availability of post-graduate courses, family commitments and lack of motivation also served as barriers to the advancement of their studies. A minority of participants reported no desire to attend a post-graduate course in paediatrics, due to the extensive course duration, having no particular interest to specialise in paediatric patient management and the willingness to refer complex paediatric cases to more experienced or specialised chiropractors. There is an increasing demand for better qualified and skilled graduates in the South African economy and community. Taking this into consideration, it is recommended that stakeholders in healthcare and education in both the private and public sectors in SA, need to actively engage to implement methods in order to make post-graduate study an attractive, viable option for personal and career orientated development.

5.7 SUMMARY OF THE CHAPTER

This chapter discussed the findings of the study and illustrated the perceptions of new graduate chiropractors in their management of paediatric patients in the eThekwini Municipality. The majority of the results in this study appeared to correlate with the conclusions of relevant studies pertaining to the perceptions, confidence and competence of healthcare practitioners. This study does, however, explore the perceptions, educational training, challenges and recommendations of new graduate chiropractors in SA, which are concepts previously only vaguely explored and described from the viewpoint of a new graduate chiropractor. The following chapter summarises the aims and findings of the research and provides the strengths, limitations and recommendations of the study.

CHAPTER 6 SUMMARY, STRENGTHS AND LIMITATIONS, RESEARCHER'S REFLECTIONS, RECOMMENDATIONS AND CONCLUSION OF THE STUDY

6.1 INTRODUCTION

This chapter recapitulates the aims of the study and addresses the research questions formulated at the beginning of the research. The study's strengths, limitations, the researcher's reflections and recommendations to the chiropractic paediatric programme are also elaborated upon.

6.2 SUMMARY OF THE STUDY

The aim of this study was to identify and explore the perceptions of new graduate chiropractors in their management of paediatric patients in the eThekwini Municipality. The research questions elaborated on below were formulated in order to meet this aim.

6.2.1 Research Question 1: What are the Perceptions of Chiropractors with Regards to Paediatric Patient Management?

The participants perceived the management of paediatric patients as an integral, aspect of chiropractic care; however, they unanimously expressed a lack of confidence and knowledge when managing the younger paediatric population. This deficit in confidence and competence was attributed to the inability, especially of children under the age of 10 years old, to adequately communicate and cooperate with the chiropractor. The participants were of the opinion that they were not sufficiently trained to manage all aspects of care pertaining to the younger paediatric population and perceived their skill in the diagnostic assessment and treatment of paediatric patients to be substantially deficient.

6.2.2 Research Question 2: Does a New Graduate Chiropractor Understand when to Manage a Paediatric Patient Him/Herself and when to Refer to Other Healthcare Specialists?

In general, the participants reported they could identify obvious signs of serious underlying pathology in a paediatric patient, however, they unanimously acknowledged that they were not specialists in the field of paediatrics and hence could possibly overlook signs and symptoms of more complex, sinister pathology in paediatric patients. Due to their perceived lack of skill in paediatric management, new graduate chiropractors demonstrated greater willingness to seek counsel from and refer paediatric patients to more experienced chiropractors and other healthcare specialists. The participants unanimously related a multidisciplinary approach in their management of paediatric patients.

6.2.3 Research Question 3: What Aspect, If Any, Would New Graduate Chiropractors Want to Improve in Their Management of Paediatric Patients?

The desire to enhance the standard of care provided to paediatric patients was expressed by the majority of participants. Areas of potential enhancement included paediatric communication skills; time management abilities; diagnostic and orthopaedic assessment, as well as paediatric treatment protocols, with particular emphasis on paediatric adjustment, and the provision of auxiliary therapy. The participants further added that the utilisation of aids, such as practical courses, notes, journal articles, toys and interaction with other healthcare practitioners, could potentially improve their assessment skills of paediatric patients and allow for more proactive, interactive consultations with this age group.

6.2.4 Research Question 4: Are There Aspects That New Graduate Chiropractors Suggest the Chiropractic Paediatric Programme Incorporate or Adjust, in Order to Improve the Quality Of Paediatric Education and Therefore Paediatric Care?

Participants unanimously agreed that multiple areas of improvement existed within the DUT chiropractic paediatric module. In order for the amelioration of knowledge, confidence and skill in paediatric patient management, the following recommendations were suggested:

- An earlier introduction to the paediatric component of the chiropractic course, to allow for greater time to be focused on paediatric practical sessions and theoretical grounding.
- Creating opportunities for a variety of healthcare specialists to share their knowledge and practical expertise and acquaint the students with diverse skills and paediatric techniques.
- Integration of frequent, consistent practical sessions with focus on greater exposure to paediatrics and congruency between the theoretical and practical component of the paediatric curriculum.
- The introduction of visits to paediatric clinics/shelters into the paediatric module.
- Promotion of paediatric treatment in the Chiropractic Day Clinic and public sector, in order to increase the exposure of students and novice chiropractors to paediatric patient care.

6.3 STRENGTHS OF THE STUDY

This qualitative study allowed the researcher to obtain the perceptions, insight and experiences of new graduate chiropractors in their management of paediatric patients, concepts which were previously unexplained in South Africa. This study further contributed to the limited field of paediatric and chiropractic educational research. Furthermore, the study highlighted aspects pertaining particularly to the DUT chiropractic paediatric component, utilising a unique cohort.

6.4 LIMITATIONS OF THE STUDY

The study was conducted in the eThekwini Municipality and concentrated on a specific cohort, which were new graduate chiropractors who had graduated from the DUT chiropractic programme. The experiences and perceptions of the new graduate chiropractors may differ from chiropractors who graduated from other universities, whose paediatric curriculum may be unique and different to that of DUT. Caution is, therefore, advised against the generalisation of the findings of this study, however, the findings may be useful as guidelines for curriculum reviews, as well as the lecturing,

and future paediatric orientated outreach initiatives. Furthermore, this study explored the perceptions of new graduate chiropractors in areas such as confidence, knowledge and skill, with regards to their paediatric management and did not employ methods to assess their actual knowledge and skill. It is therefore possible that although new graduate chiropractors felt as if they were not knowledgeable and skilled sufficiently to manage the younger paediatric population, this may not reflect the reality of their actual competence in paediatric management.

6.5 RESEARCHER'S REFLECTIONS

This section provides a subjective assessment of the thoughts and perceptions of the researcher during the research process. The researcher was pleased to conduct the study on participants who were eager, timeous with their interview appointments, and shared their thoughts openly. The data collection process allowed the researcher the opportunity to develop and enhance interviewing skills, for which the researcher is grateful. The limited published research in the field of chiropractic paediatric education and chiropractic paediatric care caused difficulty on behalf of the researcher in obtaining relevant information pertaining to these aspects.

6.6 RECOMMENDATIONS

The onus is upon the stakeholders of chiropractic education and the DUT to address the obstacles and deficiencies in the paediatric curriculum, as reported by the participants of this study. The recommendations to improve the paediatric component of the chiropractic curriculum are described below.

6.6.1 Recommendations for the Chiropractic Programme at DUT

- It is suggested that the paediatric component of the chiropractic course be introduced earlier in the chiropractic curriculum, instead of being reserved only for the fifth year curriculum. This will allow for greater time to be focused on paediatric practical sessions and theoretical grounding.
- The paediatric programme should implement opportunities for a variety of paediatric healthcare specialists to interact with the students, in order to introduce them to diverse skills and paediatric techniques. Expert opinions and

experiences are invaluable sources of knowledge which could encourage further interest in the field of paediatrics.

- The integration of frequent, consistent practical sessions, with emphasis on the congruency between the theoretical and practical components of the paediatric curriculum, is recommended. Methods must be implemented to ensure opportunities for the application of theoretical knowledge and practice of paediatric communication skills.
- The introduction of clinical placement programmes aimed at fostering confidence and competence in the management of younger paediatric patients, may be beneficial to the chiropractic paediatric curriculum. Paediatric clinic and shelter visitations may also be useful in increasing student's exposure to paediatric patients during their training.
- Guidelines must be implemented on the use of additional sources of information. It is recommended that the lecturer suggest or provide credible online and print media to enhance the consolidation of knowledge and understanding. Greater utilisation of open access articles and promotion of easier access to a variety of internet databases must be encouraged, to allow students to explore related paediatric research and enhance their own learning. These concepts promote self-learning, enhance peer learning and can help students improve their examination preparation.
- The promotion of paediatric treatment in the Chiropractic Day Clinic is highly recommended. The appropriate promotion of the chiropractic management of paediatric patients could increase the awareness among the parents and caregivers of children and infants on the appropriateness of chiropractic care. This could, in turn, increase the students' exposure to paediatric patients in the Chiropractic Day Clinic. It is suggested that paediatric orientated sports' events and community service outreach programmes be targeted and initiated as methods of promotion of the chiropractic management of children.

6.6.2 Recommendations for Further Research

It is recommended that a comparative study be conducted on new graduate chiropractors from the University of Johannesburg to determine the similarities, differences and any further recommendations to enhance the paediatric programme

in the chiropractic curriculum. The findings of these studies could contribute to the amelioration of chiropractic paediatric education and training in South Africa. Furthermore, this study investigated the perceptions of new graduate chiropractors in their paediatric patent management, however, no methods were employed to accurately assess their knowledge and skill level. It is, therefore, suggested that further research be conducted to assess the competence of new graduate chiropractors in their management of paediatric patients.

6.7 CONCLUSION

This qualitative study assessed the perceptions of new graduate chiropractors with regards to their management of paediatric patients in the eThekwini Municipality. The findings indicate that new graduate chiropractors perceived the management of paediatric patients as a crucial, important aspect of chiropractic care, however, they exhibited a lack of self-confidence and expressed a significant paucity in their knowledge and skill level with regards to their management of the younger paediatric population. The challenges and obstacles that new graduate chiropractors encountered in their management of paediatric patients was also discussed, along with a brief overview of their referral relationships with other chiropractors and healthcare specialists. The beneficial aspects learnt during the chiropractic paediatric course were also highlighted. In general, however, new graduate chiropractors felt that they were not sufficiently trained to manage all aspects of care pertaining to the younger paediatric population and recommended a variety of aspects that could be improved upon to enhance the quality of chiropractic paediatric education and hence overall paediatric care by chiropractors. This qualitative research is one of the few studies pertaining to chiropractic paediatric education and training. Many of the findings of this study exhibited similarities with previous studies, however very few were conducted in the context and field of chiropractic, therefore, the study adds a valuable, new perspective from the viewpoint of the new graduate chiropractor on areas of improvement in the chiropractic paediatric curriculum. There remains a need however, for further investigation and evaluation of senior students' and new graduate chiropractors' confidence and competence in the management of vulnerable patient populations, such as paediatrics.

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APPENDICES

Appendix 1: Institutional Research Ethics Committee Clearance Certificate

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: lavishadd@dut.ac.za
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www.dut.ac.za

9 November 2018

Ms T M Frederick
17 Topaz Avenue
Moorton
Chatsworth
4092

Dear Ms Frederick

Perceptions of new graduate chiropractors in their management of paediatric patients in the eThekwini Municipality

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

Kindly ensure that participants used for the pilot study are not part of the main study.

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

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

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

Yours Sincerely,

Professor J K Adam
Chairperson: IREC

Appendix 2: Letter of Information

Dear Participant,

I wish to welcome you to my research study and thank you for your co-operation.

Title of the Research Study: Perceptions of New Graduate Chiropractors in Their Management of Pediatric Patients in the Ethekwini Municipality.

Principal Investigator/s/researcher: Tarryn Miranda Frederick, M. Tech: Chiropractic Candidate.

Supervisor: DR. D. Varatharajullu, M. Tech: Chiropractic

Co-Supervisor: Prof MN. Sibiya, D. Tech: Nursing

Brief Introduction and Purpose of the Study: Chiropractic is the most visited complementary alternative medicine by paediatric patients. Thus, the aim of this research is to assess the knowledge and perceptions of new graduate chiropractors in the management of paediatric patients in the eThekwini Municipality.

Outline of the Procedures: You will be required to participate in an interview that is estimated at 40 minutes in duration. A request is made for the interview to be voice recorded for record purposes. The interviews will be conducted at your place of employment.

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

Benefits: The research will add new literature on paediatric training which will benefit the chiropractic program and further enhance the chiropractic profession. The research can stimulate further interest into post graduate paediatric training.

Reason/s why the Participant May Be Withdrawn from the Study: You are free to withdraw from study at any stage of the study. There will be no adverse consequences should you choose to withdraw.

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

Costs of the Study: None.

Confidentiality: All personal details will be kept confidential and allocated a code. The raw data will only be accessible to the researcher, research supervisor and co-supervisor.

Research-related Injury: None

Persons to Contact in the Event of Any Problems or Queries: Persons o contact in the event of any problems or queries:
Please contact the researcher Tarryn Miranda Frederick on 062 978 4593, my supervisor Dr D Varatharajullu on 031-373 833, Prof M.N. Sibiya on 031-373 2704 or the Institutional Research Ethics Administrator on 031 373 2375. Complaints can be reported to the Director: Research and Postgraduate Support, Prof C. Napier on 031 373 2577 or carinn@dut.ac.za

Appendix 3: Consent

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Tarryn Miranda Frederick, about the nature, conduct, benefits and risks of the 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 computerized 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, Tarryn Miranda Frederick herewith confirm that the participant has been fully informed about the nature, conduct and risks of the above study.

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

Appendix 4: Interview Guide

Date _____ Participant no: ☐

SECTION A: DEMOGRAPHIC DATA

Age _____

Gender _____

Highest qualifications _____

Post graduate study_____

Institution from which participant graduated and year of graduation_____

Number of months/years participant has been in practice after graduation _____

Approximate number of pediatric patients treated _____

SECTION B: INTERVIEW QUESTIONS:

1. What are your perceptions, with regards to paediatric patient management?

Probe: Do you feel adequately prepared and confident to manage a paediatric patient? If not, please elaborate.

2. Do you feel, as a new graduate, that you are adequately knowledgeable in order to diagnose a paediatric patient?

Probes: Do you feel that you are well enough informed regarding paediatric diseases and disorders, to identify the nature of a medical condition by examination of the symptoms? Do you continue to read current literature, pertaining to paediatric

management to keep you informed on the current protocols for chiropractic paediatric management?

3. Would you be interested in attending a post-graduate paediatric course? Please elaborate.

Probe: Do you think attending a course specifically designed to equip you with the skills, knowledge and overall efficiency when managing paediatric patients, will be of benefit to you, taking into account , the cost and availability of the course, with most courses being available only outside of South Africa.

4. Do you feel that you fully understand when to manage a paediatric patient yourself and when you should refer to other health care specialists?

Probe: As a new graduate, without years of extensive interaction with paediatric patients, is it apparent when you should facilitate treatment plans to assure medical care is provided to the paediatric patient and when to transfer the paediatric patient to another health care specialist e.g. a paediatrician? Do you think that you can easily recognise a 'Red Flag' paediatric case?

5. Describe the most challenging aspects, regarding paediatric patient treatment and management.

Probe: Can you relate any instances of difficult elements, which you have encountered in private practice, during the consultation or facilitating treatment protocols to paediatric patients?

6. What aspects, if any, would you want to improve in your management of paediatric patients?

Probes: What elements, pertaining in particular to your provision of diagnostic and therapeutic services, do you desire to enhance, when managing paediatric patients? Elaborate on the aids, that you could utilise to do so.

7. In your opinion, what do you think was the most useful aspect, that you learnt regarding paediatrics in chiropractic, that has helped you manage or treat paediatric patients in private practice?

Probes: Elaborate on the theoretical grounding and clinical experience that has assisted you to provide adequate care to paediatric patients? Were there any

additional sources of information that you found useful regarding paediatrics, during your chiropractic course?

8. Are there aspects, that you suggest the chiropractic paediatric programme incorporate or adjust, to improve the quality of paediatric education and therefore paediatric care?

Probes: What elements do you feel, can be introduced or omitted from the chiropractic paediatric programme in order to facilitate a better understanding and greater knowledge of paediatrics? Do you feel that the chiropractic paediatric programme has adequately prepared you to handle and treat paediatric patients? How do you think your experience in the programme could have been maximised or enhanced?

Appendix 5: Exemplar Transcript

TRANSCRIPT 4 (P4)

Date: 26/02/2019

Location: At the participant's place of employment

Time: 15:00

The interview was set up telephonically, whereby a date, time and venue were decided upon.

Interviewer: Good Day Doctor. I wish to welcome you to my research study and thank you for your participation. Before we begin, this interview will be voice recorded; do you have any problems with that?

Interviewee: No, that is fine.

Interviewer: Great. So, I will just give you a moment to read the letter of information and consent and just sign your consent if you are ok with everything.

Interviewee: Ok, so I've signed the letter of consent. Read the letter of information…

Interviewer: Ok, fill out the demographic data in the interview guide.

Interviewee: Ok, done that.

Interviewer: Ok. So let's begin. What are your perceptions with regards to paediatric patient management?

Interviewee: So, I would say that paediatric patients are not small humans. They are their own sort of species. When it comes to treating paediatrics... So, you can't just take what you'd use on an adult and just sort of characterize it to fit paediatrics. There are a lot more conditions, the examinations are a lot longer and a lot more difficult, rather than in an adult, where you can just focus on the patient themselves. With paediatrics you've got to actually focus, you've got to check mom, check dad, check brother, check sister, on each patient because there is a lot of more systemic conditions I've noticed, when dealing with paediatrics, than rather adults, where it's just a simple diagnosis, like a rotator cuff tear, or impingement in the shoulder, or a cervical disc. With kids, there is a lot of systemic disease, a lot of illnesses, a lot of malignancies as well in patients as compared to the adult generation. Plus, I deal with a lot of school kids, where they are in grade seven- grade eight, where they are sort of going for bursaries and all that… So, your pain management, dealing with parents who are a little bit pushy sometimes, to get their kid back out onto the sports field and you also got those, where mommy loves the child very much and doesn't want the child to do any activity whatsoever, when they should be doing proper rehab and going from there. So, I think it's more, let's call it, multidisciplinary. So, we're dealing a lot with paediatricians and dieticians. Especially those from your lower socioeconomic

standpoint, you've got to manage that patient very carefully when dealing with sort of nutrients and all that. So, you can't just go there expecting to find a healthy child. So, every time a child comes through the appointments are a lot longer and you've almost got to have a different mind-set when treating a child, as compared to treating an adult. So, when you have an adult come through the door, it is almost a relief, being a little bit easier, sort of understandable with that.

Interviewer: Ok. Do you feel adequately prepared and confident to manage a paediatric patient? If not, please elaborate.

Interviewee: I would say up until the age of probably ten, (pause) ten and older, I think I'm quite adequate in dealing with, but I think when you start getting to real paediatrics, sort of your few month-old babies to your few years old, I don't think from varsity that we are prepared for that. I think that needs to be its whole own separate course altogether. So, you have got to go over the anatomy, developmental stages and all that from scratch, because I mean, those few lectures we got back at varsity don't prepare you much. I mean adjustments we do- what three years of adjustments, before we actually get into clinic and actually see patients regularly. Whereas, to be honest with you, the first time I adjusted a paediatric-this is talking under ten years old- was probably my last week in clinic. So before getting into private practice I probably adjusted one true paediatric patient. So, I do not treat any kid younger than five-years-old. I normally refer that to a guy just up the road and I normally go and observe those treatments. So I'm not comfortable treating paediatrics sort of under five-years-old, but five and upwards, I don't really have a problem with that. But generally, under that, you need to go see a specialist chiropractor, someone that deals more regularly with paediatrics and has been in practice maybe ten years at least (pause) because, still trying to figure out adult stuff when they come in can be quite difficult, without paediatrics being a whole new (pause) almost like a subspecialty. You cannot just have the one hour a week we used to get at varsity and be sufficient enough to do that as well.

Interviewer: Alright. Do you feel, as a new graduate that you are adequately knowledgeable in order to diagnose a paediatric patient?

Interviewee: I would say the younger-younger patients, er, I would say under ten, with that, I would say it is very, very difficult to diagnose accurately and say a 100%, without getting a referral to a specialist to confirm, or to do tests that we- that aren't available to do for paediatrics. So I think it comes back to that specializing in paediatrics. I don't feel that I, in my what (pause) eight months of private practice, am sufficient enough to deal with paediatrics. I mean it normally takes about five years, to be really confident dealing with adult adjustments, diagnostics, rehab and then to deal with kids… I think you've got to be a lot more specialized, have done extra research and have done extra courses to certify (pause) whatever you want to name it… Have a more specialized interest in it. I tend to prefer more sporting, everyday chiropractic stuff, rather than the actual paediatrics. So I think it is more specialized. There are not many people in Durban, which I know of, that actually specialize in (Participant gestures inverted commas) "paediatric chiropractic."

Interviewer: Do you continue to read any current literature, pertaining to paediatric management, to keep you informed on the current protocols for chiropractic paediatric management?

Interviewee: I would say no. The only sort of paediatric stuff that I do follow is scoliosis-based stuff, so infantile colic and adolescent scoliosis. I do a lot of reading on that but with regards to other conditions, not particularly as much as I do for other general musculoskeletal conditions in adults.

Interviewer: Would you be interested in attending a post-graduate paediatric course? Please elaborate.

Interviewee: I would have to say, probably not. I just- I am not really interested in paediatrics, under ten. So, the younger sort of kids, I refer out- just not- I don't feel that I'm qualified and educated enough or have the willingness to go and do that- to provide ethical treatment to them. So, I want the best for my patients. I'd rather send them to someone who specializes in that and that has the ten- fifteen years of experience. To be honest paediatrics, (pause) going and studying again for another Masters… I think at this point in my life, I'm not ready to do another whole five years of studying plus work, plus private life and research again. I just can't- just can't do that. So I probably wouldn't be interested in that. I think that is more if you really, really want to specialize or if you are going to be treating, I'd say those five-years-old and younger. So when you are more dealing with your infants sort of and we are still dealing with developmental milestones and reflexes and all of that, then you definitely need to be more specialized and actually go and attend courses and do your CPD points, sort of based on paediatrics. I am still interested in sport and everyday chiropractic. I do not personally have an interest really in paediatrics-young, infantile paediatrics.

Interviewer: Ok. Do you feel that you fully understand when to manage a paediatric patient yourself and when you should refer to other health care specialists?

Interviewee: So quite often when I do see someone, I do refer them to a healthcare specialist depending on their needs. So I work with sort of a multidisciplinary team, I have got biokinetiscists, physiotherapists and even other chiropractors that I refer to, if I am not getting the results that I would like to see. I normally refer them off to another chiropractor to double check, just to see that they are all fine. Then yes… Neurologists, paediatricians, all that… So especially dealing with kids, it is a multidisciplinary approach. You cannot just wait until it is too late and then refer out, when you can miss malignancies, infectious diseases and stuff like that. So you definitely cannot hog a patient. You have to get knowledge from a specialist. So chiropractic… We are musculoskeletal specialists, so when there are developmental sort of milestones that have not been met, that is when red flags should go off and you start referring to the relevant parties with that. Then you quite often find that those parties are quite willing to work with you, rather than if you send someone, a kid, who you have seen for a year with something that is not right and then you only send after a year. So rather get stuff-red flags, checked out with those specialists first and then move on from there.

Interviewer: Alright. Describe the most challenging aspects, regarding paediatric patient treatment and management.

Interviewee: Well, I would say definitely because they are not- going back to earlier- they are not small humans. So what we learnt at varsity does not always apply to paediatric patients. They-a lot of them, cannot communicate for themselves quite well, so if you ask someone, “Does it hurt here?” you won’t often get any response or anything like that. So, you have got to coerce them, often through their parents as well. Uhm, I think understanding that a lot of them don’t understand their condition and they are not at that mental aptitude to realise what is going on. If they have got a serious spinal scoliosis, to them it is normal. They do not notice anything different with that. So with those, I think education is important, for example, we cannot just tell a kid, “Ok, you need to- you can’t just go out and play soccer with your friends today, because you’ve got a spinal fracture,” or something. You need to sit down, explain to them what it is, why they cannot do this, what they need to do to be stronger and better and that often involves parents. If you leave a kid to go and do a few stretches or anything like that, they are definitely not going to do it. So you have got to follow up. Especially I find with your fourteen to eighteen-years-old, those are sort of the laziest out of all patients. They do not want to do any stretches or any rehabilitation so… I’ve rambled on… What was the question again?

Interviewer: Describe the most challenging aspects, regarding paediatric patient treatment and management.

Interviewee: And I also think obviously, there are a lot of systemic conditions to be considered when dealing with youngsters as well. So a lot of the time, they may present with musculoskeletal pain- so back pain, shoulder pain or something like that, when actually there is an underlying systemic condition that is going on. It is quite often that you actually find out that they have got a more serious underlying condition and so parents have been sort of carriers and they have not known about it until then. So it also comes down to dealing with the family rather than dealing with just one patient. So obviously you get mum that finds out that little Timmy now has a serious condition that is going to change the way they sort of go ahead with life. They have got to get a psychologist involved and obviously deal with all these aspects through there and it is I think- it is more time consuming as well. It is also not like an adult, where you go, “Please lie on your stomach,” and “Ok, lie on your back and let us have a quick look here… Ok I’m just going to raise your leg…” With kids, they are often not interested or not willing to participate with examinations. So quite often, you’ve got to have mum sitting in the table or sort of helping out, or examining them while they are sort of latched onto mum and try to communicate through parents, through to the actual kids themselves. So you are basically having a conversation with two people while talking to one. Then obviously crying and screaming kids are also a nice big one er, especially when you got thin plywood walls… It is not the greatest to have.

Interviewer: Alright. What aspects, if any, would you want to improve in your management of paediatric patients?

Interviewee: I would say I probably need a little bit better education. So, actually going ahead and doing courses and sort of being more specialized into it, but then again, most of my-my difficult patients, are the ones that are not sort of obvious so I tend to refer off anyway. So I would say I probably need to do a little bit more reading, a little bit more education-based stuff, more-more reading up, er and more actual courses if there are any practical courses. That would be quite interesting to go and see how

those work. So I think a few theory courses around the actual practical stuff. I mean being to varsity we learnt theory, but the practicals, we both know those are really important, because I mean, every day when a patient sits at your table, it's not- unless you are actually spilling information out at them- it does not help them. You actually need to physically get there, actually do the adjustments, do the rehabilitation with them, rather than just throwing information at them. So, I think, ya, a lot more practical courses, but also from varsity, I think it needs to be instilled earlier than fifth year. So, get some more stuff under the belt before you sort of get to your practical years.

Interviewer: Ok. In your opinion, what do you think was the most useful aspect, that you learnt regarding paediatrics in chiropractic, that has helped you manage or treat paediatric patients in private practice?

Interviewee: (Sighs). So, say that once more again for me please.

Interviewer: In your opinion, what do you think was the most useful aspect, that you learnt regarding paediatrics in chiropractic, that has helped you manage or treat paediatric patients in private practice?

Interviewee: I would say definitely uhm, the examination when it comes to patients. So, with them, good old- What was it? The examination sheet we used back at varsity, where we had to look in the nose, look in the ears, neurological examinations… I think that is very important when it comes to paediatric patients, because quite often, people come in with er, for example, adults come in with lumbar pain and you sort of stick to those regionals for them, but with a kid you have got to check literally from head to toe with all measurements, all recordings done and you have got uhm-monitor it over time. So it is not just that someone comes in and you do their blood pressure at the first visit and you continue on off that first reading. Every time they come in you have got to check temperature, check blood pressure, and check if anything has changed through that time. So you go to measuring cap size to length to width. So you have also got to do weight of the baby as well. So I think, the whole systemic approach has definitely been probably the best thing for me going forward, because quite often, you pick up stuff that if you did not do it, is actually the cause of the pain. Otherwise, you sit there, spending money- patients' money- you are running tests, sending to specialists and all that, but if you just did the examination properly the first time, then that would definitely make it a lot easier to deal with the patients through there.

Interviewer: Ok. Where there any additional sources of information that you found useful regarding paediatrics, during your chiropractic course?

Interviewee: There was a textbook… I cannot for the life of me remember what the name is, but there was a paed- er, paediatric textbook somewhere. It was in the library or somewhere that I read back in varsity and that sort of gave me the whole systemic approach to that (pause) but besides that, not much else. Relying a lot on the university education that they gave us, which is quite lacking, personally I feel. So compared to the ratio- compared to adults to actual paediatrics and pregnancies and all that… Lacking quite a bit.

Interviewer: Are there aspects, that you suggest the chiropractic paediatric programme incorporate or adjust, to improve the quality of paediatric education and therefore paediatric care?

Interviewee: Ok. So I think the varsity needs more of a specialist, uhm, lecturer. Someone that actually treats adolescents and children on a regular basis and that has years of experience. I think we definitely need more practical aspects of it. So I think in class we need children there for us to actually examine them. We cannot just use a doll that does not respond the same way as a real human does. That is like learning to adjust a er, boxing bag the whole time. You can only go so far, but when you actually have a patient lying on your table, it is going to be a lot different to something that is not real. So I think definitely we need more, uhm, more specialist lecturing for that. I think definitely, we need more practical components to that and it needs to be more regular as well, because I mean we literally have the lives of children in our hands every time we do a paediatric adjustment. So you definitely have to be a bit more careful and check your contraindications. A lot more- I would say- a lot more practical, more specialized chiropractic techniques with paediatrics, rather than waiting until someone gets to clinic and then everyone runs in, because it is the first baby they have ever seen be adjusted. So I think we need to get a few more lecturers in for the actual paediatric component. We cannot just rely on one person's sort of opinion and speciality. We need to have someone that has practiced for ten years, someone that has practised for five years, someone that has practised for two years and just see the difference over time, with those that have actually spent time with children in practice themselves, and then ya…More time, more practicals, uhm, a little bit more focus on paediatrics. I found personally, that it was one of those subjects that was very basic and brushed over at varsity. It was pretty much, "Here is the book, go and learn it and then we'll test you on that." There were no practical aspects. I think the only practical stuff we did were the reflexes in varsity and even those are your basic-basic-basic sort of tests. So I definitely think we need to go into more detail, sort of know more conditions regarding actual paediatrics. So we did not even do paediatric x-rays, or any diagnostic imaging. So if I think someone needs an x-ray, I actually phone another chiropractor down the road and go through the case with them and they will say, "Ok, I think we need to go for an x-ray or something with that little one and speak to a paediatrician and see what they say." So we actually haven't done any diagnostic testing with regards to imaging at varsity at all so… Ya. I think that is all I can think of at the top of my head for now.

Interviewer: Ok. Thank you so much for your time doctor. Have a great day.

Interviewee: Thanks.

Appendix 6: Editor's Certificate

Helen Bond
IMPELA EDITING
SERVICES
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079 395 5873

11 June 2019

CERTIFICATE

Tarryn Miranda Frederick

tmfrederick94@gmail.com

Dear Tarryn

Thank you for using Impela Editing Services to proofread your Masters dissertation.

We have proofread for errors of grammar, punctuation, spelling, syntax and typing mistakes. We have formatted your work according to the institution's guidelines, added a digital table of contents, and checked the references (this means checking the formatting).

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Kind regards

Helen Bond (Bachelor of Arts, HDE)