The management of non-musculoskeletal disorders by chiropractors in the eThekwini District

by

JANICE PILLAY

Dissertation submitted in partial compliance with the requirements for the

Master's Degree in Technology: Chiropractic

Durban University of Technology

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

_____ _____

Janice Pillay Date

Approved for Final Examination

_____ _____

Dr A. van der Meulen Date

M.Tech: Chiro

DEDICATION

This is dedicated to:

My parents, Jayson and Reena Pillay, who are the backbone of my success. Thank you for the sacrifices you have made to give me the life that I have. This would not have been possible without your unwavering encouragement, patience and love.

My grandmother, Sivagami Govender, I have never met a more selfless soul. Thank you, Ma, for your unconditional faith in me, your devotion and prayer throughout my academic career.

ACKNOWLEDGEMENTS

This would not have been possible without the guidance of the Almighty God.

I would like to express my deepest appreciation to the following individuals:

- Dr Anthony van der Meulen, thank you for your assistance and expert guidance throughout this research process. I am appreciative of your fast feedback and urgency towards the completion of this dissertation.
- The chiropractors who participated in my study, thank you for the time and effort in answering my questionnaire. Your responses have helped me complete this dissertation.
- Mr Deepak Singh, thank you for your assistance, time and patience with the statistical analysis of my study.
- Elize van der Walt, thank you for your time and expert proofreading skills.
- My sister, Roumayne Pillay, thank you for your patience and advice during the stressful moments throughout my life. You are the best friend that always has my back.
- My fur babies, Sophia and Swazi, who have been my rays of sunshine every day.
- My dear friends, Karishma Nana and Nivida Ganesh, thank you for your endless motivation and help throughout this process. I am grateful for the years of friendship and laughs along the way.
- Finally, thank you to the individuals who have been an inspiration in my life, who have unconditionally supported and believed in me through the most crucial stages of this process, even when I wanted to give up.

"When obstacles arise, you change your direction to reach your goal; you do not change your decision to get there" (Zig Ziglar).

ABSTRACT

BACKGROUND: The management of non-musculoskeletal disorders (NMSDs) by chiropractors is gaining more popularity among patients who are leaning towards complementary and alternative medicine (CAM) to optimise their health. Patients are made aware that chiropractors offer care holistically, rather than solely treating musculoskeletal disorders (MSDs). However, due to the paucity of evidence-based research in the chiropractic management of NMSDs, it is unclear whether chiropractors are actually treating the source of a NMSD or merely providing symptomatic relief of NMSDs. The study's objectives was to determine the types of NMSDs presenting to chiropractors in the eThekwini District; the management protocols of chiropractors for NMSDs and the association between selected demographic characteristics of chiropractors (e.g. age, gender, qualification, institute of study, number of years in practice, philosophical orientation) and the management of NMSDs.

AIM: To determine the nature and extent of the management of NMSDs by chiropractors in the eThekwini District.

METHODOLOGY: The study was designed as a cross-sectional survey-based study with a quantitative paradigm. Information was obtained through questionnaires completed by registered chiropractors practicing full-time and part-time in the eThekwini District. A pre-validated questionnaire was adapted for this study. Outcome measures included the frequency of NMSDs being treated by chiropractors as a primary and as a secondary complaint; patient demographics of those who presented to the chiropractor with NMSDs, the chiropractor's management protocols utilised to manage NMSDs and the association between the chiropractors' demographic characteristics and the choice of management methods of NMSDs. A focus group was held, followed by a pilot study to determine the validity of the questionnaire. A total of 73 chiropractors returned completed questionnaires with a response rate of 82%. The data was then coded on a Microsoft Excel spreadsheet and transferred to SPSS for statistical analysis.

RESULTS: Seventy-three of 89 chiropractors responded. The primary NMSDs garnering the greatest positive ratings include headache of NMSK origin (89%), infantile colic (80.8%), dizziness (67.1%), vertigo (61.6%), sinus-related disorders (58.9%) and tinnitus (54.8%). Of the secondary NMSK complaints, headache (82.2%), dizziness (72.6%), constipation (68.5%), sleep disorders (64.4%), fatigue (63%), sinus-related disorders (61.6%), vertigo (57.5%), bowel

disorders (56.2%), infantile colic (52.1%) and tinnitus (52.1%) were the most frequent NMSDs with symptomatic improvement, following treatment of MSK conditions seen by participants. For the management of primary and secondary NMSDs, the most common treatment modalities reported were auxiliary therapies, patient education and manipulative therapy. The majority of participants used a variety of treatment methods (no single treatment method was exclusive to a particular disorder) to manage NMSDs. A significant positive association ($p < 0.001$) was found between female chiropractors and the more frequent use of auxiliary therapy to manage NMSDS than their male counterparts. No other associations (for age, qualification, institute of study, number of years in practice and philosophical orientation) were observed between the chiropractors' demographic characteristics and the management of NMSDS.

CONCLUSION: The majority of chiropractors in the eThekwini District report managing some NMSDs in clinical practice. When the results of NMSDs treated collectively (as primary and secondary complaints) were combined, it was found that the most common NMSDs - garnering the greatest positive ratings - were headache of NMSK origin (most commonly migraine), infantile colic, dizziness, vertigo, sinus-related disorders and tinnitus. Future studies should use stringent criteria to investigate a larger representation of chiropractors across the country for the management of NMSDs.

Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF SYMBOLS AND ABBREVIATIONS

™:	Trademark
>:	Greater than
<:	Less than
%:	Percent
=:	Equals
α:	Alpha
n:	Sample size or count
ACA:	American Chiropractic Association
ACC:	Association of Chiropractic Colleges
ADHD:	Attention-deficit/hyperactivity Disorder
AHPCSA:	Allied Health Professions Council of South Africa
AMA:	American Medical Association
C1- C7:	1st – 7th cervical vertebrae
CAM:	Complementary and Alternative Medicine
CASA:	Chiropractic Association of South Africa
CNS:	Central Nervous System
CPD:	Continuing Professional Development
DUT:	Durban University of Technology
e.g.:	for example
EMS:	Electronic Muscle Stimulation
GERD:	Gastroesophageal Reflux Disorder
GP	General Practitioner

HVLA: High-Velocity Low-Amplitude

IFC: Interferential current

IREC: Institutional Research Ethics Committee

L1- L5: 1st – 5th lumbar vertebrae

LBP: Low back pain

MSDs: Musculoskeletal disorders

MSK: Musculoskeletal

NMSDs: Non-musculoskeletal disorders

NMSK: Non-musculoskeletal

PCP Primary Care Physician

RHDC: Research Higher Degrees Committee

ROM: Range of motion

S1- S2: 1st – 2nd sacral vertebra

SACA: South African Chiropractic Association

SAHPA: South African Health Practitioners Association

SAMPA: South African Manipulative Practitioners Association

SIJ: Sacroiliac joint

SMT: Spinal Manipulative Therapy

SPSS: Statistical Package for the Social Sciences

STT: Soft Tissue Therapy

T1- T12: 1st – 12th thoracic vertebrae

TENS: Transcutaneous Electrical Nerve Stimulation

TMJ: Temporomandibular joint dysfunction

U/S: Ultrasound

UCA: Universal Chiropractors Association

VSC: Vertebral Subluxation Complex

WFC: World Federation of Chiropractic

CHAPTER ONE
INTRODUCTION

1.1 INTRODUCTION TO THE STUDY

The traditional and historical role of chiropractic care was described by the founder of the chiropractic profession Daniel David (DD) Palmer who stated: “Functions performed in a normal manner and amount result in health. Diseases are conditions resulting from either an excess or deficiency of functioning” (Johnson et al. 2008). In recent years, a trend has been observed whereby patients lean towards complementary and alternative medicine (CAM). It has been reported that more than 40% of patients who seek medical and CAM care, do so to optimise health, as patients are made aware that chiropractors offer care holistically, rather than solely treating musculoskeletal (MSK) conditions (Blum et al. 2008). However, due to the paucity of evidence-based research in the chiropractic management of non-musculoskeletal disorders (NMSDs), it is unclear whether chiropractors are actually treating the source of a NMSD or merely providing symptomatic relief of NMSDs (Leboeuf-Yde et al. 1999; Johnson et al. 2008).

In South Africa (SA), only one study has been conducted (Leboeuf-Yde et al. 2005) that is comparable to the current study in determining the types of NMSDs presenting to chiropractors. The study was done fourteen years ago and involved the participation of various countries (Canada, United States, Mexico, Hong-Kong, Japan and Australia). Since then, the awareness of the chiropractic profession has increased globally, and more graduates are exposed to various philosophies. There are two main philosophies that influence the manner in which graduates will practice. The “straight” chiropractor solely believes in a spinal health care model where a vertebral subluxation may lead to nerve interference and, therefore, to disease; while the “mixer” treats patients in a holistic manner and bases his/her practice on evidence-based research (Parkinson et al. 2011). Chiropractic care (opening more practices in wider communities) and information (e.g. through the internet) are more accessible to patients than a decade ago and it is theorised that more patients may present with NMSDs (alone or concomitant to MSK complaints) to chiropractors. It is also assumed that fulfilling the requirements of the Continuing Professional Development (CPD) points - recently made compulsory by the Allied Health Professions Council of South Africa (AHPCSA 2013) - will

expose chiropractors to more courses and seminars on the role of chiropractic in the care of NMSDs.

1.2 RATIONALE

It has been more than a decade since Leboeuf-Yde et al. (2005), reported that a minority of patients in that study self-reported definite improvements of NMSK symptoms post chiropractic care, with the most common improved NMSDs being breathing (27%), digestion (26%) and circulation (21%) (Leboeuf-Yde et al. 2005). The findings of the current study will identify trends in the management of NMSDs by chiropractors in the eThekwini District (who represent a microcosm of chiropractic in SA). Depending on the findings of this study, a future study with a larger representation of chiropractors across the country can be conducted to determine evolution of the profession in SA in the management of NMS conditions. Although the evidence is not strong and the mechanisms are not fully understood about how chiropractic care influences NMSDs, it is however, imperative to keep up to date with developments in the profession and to recognise and embrace findings on the improvement in patient management protocols (Palmer 2009). This study may facilitate further research and recommendations could be made to academics involved in chiropractic to publish more case reports and clinical trials pertaining to this topic. The findings of this study could provide the basis for conducting a larger, robust study on the chiropractic management of NMSDs which could lead to the expansion of chiropractic outside of its traditional domain of the conservative management of MSK disorders.

1.3 AIM AND OBJECTIVES

1.3.1 Aim

- To determine the management of NMSDs by chiropractors in the eThekwini District.

1.3.2 Objectives

- To determine the types of NMSDs presenting to chiropractors.
- To determine the management protocols of chiropractors for NMSDs.

- To determine the association between selected demographic characteristics of chiropractors (e.g. age, gender, qualification, institute of study, number of years in practice, philosophical orientation) and the management of NMSDs.

1.4 THE SCOPE OF THE STUDY

A population size of 110 chiropractors was found in the eThekwini District and a sample size of 72 was determined by a statistician for this study. Random probability sampling was used to determine this number (Singh 2015). Due to financial, human resource and logistical constraints, the study was limited to chiropractors from the eThekwini District and the results are, therefore, generalisable to this cohort only. Convenience sampling method was used to recruit the chiropractors by choosing chiropractors' names from four labelled hats. Seven names were picked from a hat marked "eThekwini North"; four names from "eThekwini South"; thirty-seven names from "eThekwini Central"; and twenty-four names from "eThekwini West". A letter of Information and Informed Consent form (Appendix C), as well as the questionnaire, was delivered to each of the selected chiropractors. After five working days, the researcher telephonically enquired whether the questionnaires were ready for collection. When a questionnaire was collected by the researcher, the results were coded on an excel spreadsheet. These results were given to a statistician for data analysis. Access to the responses from the questionnaires was limited to the researcher, statistician and supervisors. SPSS (version 25.0) was used to analyse the data and the level of significance was set at 0.05.

1.5 OUTLINE OF CHAPTERS

Chapter One: The background and the rationale for the study are described. The aim and objectives are outlined, and a brief summary of the study is provided in the scope.

Chapter Two: A literature review is presented. This will facilitate a discussion on the background of NMSDs and its relation to chiropractic.

Chapter Three: The research methodology is described in detail. The statistical analyses and the ethical considerations are also provided.

Chapter Four: The results of the study are presented and described using both descriptive and inferential methods.

Chapter Five: The results of the study are discussed. Recommendations arising from the results of this study are presented. This chapter concludes with a brief outline of the limitations of the study.

Chapter Six: The overall conclusions based on the results are presented. Recommendations for future studies are also outlined.

CHAPTER TWO
LITERATURE REVIEW

2.1 INTRODUCTION

This chapter will briefly define and describe the origin of chiropractic and the evolution of the profession. Chiropractic legislation, scope of practice as well as the two diverse philosophies of chiropractic will also be described. There are two diverse factions within the profession (the "Straights" and the "Mixers") who believe in different philosophies. This chapter describes the different viewpoints which may lead chiropractors to claim to treat disorders which are within the ambit of NMSDs. Chiropractic management of both MSDs and NMSDs is also discussed. A detailed appraisal of the evidence of chiropractic care for NMSDs is also provided.

2.2 DEFINITION AND DESCRIPTION OF CHIROPRACTIC

"Chiropractic is a healthcare profession concerned with the diagnosis, treatment and prevention of disorders of the neuro-musculoskeletal system and the effects of these disorders on general health" (World Federation of Chiropractic (WFC) 2012). Since its inception in 1895, chiropractic remains the largest CAM profession in the United States (US) (LeFebvre et al. 2012; Salehi 2015). Besides manipulation of the spine and extremity joints, adjunctive auxiliary procedures such as electrotherapy; soft tissue therapy; lifestyle modification and advice, patient education; exercise and rehabilitation and activity modification advice; prescription of assistive devices; dietary advice; taping/strapping and other devices may be utilised in the management of a patient (Hawk et al. 2007; WFC 2012; LeFebvre et al. 2012). This approach to the management of patients is also adopted by the majority of chiropractors in South Africa (WHO 2005; LeFebvre et al. 2012).

Historically, chiropractic was based on the concept of the existence of the joint subluxation. This was promulgated by its founder, DD Palmer, who asserted that the root of all disease was related to the presence of spinal subluxations (Bergmann and Peterson, 2011). He defined "subluxation" as a "static misalignment of a single vertebra" (Kaptchuk et al. 1998). Palmer believed that vertebral subluxations could impinge on spinal nerve roots and result in obstruction of the neural impulses from the central nervous system (CNS) and manifest as

disease (Bergmann and Peterson 2011). However, there have been developments in the theories and models governing chiropractic philosophy. The way that a subluxation is viewed today differs significantly from its definition in the early stages of chiropractic. According to the Australian Spinal Research Foundation (2017), the current conceptual definition of a vertebral subluxation is that it ‘‘is a diminished state of being, comprising of a state of reduced coherence, altered biomechanical function, altered neurological function and altered adaptability”. There are some chiropractors who are of the opinion that postural defects such as muscle imbalances lead to subluxations. Others consider that tension in the back muscles causes subluxations whilst some still believe that nerve disturbances initiate subluxations (Kaptchuk et al. 1998). In recent years a “vertebral subluxation complex” has been accepted by many chiropractors. In this model, factors such as posture, mobility, muscle tone, and the condition of the nerves itself, are cited as causes of the vertebral subluxation (Kaptchuk et al. 1998).

2.3 A SUMMARY OF THE ORIGINATION OF CHIROPRACTIC

Since its inception in 1895, the evolution and development of the chiropractic profession has been turbulent. Its founder, DD Palmer, was the target of considerable criticism from practitioners of orthodox medicine. During this time, the healthcare options (alternate to medicine) available to Americans included, but were not limited to, bonesetting, herbalism, homeopathy, magnetic healing, naturopathy and osteopathy (Keating et al. 2004).

Chiropractic theories were developed from bonesetting, osteopathy and medical manipulation (WFC 2012). It was highlighted that osteopathy and chiropractic were “separate and distinct” entities in healthcare. Osteopathic medicine focuses on manual contact for the diagnosis and treatment of various diseases/ disorders with the utilisation of a wide variety of manual techniques to promote the maintenance of health and the management of various diseases (WHO, 2010). Osteopathy emphasized the “rule of the artery” whereas chiropractic believed in the “supremacy” of the nervous system.

The chiropractic profession’s struggle to gain legitimate access into the mainstream healthcare system is divided into five distinct eras:

2.3.1 The Era of Free Trade in Medicine: 1860-1900

During this time, legislation governing healthcare in the US did not exist. The most prominent group of healers included physicians (orthodox medicine) whose treatment consisted of bloodletting and tonics; homeopaths whose principal treatment included remedies and lifestyle advice; and eclectics, whose treatment methods were botanical remedies, rest and steam baths (Keating et al. 2004; Simpson 2012). Magnetic healers (which influenced the founders of other CAM schools) and manual therapists were also part of healthcare during this period. This era marked the time that the medical profession earned superiority in the professional hierarchy. The introduction of vaccinations and antibiotics were considered miraculous breakthroughs in healthcare. Medicine enjoyed the benefits of these advancements and behaved aggressively toward its competition in healthcare whilst Palmer was seen as campaigning against medicine in public (Keating et al. 2004). This was one of the many reasons leading to the rejection of chiropractic by science and the profession escaped this time of educational reform. The "Flexner Report" (introduced by the American Medical Association's Medical Education Committee) promoted chiropractors as "unconscionable quacks who should be dealt with by the public prosecutor and the grand jury". This started the feud between medicine and chiropractic (Simpson 2012).

2.3.2 The Era of Prosecution: 1900-1950

In 1902, DD Palmer was charged and later jailed for practicing medicine without a license, a fate that befell approximately 15000 other chiropractors (DeVocht 2006; Simpson 2012). Bartlett Joshua (BJ) Palmer - DD's son - founded the Universal Chiropractors Association (UCA) as a protective body for all chiropractors and then condemned the "mixer" philosophy, which was adopted by the UCA's rival, the American Chiropractic Association (ACA) (Keating et al. 2004). The chiropractic defence strategy in court was that chiropractic was a separate and distinct practice and had a different philosophy from medicine; they analysed the spine, trying to find the cause of the disease and did not diagnose, but adjusted (manipulated) the spine (not "treated"). It was also propounded that the profession was built upon success where the medical profession failed (Simpson 2012). BJ Palmer then began the "straight" philosophical orientation. By 1924, the Basic Science Boards of Examiners - that tested applicants in several disciplines for licensure - began but these examinations favoured mainstream medicine, resulting in no licensure for chiropractors between 1929 and 1950 (Keating et al. 2004). This resulted in the arrest and prosecution of practicing chiropractors as they did not receive licensure to practice in some states. Palmer, nonetheless, encouraged these graduates to practice anyway (Senzon

2014). This led to acrimonious relationships with other factions and widened the divisions within the chiropractic profession and contributed to further distance between mainstream medicine and chiropractic.

2.3.3 The Era of Persecution: 1920-2000

The Iowa Plan (in the US, and soon after, in Australia) was adopted by The American Medical Association (AMA), whose ideology was based on the elimination of the “chiro cult”. The feud between medicine and chiropractic continued and the chiropractic profession continued to be ostracised by the community. Chiropractic schools initially had negligible curricula and training and a high school graduation wasn’t required for enrolment. This led mainstream physicians to believe that the practice of chiropractic was unethical (Keating et al. 2004). During this period, there were 392 schools of chiropractic training in the US compared to 76 medical schools (Simpson 2012).

2.3.4 The Era of Legitimisation: 1960-2000

Several noteworthy developments occurred during this era viz. the advancements in legislation governing chiropractic practice in 90 jurisdictions worldwide; chiropractic education was included in universities funded by governments; and there were advancements in chiropractic research. After a difficult battle, chiropractors were recognised legally in nearly all states in the US by 1974 (Keating et al. 2004). It was also made known that chiropractors were the only healthcare specialists trained in the detection and correction of vertebral subluxation (strangely enough, as no evidence showed that subluxations existed). It was determined that chiropractors can successfully manage MSDs, but not visceral disorders as this was not supported by evidence (Simpson 2012). However, some of the chiropractors continued to assert that they could successfully manage NMSDs as well, despite not having the evidence to support this claim.

2.3.5 The Era of Opportunity: 2000-present

Dovetailing with the *Era of Legitimisation*, it is proposed that the profession needs to unite and claim its place in the healthcare system. This includes chiropractic institutions restructuring their curricula; the WFC and other associations identifying the subluxation as a hypothesis and using one definition to define it; or splitting the profession into the straight (subluxation-based) or mixer (evidence-based) practitioners. There are many conflicting viewpoints and variations within the profession about its scope of practice. This often leads to confusion among the public

and within the profession itself. Licensing laws also vary from state to state, e.g. in Washington State, chiropractors adopt a straight philosophical orientation, but in Oregon, their scope of practice is broader (Keating et al. 2004; Simpson 2012).

The concept of “innate intelligence” was introduced by Palmer (Keating 1995). This model explained how an ‘intelligent entity’ was in charge of all bodily functions and used the nervous system to wield its influence. The concept of chiropractic shifted from a mechanistic model of healthcare to a vitalistic healthcare model (Keating et al. 2004). Palmer began his school of thought by claiming to detect inflammation in his patients and expounded that this was the cause of all disease. He further stated that the displacement of anatomical structures in the body was the cause of this inflammation (later it became exclusive to joints) which caused impingement of nerve roots. This pressure caused neural impulses to reach organs. This displacement could be corrected by repositioning the parts of the body thus reducing friction and inflammation. This theory was epitomised by the Meric chart which linked specific spinal segments to specific organs (Keating et al. 2004).

Palmer used the anecdotal case of Harvey Lillard to substantiate this theory in 1897. Lillard, who reportedly had been deaf for 17 years, regained his hearing after receiving just two treatments of chiropractic manipulation. Palmer’s teachings focused on the vertebral subluxation being the cause of all disease, which when corrected, would restore health (Palmer 1910). DD Palmer believed that subluxations were caused by physical trauma, toxins, and even auto-suggestion. Willard Carver (a chiropractic attorney) introduced the “structural approach” to chiropractic which stated that there were displacements of multiple segments leading to subluxations and also analysed the influence of gravity on these structures (Keating et al. 2004; Strahinjevich and Simpson 2018).

Palmer’s philosophy signified an early post-rational perspective with lack of a strategic plan. In the first 100 years, chiropractic legislation and educational standards were not defined as Palmer often crossed boundaries of other factions of healthcare (Senzon 2014). This contributed to the view (of other factions of healthcare and the public) of chiropractic being an unorthodox practice and this resulted in a poor public image for chiropractic.

The first chiropractor in SA was an American graduate of Palmer School of Chiropractic in 1926 and began the South African Chiropractic Association (SACA). Alan and Ivan Payne were the first South African citizens to graduate from Lincoln Chiropractic College and returned to SA in 1938. In 1940, the South African Health Practitioners Association (SAHPA) was founded and its

members included chiropractors, naturopaths and osteopaths. Three years later, the South African Manipulative Practitioners Association (SAMPA) was established in Durban. Both associations (SAHPA and SAMPA) revolutionised into a single association following the introduction of the Medical Auxiliaries Bill in 1949. Later, the associations (SAHPA and SAMPA) became separate and distinct again and SACA consisted of the “straights” (who believed in straight chiropractic practice) and SAMPA (later changed to Pan-African Chiropractic Association) who emphasised a more eclectic approach to practice. In 1970, a single association for all chiropractors was formed known as the Chiropractic Association of South Africa (CASA). The first students were admitted into the first chiropractic programme at Technikon Natal (currently known as the Durban University of Technology) in 1989 (Till 2018).

The inter-professional conflict (within chiropractic) did, however, contribute to shaping the chiropractic culture and even though some of the obstacles have been removed, there are still lingering effects which the profession is faced with today (Simpson 2012).

2.4 PHILOSOPHICAL ORIENTATION

DD Palmer’s philosophical approach was one which viewed the human body as a dynamic system. He believed that the potential of a vertebral subluxation was the cause of disease which when adjusted (manual therapy) could impact the spine and body as a whole**,** resulting in the improvement of a patient’s health (Senzon 2014). The philosophical orientation of the chiropractor may have an impact on their approach to treating NMSK conditions. Following DD Palmer’s death in 1913, conflict began between the “Straights” and the “Mixers” in the profession who had different beliefs and perceptions regarding treatment protocols and the perceived outcomes of chiropractic care (Senzon 2014).

According to Kaptchuk and colleagues (1998) “Straight” chiropractors (the minority) exclusively believe in the emphasis of ‘innate intelligence’ and spinal adjustments. They suggest that the vertebral subluxation is the cause of all disease and focus on the correction of the subluxation (Senzon 2014; Hartvigsen and French 2017). The “Mixer” (the majority) is more open-minded to scientific evidence-based research and conventional medicine (Kaptchuk et al. 1998; Hartvigsen and French 2017). During the early development of chiropractic, the “Mixers” also included medical doctors, homeopaths, osteopaths and naturopaths among other practitioners. This

faction of practitioners included their other practices in order to redefine chiropractic as a profession (Senzon 2014).

The significant factors which divide the two factions of chiropractic in the eyes of mainstream medicine are the following:

- The interaction between other healthcare practitioners (the ongoing feud between mainstream medicine and CAM). Other healthcare practitioners are not very accepting of the chiropractic profession on its own, and the fact that within the profession, there are two factions with different school of thoughts, make it even more daunting to other practitioners and the public.
- The suitable language and terms with which chiropractic techniques are described (for e.g. some chiropractors use the term “adjustment” and others use “manipulation”).
- The scope of practice, the clinical significance of subluxation correction and the perceived effects following chiropractic management of a patient (Keating et al. 2004).

In a study conducted in Durban, SA, it was reported that 17.9% of 56 chiropractors regarded themselves as straight chiropractors (removing subluxation to promote healing) (McGregor et al. 2014). In other countries (e.g. the US) there are more straight chiropractors in comparison to SA. The conflicting beliefs between the two factions within the chiropractic discipline, creates clashing worldviews which generates challenges within the professional body as each faction strongly assumes that its viewpoint is supreme (Senzon 2014).

2.5 THE CURRENT STATUS OF CHIROPRACTIC

One hundred and twenty-three years later, chiropractors are practicing legally in over 100 countries globally. Ninety of these countries have national associations of chiropractic. The profession (after medicine and dentistry) is currently recognised as the third-most utilized primary healthcare discipline in the world and is the most well-established CAM profession (WFC 2012). The chiropractic profession has grown to approximately 75 000 chiropractors in the US. In SA, there are approximately 400 practicing chiropractors (WFC 2012). SA is recognized as one of the countries where the growth of the chiropractic profession is the highest (LeFebvre et al. 2012). In SA, chiropractic is integrated in medical insurances (medical aids)

and government funded universities and healthcare programs, whereas in some countries e.g. the US, private schools of chiropractic exist (Hartvigsen and French 2017).

Chiropractors are currently referring to the appropriate healthcare practitioners (Le Febvre et al. 2012). The conflict between the chiropractic profession and mainstream medicine has since been resolving as many chiropractors have reported that they are receiving referrals from medical professionals (family practitioners being the most common referrals followed by nurses, internists, neurosurgeons, neurologists, gynaecologists and general surgeons). In a study by Wardle et al. (2013) in Australia, it was found that only 23.1% of general practitioners (GPs) referred to a chiropractor once a month; 41% referred a few times a year and 21.7% did not refer to chiropractors. In a similar study conducted earlier in the US, it was found that 87% of patients asked their primary care physician (PCP) about chiropractic; 75% of patients requested a referral to a chiropractor; 65% of PCPs recommended patients to consult a chiropractor but only 24% referred formally (Greene et al. 2006).

It was reported that chronic pain (unresponsive to medicine), neck/back pain, MSK conditions and fibromyalgia were the most common reasons for referral to a chiropractor (Greene et al. 2006). The factors affecting referral to chiropractors by PCPs included the PCPs' personal use of chiropractic, PCP's level of knowledge about chiropractic; their comfort level with chiropractic; previous referral to a chiropractor; positive results with previous referrals; patients' request for a referral and a lack of other options (Wardle et al. 2013). General practitioners' referrals to other GPs who include CAM usage in their practice were greater than their referrals to specialists in CAM care. This shows that there are still lingering effects of the feud between mainstream medicine and chiropractic today. This breaks the continuity of patient care if patients are not referred to the correct healthcare provider. Patients are becoming more curious about the chiropractic profession which shows that the profession has the opportunity to grow and advance. The healthcare system in each country needs to secure a definite place for chiropractic in order for these advancements to occur (Wardle et al. 2013).

2.5.1 Challenges in the Chiropractic Profession

Historically, the profession faced numerous barriers in its development into an orthodox health discipline. These factors included the political struggle at that time; medical ostracism; the lack of research and funds; the lack of university-based or -affiliated chiropractic colleges; the seclusion from the scientific community and isolation from other healthcare practitioners and

hospitals; the anti-scientific aspects of its philosophy (e.g. the theory of subluxation which lacked evidence-based justification) (Keating 1992).

At present, the profession continues to face some of its historical challenges as well as new challenges in establishing itself in the healthcare system. The scope of practice, the existence of laws and regulations which restricts its licensure, and reimbursement (Cooper and McKee 2003), and competition with other healthcare professions, viz. physical therapy, adds to this growing body of challenges. In SA, the National Department of Health Policy restricts chiropractors to private practice and prohibits them from being included in the public healthcare system (Chiropractic Association of South Africa (CASA) Competition Commission Report 2016). There are restricting laws on advertising, reimbursements from medical aid, marketing and scope of practice (e.g. In SA, the prescription of drugs and surgery is prohibited for chiropractors) (CASA 2016). This further poses as a barrier in the expansion of the profession as these restrictions make it even more difficult for chiropractic to gain needed recognition compared to other healthcare professions (e.g. the laws of advertising for chiropractors are very stringent compared to a general practitioner). These challenges ultimately are suppressing the profession from developing even further which may be the reason why many patients neglect chiropractic as a primary choice of treatment.

2.5.2 The future of the profession

After extensive review of the current literature, four options emerged on the future of the profession viz.:

- Progress forward as a unified body. The “Straights” and “Mixers” unite to form a school of thought where both factions are satisfied in the philosophical approach to chiropractic. This would minimize the segregation in the profession and other healthcare disciplines may become more accepting of the profession.
- uphold the status quo; or
- Segregate the profession and allow each faction to fend for itself. However, this would cause further conflict amongst members in the profession which would prevent the growth and evolution of chiropractic (Simpson 2012).
- Integration with medicine (similar to osteopathy). Chiropractic students need to be exposed to a large volume and a variety of patients in a similar manner as mainstream medical students. The profession needs to unite in using the same terms (e.g. manipulation or adjustment) and be able to substantiate their practice by evidence in order to minimise

confusion in the healthcare system as. For the advancement of the profession, more stringent educational standards need to be made for admissions. College curricula need to shift to a more evidence-based approach (as mainstream medicine) and abandon historical unsupported theories (Wyatt et al. 2005). The healthcare system overall needs to create public awareness for the need of spinal care, public health, nutritional guidance and activity modification (Strahinjevich and Simpson 2018). For chiropractic to integrate with conventional medicine, some of the following changes would need to occur:

- Hospitals need to offer and cover chiropractic,
- There would need to be insurance coverage for chiropractic,
- More integrative medical centres need to be established,
- The chiropractic/ medical councils in a particular country need to regulate integrative laws for CAM and conventional medicine,
- The two factions (straights and mixers) of chiropractic need to unite and solely practice based on existing scientific evidence. Even though the progress is slow, more inter-professional communication skills need to be learned and explored (Keating et al. 2004).

2.6 CHIROPRACTIC LEGISLATION AND SCOPE OF PRACTICE

During the early 1900s, the existence of the profession was largely promulgated in the US (Chapman-Smith 2000). Today, chiropractic regulation is much different from what it was several decades ago, and the legal status of the profession is variable globally (WFC 2012). In the US, parts of Europe, Canada and SA, the chiropractic profession is regulated and recognised as a healthcare discipline (WFC 2012). In other countries (e.g. Germany and Japan), chiropractic education is currently undeveloped and there are no regulations for chiropractic practice (WFC 2012). In Switzerland, the chiropractic act is under the umbrella laws of the mainstream health system.

In SA, CASA is a body that protects the status of the profession and its members. This association unites and empowers chiropractors in SA (those that have membership). The Allied Health Professions Council of South Africa (AHPCSA) regulates the profession and there are umbrella laws of CAM for which chiropractic is recognised under (WFC 2012). The Act 63 of 1982 of the AHPCSA governs the chiropractic profession and is also responsible for preventing

the incorporation of chiropractic into the public health domain (Mullinder 2017). The WFC in a 2012 report stated that SA's legal status of chiropractic is identified as "legal pursuant to legislation to accept and regulate chiropractic practice".

The scope of practice is defined by state laws legally. According to Philips (2001), the scope of practice defined by the Association of Chiropractic Colleges (ACC) is establishing a diagnosis; assisting neurological and biomechanical integrity through suitable chiropractic case management; and the promotion of health. Legislation in SA allows chiropractors direct patient contact without referral from medical practitioners as they are recognized as primary-contact healthcare practitioners (WFC 2012). According to WFC (2012), the scope of practice includes the duty to diagnose, manage neuro-musculoskeletal disorders conservatively without the use of surgical procedures, drugs or medicines and in some countries (e.g. SA), chiropractors have the right to order diagnostic tests such as blood tests and plain film imaging (i.e. x-rays) (WFC 2012). In some states in the US, the scope of practice is limited to spinal adjustments only while in other states (majority), the scope of practice is broad and includes a range of treatment modalities.

Management of disorders (which are within the scope of practice) includes the use of its principle modality viz. spinal manipulation. Auxiliary therapeutic modalities may also be utilised. These include electrotherapy (e.g. TENS, IFC, therapeutic ultrasound (U/S), electrical muscle stimulation (EMS), soft tissue therapy (STT) (e.g. dry needling, massage, ischemic compression, rehabilitation, dietary advice, lifestyle modification, heat therapy, cryotherapy, patient education and other assisted devices (Bergmann and Peterson 2011; WFC 2012).

2.7 DEFINITION AND DESCRIPTION OF THE TERMS "MUSCULOSKELETAL" AND "NON-MUSCULOSKELETAL"

2.7.1 MUSCULOSKELETAL

The human MSK system comprises of muscles, tendons, ligaments, fascia, cartilage, connective tissue and the bones which form the human skeleton. This system's principal function includes stabilizing and supporting the human body, assists in movement as well as to provide protection of visceral organs. The axial and appendicular skeleton makes up the human skeleton. The axial skeleton consists of the spinal vertebrae and its intervertebral discs. The appendicular skeleton includes the upper and lower limb segments. The types of muscles found

in this system include (mainly) skeletal and smooth muscle. These are innervated by nerves which send electrical impulses from the CNS which cause contraction of the muscle (Imosemi et al. 2015).

2.7.2 NON-MUSCULOSKELETAL

This system refers to conditions where the primary symptoms are not directly related to the spine or musculature (Hawk et al. 2007). It is related to disorders affecting the viscera. Examples of MSK and NMSK disorders are provided in **Table 2.1**.

Table 2.1 Examples of musculoskeletal and non-musculoskeletal disorders

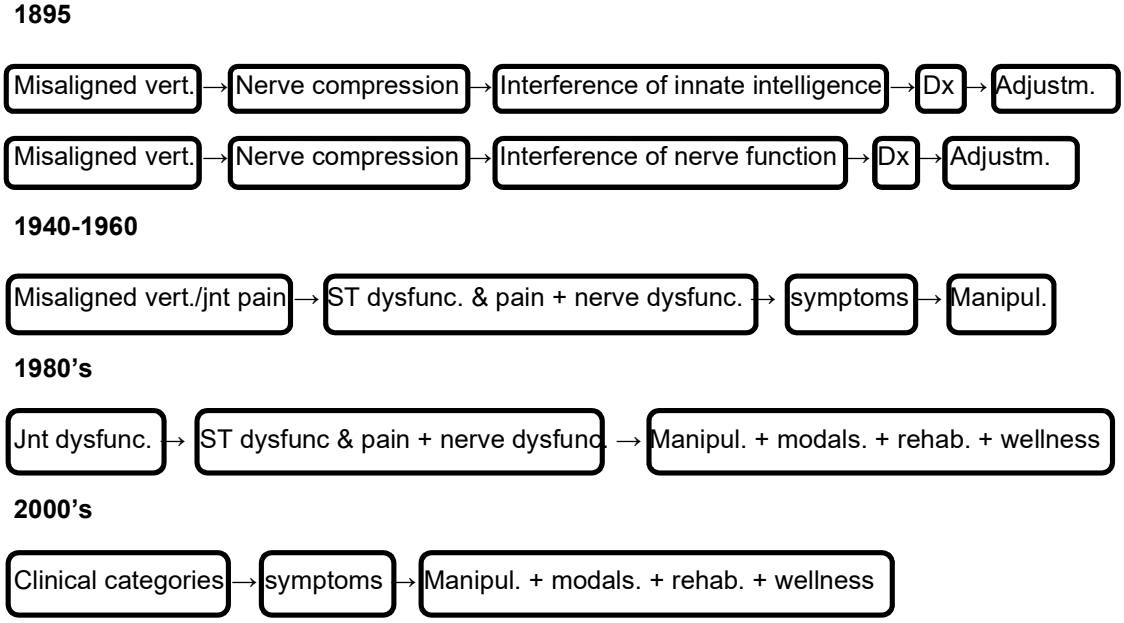
Musculoskeletal	Non-musculoskeletal
Sciatica/radiating leg pain	Asthma
Neck pain	ADHD
Non-specific mid back pain	Cerebral palsy
Coccydynia	Ischaemic heart disease
Ankle/foot sprains	Peptic ulcer
Carpel tunnel syndrome	Infantile colic
Lateral epicondylitis	Hypertension
Temporo-mandibular joint disorders	Nocturnal enuresis
Frozen shoulder syndrome	Dysmenorrhoea

Adapted from Clar et al. (2014)

2.8 THEORIES OF CHIROPRACTIC

Chiropractic theories have evolved over the years. These theories support the vertebral subluxation complex (VSC) which follow the pattern that subluxation is a misalignment of a vertebra which causes pressure on nerves thus affecting the nervous system. This results in disease (Vernon 2010). Palmer believed that the removal of subluxation by chiropractic adjustment, releases the nerve pressure which restores health. The original model of VSC included five components viz. spinal myopathology, kinesiopathology, histopathology, neuropathology and biochemical changes. This model was expanded into nine components, to include connective tissue physiology, angiology, anatomy, inflammatory response (Ryan and Rollette 2013). A summary of these theories which support the VSC is shown in **Table 2.2**. The Meric system (developed by BJ Palmer and Wishart) was a manifestation of the VSC. It related

the spinal level of peripheral nerves and their end-organ innervation. Figure 2.1 depicts the historical foundational and evolutional of the subluxation model.



Adapted from Vernon (2010)

Figure 2.1: The evolution of the subluxation model

Vert. = vertebra; Dx = Disease; Adjustm. = adjustment; jnt = joint; dysfunc. = dysfunction; Manipul. = manipulation; ST = soft tissue; modals. = modalities; rehab. = rehabilitation

Table 2.2 The theories which support the vertebral subluxation complex

Theory	MSK/NMSK	Description
Inflammation hypothesis	MSK and NMSK	Inflammation of the joints causes MSK and joint pain (due to swelling pushing on nerve fibres) which chiropractors treat predominantly with mobilisations, ice, elevation, pressure and nutrition.
Segmental dysfunction hypothesis	MSK	"Joint and muscle pathology and facilitation" Functional, structural and asymmetrical dis-relationships in the spine. This includes abnormal motion of joints, postural deviations, and neurological phenomena. Describes the common spinal lesion which chiropractors are known to treat.
Instability hypothesis	MSK	"Bone out of place"

		Postural stress and repeated/severe trauma with consequent ligament, capsular and discal tissue scarring = misalignment or instability = pain and disability
Immobilisation degeneration hypothesis	MSK	Immobilisation or fixation of the joints of the spine particularly in combination with trauma, cartilage destruction, proinflammatory changes, architectural and bony changes and osteophytes. The most prominent characteristic of aging is the loss of motion/ movement
Neuropathology hypothesis	MSK	The nerve transmission is affected by the intervertebral subluxation which compresses or irritates the spinal nerve roots
Somatoautonomic or viscerosomatic reflex/ hypothesis	NMSK	"Lesions in spinal joints could elicit facilitation-induced reflexes which disturb or impair visceral function". A viscerosomatic reflex is instigated by afferent impulses from visceral receptors. The impulses are transmitted to the spinal cord (dorsal horn) and synapse with interconnecting neurons. The stimulus is sent to sympathetic and peripheral motor efferents. This results in motor and sensory changes in the somatic tissues of skin, viscera, blood vessels and muscles. This reflex is the resultant of the effect of afferent stimuli that are brought about by a visceral disorder. The impulses that travel along afferent nerve fibres parallel efferent fibres that arise from the same segment in the spinal cord (Beal, 1985).
Myelopathy hypothesis	MSK	Pressure from masses (e.g. carcinoma) leading to destruction of the spinal cord. Misalignments of the occipito-atlantal-axial joint affect functioning of the body due to direct compression of the spinal cord.

Adapted from Leach (2004)

MSK = musculoskeletal; NMSK = non-musculoskeletal; e.g. = example

2.9 CHIROPRACTIC MANAGEMENT OF MUSCULOSKELETAL CONDITIONS

Chiropractors are most commonly known to be specialists in the treatment of neuro-musculoskeletal disorders. According to Bergmann and Peterson (2011), there are numerous patients who report chiropractic to be superior to medical care in the treatment of back pain and headaches. Mixer-oriented chiropractic currently encourages a holistic model of healthcare (evidence-based) and focuses on the assessment and conservative management of MSK disorders (especially those of the spine and extremity joints). The chiropractic management of

an MSK disorder begins with history-taking and a physical examination (motion palpation of anatomical structures and joint play, orthopaedic and neurological testing). If blood tests or imaging are required, these will be ordered. A diagnosis is then made which determines the mode of management. Generally, MSK conditions are treated by modalities such as joint manipulation and mobilisation, soft tissue therapy, exercise and rehabilitation, lifestyle modification, gradual increase in activity and home care. Therapeutic modalities (electrotherapy, heat, ice, U/S), nutritional advice, strapping/taping are also used to manage MSDs. The most common MSDs treated by chiropractors include spinal complaints (e.g. LBP), headaches and extremity complaints (e.g. rotator cuff injuries) (LeFebvre et al. 2012).

2.10 CHIROPRACTIC MANAGEMENT OF NON- MUSCULOSKELETAL CONDITIONS

Non-musculoskeletal conditions are defined as “conditions in which the primary symptoms are not related directly to the spine or musculature” (Hawk et al. 2007). Some chiropractors may treat NMSDs instead of just focusing on managing MSK conditions as their opinions (based on teachings from their superiors in university) may differ from other chiropractors. The number of years in practice may also affect the chiropractor’s opinions on whether chiropractic treatment (e.g. vertigo) can be improved by chiropractic management. For example, a chiropractor in practice for more than fifteen years may be more open to treating nocturnal enuresis primarily compared to a new chiropractic graduate who may not be sufficiently confident to treat this condition. A study investigating attitudes of clinicians in Canada towards the chiropractic management of NMSDs showed that asthma, constipation, dysmenorrhea, chronic pelvic pain, vertigo and infantile colic had the greatest positive ratings reported by patients and the chiropractor (Parkinson et al. 2011). These opinions may be based on Palmer’s teachings that chiropractic may treat NMSDs successfully. A study by Innes et al. (2018) found that chiropractic students (in Australia) were highly likely to offer advice on NMSDs and that a high number of these students held non-evidence-based beliefs about spinal manipulative therapy (SMT). These students may resort to this type of practice based on their clinician or lecturer’s influence towards managing these conditions. Some students may be influenced by Palmer’s theories and other chiropractors who strongly believe in this type of practice. This proves that students may not understand the limitations of the chiropractic scope of practice (Innes et al. 2018). Patients may present to chiropractors for the management of certain NMSDs (e.g.

nocturnal enuresis) as they are becoming aware that chiropractic provides holistic patient care and has a bio-psychosocial approach to health and wellness rather than exclusively reducing pain related to MSDs (Blum et al. 2008). There is a faction within the chiropractic fraternity that proposes that SMT may improve visceral-related conditions based on the findings of a number of studies **(Table 2.3)**, although the evidence is not strong enough (Bolton and Budgell 2012). There are various techniques described in the literature that are used by chiropractors to manage NMSDs. These include manual therapy (i.e. HVLA thrust spinal manipulation and joint mobilisations), STT, Gonstead technique, sacro-occipital techniques, chiropractic biophysics as well as lifestyle, diet, exercise and behavioural modification (Hawk et al. 2007).

Table 2.3 Evidence of literature depicting chiropractic care for the management of NMSD's

Condition	Reference	Design	Setting	Sample Size	Intervention	Summary of Results
ADHD/ Learning disabilities	Karpouzis et al. (2010)	Systematic review	Electronic databases were searched until July 2009 (Index to chiropractic literature; Cochrane central register of controlled trials, Cochrane library of systematic reviews, PubMed, MEDLINE-Ovid, PsycINFO, CINAHL, Mantis, Scopus, ISI web of science) Hand searched articles (DC tracts, Journal of Manipulative and Physiological therapeutics)	The search yielded 58 citations. Children (0 – 17 y/o) diagnosed by a Paediatrician, Psychiatrist, Medical Doctor, Clinical or Educational Psychologist.	>100 techniques including SMT, exercise instruction, patient education. No chiro intervention was excluded from this review.	"empty review". (no eligible evidence) as no studies met the inclusion criteria for the review. There wasn't any evidence of studies for or against chiro care for this condition (paediatric and adolescent ADHD) using RCTs were found.
	Muir	Case report of a	Chiropractor in	5-year-old male	SMT (upper C/S,	Favourable over 1 yr. as

	(2012)	child with ADHD	private practice	diagnosed with ADHD by a mental health practitioner 1 yr. prior	interscapular, TL region, paraspinal mms) STT, stretching Rx began on a thrice-weekly basis and declined to twice weekly over approx. 12 wks	subjective positive effects were noted during the course of Rx, with episodes of acting out, concentration, ability to follow instructions, poor school and home performance and other associated symptoms improved over the Rx duration.
	Guliani et al. (2012)	Case report of an infant with developmental delay, colic and GERD	Chiropractor in private practice	15-month-old female	Infant toggle headpiece, Logan Basic protocol. SMT (C1, sacrum). Rehab exercises. Seen once a wk. (19 visits).	Significant improvement after 18 visits as pt. could walk unassisted and speak 3-4 words. GERD and colic resolved after 3 chiro adjustments (once a month for 3 consec. months).
	Hodgson and Vaden (2014)	Case series of 4 children receiving Torque Release Chiropractic	Private clinic setting	pts (8 - 12 y/o) diagnosed with ADHD by a medical Dr	Torque release technique over a 5-10-month period	ADHD symptoms (inattention, hyperactivity) improved by 17.3%, functional status improvement 23.3%, general

						wellbeing improved at 21.0%. However, a small pop. was used.
Allergies	Takeda, Arai and Touichi (2002)	RCT on long term remission and alleviation of symptoms in Crohn's dx and allergy after SMT	Chiropractor (setting not specified)	57 pts divided into 2 grps. Grp 1 - Rx grp (17 pts) Grp 2 - Control grp (34 pts)	Grp 1- thoracic and lumbar SMT Grp 2- did not receive SMT	From 17 pts who received SMT, 12 pts showed long-term remission of symptoms allergy and Crohn's dx), 9 had an alleviation effect. The IVF narrowing improved seen via x-rays taken pre and post Rx in grp 1.
Asthma	Davis and Byrley (2012)	Case study on the outcomes of a child suffering with asthma, chronic colds and resp. issues	Chiropractor in private practice	2 y/o male	Low-force adjustments with activator instrument (C1, C5, T2, right sacrum and other subluxated levels)	Subjective resolution of symptoms after receiving 4 adjustments over 3 wks (acc. to the parent)
	Cuthbert and Rosner (2010)	Case report of a child with developmental delay Sx's, asthma, chronic h/a	Chiropractor	10 y/o male	Spinal (C/S and T/S) and cranial Rx ("gentle cranial corrections, mm strengthening over 3 wks (5 visits)	No H/a after 3 wks. Asthma meds discont. after Rx and there was improved reading (after 5 Rxms) and school performance (by school reports) however no

						objective measurements. Symptom free for 2 yrs acc. to authors.
	Kaminskyj et al. (2010)	Systematic review of the literature of chiro care for pts with asthma	Multi modal search between 1980 to March 2009 (MEDLINE, CINAHL, AMED, Alt healthwatch, Index to chiropractic literature, MANTIS, Cochrane database of systematic reviews) 8 articles met the inclusion criteria	Several pts of various ages (children and adults)	SMT, mobilization, STT, resp. exercises	8 studies revealed that chiropractic showed improvements in subjective measures (pt ratings, bronchodilator use) and at times positive objective (spirometry readings, lung function test) results (none were statistically signif.) Chiro care is best used as an adjunct to medical therapy rather than a replacement.
	Balon et al. (1998)	RCT of a comparison of active and simulated chiro manipulation as an adjunct Rx for asthma	Chiropractor practicing in the relevant area	80 children with mild-moderate asthma (7-16 years old) with >1-year asthma	SMT, STT, diversified and simulated techniques. Between 20- 36 Rxs during the 4 months	Outcome measure was the change in initial peak expiratory flow at 2 and 4 months before the use of a bronchodilator. Improvement of asthmatic symptoms

						and QOL, but no signif. changes in spirometric measures (P = 0.59) and (P = 0.84) at 2 months. At 4 months (P = 0.55) and (P = 0.35).
	Rampersad (2008)	RCT of the short-term effectiveness of 2 manual interventions in the Rx of chronic moderate asthma	Murchinson District Hospital Asthma Clinic in SA	45 asthmatics (18- 45 y/o) were divided into 3 grps	Grp A – short-acting β2-agonist bronchodilator Grp B – SMT and ribcage mobs Grp C – combo of Rx above	Baseline measurements incl. chest wall expansion and lung function parameters (FEV1, FVC, FEV1/FVC%). Measured 15 mins. post Rx. Statistically signif. increase in FEV1 in grp A (P = 0.008). Increase in axillary chest wall expansion (P = 0.014) + half-way measurement (P = 0.014) and overall chest wall expansion (P = 0.001) in grp B. Signific. increase (P = 0.018) for half-way measurement in chest wall expansion in grp C.
Bladder/ Bowel	Alcantara et	Integrative	Search on	Children 0- 18 y/o with	Diversified	Inconclusive as no. of

Dx/ Constipation	al. (2014)	review of the literature on chiro care of infants with constipation	databases Pubmed, MANTIS, Index to Chiropractic Literature until 2013.There were 16 studies included.	chronic constipation	technique, Gonstead, Logan basic, Thompson, Laney, chiropractic biophysics, cranio-sacral therapy	bowel movements dependent on subjective measures (pt records). More research needed
	Parnell and Nekoomand (2011)	Case report of a pediatric pt who sought care for chronic constipation		5 y/o female with chronic constipation since birth	Full spinal diversified treatments (L1 and C1) over 6 wks	A signif. bowel movement a few hrs after the 1st Rx. Abdominal gas, pain and bloating was eliminated. 4-5 bowel movements per wk after Rx vs 1 bowel movement per wk prior to Rx.
	Angus, Asgharifar and Gleberzon (2015)	Narrative review of the literature of studies describing the mxm of GI dx	Index to Chiropractic Literature, CINAHL, MEDLINE (between 1980 and November 2012)	Patients of all ages with GI dx from 21 citations	SMT, mobilizations, STT, modalities, stretches, I.C, traction, nutritional and visceral manipulation, occiput- sacral decompr., toggle recoil, Logan basic	Mild-moderate improvement in GI symptoms (constipation, dyspepsia etc) in a few of the studies when used as an adjunct to other forms of conventional Rx. However no definite

					technique, activator technique, craniosacral therapy, Gonstead technique, massage of the abdomen	conclusions could be made.
	Rice et al. (2013)	Case reports of 2 pts presenting with small bowel obstr. Symptoms d.t abdo. adhesions post-op.	US (setting not specified)	2 pts (1) male 69 y/o (2) female 49 y/o	20 hrs soft tissue manipulation (whole body) and manual phys. therapy of abdo. viscera (4 hrs a day for 5 days) As above	Improved ROM spine + hips (degrees), improved abdo. mobility by decreased adhesions in bowel and abdo. wall, asyptom. for 1yr post Rx. Pain decreased by 90%, improve ROM, posture, visceral mobility, myofascial mobility. After 1 yr = no additional symptoms
	Ernst (2011)	Systematic review of clinical trials for GI problems	Databases until March 2010 (Embase, Medline, Cinahl, AMED, the Cochrane Library, The Index of Chiropractic	(Hains et al.) 62 pts who experienced GI dx for 3 months (diagnosed by a physician or DC)	(Hains et al.) Grp 1 rec. 20 sessions of SMT + I.C. Grp 2 rec. SMT only Grp 3 rec. I.C. only	(Hains et al.) Grp 1 = improved by 66% Grp 2 = improved by 40% Grp 3 = improved by 65 %

			Literature were searched. 2 articles met the inclusion criteria.	(Pikalov and Kharin) 11 pts with duodenal ulcers	(7 wks, 3 visits per wk). (Pikalov and Kharin) 3-14 sessions of SMT + conventional Rxs	(measured via pt. questionnaire and NRS even after 6 months (Pikalov and Kharin) 24 control pts vs 11 SMT grp. SMT grp was reported to experience clinical remission earlier than control grp.
	Jaeger, Moore and Burkhardt (2014)	Case report on the effectiveness of chiro care on a pt with urinary incontinence and vertebral subluxations	Chiropractor in private practice	63 y/o female with recent hx of urinary incontinence and pain. X-rays showed kyphotic/hypolordotic C/S, laterally translated C/S and L/S, ant. head carriage.	22 visits over 54 days. Rx = adjustments, postural correction ex's, cryotherapy, stretching, spinal traction	Complete resolution of urinary incontinence and pain, and correction of spinal alignment compared on x-rays. Subjective (pt record) and objective measurements (correction of spinal alignment closer to

						normal value). Possible benefits
Cerebral palsy	Kachmar et al. 2016	Case series of changes in mm spasticity in pts with cerebral palsy after SMT	Rehab. clinic	29 pts (7- 18 y/o) with cerebral palsy	1 SMT and a 2 wk course of Rx, physical therapy, massage, reflexotherapy, extremity mobs, mechanotherapy and rehab for 3-4 hrs.	Substantial decrease in wrist mm spasticity in all pts after SMT (measured by Neuroflexor device)
	Goodsell and Schneider (2010)	Case report of a pt with cerebral palsy who presented for chiro care	Chiropractor in private practice	16 y/o female with hx of cerebral palsy and vertebral subluxation. Assoc. symptoms incl. mm spasticity and poor sleeping habits	2 adjustments a wk for 6 months	EMG findings revealed improvement in mm tone and decrease in fixation at C1. Subjective better sleeping habits (acc. to pts parents).
Clinical depression	Rowell et al. (2006)	Case report of a pt with depressive symptoms	Chiropractor (setting not specified)	71 y/o female	Flexion-distraction technique, heat, IFC of the L/S applied 11 times over 11 wks	The pt's depression improved whilst under txm for her LBP. Initial BDI reading = 8. Post chiro care, BDI = 4 to 0. However, a variety of factors could contribute to that acc. to the author (natural progression, pt-

						dr interaction etc.)
	Berg (2016)	Case study on the effects of chiro care on the Rx of a pt with depression, fatigue and malaise	Chiropractor (setting not specified)	30 y/o male (fatigue, malaise, depression) also experiences general h/a's and acid reflux (not diagnosed medically)	8 months of Gonstead technique (46 procedures, 22 visits) at C1, C7, T4- T11, L1- L4)	Symptoms of fatigue, depression and malaise were reduced objectively measured by nervoscope (microvoltmeter that indicates temperature differences of paraspinal tissues) and chiro analysis as well as a SF-36 general health survey
Cushing's Dx/ Sx	-	-	-	-	-	-
Diabetes Mellitus	Roberto and Sousley (2011)	Case study of the effects of chiro care and dietary modification on a pt with DM type II	Chiropractor in private practice	61 y/o male (20 yr hx of DM type II)	12 wks (3 visits per wk). Diversified full spine SMT, dietary modification, postural correction (C1- C6, T10- L2)	After 1 month of Rx, pt ceased the use of DM meds, after 2 months, his GP confirmed that his blood glucose levels normalised. Plasma glucose levels returned to normal range.
Dizziness and Vertigo	Strunk and Hawk (2009)	Feasibility study on the effects of chiro care on	Chiropractic college health centre and senior	20 pts (> 40 y/o)	Manipulation (diversified, instrument, flexion	Improved balance, reduced dizziness and neck pain (acc. to the

		dizziness, balance and neck pain	fitness centre		distraction, drop table, STT, postisometric relaxation, heat, cold therapy). 2 visits per wk for 8 wks.	Dizziness Handicap Inventory) however a larger sample size is needed for further investigations.
	Kelly and Holt (2010)	Case report on changes in vertigo, migraine and neck pain symptoms in a pt receiving chiro care		12 y/o male with hx of recurrent dizziness and migraines	HVLA adjustments over a 12-month period (frequency = 3 visits a wk for 4 wks, then 1 visit a month) at levels C1-C2 and C6-C7, mid-T/S and sacrum. C/S stretches twice daily	After 1 wk of chiro care, pt reported cessation of H/As and neck pain, vertigo attacks reduced in frequency. This was measured by the no. of days that the pt was absent from school (pre chiro Rx = 223, post Rx = 56 days
	Kendall et al. (2018)	RCT on the chiro Rx for non-specific dizziness and neck pain	Chiropractor (setting not specified)	Pts aged 65-85 y/o with self- reported dizziness	Group 1 – Activator manipulation of C/S and T/S, massage, mobs, ROM (n = 13) ex, home advice, heat Group 2 – Sham grp (n = 11) Rx wkly for 4 wks.	Measurements = DHI, neck disability index and self- reports. Trend favoured group 1 as improvements in all 3 measurements above. However, a larger grp needed.

	Chaibi and Tuchin. (2010)	Case study on SMT of cervicogenic dizziness using Gonstead method	Chiropractic clinic	29 y/o male with 10-yr hx of cervicogenic dizziness	Gonstead method at C1, C2, C7, T6-T11. 17 Rxs over 2 months.	Reduction in pain and dizziness and improved QOL. Baseline measurement of DHI = 85/100. Post Rx = 0.5/100
Dyspepsia/ Reflux	Guliani et al. (2012)	Case report of an infant with developmental delay, colic and GERD	Chiropractor in private practice	15-month-old female	Infant toggle headpiece, Logan Basic protocol. SMT (C1, sacrum). Rehab exes. Seen once a wk (19 visits).	Signif. improvement after 18 visits as pt could walk unassisted and speak 3- 4 words. GERD and colic resolved after 3 chiro adjustments (once a month for 3 consec. months).
	Angus, Asgharifar and Gleberzon (2015)	Narrative review of the literature of studies describing the mxm of GI dx	Index to Chiropractic Literature, CINAHL, MEDLINE (between 1980 and November 2012)	Patients of all ages with GI dx from 21 citations	SMT, mobs, STT, modalities, stretches, I.C, traction, nutritional and visceral manipulation, occiput- sacral decompr., toggle recoil, Logan basic technique, activator technique, craniosacral	Mild-moderate improvement in GI symptoms (constipation, dyspepsia etc) in a few of the studies when used as an adjunct to other forms of conventional Rx. However no definite conclusions could be made.

					therapy, Gonstead technique, massage of the abdo	
	Sweidan (2015)	Pilot study to det. the effects of SMT on functional dyspepsia in adults	DUT Chiropractic Day Clinic	30 pts with diagnosed dyspepsia (18- 55 y/o) divided into 2 grps	Grp A - diversified chiro adjustments in C/S, T/S, L/S Grp B – inactive laser in C/S, T/S and L/S. 1 Rx per wk for 3 wks.	Signific. decrease in NPRS in grp A (P = 0.002). However, data concluded to be insignif. as both grps had reduced pain and discomfort over time
Dysmenorrhea	Reis, Hardy and de Sousa (2010)	Pilot observational cohort study to assess the effectiveness of CT massage in the Rx of primary dysmenorrhea	University Clinic	72 young females with primary dysmenorrhea	Lumbar CT massage (twice wkly), sacral + lumbar + last T/S vertebra + subcostal manipulations	Measurements = pain score, use of pain meds. After the 1st month, pain score reduced (P < 0.001). However, no correlation between pain score and no. of massages.
	Hondras, Long and Brennan 1999	RCT on SMT vs low force mimic maneuver for females with primary dysmenorrhea	National College Chiropractic Centre (chiro outpatient clinic)	68 females in each grp (18-45 y/o)	HVLA, short-lever, high-force SMT vs low-force manoeuvre	plasma concentration of prostaglandin F2a metabolite, KDPFG2a was measured 15 min before Rx and 1 hr post Rx on day 1 of 4 consecutive menstrual

						cycles. No Rx effects were detected over 3 cycles for VAS, KDPFG2a or pt. questionnaire (P = 0.65, P = 0.61, P = 0.78).
	Spears (2005)	Narrative review of chiropractic and alternative health practices in the Rx of primary dysmenorrhea	MEDLINE database was used to search for lit. reviews, RCTs, lab research, case studies from 1985 – 2004.	Females with dysmenorrhea (not specified)	Spinal (HVLA) adjustment (T10, L5-S1, SIJ), modalities (non-invasive)	Reduction in plasma levels of KDGPF2a + pain perception. Another study = EMG readings decreased post txm
	Moosa (2002)	RCT on the chiro Rx of primary dysmenorrhea	University clinic in SA	45 females (18 -30 y/o)	3 groups of 15 pts. All 45 pts received 13 Rx over 8 wks. Grp 1 = L/S and sacral adjustments Grp 2 = full spine adjustments Grp 3 = detuned U/S (placebo)	All grps showed improvements (subjective via McGill pain questionnaire) in pain and distress. However, was not statistically signif. (P = 0.32) for all 3 grps for the questionnaire. SMT can be used as an adjunct Rx.
	Bromfield (1996)	Clinical trial to det. the efficacy of chiro Rx in	Setting not specified	30 patients (divided into 2 grps, control and experimental)	The control group (15 patients) received	Statistically signif. improvement in experimental grp (McGill

		primary dysmenorrhea			chiropractic treatment in the form of soft tissue massage. The experimental group (15 patients) received massage and SMT of lower T/S, L/S (mainly L5) and SIJ. 16 visits twice wkly (4 wks), then once a wk (8 wks).	pain questionnaire) (P ≤ 0.001) as well as for control grp (P ≤ 0.01). On the NPRS, experimental grp showed decrease in pain (P ≤ 0.05). No change in control grp (P = 0.068).
Fatigue	Porter et al. (2010)	Systematic review on the alternative interventions used in the Rx of Chronic Fatigue Sx and Fibromyalgia	Several databases (PubMed, MEDLINE, PsychInfo) were searched. 70 controlled clinical trials were included	Pts (not specified) diagnosed with Chronic Fatigue Sx or Fibromyalgia	Manipulation, massage, acupuncture, biofeedback	2 RCTs showed positive effects with pts with Fibromyalgia however the sample size was limited (*n* = 13)
	Berg (2016)	Case study on the effects of chiro care on the Rx of a pt with depression, fatigue and	Chiropractor (setting not specified)	30 y/o male (fatigue, malaise, depression) also experiences general h/a's and acid reflux (not diagnosed medically)	8 months of Gonstead technique (46 procedures, 22 visits) at C1, C7, T4- T11, L1- L4)	Symptoms of fatigue, depression and malaise were reduced objectively measured by nervoscope (microvoltmeter that

		malaise				indicates temp. differences of paraspinal tissues) and chiro analysis as well as a SF-36 general health survey
	Arick (2016)	Case report on chiro Rx of chronic fatigue	Chiropractic clinic	34 y/o female with complaints of fatigue and inability to lose weight for 2 yrs	Dietary changes (anti-inflammatory diet), lifestyle modification and supplementation of 12 wks	Increased energy and weight loss (15 pounds) as lab findings improved (thyroglobulin antibodies returned within normal range; salivary cortisol increased)
Gynaecological Dx	Gauthier and Mullin (2010)	Case report of the effects of Gonstead chiro care on a pt with primary amenorrhea	Chiropractic clinic	25 y/o female pt with amenorrhea	Gonstead chiropractic protocol utilized at levels C0/C1, S2	Following 3 adjustments, the pt reported her 1st menstrual period. Progesterone cream was supplemented. Chiro care may be beneficial
Headaches	Cuthbert and Rosner (2010)	Case report of a child with developmental delay Sx's, asthma, chronic h/a	Chiropractor	10 y/o male	Spinal (C/S and T/S) and cranial Rx (gentle cranial corrections, mm strengthening over 3 wks (5 visits)	No h/a after 3 wks. Asthma meds discont. after Rx and there was improved reading (after 5 Rxms) and school performance (by school

						reports) however no objective measurements. Symptom free for 2 yrs acc. to authors.
	Kelly and Holt (2010)	Case report on changes in vertigo, migraine and neck pain symptoms in a pt receiving chiro care		12 y/o male with hx of recurrent dizziness and migraines	HVLA adjustments over a 12-month period (frequency = 3 visits a wk for 4 wks, then 1 visit a month) at levels C1-C2 and C6-C7, mid-T/S and sacrum. C/S stretches twice daily	After 1 wk of chiro care, pt reported cessation of H/As and neck pain, vertigo attacks reduced in frequency. This was measured by the no. of days that the pt was absent from school (pre chiro Rx =223, post Rx = 56 days
	Berner and DeMaria (2013)	Case study on the improvement of migraines in a child following C/S curve correction	Chiropractor (setting not specified)	12 y/o female (severe migraines for 6 yrs) Frequency = 3 times a wk. Videofluoroscopic exam showed -45cm kyphosis in C/S. On flexion, C1 and C6 lock noted, on extension, T1 and T2 were locked	6 visits over 1 month of toggle adjusting and pressure and instrument assisted adjustments	Significant improvement in C/S curve (-45 cm kyphosis to +28cm) measured by a videofluoroscopic exam. 90% improvement in symptoms
	Cullinan (1998)	RCT on the efficacy of	DUT Chiropractic Clinic	30 pts (20-59 y/o) diagnosed as having	Grp 1 - chiro adjustments with	Subjectively grp 2 responded better

		acupuncture combined with chiro therapy in the Rx of migraines		migraines	acupuncture Grp 2 - chiro adjustments only. 10 txms over 4 wks.	however, this wasn't true for the inter-grp analysis (P > 0.05). Grp 2 improved in terms of frequency, duration, intensity (P < 0.05).
	Laferriere (2016)	Case report of chiro Rx outcome of migraine w/o aura in a child presenting with bruxism and chronic sinus congestion	Chiropractor (setting not specified)	6 y/o female suffering with migraine w/o aura, bruxism and chronic sinus congestion	Manipulation, massage and sinus lymphatic drainage	Migraine – After 4 visits, intensity reduced from 5/10 to 2/10 and frequency reduced from 3 times per wk to once a wk w/o meds. Sinus symptoms also improved.
	Tuchin, Pollard and Bonello (2000)	RCT on chiro SMT for migraine	Chiropractic research centre of Macquarie University	127 patients (10- 70 y/o) with migraine diagnosed on the basis of the IHS std. with at least 1 migraine a month Control grp = 40 pts Experimental grp = 83 pts	2 months of diversified SMT (max of 16 Rxs).	Majority of patients reported significant improvements after SMT (via h/a diaries, VAS, use of meds). Experimental grp showed statistically signif. improvements in migraine freq. (P < 0.005), duration (P < 0.001), disability (P < 0.05) and med usage (P

						< 0.001) when compared to control grp. 22% of pts reported >90% reduction of migraines.
	Chaibi et al. (2016)	RCT on SMT for the Rx of migraine	Akershus University Hospital	104 migraine sufferers (at least 1 attack a month)	Experimental grp – SMT Placebo grp – sham push manoeuvre Control – continued with meds 3 months of Rx (12 visits), with F/U's at 3, 6 and 12 months.	Migraine days signif. reduced from baseline to post Rx measurements (P > 0.001). Migraine duration and h/a index were reduced more in experimental grp (P = 0.02, P = 0.04).
Hearing loss/ Otitis media	Dwyer and Boysen (2011)	Case report of a pt with otitis media and conductive hearing loss	Chiropractor (setting not specified)	6 y/o male diagnosed by pure-tone audiometry	C/S, T/S and pelvic SMT + cranial manipulation	After 6 adjustments, the child was asymptomatic (free of otitis media symptoms on long-term F/U. 19 months post Rx, audiogram revealed normal hearing.
	Pohlman and Holton-Brown (2012)	A literature review of otitis media and SMT	Databases (PubMed, Cochrane Library, Cumulative Index	Children with otitis media < 6 y/o	SMT, activator, toggle, sacro occipital technique,	No evidence to support or refute the use of SMT in the Rx of otitis media.

			to Nursing and Allied Health, Index to Chiropractic Literature, The Allied and Complementary Medicine and Alt Health Watch) were searched. 49 articles were included.			
Heart Dx	Leboeuf-Yde et al. (1999)	Retrospective information from chiropractors through standardised interview of patients post treatment	Private practice of 87 Swedish chiropractors	20 patients per chiropractor (1504 questionnaires)	SMT with or w/o additional therapy (number of spinal areas treated were positively associated with the number of reactions)	25% of patients reported improvement of NMSK symptoms. -26% airway passages -25% digestive system -14% vision -14% heart/circulation
	Pastellides (2009)	RCT on the effect of cervical and thoracic manipulations on BP regulation	DUT Chiropractic Clinic	40 asymptomatic normotensive male patients (20- 35 y/o)	C/S (CO/C1) and/or T/S (T1- T5) HVLA SMT (measured up to 30 min post SMT). 4 days of Rx Day 1 = sham laser Day 2 = C0/C1	BP decreases following C/S or T/S SMT however a combo does not have a signific. effect Decreased systolic BP but not diastolic BP.

					SMT Day 3 = T1- T5 SMT Day 4 = Combo of C0/C1 and T/S SMT	Day 2 systolic = (P = 0.005) Day 3 systolic = (P ≤ 0.004) Day 4 systolic = (P = 0.001)
Hernia	-	-	-	-	-	-
Thyroid Dx	-	-	-	-	-	-
Hypertension	McMasters et al. (2013)	Preliminary study to determine if chiro care would change BP measurements	Chiropractic teaching clinic	24 > 40 y/o African American pts diagnosed with pre-HT (120-130/80-89) / HT (140-159/90-99) mmHg	Manipulation for 23 visits	BP baseline readings vs readings taken at visits 21- 23. BP readings not sig. (P > .07). When BMI outliers were excluded, there was a statistically sig. decrease in diastolic value (P = .004).
	Bakris et al. (2007)	Pilot study of atlas vertebra alignment and achievement of arterial pressure goal in HT pts	Chiropractor (setting not specified)	HT pts between 21- 75 y/o with evidence of atlas misalignment (*n* = 25)	Pts did not take HT meds for 8 wks study duration. Rx incl. a NUCCA	At wk 8 = drop in systolic pressure (P < 0.0001) and diastolic pressure (P = 0.002).
	Whedon (2013)	Case study on upper C/S chiro care of a pt with		25 y/o female medically diagnosed with HT	Knee Chest upper cervical care for 12 wks	Signif. decrease in BP from 134/98 mmHg to 114/80 mmHg however

		HT				the patient was being medically treated for HT. This pt was already being Rxd with hydrochlorothiazide.
	Torns (2012)	Cohort study on atlas vertebra realignment and arterial BP regulation	Chiropractor in private practice	42 pts washed out of BP meds prior to the study	Atlas adjustments	Statistically signif. decrease in arterial BP but increase in BP in hypotensive pts therefore realignment of the atlas doesn't signif. lower arterial BP
	Kessinger and Moe (2015)	Case report presenting a pt with chronic HT undergoing upper C/S chiro care	Chiropractor in private practice	55 y/o male with a 20-25 yr hx of HT	Upper C/S adjustment using knee chest protocol over 7 months (one adjustment)	Initial reading = 180/ 110 mmHg. Post chiro care = 164/ 94 mmHg, last reading = 136/ 82 mmHg (pt was not on HT meds). C/S adjustments may be beneficial.
Infantile colic	Mercer (1999)	Clinical trial to det. The efficacy of SMT in the Rx of colic	Academic teaching clinic (CDC)	30 Infants (diagnosed by a paediatrician) 0-8 wks old. Separated into 2 grps (control and experimental)	Group 1: de-tuned U/S machine Group 2: SMT 6 visits over 2 wks, F/U visit 1 month after cessation of Rx.	Signif. improvement in colicky symptoms after 1 wks of SMT (P = 0.011). Complete resolution of symptoms in 93% of infants in experimental grp.

	Wiberg et al. (1999)	RCT to det. If there is a short-term effect of SMT in the Rx of colic		41 infants (2- 10 wks old)	SMT and dimethicone (for 12-15 days)	Acc. to parent diaries, crying decreased. 2.4 hrs in SMT grp and 1 hr in dimethicone grp (Days 4-7) Crying decreased 2.7 hrs in SMT grp and 1 hr in dimethicone grp
	Olafsdottir et al. (2001)	RCT of the efficacy of SMT in the Rx of colic		86 infants (3-9 wks old)	SMT (3 visits for 8 days)	SMT was no more effective than placebo after F/U period of 8- 14 days (acc. to parent diaries) (P = 0.74) Hrs of crying (P = 0.98)
	Browning and Miller 2008	RCT of 2 interventions for colic		48 infants < 8 wks old 3 who cried > 3 hrs a day and for 4 out of 7 days	SMT and OSD (2-3 times a wk for 2 wks)	After 4 wks F/U period, both interventions had benefits in reducing crying. Both grps cried less and slept more after 2 wks of Rx
	Angus, Asgharifar and Gleberzon (2015)	Narrative review of the literature of studies describing the mxm of GI dx	Index to Chiropractic Literature, CINAHL, MEDLINE (between 1980 and November	Patients of all ages with GI dx from 21 citations	SMT, mobs, STT, modalities, stretches, I.C, traction, nutritional and visceral manipulation, occiput- sacral	Mild-moderate improvement in GI symptoms (constipation, dyspepsia etc) in a few of the studies when used as an adjunct to other forms of

			2012)		decompr., toggle recoil, Logan basic technique, activator technique, craniosacral therapy, Gonstead technique, massage of the abdomen	conventional Rx. However no definite conclusions could be made.
	Guliani et al. (2012)	Case report of an infant with developmental delay, colic and GERD	Chiropractor in private practice	15-month-old female	Infant toggle headpiece, Logan Basic protocol. SMT (C1, sacrum). Rehab ex's. Seen once a wk (19 visits).	Signif. improvement after 18 visits as pt could walk unassisted and speak 3- 4 words. GERD and colic resolved after 3 chiro adjustments (once a month for 3 consec. months).
	Rubin and Istok (2013)	Case report on the resolution of infantile colic, plagiocephaly, torticollis, feeding difficulties following subluxation-	Chiropractic clinic	3-month-old male with colic, congenital torticollis, plagiocephaly and feeding difficulties	Diversified paeds adjustments, craniosacral therapy aimed at reducing subluxations in the upper C/S.	Following the first adjustment, the pt was relaxed. Subjective marked improvement after each visit and complete resolution of symptoms after 4 visits (reported by the mother)

		based chiro				
Infertility	Kramp (2012)	Case series of 10 infertile females	Clinic (not specified)	10 pts (28- 41 y/o) who were “unable to conceive after 1 yr of unprotected intercourse”. Pts were not undergoing fertility Rx during this study. 7 pts had previously been pregnant.	Manual therapy to the pelvis. Mm energy, lymphatic drainage, visceral manipulation, craniosacral therapy (1 – 6 visits)	6/10 conceived w/i 3 months and delivered at full term
	Alcantara et al. (2009)	Case series reporting on infertility in females, subluxation and chiro care	Chiropractor (setting not specified)	3 female pts (trying to conceive from 7 months to 4 yrs)	Diversified SMT, dietary modification, nutritional advice/ supplements	All 3 pts were able to conceive post chiro care, however the amount of time it took to conceive varied and pts were also on fertility Rx (IVF).
	Lombardi and Revels (2015)	Case study of a pt with infertility undergoing chiro care to correct vertebral subluxations	Chiropractor (setting not specified)	27 y/o female diagnosed medically with infertility (anovula). Also has headaches, sinus problems and dizziness	Rx 3 times per wk for 8 wks, 2 times per week for 10 wks and once per wk after. Rx HVLA adjustments (Thompson and diversified) at levels C2, C4, T7, L4, L5, pelvis. Paraspinal	After 2 and half months of Rx, the pt conceived (was under medical care for 6 months). More research is warranted.

					thermography and cervical extension compression traction.	
Nocturnal enuresis	Reed et al. 1994	RCT of chiro Rx for nocturnal enuresis in children	Chiropractic Clinic of Palmer Institute of Graduate Studies and Research	46 children (15 in sham grp, 31 in Rx grp)	HV, short lever SMT over 10 wks Sham = sham adjustment	Baseline Rx grp = 9.1 "wet" nights/ 2 wks. Post Rx grp = 7.6 "wet" nights/ 2 wks (P = 0.05)
	Grobler (1996)	Single blind placebo-controlled trial of the efficacy of chiro Rx in the management of nocturnal enuresis	Chiropractic Day Clinic	30 infants (diagnosed by a paediatrician) were divided into 2 grps (control and experimental)	Control grp = placebo Rx Experimental grp = SMT to T11-L2, L5 and SIJ's. 10 visits over 4 wks with a 2 wk F/U period.	Signific. Improvement in experimental grp (during F/U period) when compared to baseline period (P = 0.004, P = 0.013) (Based on no of wet nights, enuretic diary)
	Noriega, Chung and Brown (2012)	Case study on a paed pt with autism and nocturnal enuresis under upper C/S chiro care	Chiropractor (setting not specified)	6 y/o male with a hx of nocturnal enuresis and autism	C0/C1 adjustments. 25 visits in 15 wks	Reduction of vertebral subluxation was related to complete resolution of bed-wetting. Thermographic scans revealed symmetry in the C/S post chiro Rx
	Neally and Alcantara	Case series on the resolution of	Chiropractor in private practice	10 y/o male with hx of enuresis since age 2	10 y/o – diversified technique (C4, T1-	10 y/o – Cessation of bedwetting after 1st visit

	(2015)	chronic nocturnal enuresis in children with Asperger's Sx following subluxation-based chiropractic care		yrs. 9 y/o male with hx of enuresis every night since age 5 yrs.	T4, R SIJ) 9 y/o – diversified technique (C5, T6, sacrum anterior)	9 y/o – After 9 visits, minor improvements. On 10th visit, Logan technique used = cessation of bed wetting Long term F/U of both pts showed no return of bed wetting
Parkinson's Dx	-	-	-	-	-	-

Respiratory tract Infxns	Wearing et al. (2016)	Systematic review of the use of SMT in the Rx of COPD	Databases (MEDLINE, ScienceDirect, PubMed, Web of Science and Scopus) were searched.	Pts (> 18 y/o) with an existing COPD diagnosis	HVLA SMT, exercise and/or pharmacologic intervention	No evidence to support of refute the use of SMT for the Rx of RTI's.
	Leboeuf-Yde et al (1999)	Retrospective information from chiropractors through standardised interview of patients post Rx	Private practice of 87 Swedish chiropractors	20 patients per chiropractor (1504 questionnaires)	SMT with or w/o additional therapy (number of spinal areas treated were positively associated with the no. of reactions)	25% of patients reported improvement of NMSK symptoms. -26% airway passages -25% digestive system -14% vision -14% heart/circulation

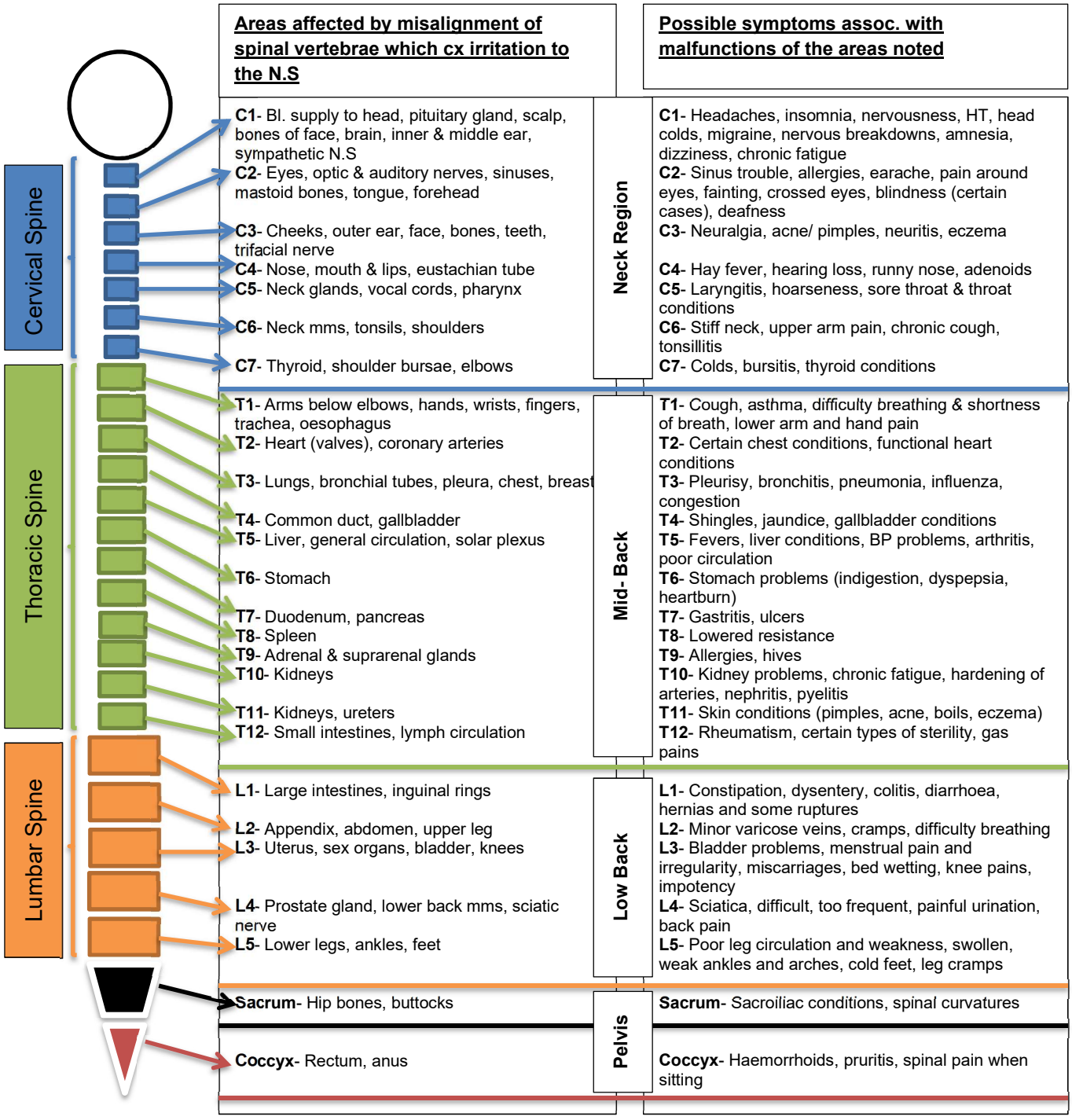
Sinus-related conditions	Ryan and Rollette (2013)	Case report of the management of a child with chronic sinusitis, constipation and pharyngitis	Chiropractic clinic in US	9 y/o female	12 visits over 3 months. Techniques included diversified, activator, applied kinesiology	Subjective improvement (pt reports) of symptoms (less nasal congestion, better bowel movements and sleep) after 3 months
	Didriksen and Hagen (2010)	Retrospective study of results of chiro Rx on pts referred from an ENT dept.	Chiropractic clinic	46 pts (37 females, 9 males) were Rxd between July 2006 and July 2008 were referred from ENT dept. for variety of symptoms	TMJ manipulation, stretching, traction and adjustments of C/S. Ice and home ex's were prescribed.	All but 6 pts benefited from chiro care (measured subjectively by biopsychosocial disability and sick leave from work). Alleviation of ENT symptoms (PRS score = 8/10, pst Rx PRS score = 3.7/10. Resulting in reduced sick days post Rx
	Laferriere (2016)	Case report of chiro Rx outcome of migraine w/o aura in a child presenting with bruxism and chronic sinus congestion	Chiropractor (setting not specified)	6 y/o female suffering with migraine w/o aura, bruxism and chronic sinus congestion	Manipulation, massage and sinus lymphatic drainage	Migraine – After 4 visits, intensity reduced from 5/10 to 2/10 and frequency reduced from 3 times per wk to once a wk w/o meds. Sinus symptoms also improved.

Skin Dx	Eldred and Tuchin (1999)	Case study of chiro care for a pt with atopic eczema	Chiropractor (setting not specified)	21 y/o female with eczema for the last 2 yrs	7 Rx's of manipulation of T5, SIJ, rib rolls of ribs 4, 5 and 6, STT to rhomboids and paraspinals	Improvement (photographic evidence and subjective pt records) in pts symptoms (eczema) especially pruritis however no conclusive findings
Sleep disorders	Kingston et al. (2010)	Systematic review of the literature on chiro and insomnia	Search of PubMed, PEDro, MANTIS, CINAHL, Cochrane review group until October 2006. 15 studies were included.	Patients of all ages (not specified by author)	SMT, mm relaxation technique, cranial manipulation	Some studies showed improvement following SMT (via pt outcome measure) but anecdotal evidence exists
Tinnitus	Alcantara et al. (2002)	Case study on the chiro care of a pt with TMJ disorder and atlas subluxation	Setting not specified	41 y/o female with ear pain (bilateral), vertigo, tinnitus, decreased hearing and h/a's	HVLA SMT (Gonstead) to atlas and TMJ over 9 visits	Symptoms of tinnitus, vertigo, decreased hearing and h/a's resolved after 9 visits
	Didriksen and Hagen (2010)	Retrospective study of results of chiro Rx on pts referred from an ENT dept.	Chiropractic clinic	46 pts (37 females, 9 males) were Rxd between July 2006 and July 2008 were referred from ENT dept. for variety of symptoms	TMJ manipulation, stretching, traction and adjustments of C/S. Ice and home exercises were prescribed.	All but 6 pts benefited from chiro care (measured subjectively by biopsychosocial disability and sick leave from work). Alleviation of ENT symptoms (PRS score = 8/10, pst Rx PRS score = 3.7/10. Resulting in

						reduced sick days post txm
Tonsillitis	-	-	-	-	-	-
Ulcerative colitis/ Crohn's Dx	Takeda, Arai and Touichi (2002)	RCT on long term remission and alleviation of symptoms in Crohn's dx and allergy after SMT	Chiropractor (setting not specified)	57 pts divided into 2 grps. Grp 1 - Rx grp (17 pts) Grp 2 - Control grp (34 pts)	Grp 1- thoracic and lumbar SMT Grp 2- did not receive SMT	From 17 pts who received SMT, 12 pts showed long-term remission of symptoms allergy and Crohn's dx), 9 had an alleviation effect. The Intervertebra foramen narrowing improved seen via x-rays taken pre and post Rx in grp 1.
Ulcers	Pikalov and Kharin (1994)	RCT to det. the effectiveness of SMT in the Rx of internal organ disorder (duodenal ulcer)	Medical hospital	11 patients (age 18-44 y/o) endoscopically diagnosed ulcer dx	Control group – traditional medical Rx Experimental group – SMT for 5-22 days (3- 14 sessions)	Experimental group – pain relief after 1- 9 days and remission of approx. 10 days earlier than control group. Measured by using clinical parameters and wkly endoscopes
Vision disorders	Leboeuf-Yde et al. (1999)	Retrospective information from chiropractors through standardised interview of patients post	Private practice of 87 Swedish chiropractors	20 patients per chiropractor (1504 questionnaires)	SMT with or w/o additional therapy (number of spinal areas treated were positively associated with the no. of reactions)	25% of patients reported improvement of NMSK symptoms. -26% airway passages -25% digestive system -14% vision -14% heart/circulation

		treatment				
	Kessinger and Boneva (1998)	RCT on the changes in visual acuity in pts receiving upper C/S chiro Rx	Chiropractor (setting not specified)	67 pts (9- 79 y/o) (37 females) (30 males)	SMT of C1 and C2	Visual acuity evaluated pre-Rx and 6 wks post Rx. Signific. Improvement in distance visual acuity in the right eye ($P < 0.05$).

SMT = Spinal manipulative therapy; IC = Infantile colic; SOT = Sacro-Occipital Technique; CAM = Complementary and Alternative Medicine; NMSK = Nonmusculoskeletal; STT = Soft tissue therapy; C/S = Cervical spine; T/S = Thoracic spine; TL = Thoracolumbar; GERD = Gastroesophageal reflux disease; QOL = Quality of life; GI = Gastrointestinal; IBD = Inflammatory bowel disease; CT = Connective tissue; U.S = United States; S.A = South Africa; U/S = Ultrasound; HVLA = High velocity, low amplitude; Rx = treatment; approx. = approximately; y/o = years old; IVF = Intervertebral foramen; Grp = group; pts = patients; TMJ = temporomandibular joint; resp distress = respiratory distress; wks = weeks; ROM = range of motion; h/a = headache; FM = fibromyalgia; HT = hypertension; BP = blood pressure; w/o = without, TRC = Torque Release Chiropractic; Rx = Treatment; Pop. = population; mmHg = millimetres of mercury; BMI = Body mass index; Sx = Syndrome; discont. = discontinued; acc. = according; obstr. = obstruction; BDI = Beck Depression Inventory; rec. = received; NRS = Numerical rating scales; mxm = management; decompr. = decompression; NUCCA = National Upper Cervical Chiropractic procedure; consec. = consecutive; COPD = Chronic Obstructive Pulmonary Disorder; VAS = Visual Analog Scale; FEV1 = Forced expiratory volume; β2 = Beta 2; FVC = Forced vital capacity; IHS = International Headache Society; OSD = occiptosacral decompression



Adapted from Gray (1976)

Figure 2.2: Vertebral Subluxation and Nerve Chart (Meric Chart)

C = cervical spine; T = thoracic spine; L = lumbar spine; N.S = nervous system; Assoc. = associated; Mms = muscles; HT = hypertension; Bl. = blood

2.11 CRITICAL APPRAISAL OF THE EVIDENCE

After appraising the available literature, there appears to be paucity of strong evidence for the management of NMSDs by chiropractors. The literature that does exist is anecdotal as the majority of "evidence" is based on case reports while robust studies and clinical trials remain scarce. These reports describe a clinical case and provide information for patient care. However, case reports are considered the lowest validity and are vulnerable to selection bias compared with other types of studies (Bruno 2016). Case reports are usually done when randomized clinical trials (RCT) are not feasible or ethical and they can be completed quickly (Skyes et al. 2017). Major weaknesses of non-experimental designs are the issue of confounding due to uneven distribution as they are not randomized into treatment groups, the lack of standardization of treatment protocols and lack of control groups.

The limited literature on the management of the NMSDs included in this study (e.g. headaches, infantile colic, and asthma) involved RCTs. This type of evidence-based study is accepted as the "gold standard" for evaluating the effects of therapeutic interventions under controlled conditions. Other advantages of RCTs include randomization, control, blinding, rigorous analysis methods and experimental design. However, this type of study can also have limitations such as setting and monitoring bias, ethical issues, selection bias of patients and short duration (of most trials which might be insufficient for treatment effects to be observed) (Saturni et al. 2014).

2.11.1 ADHD/Learning disabilities

Although there is no conclusive evidence that chiropractors can effectively treat ADHD, there is anecdotal evidence **(Table 2.3)**. There are reports that showed that toddlers and adolescents diagnosed with ADHD had myofascial trigger points and spinal restrictions at the levels of the upper cervical vertebrae, mainly C1 to C4. Many of the patients also had hypertonic paraspinal muscles in the cervical and thoraco-lumbar (junction) regions of the spine. When corrected by spinal manipulation, soft tissue therapy, and stretching, many patients showed an improvement in their ADHD symptoms which included poor home and school performance, behavioural patterns (acting out) and capability to adhere to instructions (Muir 2012). A study conducted by Bastecki, Harrison and Haas in 2004 hypothesized that a link may exist between cervical kyphosis and ADHD. It was suggested that changes in the cervical curvature may cause alterations in the nervous system function which may lead to the presentation of ADHD symptoms in a patient. The abnormal stresses are removed from the spinal cord by restoring normal biomechanical curvature and structure. This ultimately improves nervous system functioning (Bastecki, Harrison and Haas 2004). This bizarre

explanation currently has no scientific evidence to support it. A systematic review in 2010 reported that there is insufficient evidence to refute or support the successful chiropractic management for ADHD. Physiologically based studies are required to confirm this link (Karpouzis et al. 2010; Parkinson et al. 2011).

2.11.2 Allergies

Allergies are an immune response to a substance. There is a growing body of evidence which strongly believe in the neuroimmune connection and that chiropractic may affect this function (Cohn 2008). This could mean that subluxation affecting the nervous system may also affect the immune system and if chiropractic adjustments have a positive effect on the nervous system then it may also have an effect on the immune system (e.g. allergies). However currently, there is insufficient evidence in the chiropractic management of allergies and other immune system disorders (Takeda, Arai and Touichi 2002).

2.11.3 Asthma

There is a lack of agreement on whether chiropractors can successively manage asthmatic patients. Several studies **(Table 2.3)** found that most asthmatic studies reported improvement in symptoms and reduced medication usage following spinal manipulation but further research in this field is required (Borins 2006). In many cases, chiropractic treatment had resulted in subjective improvements and concluded that patients presenting with asthma may find chiropractic treatment to be beneficial but whether these changes are sustainable in the long term is questionable. The authors did, however, caution that chiropractic care should not be a replacement but rather utilized as an adjunct to conventional medical treatment when managing asthma. In 1982, Wiles and Diakow conducted a survey detailing the practitioner's treatment regime for the management of asthma amongst members of the Manitoba Chiropractic Association. From a total of 17 completed surveys, it was found that the chiropractic management of patients with asthma fell into six categories: 1) adjustments (88% of practitioners used this technique to manage asthma); 2) nutrition (e.g. the supplementation of vitamins B, C and E) (59%); 3) exercise (e.g. thoracic mobility exercises and breathing exercises) (29%); 4) soft tissue manipulation (24%); 5) electrotherapy (18%) and 6) psychotherapy (12%). The following were the spinal regions adjusted in these patients most frequently: upper cervical (C) spine (47%), lower C spine (33%), upper thoracic (T) spine (80%), lower T spine (40%), lumbar spine (7%) and sacroiliac area (13%) (Wiles and Diakow 1982). There are several types and triggers of asthma (i.e. childhood asthma, occupational triggers and irritants, exposure, genetic predisposition, exercise-induced and adult onset) (Kim and Mazza 2011). There is no evidence of physiological changes in the lungs or airways following chiropractic manipulation. Some patients and

chiropractors themselves, are of the opinion that chiropractors can treat asthma while others believe that asthmatic symptoms are reduced following chiropractic care (Kaminskyj et al. 2010). There may be a case for the adjunctive use of chiropractic care in the management of asthma but not as a basis for the cure. The evidence remains inconclusive rather than negative for chiropractic management of asthma.

2.11.4 Bladder disorders/bowel dysfunction and constipation

Chiropractic management of bladder/bowel dysfunction and constipation may be helpful in some cases, but more research is required to strengthen the case for chiropractic intervention in these conditions. The majority of existing literature reports that patients had mild-moderate improvements in symptoms (such as improved abdominal pain and bloating, number of bowel movements) post-chiropractic care, but this was assessed through patient records/questionnaires which are subjective (Alcantara et al. 2014). It was concluded that chiropractic can be used as an adjunct to other forms of conventional treatment and not as the treatment of choice as the evidence does not support it (Angus, Asgharifar and Gleberzon 2015). Jaeger, Moore and Burkhardt (2014) states that by reducing spinal misalignments, the spinal canal may be restored to its proper length leading to a reduction of stress on the canal. This should result in the optimal function of nervous system although there is no scientific evidence to support this claim.

2.11.5 Cerebral Palsy

The literature on the chiropractic management of cerebral palsy is lacking. Even though there have been objective improvements (decreased spasticity in the wrist measured by neuroflexor device and EMG readings showing improvement in muscle tone) following chiropractic care, it cannot be concluded that chiropractic care for cerebral palsy is truly beneficial (Goodsell and Scneider 2010; Kachmar et al. 2016). The existing anecdotal studies are of low value (case reports).

2.11.6 Clinical Depression

There is a link in the literature between depression and low back pain. Kongsted et al. (2014) showed that pain can affect the outcome in depression negatively as there was an increased likelihood of poor prognosis in pain patients when depression was present. According to Trivedi (2004), back pain and joint pain are one of the symptoms associated with depression. In a primary care setting, it was found that a higher percentage of patients with depression presented with painful physical symptoms and the more severe the physical symptoms, the worst the depression. Both pain and depression share a neurologic pathway. Both are influenced by serotonin and norepinephrine. Because of this link, pain and

depression should be treated together to attain remission. This suggests that a patient's ability to attain remission may directly be proportional to the reduction of painful symptoms (Trivedi 2004). It was found that chiropractic treatment aimed at treating low back pain such as flexion-distraction techniques, interferential current (IFC) therapy and heat therapy may improve a patient's depressive symptoms (Rowell et al. 2006). These measures, however, are very subjective and are usually based on patient reports. An improvement in a patient's depressive symptoms following chiropractic care may be due to a variety of factors e.g. therapeutic effects of the chiropractor touching the patient, natural progression, improvement due to reduced back pain, and doctor-patient interaction (Rowell et al. 2006).

2.11.7 Cushing's Disease/Syndrome

Due to the limited research on the chiropractic care for Cushing's disease/syndrome, it was concluded that chiropractic management of Cushing's may not have a treatment effect.

2.11.8 Diabetes Mellitus

Diabetes is a multi-system disease with several neuromusculoskeletal effects e.g. carpal tunnel syndrome, muscle cramps, adhesive capsulitis of the shoulder, and tenosynovitis. The main goal of therapy for diabetes is achieving proper glycaemic control (Skugor 2017). The approach to treatment includes a combination of pharmacological and non-pharmacological measures (Labuschagne, Matsaung and Mametja 2017). There are many pharmacological treatment options such as insulin seretagogues, alpha-glucosidase inhibitors, insulin sensitizers, incretin-based therapies, etc. although metformin is the first line treatment option for Type II diabetes (Madhu and Srivastava 2015; Skugor 2017; Labuschagne, Matsaung and Mametja 2017). Non-pharmacological measures include dietary factors such as low sodium intake and exercise therapy to help with weight management. The control of blood sugar, dyslipidaemia and blood pressure as well as monitoring for microvascular and macrovascular complications can ultimately decrease mortality and morbidity associated with diabetes (Labuschagne, Matsaung and Mametja 2017). The neuromusculoskeletal effects are manageable by chiropractors as it is within the scope of practice (Wyatt and Ferrance 2006) but there is no evidence that chiropractic care has a significant treatment effect on the regulation of blood glucose or insulin levels.

2.11.9 Dizziness and vertigo

A trend in the literature is leaning towards the efficacy of the chiropractic management of dizziness and vertigo. Case studies by Strunk and Hawk (2009), Kelly and Holt (2010), Chaibi and Tuchin (2010) and Kendall et al. (2018) have shown that patients suffering from these symptoms have experienced improved balance and a cessation of vertigo attacks

following chiropractic treatment. The literature has also shown that dizziness and vertigo have been treated secondarily to neck pain and headaches. After chiropractic treatment, many have reported cessation in neck pain, headaches and dizziness. However, due to the lack of clinical trials, one cannot conclude that chiropractic treats dizziness; it is possible that the dizziness improves once a headache (e.g. cervicogenic which causes the dizziness) is successfully treated (Kelly and Holt 2010). According to a survey in 2010, chiropractors reported that they consult with 1- 3% of patients with dizziness per month (Ndetan et al. 2016). However, older patients who presented to a chiropractor had a neuromusculoskeletal cause for their dizziness (secondary complaint) which was helped by a chiropractor (Ndetan et al. 2016). It can be concluded based on the literature that dizziness may be a symptom of a musculoskeletal disorder (e.g. cervicogenic headaches) for which chiropractors are known to treat. However, there is no evidence that dizziness due to other conditions e.g. anaemia, inner ear disorders or even hypertension will respond positively to chiropractic care.

2.11.10 Dyspepsia/reflux

There is limited anecdotal evidence supporting the chiropractic management of dyspepsia. A case report by Guliani et al. in 2012 found that GERD symptoms were reduced after three chiropractic adjustments (once a month). On the other hand, a pilot study by Sweidan in 2015 reported showed that GERD symptoms improved after chiropractic adjustments once a week for three weeks. In this study, the treatment group (adjustments) and placebo group (inactive laser) both improved over time (Sweidan 2015). This shows that there is no standardisation of treatment protocols for the chiropractic treatment of dyspepsia nor has the manipulation found to be superior to placebo. It was found that chiropractic manipulation may be beneficial in the management of functional dyspepsia when used as an adjunct treatment (Angus, Asgharifar and Gleberzon 2015). A survey in 2004 by the UK General Chiropractic Council found that 57% of UK chiropractors believed that their management of digestive disorders was effective (Ernst 2011). However, the evidence of chiropractic care in the management of dyspepsia is weak as the research is limited to anecdotal case studies. (Sweiden 2015).

2.11.11 Dysmenorrhea

Chiropractic management of dysmenorrhea was found to be beneficial. Spinal manipulation and soft tissue therapy were reported to be effective in the treatment of dysmenorrhea-related symptoms (Bromfield 1996). In the 1982 survey-based study by Wiles and Diakow, it was shown that the majority of practitioners managed a patient with dysmenorrhea by utilizing the following treatment regime: adjustments (100% of chiropractors agreed on utilizing this technique in the care of dysmenorrhea), exercise (e.g. pelvic exercises, lumbar

stretching and cardiovascular exercise) (41%), nutrition (e.g. supplementation of calcium, iron, vitamins C and E, dietary advice) (35%), soft tissue manipulation (e.g. acupressure of the psoas or pelvic organs) (29%), psychotherapy (12%). The following were the spinal regions adjusted in these patients: upper C spine (35%), lower C spine (18%), Upper T spine (18%), lower T spine (41%), lumbar spine (94%), sacroiliac (59%), coccyx (6%) (Wiles and Diakow 1982). In a study on the chiropractic treatment of primary dysmenorrhea, the authors theorized that a joint subluxation creates pressure on the spinal nerves which may be associated with neurological and mechanical dysfunction for which an adjustment may be beneficial (Spears 2005). This harkens back to Palmers subluxation model and the practice approach of chiropractic till the 1980s. The somatoautonomic theory is also used to explain this hypothesis **(Figure 2.1)**. However robust studies on the chiropractic management of dysmenorrhea are lacking.

2.11.12 Fatigue

According to Berg (2016), regular and specific spinal adjustments in areas which affect autonomic function can improve energy levels and reduce fatigue generally but no explanation for the physiological basis of this assertion was provided. There does seem to be some evidence for the chiropractic management of fatigue. Arick (2016) reported the improvement of fatigue symptoms which according to the author was supported by laboratory findings (thyroglobulin antibodies returned to normal post-chiropractic care, but it must be noted that the thyroglobulin antibodies are not standard markers for fatigue). Similarly, objective improvements were also seen by nervoscope measurements (measures temperature difference from one side of the spine to the other) following chiropractic care of fatigue (Berg 2016) but this device is not acknowledged by the medical profession or even within the chiropractic profession. It is, however, imperative to recognise that there are several causes of fatigue such as iron deficiency anaemia and medication (beta blockers and antihistamines) as well as other causes of fatigue associated with chronic disease (hypothyroidism, multiple sclerosis) (Newton and Jones 2010). In these instances, there may be a potential role for chiropractic care (especially dietary advice and lifestyle modification) which will improve energy levels and reduce symptoms of fatigue (Hains et al. 2000). However, currently the scant literature that exists cannot support or refute that chiropractic care for fatigue may be beneficial in certain cases.

2.11.13 Gynaecological conditions (excluding dysmenorrhea)

The supportive evidence for the chiropractic treatment of gynaecological conditions (excluding dysmenorrhea) is lacking. Studies have shown that chiropractic may be beneficial

for reducing back and pelvic girdle pain associated with certain gynaecological conditions (Reis, Hardy and de Sousa 2010).

2.11.14 Headaches (excl. cervicogenic, tension)

Chiropractic care is widely utilized in the management of headache such as migraine even though the clinical role of manual therapies in the management of such headaches is unclear. A survey of 1869 chiropractors reported that the majority (53 %) managed migraine patients often. These chiropractors were older, had more experience in terms of years of practice, and reported a higher number of patient visits per week and patient care hours. They reported using HVLA SMT, sacro-occipital techniques, chiropractic biophysics, instrument adjusting, heat/cryotherapy, dry needling, extremity adjusting and orthotics in their management of migraine (Moore et al. 2018). One weakness of these studies is whether the patients were correctly diagnosed with a particular type of headache (e.g. migraine). Cervicogenic headache may be similar in presentation to non-classic migraine (e.g. migraine without the auras).

2.11.15 Hearing loss and otitis media

Although DD Palmer first described the restoration of hearing of a (reportedly) deaf patient after spinal manipulation, there is no evidence for the effectiveness of chiropractic management of ear-related disorders. Although there are a few studies which show improvement in otitis media symptoms post-chiropractic care, it is possible that spontaneous resolution of the symptoms may have occurred due to the natural healing process. It can be concluded that chiropractic care of these disorders may be beneficial (as it is hypothesised by some chiropractors that SMT of the cervical spine may reduce tension in muscles that are hypertonic, which increases lymphatic drainage) when used in addition to medical care (Zhang and Snyder 2004).

2.11.16 Hernia (hiatus/inguinal/femoral)

There is no evidence for the effective management of these conditions by chiropractors.

2.11.17 Thyroid conditions

The evidence on any link between chiropractic care and improvement in thyroid conditions is lacking.

2.11.18 Hypertension and heart disease

Studies on the chiropractic treatment of hypertension and heart disease have produced inconclusive results. Hawk et al. (2007) reported that there are two papers by Morgan (1985)

and Goertz (2002) that had found adverse effects with regards to managing hypertension, but these adverse effects were not solely related to spinal manipulation. Although, there was no strong evidence that chiropractic care is beneficial for hypertension or heart disease, it was thought that there may be a likelihood that some sub-populations may benefit. The 1982 survey by Wiles and Diakow revealed that the treatment regime used by practitioners in the chiropractic management of hypertension and heart disease was the following: adjustments (88% or practitioners utilized this technique), nutrition (82%), exercise (e.g. aerobic exercise, swimming, deep breathing exercises) (35%), soft tissue manipulation (18%), and psychotherapy (35%). The spinal regions adjusted most frequently in these patients were: upper C spine (60%), lower C spine (13%), upper T spine (33%), lower T spine (27%), lumbar (13%), and sacroiliac (13%). Even though there are studies which show that blood pressure readings post-chiropractic care had been lowered (statistically insignificantly) compared to pre-chiropractic care, it must be noted that blood pressure readings may fluctuate throughout the day (Bakris et al. 2007; Kessinger and Moe 2015). There are also many other factors (e.g. stress, caffeine intake, pain) which play a role in reducing/increasing blood pressure readings, and even though there have been reports of lower blood pressure following spinal manipulation the duration of the treatment effect is unknown.

2.11.19 Infantile Colic

The literature shows that infants presenting with colic were found to have vertebral subluxations most predominantly at the first cervical vertebra (C1) and the sacrum. There could be an association between infantile colic and the existence of spinal joint fixations in specific regions of an infant's spine viz. cervical spinal regions (C0-C4), thoracic spinal regions (T1-T7), lumbar regions (L1-L3) and bilateral sacroiliac joints (Van Lingen 2003). These findings are supported by previous studies (Mercer 1999; Wiberg et al. 1999; Klougart, Nilsson and Jacobsen 1989) who reported improvements in symptoms of infantile colic after chiropractic treatment (removal of spinal fixations). Treatment mainly included spinal manipulation of C1 utilizing a Toggle Headpiece; the sacrum using the Logan procedure, craniosacral therapy, STT and rehabilitation exercises. A patient presenting with GERD and colic was managed effectively only after three spinal manipulations and by the 18th visit, vocabulary and speech was at a proper developmental milestone (Guliani et al. 2012). The author recommended that chiropractic treatments could be incorporated in the management of these conditions. In the absence of robust findings to support this recommendation, the observations of this author are at best speculative. A clinical trial conducted by Mercer (1999) showed that patients who presented with colic and received spinal adjustments to restricted (i.e. subluxed) regions in the spine, improved significantly based subjectively on the parents' perception. It was found that only after two to three

treatments the symptoms of colic (in the experimental group) were reduced and by the fourth to sixth treatments, there was complete resolution of the colicky symptoms. It can be concluded that there may be scientific evidence for the role of chiropractic in the management of colic (Mercer 1999). Currently, one cannot arrive at a definitive conclusion about the efficacy of manual therapy for infantile colic even though most studies have reported positive findings (symptoms of colic improved) (Mercer 1999; Wiberg et al. 1999; Guliani et al. 2012; Rubin and Istok 2013).

2.11.20 Female infertility

More research is warranted on whether chiropractic treatment for infertility is effective. Case studies show that chiropractic care may be beneficial as most of the participants conceived within months post-chiropractic care (Alcantara et al. 2009; Kramp 2012; Lombardi and Revels 2015). However, it cannot be concluded that chiropractic treatment was solely responsible as there are many other factors such as diet, medication, exercise and lifestyle modification which may have aided in the patients conceiving. The treatment of infertility is very challenging.

2.11.21 Nocturnal enuresis

Older studies on the chiropractic treatment of nocturnal enuresis (by Blomerth in 1994 and Grobler in 1996) reported substantial improvements post-chiropractic care (Hawk et al. 2007). An eight-year old male with a history of nocturnal enuresis had complete resolution of symptoms following one lumbar spine adjustment (Blomerth 1994). A controlled trial showed significant improvements in the experimental group when compared to the baseline period ($p = 0.004$, $p = 0.013$) of enuresis (number of wet nights) following chiropractic treatment when compared to the baseline period (Grobler 1996). There are several case studies which reveal a dramatic improvement in bed-wetting following chiropractic management and eventual resolution of these symptoms. However recent literature reveals that chiropractic care may be beneficial in demystifying the problematic symptoms rather than treating the disorder primarily (Neally and Alcantara 2015).

2.11.22 Parkinson’s disease

There is no evidence for the effective management of this condition by chiropractors although joint mobilisation and myofascial trigger point therapy may be beneficial in alleviating joint and muscle pain caused by spastic paralysis associated with the condition.

2.11.23 Respiratory tract infections

There is a lack of scientific evidence on the chiropractic management of respiratory tract infections although there are anecdotal reports (Leboeuf-Yde et al. 1999; Wearing et al. 2016).

2.11.24 Sinus-related conditions (excl. headaches)

There is a growing body of anecdotal evidence (subjective improvements) pertaining to the chiropractic care of sinus-related conditions. A large quantity of the literature (case reports and retrospective analysis) report an improvement in sinus related symptoms following chiropractic techniques such as manipulation, sinus lymph drainage and massage (Laferriere 2016). There may be a role for chiropractic as an adjunctive in the management of these disorders, but robust studies are needed to bolster this observation.

2.11.25 Skin disorders

It was concluded that the there is insufficient evidence on the chiropractic management of skin disorders as there is a paucity in the literature.

2.11.26 Sleep disorders

Insomnia (a type of sleep disorder where the person had difficulty falling asleep) is a multifaceted disorder and may largely be one of the effects of MSK pain syndromes such as cervical spine pain. Chiropractic has shown to be effective in the management of these MSK pain syndromes which may reduce the symptoms of sleep disturbance in these cases. However, there is no definitive evidence on the benefits of chiropractic in the management of insomnia alone (Kingston et al. 2010).

2.11.27 Tinnitus

There is limited research on the chiropractic management of tinnitus alone. However, a case report by Alcantara et al. (2002) reported that a patient who had TMJ restrictions (which is MSK in origin and is manageable by chiropractors), experienced symptoms of tinnitus. Chiropractic treatment (HVLA SMT and stretching) of the TMJ restriction had resolved symptoms of tinnitus. It is possible that tinnitus associated with TMJ disorders might resolve with chiropractic care but there is no evidence that it will respond to chiropractic care if it is due to other conditions e.g. iron deficiency anaemia or ear disorders.

2.11.28 Tonsillitis

The evidence on any link between chiropractic care and improvement in tonsillitis is lacking.

2.11.29 Ulcers and inflammatory bowel disease (ulcerative colitis and Crohn's disease)

The study by Takeda, Arai and Touichi (2002) found objective improvements (according to the author, x-rays showed IVF narrowing improved post-treatment in experimental group) following chiropractic treatment (thoracic and lumbar SMT) of Crohn's disease and allergy. How this was related to Crohn's disease or allergies was not explained. An earlier study by Pikalov and Kharin in 1994 reported remarkable and surprising results. It was found that chiropractic treatment was more beneficial compared to traditional medical treatment of ulcers. In this study, traditional medical treatment for ulcers was administered to the control group and SMT was administered for five to 22 days to the experimental group. The experimental group was reported to have had pain relief after one to nine days and remission of approximately ten days earlier than the control group. These improvements were measured by weekly endoscopes and by using clinical parameters (Pikalov and Kharin 1994). Interestingly no other study has subsequently confirmed these results.

2.11.30 Vision Disorders

The evidence on any link between chiropractic care and improvement in vision disorders is lacking.

2.12 CONCLUSION

It is not fully understood whether chiropractic treatment may actually treat the disorder or whether therapy may have an unexpected positive effect on the functioning of the human body. (Leboeuf-Yde et al. 1999; Leboeuf-Yde et al. 2005). However, a number of authors attribute the visceral effects of spinal manipulation to somato-autonomic reflexes (Rome 2010; Bolton and Budgell 2012). Leboeuf-Yde et al. (1999) found that 25% of patients reported improved circulation, breathing and vision following chiropractic care for MSK complaints. It should be noted that the terms described are vague and do not specify any particular pathology. It was also observed that the same modalities of treatment were used to manage both MSDs and NMSDs. The seminal multination study of Leboeuf-Yde et al. (2005), which included SA, was conducted to determine whether NMSK responses to chiropractic care are influenced by the attitudes of the chiropractors, the country of study, patient demographics, treatment protocols and information provided to patients. More than half of the patients (56%) who presented with an MSK disorder reported that there was an improvement in several NMSK complaints (Leboeuf-Yde et al. 2005). However, only a few of the patients who presented with NMSK complaints reported an improvement after

chiropractic intervention. There is a likelihood that the spinal column may mimic symptoms arising from visceral organs which may lead patients to believe that chiropractic can treat NMSDs (Leboeuf-Yde et al. 2005). To conclude, the existing literature on the chiropractic management of NMSDs are not robust and the majority of the studies lack sound evidence supporting that chiropractic may be effective in treating these conditions.

CHAPTER THREE
METHODOLOGY AND MATERIALS

3.1 STUDY DESIGN

The study was designed as a cross-sectional survey-based study with a quantitative paradigm. Ethical clearance and approval to conduct this study was obtained from the Institutional Research and Ethics Committee (IREC) of the Durban University of Technology (DUT) (Ethics Clearance Certificate Number: **98/16**) **(Appendix A)**.

3.2 STUDY POPULATION, RECRUITMENT, SAMPLING AND SAMPLE SIZE

The study population was chiropractors registered with the AHPCSA and who are practicing in the eThekwini District of KwaZulu-Natal. The registrar of AHPCSA was contacted and the number of currently registered chiropractors in the eThekwini District was determined. It was found that a total of 87 chiropractors practiced in this District. An additional 23 chiropractors were found in the list provided by CASA. Therefore, a total number of 110 practicing chiropractors were found. After excluding the three full-time academic staff from this new list, the revised total of practicing chiropractors in the eThekwini District was 107. The researcher then located the practice area for each of these chiropractors and categorised these into eThekwini North, eThekwini South, eThekwini Central and eThekwini West regions. A statistician determined the number of chiropractors that needed to be sampled from each of these regions to achieve a satisfactory and representative sample size. Taking into account a dropout rate of 10%, a minimum sample size of 72 practicing chiropractors was reached. Every chiropractor's name in the eThekwini District was written on a piece of paper and placed into a hat. There were ten chiropractors in "eThekwini North"; six chiropractors in "eThekwini South", 53 chiropractors in "eThekwini Central" and 38 chiropractors in "eThekwini West". In order for the sample size (n = 72) to be reached, seven names were taken from the hat marked "eThekwini North; four names from "eThekwini South; thirty-seven names from "eThekwini Central and twenty-four names from "eThekwini West". If the chosen chiropractor met the inclusion criteria, the researcher personally visited the chiropractor's practice and delivered an A4 envelope which contained the questionnaire **(Appendix B)** and the letter of information and informed consent **(Appendix C)**. If the chiropractor was able to do so; informed consent was obtained immediately, and the questionnaire was also completed immediately. If the chiropractor was unable to complete

the questionnaire, the researcher then made an appointment to collect it. After five working days, a telephonic reminder was sent to the chiropractor. If a chiropractor declined to participate in the study, the researcher picked another name out of the hat. This procedure was repeated until the sample size was reached in order to reach the total sample size of 72. Random probability sampling was used to determine this number (Singh 2015).

Table 3.2.1: Population and sample size in each region of the eThekwini District

	Population	Percent of Population	Sample Size
North	10	9	7
South	6	6	4
Central	53	50	37
West	38	35	24
Totals	**107**	**100**	**72**

3.3 INCLUSION AND EXCLUSION CRITERIA

3.3.1 Inclusion Criteria

- The chiropractors had to currently be registered with the AHPCSA.
- The chiropractors had to be currently practicing (full-time or part-time) in the eThekwini District of KwaZulu-Natal.

3.3.2 Exclusion Criteria

- Failure to obtain informed consent from the chiropractors.
- Chiropractors who participated either in the focus group or pilot study.
- Chiropractors who were full-time academic staff members.

3.4 MEASUREMENT TOOLS

A pre-validated questionnaire **(Appendix B)** was adapted for this study. The literature used to adapt the questionnaire included:

- Leboeuf-Yde et al. (2005): for patients' demographic profile; chiropractic intervention used in treatment protocols; the chiropractor's qualification (education) and employment status (part-time or full-time); and the number of visits of the patient.
- Leboeuf-Yde et al. (1999): for patients' demographic profiles; patients' primary complaints; and number of visits of the patient.
- Parkinson et al. (2011): for chiropractor characteristics (number of years in practice and philosophical orientation).

The three articles were also used for the questions on the types of NMSDs managed by the chiropractors.

The questionnaire consisted of three sections (A, B and C) viz.:

- **Section A** included the chiropractor's/participant's demographic information such as age, gender, number of years in practice, qualifications, institute of study, philosophical orientation, referrals and whether they are in full- or part-time practice.
- **Section B** included details of whether the patient's presenting (primary) complaint was non-musculoskeletal in nature as well as the age group of the patient, their gender, treatment protocols used by the chiropractors and the average number of consultations.
- **Section C** included details of whether the management of musculoskeletal disorders as the primary complaint had non-musculoskeletal effects/responses and the age group of the patient, their gender, treatment protocols used and the average number of consultations.

The simple design of the questionnaire allowed the respondents to tick-off the relevant check boxes. It also permitted a number of open-ended answers by providing an "other" check box and a space to write down their response. The questionnaire was evaluated by a focus group and then piloted.

3.4.1 Focus Group

Once provisional ethical approval was obtained from IREC, a focus group of four chiropractors (between 30-45 years old, 3 female participants and 1 male participant) was held, and the face and construct validity of the questionnaire was determined.

Face validity:

Face validity refers to whether a test appears to measure what it aims to test. It is a basic measure of validity (McLeod 2007). The face validity of the questionnaire of this study was determined by the following:

- Simple English language and text.
- Simple and concise questions and questions which related to the aim and objectives of the study.

The questions related to the chiropractor's characteristics gave individuals who evaluated the questionnaire an idea of how the questions related to the aim of the study as some characteristics (e.g. the number of years in practice) may have portrayed that the longer in practice, the greater the possibility of the chiropractor managing a NMSD.

Construct validity:

Construct validity refers to whether the study test relates to underlying theoretical concepts (i.e. "the extent to which a test measures what it claims to measure" (Brown 1996). This study set out to determine whether the participants (chiropractors) managed NMSDs in their practice. Construct validity was determined by including questions that elicited responses pertaining to the types of NMSDs managed and the treatment used. A Likert scale was also used which revealed how often or not a chiropractor treated a particular condition.

Participants of the focus group:

The focus group consisted of four participants who were practicing chiropractors from the eThekwini District. Informed consent was obtained prior to their participation in the focus group.

3.4.2 Pilot Study

The pilot study followed the focus group. The researcher used the same procedure for the pilot group as the one for the main study in order to recruit participants and complete the questionnaire. This was done to test the full implementation process (Van Teijlingen and Hundley 2001). The feedback received from the pilot group included minimal grammatical changes and added treatment options that were corrected in the final draft of the questionnaire.

3.5 A SUMMARY OF THE STUDY PROCEDURE

Permission was sought from the Registrar of the AHPCSA for the recruitment of chiropractors **(Appendix D)**. Full ethical approval obtained from IREC.

↓

Sampling of chiropractors as described above.

↓

Delivery of the informed consent form, letter of information and questionnaire to the chiropractors' practices.

↓

The completed informed consent form and questionnaire were collected if the chiropractor was able to complete these.

↓

The completed questionnaires were placed in Box A and the informed consent forms were placed in Box B.

↓

If the chiropractor was unable to complete the informed consent form and questionnaire immediately, these were collected after five working days and placed in the respective boxes.

↓

Data was captured on an EXCEL spreadsheet.

↓

Statistical analysis by statistician using the latest version of SPSS (version 25.0)

3.6 STATISTICAL ANALYSIS

The latest version of SPSS, version 25.0 was used to analyse the data. This was graphically publicised by means of charts and bar graphs (Willemse 2009). The analysis involved descriptive statistics utilising frequency tables and charts for responses to categorical variables to be illustrated. Inferential statistics were used to determine associations between variables (where possible), by means of chi square tests at an $\alpha = 0.05$ level of significance (Lind et al. 2004). In order to determine the association between variables in the study, cross-tabulations were utilized (Willemse 2009). In instances where frequency violations occurred, Fisher's exact test was used. The data was then coded on a Microsoft EXCEL spreadsheet and transferred to SPSS for statistical analysis (Singh 2015).

3.7 ETHICAL CONSIDERATIONS

- Permission was obtained from the Registrar of the AHPCSA to utilise chiropractors from the eThekwini District as participants in this study.
- Ethical clearance to conduct the study was obtained by IREC.
- Informed consent was obtained from participants.
- No names of any participants appeared on the questionnaires or in this dissertation or will appear in any articles published.
- The data will be kept in a secure cupboard at the premises of the DUT Chiropractic Programme for approximately five years. It will then be shredded and disposed appropriately.
- Electronic data will be kept on an external hard drive by the researcher.

3.7.1 The Ethical Principles of Autonomy, Non-maleficence, Beneficence and Justice

Autonomy: Participation was purely voluntary, and no coercion was used. Participants were free to withdraw at any point in the study.

Non-maleficence: No participants were harmed in this study.

Beneficence: This study benefitted the chiropractors as it might create awareness of chiropractic management and promote a holistic approach to the management of NMSDs.

Justice: Every chiropractor included in the study had a fair and equal chance to voice their opinions in this study with no discrimination.

CHAPTER FOUR
RESULTS

4.1 RESPONSE RATE

The population of 107 practicing chiropractors in the eThekwini district was identified through a list requested by the researcher from AHPCSA. A minimum sample size of 72 was determined by the statistician. Eighty-nine questionnaires were distributed to participants and 73 questionnaires were returned, which satisfied the requirements of the minimum sample size. No questionnaires were excluded or invalid. A response rate of 82% was achieved.

4.2 SELECTED DEMOGRAPHIC PROFILE OF THE PARTICIPANTS

4.2.1 Age and gender

Table 4.1: Age and gender of the study sample

	***N* (%)**	**Mean (± SD) age (yrs)**	**Range (yrs)**
Male	34 (46.6)	40 (± 10)	26-70
Female	39 (53.4)	36 (± 8)	24-63
Total	**73 (100)**	**38 (± 9)**	**46**

yrs = Years

The sample population included a larger proportion of females (*n* = 39, 53.4%) than males (*n* = 34, 46.6%). The age of participants ranged from 24 to 70 years; the mean age being 38 years and the mode being 46 years. The mean age of females (36 years) was slightly lower than that of males (40 years).

4.2.2 Number of years in practice (full-time and part-time)

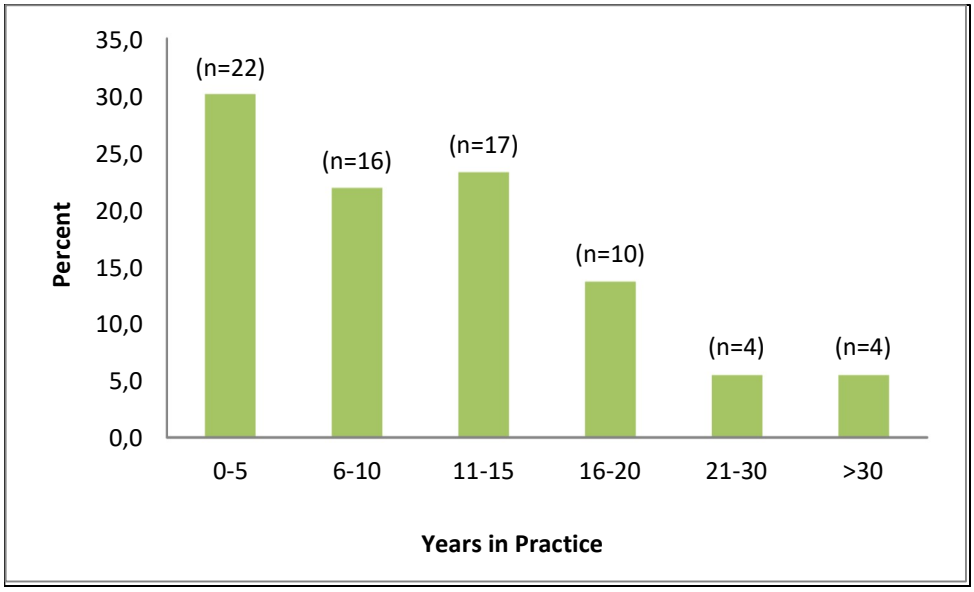


Figure 4.1: Number of years in practice

The largest proportion of participants (*n* = 22, 30.1%) were in practice for less than five years. Only 8 (11%) of the participants had been in practice for more than 20 years and more than half (*n* = 38, 52.1%) of the sample population had been in practice for 10 years or less. The smallest number of chiropractors (*n* = 8) have been in practice for 21-30 years and >30 years. The mean (± SD) number of years in practice was 12 (± 10) years.

4.2.3 Full-time or Part-time practice

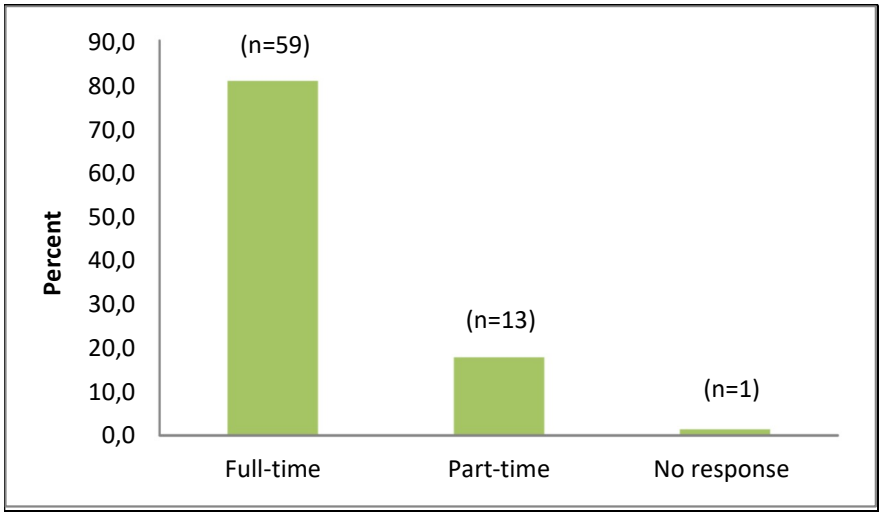


Figure 4.2: Full-time or part-time practice of participants

The majority of the participants (*n* = 59, 80.8%) in this study were in practice full-time. One participant did not respond to this question.

4.2.4 Qualifications of the participants

Table 4.2: The participants' qualifications

Qualification	*n*	%
M.Tech: Chiropractic	67	91.8
DC	6	8.2
Total	**73**	**100.0**

DC = Doctor of Chiropractic

The majority of participants (91.8%) had an M.Tech: Chiropractic qualification while the rest (8.2%) had a DC qualification.

4.2.4.1 Post-graduate qualifications and/or certifications

Table 4.3: The participants' reported post-graduate qualifications and/or certifications

Post-Graduate Qualifications and/or Certifications	*n*	%
- Certified Chiropractic Extremity Practitioner	1	1.36
- Certified Chiropractic Sports Physician	2	2.78
- Chiropractic Foot Care	2	2.78
- Chiropractic Foot Care + Masters in Sports Medicine + Certified Chiropractic Sports Physician	1	1.36
- Diploma Chiropractic Rad.	1	1.36
- Injections NSAIDS + Diploma Hypnotherapy	1	1.36
- Internationally Certified Chiropractic Sports Practitioner	1	1.36
- Masters in Sports Medicine	1	1.36
- Masters of Medical Science + Post- Graduate Diploma	1	1.36
- MSK Ultrasonography + BCOM	1	1.36
- Pain Management	1	1.36
- Scoliosis Brace Fitment SPINECOR®	1	1.36
Total of responses	14	19.16
No response	59	80.82
Total	**73**	**100**

Rad = Radiography; NSAIDS = Nonsteroidal anti-inflammatory drugs; MSK = Musculoskeletal; BCOM = Bachelor of Commerce

There were only 14 responses to this question. The main qualification/certification groups involved sports (*n* = 5), extremity/foot care (*n* = 4) and diagnostic imaging (*n* = 2). Of those who responded to this question, three participants had another Master's qualification in addition to their M.Tech: Chiropractic.

4.2.5 Supplementary courses completed by the participants

Table 4.4: The supplementary courses completed by the participants

Courses	*n*	%
Acupuncture	1	1.36
Acupuncture + Biopuncture + Dry needling	1	1.36
Acupuncture + Certified Chiropractic Sports Physician	1	1.36
Certified Chiropractic Extremity Practitioner	1	1.36
Chiropractic Foot Care	1	1.36
Dynamic Tape + Chiropractic Foot Care	1	1.36
Dynamic Tape + Internationally Certified Chiropractic Sports Practitioner	1	1.36
Dynamic Tape + Massage	1	1.36
Dynamic Tape + Pain Management	1	1.36
Gonstead	1	1.36
International Veterinary Chiro Ass.	1	1.36
KinesioTape®	7	9.58
KinesioTape® + Dynamic Tape + Extremity Manipulation + Basic Life Support	1	1.36
KinesioTape® + Basic Life Support + CardioVascular Life Support	1	1.36
KinesioTape® + Biopuncture	1	1.36
KinesioTape® + Biopuncture + MSK Ultrasonography	1	1.36
KinesioTape® + Biopuncture + Pain Management	1	1.36
KinesioTape® + Centre for Logistics Excellence	1	1.36
KinesioTape® + Diabetes education	1	1.36
KinesioTape® + Dynamic Tape	5	6.84
KinesioTape® + Dynamic Tape + Extremity Manipulation + Elite Chiro Coaching	1	1.36
KinesioTape® + Dynamic Tape + Personal Fitness Trainer + Pilates	1	1.36
KinesioTape® + Dynamic Tape + Torque Release	1	1.36
KinesioTape® + Functional Medicine + Pilates	1	1.36
KinesioTape® + Internationally Certified Chiropractic Sports Practitioner + Pilates	1	1.36
KinesioTape® + NeuroImpulse Protocol	2	2.73
KinesioTape® + NSAIDS	1	1.36
KinesioTape® + NSAIDS + Statistics	1	1.36
KinesioTape® + Pain Management	1	1.36
KinesioTape® + Supervisor	1	1.36
M.Tech: Homeopathy	1	1.36
NSAIDS	2	2.73
Paediatrics	2	2.73
Paediatrics + Craniosacral Therapy	1	1.36
Paediatrics + NeuroImpulse Protocol	1	1.36
Pilates + Solgar Training	1	1.36

Sports Massage	1	1.36
Total of responses	50	68.49
No response	23	31.50
Total	**73**	**100**

Ass. = Association; chiro = chiropractic; MSK = musculoskeletal; NSAIDS = Nonsteroidal anti-inflammatory drugs

Fifty participants had attended and completed supplementary courses. Only 23 participants recorded not having completed any supplementary courses or qualifications. This suggests that the majority of chiropractors (in the eThekwini district) have done supplementary courses and most likely apply taping as an adjunct to managing their patients. The majority of participants (*n* = 43) were involved in strapping/taping viz. KinesioTape® (*n* = 30) and dynamic tape (*n* = 13). Of the 50 participants who responded to this question, some participants (*n* = 33) completed both taping (kinesio and dynamic) courses. This shows that 66% of participants had done supplementary courses in taping. Courses in pain management and/or NSAIDS were completed by 7 participants. Other courses included biopuncture (*n* = 4), involvement in paediatrics care (*n* = 4), sports-related courses (*n* = 4), acupuncture (*n* = 3) and massage therapy (*n* = 2). One respondent answered this question by stating that he/she had an M.Tech.: Homeopathy but since this is a qualification and not a course it was not included in this result.

4.2.6 Institute of study

Table 4.5: Institute of study

Place of Study	***n***	**%**
Durban University of Technology	56	76.71
Anglo-European College of Chiropractic	1	1.36
Palmer College of Chiropractic	3	4.10
McTimoney College of Chiropractic	1	1.36
University of Johannesburg	1	1.36
Life University	1	1.36
Durban Institute of Technology	2	2.73
Technikon Natal	8	10.95
Total	**73**	**100.0**

The majority of the participants (*n* = 66; 90.4%) graduated from the now 'Durban University of Technology'; which was previously known as the 'Durban Institute of Technology' and before that 'Technikon Natal' **(Table 4.5)**. There was one graduate from the University of Johannesburg. The remaining six participants had chiropractic qualifications from international institutions.

4.2.7 Country of study

Table 4.6 Country of study of the participants

Country of Study	*n*	%
South Africa	67	91.78
United States of America	4	5.47
United Kingdom	2	2.73
Total	**73**	**100**

The majority of participants studied in South Africa (*n* = 67, 91.78%), followed by the US (*n* = 4, 5.47%) and then the UK (*n* = 2, 2.73%).

4.2.8 Philosophical orientation

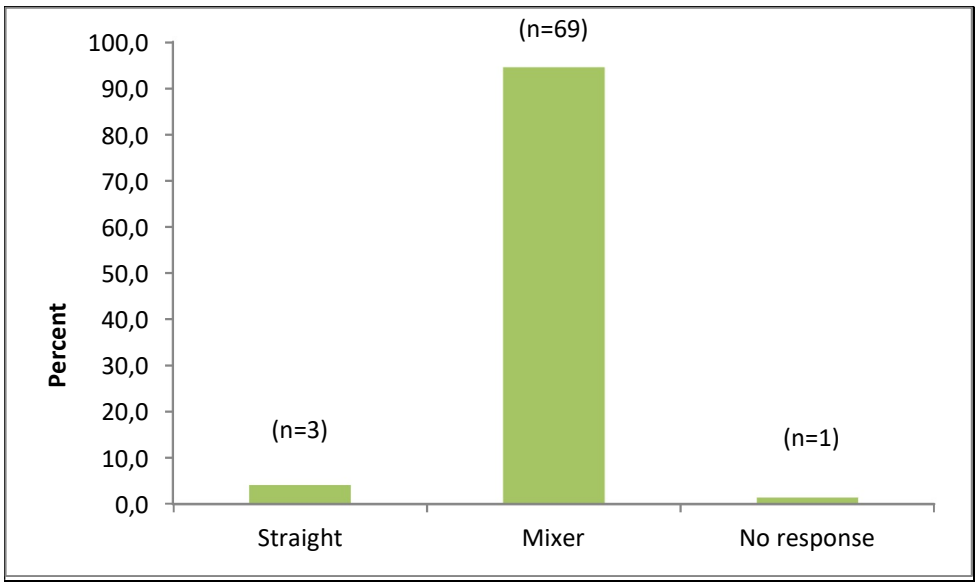


Figure 4.3: The philosophical orientation of participants

The majority of participants adopted a 'Mixer' philosophical orientation (*n* = 69, 94.5%) and the minority of participants (*n* = 3) adopted a 'Straight' philosophical orientation. One respondent did not answer this question.

4.2.9 Referrals received for NMSK complaints

4.2.9.1 Participants who received referrals for NMSDs

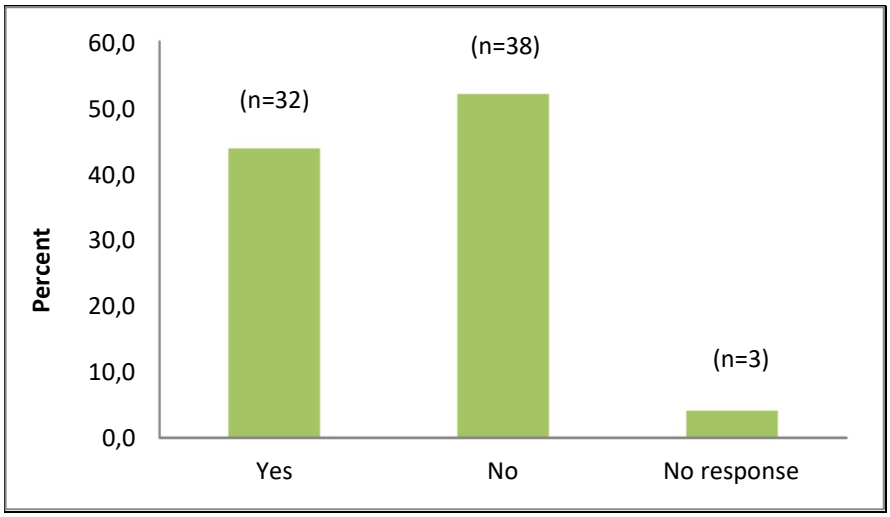


Figure 4.4: Referrals received by participants for NMSDs

Of those participants who responded (*n* = 70), the majority of chiropractors (*n* = 38, 54.3%) reported that they did not receive referrals for NMSDs. However, a significant proportion (*n* = 32, 45.7%) reported that patients with NMSDs were referred to them.

4.2.9.2 Source of referrals of patients with NMSDs

Table 4.7: Referrals to participants

Referrals to participants	*n*	%
No response	41	56.16
GP	8	10.95
GP + Dentist + Pharmacist	1	1.36
GP + Midwives + Baby Clinic	1	1.36
GP + Neurosurgeons + Orthopaedics	1	1.36
GP + Paediatricians + Midwives	1	1.36
GP + Patients + Psychologist	1	1.36
GP + Personal Trainer	1	1.36
GP + Physicians + Psychiatrists + Paediatricians	1	1.36
GP + Psychiatrists	1	1.36
GP + Specialists	1	1.36
GP + Traditional Chinese Medicine Practitioner	1	1.36
Lactation specialist	1	1.36
Midwives	2	2.73
Not specified	3	4.10

Referrals to participants	*n*	%
Others	1	1.36
Paediatricians	2	2.73
Patients	5	6.84
Total	**73**	**100**

GP = General Practitioner

Of the 32 participants who received referrals for NMSDs, 56.3% (*n* = 18) received referrals from GPs; who were by far the most common source of referral. The next most common referral sources reported were other patients (*n* = 6), paediatricians (*n* = 4), psychologists/psychiatrist (*n* = 3) and those in the field of obstetrics (*n* = 3).

4.2.10 Other occupations of the participants who were in practice part-time

Table 4.8: Other occupations of the participants

Other Occupation	*n*	%
None	60	82.19
Clinician	1	1.36
Lecturing	1	1.36
Lecturing/Tutor	1	1.36
NGO work	1	1.36
Not specified	6	8.21
Spinal Surgery Rep	1	1.36
Stay at home mum	1	1.36
Surgical sales	1	1.36
Total	**73**	**100**

NGO = Non-governmental organization; Rep = (Sales) Representative

The majority of participants (*n* = 59) were in practice full-time (Fig. 4.4). Thirteen participants (17.8% of the sample) practiced part-time and were involved in other occupations. Six participants did not specify the other occupations that they were involved in (participants had been asked to specify “other occupations” if they were in practice part-time). Other occupations reported included ‘clinician’, ‘lecturer’, ‘NGO worker’, ‘spinal surgery sales representative’ and ‘surgical sales’. One participant reported that she was a “stay at home mum” and practiced part-time.

4.3 THE TYPES OF NMSDS PRESENTING TO CHIROPRACTORS

Section B of the questionnaire **(Appendix B)** involved participants' responses for the management of NMSDs as the primary presenting complaint (e.g. a patient presents to the participant in practice complaining of constipation). Section C of the questionnaire **(Appendix B)** included participants' responses for the management of MSDs as the primary complaint with NMSK responses to treatment (e.g. a patient presents complaining of low back pain and after treatment, they report relief from constipation).

Table 4.9: Non-musculoskeletal disorders presenting as the primary and secondary complaint (%)

	PRIMARY COMPLAINT			SECONDARY COMPLAINT		
	'Rarely'/ 'Sometimes' % (frequency)	*'Very Often'/ 'Always'* % (frequency)	Total Section B (primary complaint) % (frequency)	*'Rarely'/ 'Sometimes'* % (frequency)	*'Very Often'/ 'Always'* % (frequency)	Total Section C (responses secondary to MSK complaint) % (frequency)
ADHD	17.8 (13)	5.5 (4)	**23.3 (17)**	26.0 (19)	5.5 (4)	**31.5 (23)**
Allergies	20.5 (15)	1.4 (1)	**21.9 (16)**	34.2 (25)	4.1 (3)	**38.4 (28)**
Asthma	28.8 (21)	2.7 (2)	**31.5 (23)**	37.0 (27)	6.8 (5)	**43.8 (32)**
Bladder disorders	17.8 (13)	2.7 (2)	**20.5 (15)**	21.9 (16)	6.8 (5)	**28.8 (21)**
Bowel disorders	28.8 (21)	6.8 (5)	**35.6 (26)**	37.0 (27)	19.2 (14)	**56.2 (41)**
Cerebral Palsy	15.1 (11)	4.1 (3)	**19.2 (14)**	9.6 (7)	0.0	**9.6 (7)**
Constipation	37.0 (27)	8.2 (6)	**45.2 (33)**	46.6 (34)	21.9 (16)	**68.5 (50)**
Clinical depression	27.4 (20)	0.0	**27.4 (20)**	41.1 (30)	0.0	**41.1 (30)**
Cushing's syndrome	2.7 (2)	0.0	**2.7 (2)**	1.4 (1)	0.0	**1.4 (1)**
Diabetes mellitus	11.0 (8)	0.0	**11.0 (8)**	4.1 (3)	1.4 (1)	**5.5 (4)**
Dizziness	47.9 (35)	19.2 (14)	**67.1 (49)**	47.9 (35)	24.7 (18)	**72.6 (53)**
Dyspepsia	35.6 (26)	9.6 (7)	**45.2 (33)**	38.4 (28)	11.0 (8)	**49.3 (36)**
Dysmenorrhea	30.1 (22)	2.7 (2)	**32.9 (24)**	32.9 (24)	12.3 (9)	**45.2 (33)**
Fatigue	32.9 (24)	16.4 (12)	**49.3 (36)**	39.7 (29)	23.3 (17)	**63.0 (46)**
Gynaecological disorders	13.7 (10)	0.0	**13.7 (10)**	20.5 (15)	2.7 (2)	**23.3 (17)**

	PRIMARY COMPLAINT			SECONDARY COMPLAINT		
	'Rarely'/ 'Sometimes' % (frequency)	*'Very Often'/ 'Always'* % (frequency)	Total Section B (primary complaint) % (frequency)	*'Rarely'/ 'Sometimes'* % (frequency)	*'Very Often'/ 'Always'* % (frequency)	Total Section C (responses secondary to MSK complaint) % (frequency)
Headaches	19.2 (14)	69.9 (51)	**89.0 (65)**	19.2 (14)	63.0 (46)	**82.2 (60)**
Hearing loss	23.3 (17)	0.0	**23.3 (17)**	31.5 (23)	0.0	**31.5 (23)**
Heart pathology	1.4 (1)	0.0	**1.4 (1)**	4.1 (3)	0.0	**4.1 (3)**
Hiatus hernia	21.9 (16)	2.7 (2)	**24.7 (18)**	16.4 (12)	2.7 (2)	**19.2 (14)**
Thyroid disorders	8.2 (6)	0.0	**8.2 (6)**	4.1 (3)	0.0	**4.1 (3)**
Hypertension	13.7 (10)	0.0	**13.7 (10)**	24.7 (18)	5.5 (4)	**30.1 (22)**
Infantile colic	45.2 (33)	35.6 (26)	**80.8 (59)**	24.7 (18)	27.4 (20)	**52.1 (38)**
Infertility	24.7 (18)	1.4 (1)	**26.0 (19)**	19.2 (14)	1.4 (1)	**20.5 (15)**
Inguinal/Femoral hernia	11.0 (8)	0.0	**11.0 (8)**	4.1 (3)	0.0	**4.1 (3)**
Nocturnal enuresis	19.2 (14)	5.5(4)	**24.7 (18)**	13.7 (10)	6.8 (5)	**20.5 (15)**
Otitis media	19.2 (14)	4.1 (3)	**23.3 (17)**	16.4 (12)	2.7 (2)	**19.2 (14)**
Parkinson's Disease	13.7 (10)	0.0	**13.7 (10)**	8.2 (6)	0.0	**8.2 (6)**
Peptic ulcers	12.3 (9)	0.0	**12.3 (9)**	6.8 (5)	1.4 (1)	**8.2 (6)**
Respiratory tract infections	12.3 (9)	1.4 (1)	**13.7 (10)**	19.2 (14)	2.7 (2)	**21.9 (16)**
Sinus-related disorders	45.2 (33)	13.7 (10)	**58.9 (43)**	45.2 (33)	16.4 (12)	**61.6 (45)**
Skin disorders	12.3 (9)	0.0	**12.3 (9)**	13.7 (10)	1.4 (1)	**15.1 (11)**
Sleep disorders	30.1 (22)	6.8 (5)	**37.0 (27)**	54.8 (40)	9.6 (7)	**64.4 (47)**
Tinnitus	50.7 (37)	4.1 (3)	**54.8 (40)**	52.1 (38)	0.0	**52.1 (38)**
Tonsillitis	2.7 (2)	0.0	**2.7 (2)**	6.8 (5)	0.0	**6.8 (5)**
Ulcerative colitis/Crohn's disease	11.0 (8)	0.0	**11.0 (8)**	9.6 (7)	0.0	**9.6 (7)**
Vertigo	46.6 (34)	15.1 (11)	**61.6 (45)**	41.1 (30)	16.4 (12)	**57.5 (42)**
Vision disorders	23.3 (17)	0.0	**23.3 (17)**	28.8 (21)	1.4 (1)	**30.1 (22)**

	PRIMARY COMPLAINT			SECONDARY COMPLAINT		
	'Rarely'/ 'Sometimes' % (frequency)	*'Very Often'/ 'Always'* % (frequency)	Total Section B (primary complaint) % (frequency)	*'Rarely'/ 'Sometimes'* % (frequency)	*'Very Often'/ 'Always'* % (frequency)	Total Section C (responses secondary to MSK complaint) % (frequency)
Cramps	1.4 (1)	0.0	**1.4 (1)**			
Ptosis	1.4 (1)	0.0	**1.4 (1)**			
Stress	0.0	1.4 (1)	**1.4 (1)**			

The percentage and frequency of the NMSDs (primary and secondary) (combination of "*rarely/sometimes*" and "*very* often/*always*") presenting to the participants (*n*=73) is tabulated in **Table 4.9**. 'Primary NMSK complaints' refer to instances when the patient's presenting (primary) complaint was non-musculoskeletal in nature. 'Secondary NMSK complaints' refer to instances when the patient's presenting (primary) complaint is musculoskeletal in nature but the chiropractor reported noticing positive NMSK effects or improved symptoms of any co-existing NMSD.

The results in **Appendix F** (expanded data tables) are condensed and presented in **Table 4.9** in order to identify discernable trends through a combination of "*rarely/sometimes*" and "*very often*/*always*" and the totals for each section. The management of all NMSDs which have a percentage of 50% or greater (more than 50% of the study sample said that they manage this condition either as a primary or secondary complaint) are highlighted in yellow.

4.3.1 Management of NMSDS as Primary Complaint

The NMSDs (as a primary complaint) marked as *"No/Never"* (participants do not treat the NMSD) by more than 70% of participants was heart pathology (98.4%), tonsillitis (96.9%), Cushing's (96.8%), thyroid disorders (90.5%), inguinal/femoral hernia (87.5%), ulcerative colitis/Crohn's (87.5%), diabetes mellitus (87.3%), peptic ulcers (86.2%), skin disorders (85.9%), Parkinson's (84.6%), RTI's (84.4%), hypertension (84.4%), gynaecological disorders (84.1%), cerebral palsy (78.5%), bladder disorders (77.6%), allergies (75%), otitis media (74.6%), ADHD (74.2%), hearing loss (73.8%), vision disorders (73.4%), nocturnal enuresis (73.1%), hiatus hernia (72.7%) and infertility (70.3%).

Of the primary presenting NMSDs which are managed by participants (50% or greater), tinnitus was the only one seen *"rarely/sometimes"* by the participants (*n* = 37, 50.7%) while

headache which was managed commonly, was the only one seen *"very often/always"* (*n* = 51, 69.9%).

When the percentages for "*rarely/sometimes*" and "*very often*/*always*" are combined, it was found that headache (89%), infantile colic (80.8%), dizziness (67.1%), vertigo (61.6%), sinus-related disorders (58.9%) and tinnitus (54.8%) were the most likely primary NMSDs seen and managed by the participants.

4.3.2 Management of NMSDS as Secondary Complaint (MSD is treated primarily with NMSK response to treatment)

The NMSDs (secondary complaint) marked as *"No/Never"* (participants do not treat the NMSD) by more than 70% of participants was Cushing's (98.4%), heart pathology (95.1%), thyroid disorders (95.1%), inguinal/femoral hernia (95.1%), diabetes mellitus (93.4%), tonsillitis (91.8%), Parkinson's (90.2%), peptic ulcers (90.2%), ulcerative colitis/Crohns Disease (88.3%), cerebral palsy (88.1%), skin disorders (82%), otitis media (77.4%), hiatus hernia (77.4%), nocturnal enuresis (75.8%), infertility (75%), RTI (73.8%) and gynaecological disorders (72.6%).

Where there were treatment responses to NMSDs following treatment of MSK conditions, it was found that there were ten conditions with a combined percentage (*"Rarely/Sometimes"* plus *"Very often/Always"*) of 50% or greater **(Table 4.9)**. Tinnitus (*n* = 38, 52.1%) and sleep disorders (*n* = 40, 54.8%) were the most common seen *"rarely/sometimes"* by the participants, while headache (of NMSK origin i.e. migraine) was still the only most commonly managed condition *"very often/always"* with unexpected responses to treatment following treatment of MSK conditions (*n* = 46, 63%).

When the percentages for "*rarely/sometimes*" and "*very* often/*always*" are combined for Section C, it was found that headache (82.2%), dizziness (72.6%), constipation (68.5%), sleep disorders (64.4%), fatigue (63%), sinus-related disorders (61.6%), vertigo (57.5%), bowel disorders (56.2%), infantile colic (52.1%) and tinnitus (52.1%) were the most frequent NMSDs with unexpected positive responses to treatment following treatment of MSK conditions seen by participants.

4.4 THE MANAGEMENT PROTOCOLS OF CHIROPRACTORS FOR NMSDS

The frequency of participants who utilised certain treatment modality(ies) is presented in **Table 4.10** (primary complaint) and **Table 4.11** (secondary complaint).

Table 4.10: The management protocols of participants for NMSDs which were the primary complaints

	Manipulative Therapy (SMT, CST, NIP)	Auxiliary Therapy (STT, Modalities, Mobs, D.N., Strapping)	Pt education (Rehab, nutrition, L/S mod)	Referral
Allergies	2	3	3	1
CVS	1	7	5	1
Digestive system	23	28	39	6
Endocrine system	1	2	1	0
ENT	24	51	31	5
Fatigue	10	17	18	2
Infantile colic	47	46	33	4
Nervous system	100	270	178	27
Psychological disorders	6	4	3	1
Female reproductive system	8	19	12	2
Respiratory system	4	10	6	1
Skin disorders	0	0	0	0
Sleep disorders	5	12	9	0
Urinary system	4	3	1	1
Vision disorders	0	0	0	0
Total	**235**	**472**	**339**	**51**

SMT = Spinal Manipulative Therapy; NIP = NeuroImpulse Protocol; CST = Craniosacral Therapy; STT = Soft tissue therapy; Mobs = Joint mobilisations; D.N. = Dry needling; Pt = Patient; Rehab = Rehabilitation; L/S Mod = Lifestyle Modification; CVS = Cardiovascular system; ENT = Ear, nose and throat; reprod. = reproduction

Table 4.11: The management protocols of participants for NMSDs which were the secondary complaints

	Manipulative Therapy (SMT, CST, NIP)	Auxiliary Therapy (STT, Modalities, Mobs, D.N., Strapping)	Pt education (Rehab, nutrition, L/S mod)	Referral
Allergies	3	4	6	0
CVS	6	13	7	2
Digestive system	37	72	48	2
Endocrine system	0	0	0	0
ENT	26	50	27	2
Fatigue	19	39	28	2
Infantile colic	13	14	9	1
Nervous system	74	198	131	8
Psychological disorders	6	7	8	2
Female reproductive system	11	21	15	1
Respiratory system	8	17	12	1
Skin disorders	0	0	0	0
Sleep disorders	17	39	22	0
Urinary system	7	11	8	1
Vision disorders	1	1	0	0
Total	**227**	**485**	**321**	**22**

SMT = Spinal Manipulative Therapy; NIP = NeuroImpulse Protocol; CST = Craniosacral Therapy; STT = Soft tissue therapy; Mobs = Joint mobilizations; D.N. = Dry needling; Pt = Patient; Rehab = Rehabilitation; L/S Mod = Lifestyle Modification; CVS = Cardiovascular system; ENT = Ear, nose and throat; reprod. = reproduction

Of the total sample size (*n* = 73), some participants who reported treating NMSDs "*rarely/sometimes*" and "*very* often/*always*" did not always report on the management protocols for that disorder. For example, in the total for Section B **(Table 4.9)**, 45 participants reported that they had treated vertigo as a primary complaint, but only 13 of them reported on the treatment modalities they utilised to manage this condition (participants had the choice of reporting on treatment modalities for the specific NMSDs). Although the sample size in this study was 73, for the purpose of summarizing the data for Objectives 2 and 3, each NMSD was categorized according to the bodily system it affects. Each system may have a count that exceeds the sample size (*n* = 73) because the sum of each modality of treatment was counted and totaled **(Appendix G)** as follows:

- Allergies
- Cardiovascular system (CVS) (includes hypertension and heart pathology) (Tortora and Derrickson 2014: 688)
- Disorders of the GIT (includes bowel disorders, dyspepsia, ulcerative colitis and Crohn's disease, peptic ulcers, constipation, hiatus hernia, inguinal and femoral hernia) (American College of Gastroenterology 2019)
- Endocrine system (includes diabetes mellitus, thyroid disorders, Cushing's syndrome) (Tortora and Derrickson 2014: 615)
- Ear, nose and throat (ENT) (includes sinus-related disorders, otitis media, tonsillitis, tinnitus, hearing loss) (Dhingra and Dhingra 2014)
- Fatigue
- Infantile colic
- Disorders of the Brain and Nervous system (Parkinson's disease, dizziness, vertigo, headaches, cerebral palsy) (Shah 2008)
- Psychological disorders (ADHD, clinical depression) (Alli-Feldmann et al. 2017)
- Female reproduction system (gynaecological disorders, dysmenorrhea, infertility) (Tortora and Derrickson 2014: 1041)
- Respiratory system (asthma, respiratory tract infections) (Tortora and Derrickson 2014: 840)
- Skin disorders
- Sleep disorders
- Urinary system (nocturnal enuresis, bladder disorders) (Tortora and Derrickson 2014: 979)
- Vision disorders

For example, in **Table 4.10** (NMSD was the primary complaint) under the Disorders of the Brain and Nervous System, the total number count for 'Manipulative Therapy' was 100. This total was calculated by analyzing the data table in **Appendix G** for Parkinson's, dizziness, vertigo, headaches and cerebral palsy (disorders that were categorized into the nervous system) and adding the numbers in the 'SMT', 'CST' and 'NIP' columns. For example, Parkinson's (count was 0), dizziness (count was 24), vertigo (count was 13), headaches (count was 61) and cerebral palsy (count was 2). The addition of the above counts totals 100 which is seen in **Table 4.10** (highlighted in yellow). The category Auxiliary Therapy included five therapies (which were categorized to summarise the data) viz. soft tissue therapy, electromodalities, mobilisations, dry needling and strapping). For these reasons, a count (n = 270) greater than the sample size (*n* = 73) was possible.

4.4.1 The management protocols for NMSDs as the Primary Complaint

For the primary NMSDs, the most common treatment modalities reported (total in **Table 4.10**) were auxiliary therapies (*n* = 472), patient education which included rehabilitation, nutrition and lifestyle modification (*n* = 339) and manipulative therapy which includes SMT, NIP and CST (*n* = 235).

From the highlighted NMSDs in **Table 4.9** (total for Sections B and C), the following trends in management protocols were seen:

The most utilised form of treatment (for NMSDs as the primary complaint) reported by participants for disorders affecting the digestive system were patient education (*n* = 39), auxiliary therapy (*n* = 28) and manipulative therapy (*n* = 23).

4.4.2 The management protocols for NMSDs as the Secondary Complaint

A similar trend was noted for Section C (secondary complaint) (total in **Table 4.11**) as the most commonly-utilised modalities were auxiliary therapy (*n* = 485), patient education (*n* = 321) and manipulative therapy (*n* = 227). For disorders affecting the digestive system (secondary complaint), auxiliary therapy (*n* = 72) was the most utilized modality reported by participants, then patient education (*n* = 48) and manipulative therapy (*n* = 37). The highest number of responses was for disorders affecting the nervous system in both Sections B (primary complaint) and C (secondary complaint).

Of the highlighted totals for Sections B (primary complaint) and C (secondary complaint) **(Table 4.9)** (the most common NMSDs seen by the participants), participants reported utilising a wide variety of treatment modalities to manage these NMSDs' irrespective of it being a primary or secondary complaint.

4.5 THE ASSOCIATION BETWEEN SELECTED DEMOGRAPHIC CHARACTERISTICS (E.G. AGE, GENDER, QUALIFICATION, INSTITUTION OF STUDY, NUMBER OF YEARS IN PRACTICE, PHILOSOPHICAL ORIENTATION) AND THE MANAGEMENT OF NMSDs

4.5.1 Introduction

The frequency of participants who utilised treatment methods compared to their demographic characteristics is tabulated in the tables in **Appendix G**. All attempts were made to condense the data; the biostatistician reported that statistical testing for associations between the various treatment protocols and demographics for each condition was inappropriate **(Appendix E)**. Therefore, the following trends for the association between the chiropractor's demographic characteristics and their management protocols are reported descriptively. When possible, weighted Pearson Chi square tests were done to derive *p*-values for this section.

When NMSDs was the primary complaint, no trends (table count less than 10) were observed for the following NMSDs in the following systems viz. CVS, Endocrine System, Respiratory System, Urinary System, Fatigue, Psychological Disorders, Allergies, Female Reproductive System and Sleep Disorders. When the NMSD was the secondary complaint, no trends were observed (table count less than 10) for the following NMSDs in the following systems viz. CVS, Endocrine System, Respiratory System, Urinary System, Infantile colic, Psychological Disorders, Allergies and the Female Reproductive System.

4.5.2 The association between participants' Age (and Gender) and the management of NMSDS

4.5.2.1 NMSDs as the Primary Complaint

For the management of NMSDs from the Digestive System, a table count greater than 10 was calculated. The majority of participants (n = 22) were between the ages of 20 and 49. Only three participants were older than 50 years. For the management of NMSDs of the Brain and Nervous System, it was observed that most participants (n = 90) were in the age group of 20-49 years and only a few participants (n = 10) were older than 50 years. No association was found between the age group of participants and the management of NMSDs of the Brain and Nervous System. However, for this system, a significant positive association ($p < 0.001$) was found between female chiropractors (table count of n = 167) and the utilisation of auxiliary therapy, compared to male chiropractors (table count of n = 108). For the management of disorders affecting the ENT, it was found that 20 participants were between the ages of 20 and 49 and only three participants were older than 50 years. The trend observed was that female chiropractors (n = 32) in this study (for disorders of the ENT)

were more likely (p = 0.069) to use auxiliary therapy than their male counterparts (n = 19). It was found that 43 participants who reported managing infantile colic were between the ages of 20-49 years and only four participants were older than 50 years. No trends or associations were observed when participants' age groups and their choice of management protocols of NMSDs (as a primary complaint) were compared.

4.5.2.2 NMSDs as the Secondary Complaint

For the management of disorders affecting the involved systems (table count greater than 10), the findings were similar to those observed in Section B (primary complaint). For the management of disorders of the Digestive System, the majority of participants (n = 34) were between the ages of 20-49 years and only two participants were older than 50 years. A participant count of 64 was observed for the age group 20-49 years for the management of disorders affecting the Brain and Nervous System. Only eight participants were older than 50 years. For this system, the trend was similar to that seen in Section B (primary complaint). A significant positive association (p < 0.001) was found between female chiropractors (table count of n = 123) who used auxiliary therapy as a treatment modality more frequently than male chiropractors (n = 72). The same trend (the majority of chiropractors were between the ages of 20-49 years) was observed for disorders affecting the ENT, Fatigue and Sleep Disorders. No trends or associations were observed when participants' age groups and their choice of management of NMSDs (as a secondary complaint) were compared.

4.5.3 The association between participants' Qualification (and Institution of study and number of years in practice) and the management of NMSDs

4.5.3.1 NMSDs as the Primary Complaint (number of years in practice)

For disorders in the Digestive System, a participant count of 19 was observed for the category of 0-15 years in practice. Only six participants were in practice for longer than 15 years. For the management of disorders affecting the Brain and Nervous System, it was observed that more participants had been in practice for 0-15 years (n = 72), compared to participants in practice for longer than 15 years (n = 28). The choice of management protocols was similar in both groups; therefore, an association could not be derived. No associations or trends were found when comparing the different categories of years in practice with the management of NMSDs as a primary complaint.

4.5.3.2 NMSDs as the Secondary Complaint (no. of years in practice)

Similar findings were observed (where the NMSD was a primary complaint) for the management of disorders affecting the Digestive System, the Brain and Nervous System,

ENT, Fatigue and Sleep Disorders where the majority of participants were in practice for 0-15 years and a minority of participants were in practice for longer than 15 years.

4.5.3.3 Participants Qualification and Institution of study

Of 73 participants, 67 chiropractors qualified with an M.Tech: Chiropractic degree and only six chiropractors qualified with a DC degree. This corresponds with the institute of study as 66 participants graduated from institutions in SA and six chiropractors graduated from institutions abroad. No associations or trends were observed, showing that participants' qualifications and institute of study did not influence their choice of management when treating NMSDs (as a primary and a secondary complaint).

4.5.4 The association between participants' Philosophical orientation and the management of NMSDs

The majority of participants (*n* = 69) adopted a 'Mixer' philosophy in practice. Only three chiropractors reported adopting a 'Straight' philosophical orientation. The methods used to manage NMSDs in this study was not exclusive to a certain philosophical orientation and it was found that most participants used multiple treatment methods to manage NMSDs (even though it is assumed that 'Straight' chiropractors utilise SMT only as a treatment method). No associations were found when participants' philosophical orientation was compared to their choice of management methods of NMSDs (as a primary and a secondary complaint).

CHAPTER FIVE
DISCUSSION

5.1 INTRODUCTION

This chapter aims to discuss the results of this study in relation to the literature.

5.2 RESPONSE RATE

A minimum response rate of 72 participants was required for generalisability (Singh 2015). A total of 73 questionnaires were returned after the researcher distributed 89 questionnaires, giving an 82% response rate.

5.3 DEMOGRAPHIC PROFILE OF THE PARTICIPANTS

5.3.1 Age and Gender

Due to the small sample size in this study, the proportion of males and females in this study e does not necessarily reflect that of chiropractors in the eThekwini district or SA. Female participants between the ages of 24 and 63 years made up the majority of the study sample (n = 39, 53.4%) while male participants between the ages of 26 and 70 were the minority (n = 34, 46.6%) of the sample. The male participants' mean age (n = 40) relative to that of female participants (n = 36) showed that male participants were likely to be older than females, however; there was not a considerable difference in age and gender proportion when compared to other studies in SA. The gender difference correlates with a recent study (n = 62) which sampled chiropractors in the eThekwini district as female chiropractors made up 55.7% of the study sample and male chiropractors, 44.3% (Lamprecht 2017). However, a comparison of the gender of chiropractors in SA shows a male predominance. A previous study which sampled chiropractors in SA (N = 669, n = 214) reported that 56.1% of South African chiropractors was male and 43.9% female (Johl 2016). The sample of chiropractors (n = 73) in this study contained a larger proportion of females (n = 39, 53.4%) than males (n = 34, 46.6%). This is in contrast to other South African studies which found the percentage (n = 388) of female chiropractors to be 45.3% and males to be 54.7% (De Gouveia 2009). A study by Gordon (2012), sampled chiropractors in SA (N = 514, n = 174) and also reported

the male gender predominance to be 58%. Studies in other countries (Homack 2005) have also reported a male predominance.

This is in keeping with the findings of previous South African studies, which found the largest proportion of chiropractors to be 30 to 40 years old (De Gouveia 2009; Gordon 2012; Lamprecht 2017). This may be explained by the fact that the chiropractic profession in SA is fairly new, with the first chiropractic institution only registering students in 1989 (Gordon 2012). In the US however, chiropractic students were registered much earlier which may explain why the mean age of chiropractors (in some parts of the US) was in the 40's (Homack 2005). Studies in other countries have also reported a male predominance. A study in New York (n = 69), reported 68.1% of respondents were male, and only 31.9% were female with a mean age of 40.6 years (Homack and Hedge, 2016).

5.3.2 Number of years in practice

In 2016 it was found that KwaZulu-Natal had the second highest number of practicing chiropractors in SA. Gauteng had the most practicing chiropractors in the country (43.4%), followed by KwaZulu-Natal (25.5%), Western Cape (18.9%), Mpumalanga (0.9%) and North West (0.9%) (Johl, 2016). It was not unexpected that the majority of chiropractors would practice in Gauteng and KwaZulu-Natal because the only two schools of chiropractic in SA are at the University of Johannesburg (Gauteng) and Durban University of Technology (KZN). The majority of participants in this study (30.1%) were in practice for five years or less. Overall, 61.2% of the chiropractors were in practice between six and 15 years with an average time in practice of 12 years. A previous study in SA reported that the most prevalent length of time in practice (of a chiropractor) was between five and 15 years (48.6%) (Johl 2016). Another local study found that chiropractors most commonly had been in practice for less than 10 years (Fletcher 2005). In comparison, international studies revealed the most prevalent length of time in practice was 16.4 years (Holm and Rose 2006). In the US, chiropractors had graduated much earlier (the first class of chiropractors in SA graduated in 1994) which may explain the difference in the average time in practice between studies done in the US and SA.

5.3.3 Full-time or part-time practice

The majority of participants (80.8%) were in clinical practice full-time (worked 40 hours or more per week). This correlates with previous studies done in SA which reported that the majority of chiropractors worked between 31 and 40 hours per week (De Gouveia 2009; Johl 2016; Lamprecht 2017). Gordon in 2012 reported that most chiropractors practiced for six to eight hours per day in a five-day week. International studies reported similar findings

(Gordon 2012). According to Lee et al. (2007), a greater number of female chiropractors worked fewer hours per week due to family and domestic responsibilities. This study, however, did not investigate gender in relation to the number of hours worked per week.

5.3.4 Other occupation/s

Only seven participants of those practicing part-time (n = 13) reported having other occupations. These included clinician, lecturer, NGO worker, spinal surgery (sales) representative, sales and "stay-at-home mum". It is hypothesised that chiropractors may engage in other occupations due to stagnant practices (based on location of practice and other negative factors) or the desire for a more productive life.

5.3.5 Qualification and Post-graduate qualifications/certifications

In SA an 'M.Tech: Chiropractic' qualification is granted, which explains why most participants (91.8%) reported having an 'M.Tech: Chiropractic' qualification, while 8.2% of participants in this study had a 'DC' qualification (participants that graduated overseas). Approximately a quarter of the study sample (19.2%) reported having post-graduate qualifications and 4.1% of respondents had another master's qualification. The most common post-graduate qualification groups were sports, extremity/footcare and diagnostic imaging. This shows that some chiropractors are interested in further learning/developing skills in certain areas (e.g. sports practitioner) so that they can specialise in practice and offer a better service to patients (e.g. athletes). A similar study (Johl 2016) in SA reported that many chiropractors have other non-chiropractic qualifications. The majority (56.9%) had a first professional degree or undergraduate degree, some (16%) had a master's degree, some (12.2%) had a post-graduate qualification and the minority (2.1%) had a doctorate (Johl 2016).

5.3.6 Supplementary courses

It was found that the majority of participants (68.5%) had completed supplementary courses, most commonly strapping/taping courses, followed by pain management courses. This is validated as most chiropractors utilise strapping/taping regularly in practice. The strapping courses offer a more thorough explanation and practical on how to strap/tape most effectively for certain disorders which facilitates the treatment effect. This coincides with a previous study conducted in SA where 68% of chiropractors had taken short supplementary courses (De Gouveia 2009). Only a few qualifications and supplementary courses (e.g. M.Tech: Homeopathy, paediatrics) are aligned with managing NMSDs as participants did not do supplementary courses in e.g. asthma or nocturnal enuresis or colic (even though some did a paediatrics course). However, the majority of participants are extending their knowledge in the management of MSDs as strapping is almost exclusively used for MSK

injuries. This shows that NMSDs are not a priority of further study. It is hypothesised that chiropractors engage in supplementary courses because of CPD points made compulsory by AHPCSA.

5.3.7 Institute and country of study

The majority of participants (90.4%) graduated from the Durban University of Technology (previously known as Durban Institute of Technology and Technikon Natal) with an M.Tech qualification. This correlates with the findings of this study as 91.8% of participants studied in SA (1 participant graduated from UJ). DUT and UJ are still currently the only chiropractic institutions in SA, which supports the findings of this research study (Gordon, 2012). In previous studies, it was similarly found that the majority of chiropractors practicing in SA, either graduated from DUT or UJ, while the minority graduated overseas (US and UK) (Johl 2016). The teachings of both universities (DUT and UJ) do not display the management of NMSDs in the syllabus, yet some chiropractors in this study are still managing NMSDs.

5.3.8 Philosophical orientation

It was found that the majority of participants (94.5%) in this study adopted a “mixer” philosophical orientation. These findings are supported by a previous SA study where the majority of chiropractors (59.2%) followed a “mixer” philosophical orientation and many (59.1%) also considered themselves evidence-based medicine practitioners (Keyter 2010). Three of the 73 participants reported following a “straight” philosophical orientation in practice. It was hypothesized that these three participants would only use SMT as the form of treatment (which is the sole form of treatment used by “straight” chiropractors). However, based on the questionnaires answered these participants did not only utilise SMT and included other treatment methods (e.g. electrical modalities) when treating patients. This suggests that the majority of chiropractors in SA practice evidence-based chiropractic and the “straight” philosophical beliefs promulgated by the teachings of DD Palmer are outdated and rejected. The chiropractic programme in SA implements a “mixer” philosophy which correlates with the findings of this study as most participants identified themselves as “mixers” and utilised “mixer” treatment methods.

5.3.9 Referrals received for NMSDs

Of the participants (n = 32, 43.8%) who reported receiving referrals for NMSDs, it was found that the greatest number of referrals was from GPs (56.3%), then other patients, paediatricians, psychologists and practitioners in the obstetric field. These findings are important as it suggests that other practitioners who refer patients (with NMSDs) to chiropractors may believe that there is a role for the chiropractic management of NMSDs, or

they may have had positive responses from it. This study did not investigate the types of conditions referred by these practitioners however, it is assumed that pediatricians may refer to chiropractors for infantile colic and psychologists/psychiatrists may refer patients for the investigation and management of chronic pain. It is unclear what types of NMSDs GPs are referring to chiropractors, but it is assumed that referrals for sinusitis or dizziness may be plausible. Studies previously done in SA found that the majority of chiropractors received referrals from other practitioners. A South African study in 2009 found that 87.3% of referrals to chiropractors came from GPs (De Gouveia 2009). Another study's findings in 2012 also found that a large number of referrals (87.7%) came from GPs (Gordon 2012). These studies, however, did not stipulate whether the referrals were for MSDs or NMSDs. Chiropractors are receiving referrals from other practitioners because chiropractic is a growing profession which is now more accepted by other practitioners and society than previously. The chiropractic profession is becoming more trusted, is a recommended form of healthcare and is growing interprofessional relationships (Gordon 2012). This proves to be beneficial to the chiropractic profession, but it is unknown from existing literature to what extent other practitioners are referring NMSDs to chiropractors.

In this study, more than half of the participants (52.1%) reported that they did not receive referrals for NMSDs. This finding correlates with the chiropractic scope of practice in SA as the management of NMSDs is not included or stipulated in the scope of practice.

5.4 THE TYPES OF NMSDS PRESENTING TO CHIROPRACTORS

5.4.1 Introduction

The management of all NMSDs which have a percentage of 50% or greater (more than 50% of the study sample said that they manage this condition either as a primary or secondary complaint) are reported on.

5.4.2 The management of NMSDS as a Primary Complaint

Of the primary NMSDs presenting to participants, the majority of chiropractors reported treating headache (not of MSK origin i.e. migraine) (89%), infantile colic (80.8%), dizziness (67.1%), vertigo (61.6%), sinus-related disorders (58.9%) and tinnitus (54.8%). In a previous study which included a number of countries (including SA), it was most common for patients to present to chiropractors for the treatment of primary complaints such as headache (NMSK origin), allergies, circulation, digestion, sinus-related disorders and vision disorders (Leboeuf-Yde et al. 2005). These findings correlate with the findings of this study for

headaches (NMSK origin) and sinus-related disorders only. However, due to the small number of NMSDs investigated in Leboeuf-Yde's study (which did not discuss dizziness, infantile colic and vertigo), the management of these disorders by a chiropractor cannot be ignored.

A randomised controlled trial in 2000, reporting on migraine headaches found a statistically significant improvement in the frequency ($p < 0.005$), disability ($p < 0.05$), duration ($p < 0.01$) and medication use ($p < 0.001$) of migraine headache sufferers after chiropractic SMT (Tuchin, Pollard and Bonello 2000). In the US, manipulative-based therapies were found to be the most frequently utilized CAM management for headache and migraine patients. Chiropractors were found to be the 2nd and 3rd most common practitioners which patients with migraines consulted within the US and Australia (Moore et al. 2018). While this finding may be true in other studies and correlates with the findings in this study, more evidence-based literature is needed to understand the role of chiropractic management in the interdisciplinary migraine management landscape. The findings of a previous survey-based study found that headache (of MSK and NMSK origin) patients make up a considerable proportion of chiropractic caseload in clinical practice (Moore et al. 2018). This correlates with the findings of this study because headache (migraine) was the most commonly managed NMSD presenting to chiropractors in the eThekwini district. Migraine sufferers may present to chiropractors in clinical practice because previous clinical observations suggest that cervical spine conditions may aggravate or cause migraine (the exact etiology of migraine remains unknown). The cervical spine has been reported to be involved in dizziness, headache and other referred pain and it was reported that decompression of C2 nerve root caused a reduction of photophobia, phonophobia, nausea and vomiting (Tuchin, Pollard and Bonello 2000). Another proposed concept for how chiropractic management could influence headache (of NMSK origin) is through variation of the pain sensitivity of the CNS (Tuchin, Pollard and Bonello 2000). Patients may also present with more than one type of headache (e.g. migraine and cervicogenic headache) which may account for the improvements reported following chiropractic treatment.

The management of infantile colic seems to be popular amongst chiropractors in the eThekwini district (more than 50% of this study sample manages infantile colic as a primary complaint - 84.3% - and has seen improvements in colicky symptoms following the management of an MSD - 60.3%). Many studies have reported on the improvement in colicky symptoms such as decreased crying, better sleep, and improvement in constipation (Mercer 1999; Ferrance and Miller 2010; Guliani et al. 2012; Rubin and Istok 2013). Most studies reported an improvement in these symptoms after only a few weeks (ranging from one to four weeks) of chiropractic SMT (Mercer 1999; Wiberg et al. 1999; Browning and

Miller 2008; Rubin and Istok 2013). A contrasting study in 2015 reported that colicky symptoms moderately improved only when chiropractic treatment was used as an adjunct to conventional medicine and was found that SMT was no more effective than placebo after a follow-up duration of 8-14 days following chiropractic intervention (Olafsdottir et al. 2001; Angus, Asgharifar and Gleberzon 2015). The etiology of infantile colic is multifactorial and poorly understood, therefore, it is difficult to assume which treatment methods may be beneficial in curing the disorder (Mercer 1999; Holm et al. 2018). A variety of interventions are used to manage infantile colic, such as SMT, counselling, dietary changes, behavioral modification, herbal teas, acupuncture and pharmaceuticals (Mercer 1999). No other studies have investigated the frequency with which chiropractors manage infantile colic, but studies have looked at the effect of chiropractic care on patients presenting with infantile colic. Although SMT is the most recognised form of chiropractic intervention, a large number of other interventions known to cure colic (except pharmaceuticals) are within the scope of practice of chiropractic. Holm et al. (2018) reported that colic may be caused by disturbance in the MSK system and Miller et al. (2012) found that moderate finger pressure (known as ischemic pressure or trigger point therapy in the chiropractic profession) on painful muscles caused a relaxation response in infants with colic. This is another reason why chiropractors may have had a successful response rate (or why chiropractors in this study may dwell into managing colic primarily) when managing infantile colic in clinical practice.

More than 50% of the study sample reported managing dizziness and vertigo as a primary complaint (dizziness - 73.1%; vertigo - 67.2%) and as a secondary complaint (dizziness - 80.3%; vertigo - 65.6%). Many studies report that patients suffering from dizziness and vertigo have shown improvements (improved balance, reduced dizziness) in these symptoms following chiropractic intervention (Strunk and Hawk 2009; Kelly and Holt 2010; Chaibi and Tuchin 2010; Kendall et al. 2018). Chiropractors in this study may treat dizziness and vertigo frequently as the majority of participants follow a “mixer” philosophy which suggests that they are evidence-based practitioners. This may propose that chiropractors are familiar with the literature regarding dizziness and vertigo and may believe that there is a place for chiropractic in the management of these disorders. In many instances, dizziness can be caused by MSDs which chiropractors are known to treat. It may be plausible that dizziness can be related to cervical proprioceptive dysfunction in a spondylotic neck which may cause/contribute to dizziness and vertigo. Chiropractic treatment can improve facet joint function which improves the symptoms of dizziness and vertigo. This may explain why dizziness and vertigo are being treated as primary complaints and also successful when treated secondarily.

5.4.3 Management of NMSDS as a Secondary Complaint

Where there were treatment responses to NMSDs following treatment of MSK conditions, ten conditions had a combined percentage of 50% or greater. The treatment of an MSD may have had unexpected responses which improved the NMSD secondary. The majority of participants reported that they noticed secondary and positive treatment responses to the management of headache (NMSK origin) (82.2%), dizziness (72.6%), constipation (68.5%), sleep disorders (64.4%), fatigue (63%), sinus-related disorders (61.6%), vertigo (57.5%), bowel disorders (56.2%), infantile colic (52.1%) and tinnitus (52.1%). In a previous study (which also included SA), it was reported that the majority of patients reported positive NMSK reactions following chiropractic care (in patients with or without NMSK complaints) for breathing, circulation, digestion and urination (Leboeuf-Yde et al. 2005). It cannot be determined which specific NMSDs were included in each of these categories, but the findings do not coincide with this study. Parkinson et al. (2011) reported that chronic pelvic pain, asthma, dysmenorrhea, constipation, vertigo and infantile colic showed the strongest positive response by clinicians for chiropractic treatment. A different study found that the most commonly reported positive NMSK reactions to chiropractic treatment was improved digestive function, improved breathing, better circulation, changes to blood pressure, better vision, less vertigo and improved hearing (Leboeuf-Yde et al. 1999). Hawk et al. (2007) described promising evidence for the potential benefit of chiropractic treatment for otitis media in children and elderly patients with pneumonia. This study did not support chiropractic management of hypertension (Hawk et al. 2007). In most of the studies, headache is excluded as a NMSD as this disorder may have been classified as MSK. In this study, headache (migraine which is a NMSD) was included; therefore, the chiropractic management of headache (migraine) could not be compared to other NMSK studies.

5.4.4 Conclusion

The findings of this research study showed that headache (migraine) was the most common NMSD managed primarily and secondary by chiropractors in the eThekwini district. The chiropractic management of headache, constipation, vertigo and infantile colic correlated with previous studies in that it is commonly treated by chiropractors as a primary and a secondary complaint (Mercer 1999; Tuchin, Pollard and Bonello 2000; Strunk and Hawk 2009; Kelly and Holt 2010; Chaibi and Tuchin 2010; Ferrance and Miller 2010; Guliani et al. 2012; Rubin and Istok 2013; Kendall et al. 2018). In a previous study, it was found that 74% of chiropractors claimed to have told most of their patients that chiropractic SMT may have NMSK effects on their bodies (Leboeuf-Yde et al. 2005). This may suggest that all chiropractors (whether they follow a “straight” or “mixer” philosophical orientation) have an

intrinsic belief that SMT may have NMSK effects; which is supported by chiropractic theories such as the viscero-somatic reflex (chapter 2). This does not necessarily suggest that 74% of chiropractors manage NMSDs as primary complaint regularly. It stands to reason that chiropractors who treat NMSDs have the understanding that their chiropractic management is a part of the overall management of the condition, i.e. they don't assume that chiropractic is all that is needed to resolve, for example, chronic sinusitis or infertility.

5.5 THE MANAGEMENT PROTOCOLS OF CHIROPRACTORS FOR NMSDS

5.5.1 Introduction

Chiropractic treatment protocols emphasize the use of manual techniques with a focus on joint adjustments (Salehi et al. 2015). Manual therapy is a hands-on approach and a type of conservative management with the purpose of diagnosing, assessing and treating symptoms and disorders (Clar et al. 2014).

Although the sample size in this study was 73, for the purpose of summarizing the data for Objectives 2 and 3, each NMSD was categorized (Table 4.3) according to the bodily system it affects (therefore, the total number of responses exceed 73).

5.5.2 The management protocols for NMSDs (Primary and Secondary complaint)

Participants reported utilising a wide variety of treatment modalities to manage the NMSDs in this study. The results revealed that participants (chiropractors who reported on interventions used) in clinical practice most frequently used auxiliary therapy (which included STT, electrical modalities, mobilisations, dry needling and strapping) when treating NMSDs (n = 472, 43%) as a primary complaint. A study by De Gouveia (2009) and Keyter (2010) found that the most commonly used treatment modalities in practice were joint mobilisations, massage, dry needling, exercise and ergonomics. Another study done in SA revealed that chiropractors in the US and SA utilised the same most commonly used treatment techniques for the management of disorders viz. diversified technique (which is taught in the chiropractic programme in SA), STT (the majority of chiropractors in that study - 94.5%) and ischemic compression (Fletcher 2005). Gordon (2012) revealed that the most commonly used techniques are diversified technique, lifestyle modification and trigger point therapy. This suggests that chiropractors in the eThekwini district (and in SA) utilise a wide variety of protocols when managing NMSDs (or MSDs), therefore revealing that chiropractors use similar treatment methods to manage disorders in general, regardless of it being a MSD or a NMSD.

The 2005 study by Leboeuf-Yde, reported that the upper cervical spine was most often linked to specific NMSDs, followed by the thoracic region (upper and lower) and the pelvic area (sacrum and coccyx included). This study did not explore the area most likely treated by the participant for NMSDs. There is inconclusive evidence on the effectiveness of chiropractic management of NMSDs, specifically for disorders such as hypertension, dysmenorrhea, asthma, COPD, infantile colic, otitis media, premenstrual syndrome and nocturnal enuresis (Clar et al. 2014). The most frequent treatment approach for the management of migraine (NMSK in origin) was advice on headache triggers (94.1% of patients), stress management (89.4%) and spinal mobilisation (88.4%). This treatment approach varied when compared to the management of cervicogenic headache (MSK in origin) as patients reported shoulder/ neck exercises, SMT and STT (massage, trigger point therapy and stretching) to be the most frequent therapeutic approach (Moore et al. 2018). A previous study conducted in the eThekwini district found that 98.6% of chiropractors would adjust patients with headaches (incl. migraine) and 66.7% of them regarded SMT as the primary treatment of choice with massage therapy being the most common modality used in conjunction with SMT (Kleingeld 2016). Another study also suggests a correlation between migraine and massage therapy as an effective non-pharmacologic treatment as there were improvements in sleep quality, migraine frequency, duration and somatic symptomology (Kirby 2011).

This study cannot discuss the management of NMSDs as a secondary complaint as participants were not trying to treat the NMSD but rather, treated the MSD (e.g. LBP) and had secondary unexpected positive responses/improvements in NMSK symptoms (e.g. constipation). Due to the fact that there is no real difference between treatment methods in the chiropractic management of NMSDs, it cannot be concluded that chiropractors in this study sample utilised a certain type of intervention for a particular NMSD. This weakens the treatment effect and shows that no single treatment is solely utilised for specific NMSDs (Leboeuf-Yde et al. 2005).

5.6 ASSOCIATION BETWEEN SELECTED DEMOGRAPHIC CHARACTERISTICS AND THE MANAGEMENT OF NMSDS

5.6.1 Introduction

These results relate to the tables in **Appendix G**. The relevant associations between the chiropractor's demographic characteristics and the management of NMSDs are discussed. The results give emphasis to descriptive statistics due to the high number of variables

utilised in this study. The existing literature for these particular associations is very limited, therefore this study's results in this section was not comparable. For the management of NMSDs as a primary complaint, no associations (table count less than 10) were observed between the chiropractors' demographics and the management of the following NMSDs in the following systems viz. CVS, Endocrine System, Respiratory System, Urinary System, Fatigue, Psychological Disorders, Allergies, Female Reproductive System and Sleep Disorders. For the management of NMSDs as a secondary complaint, no associations (table count less than 10) could be made between the chiropractors demographics and the management of the following NMSDs in the following systems viz. CVS, Endocrine System, Respiratory System, Urinary System, Infantile colic, Psychological Disorders, Allergies and Female Reproductive System.

5.6.2 The association between participants' Age (and Gender) and the management of NMSDS

Where the NMSD was the primary complaint, it was found that the majority of participants between the ages of 20-49 years managed disorders of the Digestive System, the Brain and Nervous System, ENT and Infantile colic. The minority of participants were older than 50 years. The same result was observed (majority of participants were between the ages of 20-49 years) when the NMSD was the secondary complaint for the management of disorders of the Digestive System, the Brain and Nervous System, ENT, Fatigue and Sleep Disorders. The majority of this study's sample (n = 68) was between the ages of 20-49 years old, with only 5 participants being older than 50 years. In this study it was difficult to statistically compare treatment methods used by participants in the two different age groups (20-49 years old and older than 50 years) due to the great discrepancy in sample size of the two groups. No trends or associations were observed when participants' age groups and their choice of management protocols of NMSDs were compared. However, it can be assumed that younger chiropractors utilise a wider variety of treatment methods as more students are exposed to evidence-based teachings and thus adopt a 'Mixer' philosophy. Older chiropractors have been more accepting of the teachings of DD Palmer and 'Straight' chiropractic methods which solely depended on SMT as the only form of treatment.

This study found that female chiropractors were significantly more likely to utilise auxiliary therapy more frequently than male chiropractors for Disorders of the Brain and Nervous System ($p < 0.001$). Fletcher (2005) found that when a cross tabulation of gender of the chiropractor with the number auxiliary and STT therapies was conducted, female chiropractors were found to use more modalities (4-7 different modalities) compared to male chiropractors (who used 3 modalities or less). Rupert (2000) suggests that female

practitioners may take more of an interest in preventative measures of treatment and activities as opposed to males. Also, female chiropractors may use auxiliary therapy more frequently to give patients a more thorough and long-lasting treatment effect. Based on the demographics of the participants in this study, it would seem that age and gender neither conclusively supports nor detracts from a potential positive perception of the management of NMSDs as there were very limited associations for these demographic characteristics.

5.6.3 The association between participants' Qualification (and Institution of study and no. of years in practice) and the management of NMSDs

5.6.3.1 Number of years in practice

The majority of participants (75%) in this study were in practice for 0-15 years while a minority (25%) practiced for 16 years or longer. The choice of management for NMSDs (primary and secondary complaints) was similar in both groups (0-15 years and 16 years or longer). Participants frequently utilised manipulative therapy, auxiliary therapy and patient education when managing these disorders **(Appendix G)**. No associations or trends were found when comparing the different categories of years in practice with the management of NMSDs as a primary or a secondary complaint. A study found that some chiropractors (most commonly new graduates) approach patient care from an MSK perspective solely and shy away from managing NMSDs (Parkinson et al. 2011). This may be prompted by the influence of their clinician's attitude/teachings during the chiropractic programme. Younger chiropractors who have been in practice for a short time and trained in SA (grounded by evidence-based and up to date teachings) may have knowledge of most treatment modalities and therefore be inclined to use them (Fletcher 2005). This correlates with the idea of new graduates shying away from treating NMSDs as there is no concrete evidence to support this theory.

5.6.3.2 Participants Qualification and Institution of study

The majority of participants had an M.Tech qualification (91.8%) from DUT (76.7%) and practiced for less than 10 years (52.1%). However, these demographics did not influence the choice of management of NMSDs, as participants from various institutions with either an M.Tech degree or a DC degree utilised a variety of treatment methods when managing NMSDs. No group was exclusive to a certain management method. This high usage of a variety of treatment modalities may be due to institutions in SA (DUT and UJ) including a diversity of treatment methods in their teaching curriculum (Gleberzon 2002; Keyter 2010). Auxiliary therapy is a third-year subject (curriculum in SA institutions) which covers many of the options provided for the question (in this study's questionnaire) on treatment modalities used. According to Coulter and Shekelle (2005), chiropractors in the US also utilise a wide

variety of therapies on a daily basis which correlate with the findings of this study as neither an M.Tech or a DC qualification (SA or overseas institution) influences the methods used to manage disorders. A Canadian study showed that many clinicians are actually moderately open towards the chiropractic management of NMSDs (Parkinson et al. 2011). It is likely that clinicians with less clinical experience (fewer years in practice) depend more heavily on evidence-based literature therefore, accounting for their low favourable response rate.

However, it was found that the number of years in practice, participants' qualifications and institution of study for chiropractors in the eThekwini District in this study did not have a direct influence on the management of NMSDs.

5.6.4 The association between participants' Philosophical orientation and the management of NMSDs

The majority of participants (94.5%) in this study reported adopting a "Mixer" philosophical orientation. As reported by Davies in 2018, the philosophical orientation adopted by the chiropractor, as well as the scope of practice (stipulated by AHPCSA), may have influenced participants' responses. 'Straight' chiropractors who manage NMSDs utilise SMT only as a treatment modality, whereas 'Mixer' chiropractors use a variety of treatment methods (e.g. electrical modalities, dry needling, assisted devices, mobilisations etc.) to manage these disorders (Keyter 2010). No relevant association could be made between participants' philosophical orientation and the particular management methods of NMSDs (as a variety of treatment methods were used by both 'Straights' and 'Mixers' in this study). However, it is proposed that those who adopt a "Mixer" philosophy are more likely to contribute to holistic patient care (involved in ergonomics and patient education, lifestyle modification and nutritional advice) and are more open to utilising other forms of treatment in practice (broad scope of practice) as oppose to solely using sMT ("Straight" chiropractors) as the treatment of choice.

5.6.5 Conclusion

A study by Leboeuf-Yde et al. (2005), with the objective to establish whether NMSK responses to chiropractic intervention was influenced by the chiropractor's attitude, the country of study, patients' demographics and treatment protocols, found that chiropractic practices in US, Canada, Hong-Kong, Mexico, Australia, Japan and SA treated similar NMSDs across the above countries. Similar conclusions are suggested by the results of this study. This shows that chiropractors internationally believe that there may be a role for chiropractic in the management of NMSDs and that globally, the chiropractic fraternity share similar beliefs in the management of a variety of disorders. It was also noted that there were

no significant differences in the reporting of a NMSD in relation to whether patients were treated with adjustments, assisted adjustments with devices, STT, mobilisations or other forms of therapy (Gleberzon 2002; Leboeuf-Yde et al. 2005; Fletcher 2005; Keyter 2010).

CHAPTER SIX
CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

This chapter includes a summary of the results found in this research study. Conclusions and limitations of this study are described and the recommendations for future studies are provided.

6.2 CONCLUSION

The aim of this study was to determine the nature and extent of the management of NMSDs by chiropractors in the eThekwini District. The results revealed that chiropractors in the eThekwini District are managing NMSDs as a primary complaint in clinical practice (e.g. a patient presents with dizziness and vertigo) and as a secondary complaint (e.g. a patient presents with neck pain and following treatment of the neck pain, the symptoms of dizziness and vertigo improve). The most common NMSDs presented to chiropractors (primary complaint) were headache of NMSK origin (89%), infantile colic (80.8%), dizziness (67.1%), vertigo (61.6%), sinus-related disorders (58.9%) and tinnitus (54.8%). The most frequent NMSDs for which symptomatic improvement was reported (following treatment of a MSD) seen by chiropractors were headache of NMSK origin (82.2%), dizziness (72.6%), constipation (68.5%), sleep disorders (64.4%), fatigue (63%), sinus-related disorders (61.6%), vertigo (57.5%), bowel disorders (56.2%), infantile colic (52.1%) and tinnitus (52.1%). When the results of NMSDs treated collectively (as primary and secondary complaints) were combined, it was found that the most common NMSDs treated by chiropractors in the eThekwini District were headache of NMSK origin (most commonly migraine), infantile colic, dizziness, vertigo, sinus-related disorders and tinnitus.

Chiropractors utilised a wide variety of protocols when managing NMSDs in this study. No single management protocol was exclusive to a particular NMSD. The most common methods used for the management of NMSDs in this study were manipulative therapy, auxiliary therapy and patient education.

The results of the association between the chiropractors' demographic characteristics and the management of NMSDs revealed that female chiropractors utilized auxiliary therapy more frequently than their male counterparts. Due to the age distribution of the sample (only

five participants were older than 50 years), no association was found between the age group of chiropractors and their choice of management methods. A similar finding (no association) was observed for the number of years in practice, qualification, institute of study and the chiropractors' philosophical orientation and their management of NMSDs in this study.

As reported by Leboeuf-Yde et al. (2005), some people are of the opinion that spinal adjustments may improve NMSDs (visceral disorders) whereas many others believe that adjustments only remove the symptoms that mimic organ disease.

6.3 LIMITATIONS

In this study, the researcher recruited all participants and secured informed consent of the participants immediately. For future studies, an independent person (who is not involved in the study) should obtain informed consent of participants.

This study's sample only included registered chiropractors practicing in the eThekwini District full-time and part-time. Future studies should investigate chiropractors' responses in SA so that the study could represent the whole chiropractic population as opposed to one province. This would ensure accurate and more representative results.

Questions in this study were answered based on the chiropractors' ability to recall the management of NMSDS (e.g. In Section B and Section C of the questionnaire, participants had to answer questions on patient demographics such as age of patients, gender, treatment methods used as well as the average number of consults of patients presenting with a particular NMSD). These answers were subjective and another limitation to the internal validity of this study.

Each NMSD was not defined by the researcher which allowed the chiropractor to have their own interpretation of the disorder (e.g. Some practitioners use the terms 'dizziness' and 'vertigo' interchangeably. Others distinguish between the two, as vertigo is very distinct where the patient gets a feeling of spinning or moving when they are not actually moving) (Muncie et al. 2017). Definitions of disorders may differ between the sample population which may have affected the validity of this study.

Thirty-seven NMSDs were included in this study. The large number of variables made statistical analysis challenging and laborious. According to the two statisticians' analysis, this study included numerous variables (Section B and Section C of the questionnaire) therefore associations and correlations were difficult to derive and had to be explained descriptively.

6.4 RECOMMENDATIONS

The following recommendations should be considered for future studies:

- For Section B and Section C of the questionnaire, a box marked “no modalities used” under “management protocols” should be included.
- Some sections had many elements to each question (e.g. name the disorder, patient demographics, treatment methods used, number of consultations required) which may have led to respondent fatigue and disinterest in answering the six-page questionnaire. This may have affected the face validity of the questionnaire.
- Personally delivering and picking up the questionnaire at chiropractic practices in the eThekwini District was very time consuming and expensive. Occasionally, the information (address of chiropractor’s practice) provided by AHPCSA, CASA and the internet was incorrect (chiropractor relocated, left the profession, moved practices). Future studies should use other methods of attaining responses such as SurveyMonkey or via e-mail.
- A future study with a larger representation of chiropractors across the country can be conducted to determine evolution of the profession in SA in the management of NMS conditions. The larger sample could be stratified (e.g. for age, gender, number of years in practice and philosophical orientation) to match the proportions of all registered chiropractors in SA. This would allow results to be more representative and also for associations between variables to be determined.

The results obtained from this study are beneficial to the chiropractic profession. It shows that even though the management of NMSDs is not within the chiropractic scope of practice in SA as stipulated by AHPCSA, chiropractors in the eThekwini District are still managing these disorders. The majority of them report successful responses of the NMSDs even when managing MSDs. More evidence-based studies should be conducted (and published) to determine the success of chiropractic management of NMSDs as there may or may not be a role for the chiropractic profession in this field. The profession is expanding and is gaining more recognition from the public. Therefore, it is imperative to keep up to date with developments in the profession and to identify and embrace findings on the improvement in patient management protocols. Recommendations could be made to academics involved in chiropractic such as teaching institutions, the council and professional bodies to include the results of these studies in their curriculum so that people are made aware of the potential benefits and growth of the chiropractic profession.

REFERENCES

Alcantara, J., Alcantara, J. D. and Alcantara, J. 2014. An integrative review of the literature on the chiropractic care of infants with constipation. *Complementary Therapies in Clinical Practice,* 20 (1): 32-36.

Alcantara, J., Plaugher, G., Klemp, D. D. and Salem, C. 2002. Chiropractic care of a patient with temporomandibular disorder and atlas subluxation. *Journal of Manipulative and Physiological Therapeutics,* 25 (1): 63-70.

Alcantara, J., Stern, G. and Oman, R. E. 2009. Female Infertility, Subluxation & Chiropractic Care: A Case Series and Selective Review of the Literature. *Journal of Pediatric, Maternal & Family Health:* 1-10.

Alli-Feldmann, L. R., Halpern, R., Rech, R. R., Winckler, V. G., Pedroni, J. and Galvan, J. C. 2017. Associative Study between ADHD, Anxiety, Depression, Stress and Excess Body weight in Adolescents. *Anxiety and Depression Journal,* 1 (1): 1-7.

American College of Gastroenterology: Common GI Symptoms. (online). 2019. Available: https://gi.org/topics/common-gi-symptoms/ (Accessed February 2019).

Angus, K., Asgharifar, S. and Gleberzon, B. 2015. What effect does chiropractic treatment have on gastrointestinal (GI) disorders: a narrative review of the literature. *Journal of the Canadian Chiropractic Association,* 59 (2): 122-133.

Arick, C. T. 2016. Chiropractic Management of a Patient with Chronic Fatigue: A Case Report. *Journal of Chiropractic Medicine,* 15 (4): 314-320.

Australian Spinal Research Foundation. 2017. The Vertebral Subluxation: Conceptual definition for research and practice. (review).

Bakris, G. L., Dickholtz, M., Meyer, P. M., Kravitz, G., Avery, E., Miller, M., Brown, J., Woodfield, C. and Bell, B. 2007. Atlas vertebra realignment and achievement of arterial pressure goal in hypertensive patients: a pilot study. *Journal of Human Hypertension,* 21: 347-352.

Balon, J., Aker, P. D., Crowther, E. R. and Danielson, C. 1998. A Comparison of Active and Simulated Chiropractic Manipulation as Adjunctive Treatment for Childhood Asthma. *The New England Journal of Medicine,* 339: 1013-1020.

Bastecki, A. V., Harrison, D. E. and Haas, J. W. 2004. Cervical kyphosis is a possible link to Attention-Deficit/Hyperactivity Disorder. *Journal of Manipulative and Physiological Therapeutics,* 27 (8): 1-5.

Beal, M. C. 1985. Viscerosomatic reflexes: A review. *Journal of the American Osteopathic Association,* 85 (12): 786-801.

Berg, B. 2016. Resolution of Fatigue, Malaise & Depression in a 30-Year-Old Male Following Subluxation-Based Chiropractic Care Utilizing Gonstead Technique: A Case Study. *Vertebral Spinal Research,* 2016: 10-20.

Bergmann, T. F. and Peterson, D. H. 2011. *Chiropractic Technique: Principles and Procedures.* 3rd ed. Missouri: Elsevier.

Berner, N. and DeMaria, C. 2013. Improvement of Migraines in a Child Following Cervical Curve Correction Uisng the Pierce Results System. *Journal of Pediatric, Maternal & Family Health:* 47-53.

Blomerth, P. R. 1994. Functional nocturnal enuresis. *Journal of Manipulative and Physiological Therapeutics,* 17 (5): 335-338.

Blum, C., Globe, G., Terre, L., Mirtz, T. A., Greene, L. and Globe, D. 2008. Multinational survey of chiropractic patients: reasons for seeking care. *Journal of the Canadian Chiropractic Association,* 52 (3): 175-184.

Bolton, S. and Budgell, B. 2012. Visceral responses to spinal manipulation. *Journal of Electromyography and Kinesiology,* 22: 777-784.

Borins, M. 2006. Manipulation for asthma: An evidence- based review of alternative therapies. *The Canadian Journal of Diagnosis*: 39-40.

Bromfield, B. F. 1996. Chiropractic management of primary dysmenorrhea. M.Tech, Technikon Natal.

Brown, JD. 1996. *Testing in language programs.* Upper Saddle River, NJ: Prentice Hall Regents.

Browning, M. and Miller, J. 2008. Comparison of the short-term effects of chiropractic spinal manipulation and occipito-sacral decomnpression in the treatment of infant colic: A single-blinded, randomised, comparison trial. *Clinical Chiropractic,* 11: 122-129.

Bruno, D. 2016. Study design made easy. *Medical Writing,* 25 (3): 26-30.

Chaibi, A. 2016. Chiropractic spinal manipulative therapy for migraine. PhD, University of Oslo.

Chaibi, A. and Tuchin, P. J. 2010. Chiropractic spinal manipulative treatment of cervicogenic dizziness using Gonstead method: a case study. *Journal of Chiropractic Medicine,* 10: 194-198.

Chaibi, A., Benth, J. S., Tuchin, P. J. and Russell, M. B. 2016. Chiropractic spinal manipulation therapy for migraine: a three-armed, single-blinded, placebo, randomized controlled trial. *European Journal of Neurology,* 24: 143-153.

Chapman-Smith, D. 2000. *The chiropractic profession.* Toronto: Harmony Printing Ltd.

Chiropractic Association of South Africa. 2016. *Competition Commission Report.* South Africa.

Clar, C., Tsertsvadze, A., Court, R., Hundt, G. L., Clarke, A. and Sutcliffe, P. 2014. Clinical effectiveness of manual therapy for the management of musculoskeletal and non-musculoskeletal conditions: systematic review and update of UK evidence report. *Chiropractic & Manual Therapies,* 22: 1-34.

Cohn, A. 2008. Chiropractic and the Neuroimmune Connection. *Vertebral Subluxation Research:* 1-5.

Cooper, R. A. and McKee, H. J. 2003. Chiropractic in the United States: Trends and Issues. *The Milbank Quarterly,* 81 (1): 107-138.

Coulter, I. D. and Shekelle, P. G. 2005. Chiropractic in North America: A descriptive analysis. *Journal of Manipulative and Physiological Therapeutics,* 28 (2): 83-89.

Cullinan, A. 1998. The Efficacy of Acupuncture combined with chiropractic manipulative therapy in the management of Migraines. M.Tech, Technikon Natal.

Cuthbert, S. and Rosner, A. 2010. Applied kinesiology methods for a 10-year-old child with headaches, neck pain, asthma, and reading disabilities. *Journal of Chiropractic Medicine,* 9: 138-145.

Davies, N. 2018. Perceptions of chiropractors in the eThekwini Municipality on the integration of chiropractic into the public healthcare sector of South Africa. M.Tech, Durban University of Technology.

Davis, H. and Byrley, A. 2012. Correction of Subluxation and Alleviation of Asthma Symptoms in a Pediatric Patient: A Case Study. *Journal of Pediatric, Maternal & Family Health,* 69-73.

De Gouveia, N. 2009. The knowledge, perception and utilisation of vitamin and mineral supplements, natural medicines and pharmacological agents as adjuncts to Chiropractic practice in South Africa. M.Tech, Durban University of Technology.

DeVocht, J. W. 2006. History and Overview of Theories and Methods of Chiropractic. *Clinical Orthopaedics and Related Research,* 444: 243- 249.

Dhingra, P.L. and Dhingra, S. 2014. *Diseases of the Ear, Nose and Throat & Head and Neck Surgery.* 6th ed. India: Elsevier.

Didriksen, A. and Hagen, H. 2010. Results of chiropractic treatment on 46 patients referred from an ear, nose and throat department. *Clinical Chiropractic,* 13: 261-267.

Dwyer, P. and Boysen, J. 2011. Resolution of Conductive Hearing Loss Due to Otitis Media after Chiropractic Treatment. *Journal of Clinical Chiropractic Pediatrics,* 12 (2): 903-909.

Eldred, D. and Tuchin, P. J. 1999. Treatment of acute atopic eczema by chiropractic care. *Australian Chiropractic and Osteopathy: Journal of the Chiropractic & Osteopathic College of Australasia,* 8 (3): 96-101.

Ernst, E. 2011. Chiropractic treatment for gastrointestinal problems: A systematic review of clinical trials. *Canadian Journal of Gastroenterolgy,* 25 (1): 39-40.

Ferrance, R. J. and Miller, J. 2010. Chiropractic diagnosis and management of non-musculoskeletal conditions in children and adolescents. *Chiropractic and Osteopathy,* 18: 1-8.

Fletcher, S. J. 2005. A Survey of Treatment Regimes of Chiropractors in South Africa. M.Tech, University of Johannesburg.

Gauthier, E. and Mullin, L. 2010. The Effects of Gonstead Chiropractic Care on a Patient with Primary Amenorrhea: A Case Report and Review of Related Literature. *Journal of Pediatric, Maternal & Family Health:* 116-121.

Gleberzon, B. J. 2002. Chiropractic Name Techniques in Canada: A Continued Look at the Demographic Trends and Their Impact on Issues of Jurisprudence. *Journal of the Canadian Chiropractic Association,* 46 (4): 241-253.

Goertz, C. H., Grimm, R. H., Svendsen, K. and Grandits, G. 2002. Treatment of Hypertension with Alternative Therapies (THAT) Study: A randomized clinical trial. *Journal of Hypertension*, 20: 2063-2068.

Goodsell, L. and Schneider, J. 2010. Improvement in Sleep and Quality of Life in a Child with Cerebral Palsy Undergoing Chiropractic Care. *Journal of Pediatric, Maternal & Family Health:* 130-135.

Gordon, J. 2012. A study to explore the perceptions that South African chiropractors have regarding the perceived role and impact of research within the profession. M.Tech, Durban University of Technology.

Gray, H. 1976. *Gray's Anatomy.* 29th ed. Philadelphia: Lea & Febiger.

Greene, B. R., Smith, M., Allareddy, V. and Haas, M. 2006. Referral patterns and attitudes of Primary Care Physicians towards chiropractors. *BMC Complementary and Alternative Medicine,* 6: 1-11.

Grobler, N. 1996. A study of the efficacy of chiropractic treatment in the management of functional nocturnal enuresis. M.Tech, Technikon Natal.

Guliani, K. and Rubin, D. 2012. Improvements in Developmental Delay, Colic and GERD in a Child Undergoing Chiropractic Care: A Case Report and Review of Literature. *Journal of Pediatric, Maternal & Family Health,* 1-4.

Hains, G. and Hains, F. 2000. Combined Ischemic Compression and Spinal Manipulation in the Treatment of Fibromyalgia: A Preliminary Estimate of Dose and Efficacy. *Journal of Manipulative and Physiological Therapeutics,* 23 (4): 225-230.

Hartvigsen, J. and French, S. 2017. What is chiropractic? *Chiropractic & Manual Therapies,* 25: 1-2.

Hawk, C., Khorsan, R., Lisi, A. J., Ferrance, R. J. and Evans, M. W. 2007. Chiropractic Care for Nonmusculoskeletal Conditions: A Systematic Review with Implications for Whole Systems Research. *Journal of Alternative and Complementary Medicine,* 13 (5): 491-512.

Hodgson, N. and Vaden, C. 2014. Improvement in Signs and Symptoms of ADHD and Functional Outcomes in Four Children Receiving Torque Release Chiropractic: A Case Series. *Journal of Vertebral Subluxation Research:* 55-79.

Holm, L. V., Jarbøl, D. E., Christensen, H. W., Søndergaard, J. and Hestbæk, L. 2018. The effect of chiropractic treatment on infantile colic: study protocol for a single-blind randomized controlled trial. *Chiropractic & Manual Therapies,* 26: 17.

Holm, S. M. and Rose, K. A. 2006. Work-Related Injuries of Doctors of Chiropractic in the United States. *Journal of manipulative and physiological therapeutics,* 29 (7): 518-523.

Homack, D. 2005. Occupational injuries to practicing chiropractors in New York State. *Journal of chiropractic education,* 19 (1): 16.

Homack, D. M. J. and Hedge, A. 2016. Survey of Occupational Injuries to Practicing Chiropractors. *Austin Journal of Musculoskeletal Disorders,* 3 (2): 1036-1039.

Hondras, M. A., Long, C. R. and Brennan, P. C. 1999. Spinal manipulative therapy versus a low force mimic maneuver for women with primary dysmenorrhea: A randomized, observer-blinded, clinical trial. *Association for the Study of Pain,* 81: 105-114.

Imosemi, I. O. and Atiba, F. A. 2015. Anatomical variations of the musculoskeletal system: A review of literatures. *Journal of Medicine and Medical Sciences,* 6 (7): 151-155.

Innes, S. I., Leboeuf-Yde, C. and Walker, B. F. 2018. How frequent are non-evidence-based health care beliefs in chiropractic students and do they vary across the pre-professional educational years. *Chiropractic & Manual Therapies,* 26: 1-9.

Jaeger, J., Moore, R. and Burkhardt, L. 2014. Resolution of Urinary Incontinence Following Chiropractic Biophysics Protocol to Reduce Vertebral Subluxations. *Vertebral Subluxation Research:* 145-152.

Johl, G. L. 2016. A Survey of the scope of chiropractic practice in South Africa:2015. M.Tech, University of Johannesburg.

Johnson, C., Baird, R., Dougherty, P. E., Globe, G., Green, B. N., Haneline, M., Hawk, C., Injeyan, H.S., Killinger, L., Kopansky-Giles, D., Lisi, A. J., Mior, S. A. and Smith, M. 2008. Chiropractic and Public Health: Current state and Future Vision. *Journal of Manipulative and Physiological* Therapeutics, 31: 397- 410.

Kachmar, O., Voloshyn, T. and Hordiyevych, M. 2016. Changes in muscle spasticity in patients with cerebral palsy after spinal manipulation: a case series. *Journal of Chiropractic Medicine,* 15 (4): 299-304.

Kaminskyj, A., Frazier, M., Johnstone, K. and Gleberzon, B. J. 2010. Chiropractic care for patients with asthma: A systematic review of the literature. *Journal of the Canadian Chiropractic Association,* 54 (1): 24-32.

Kaptchuk, T. J. and Eisenberg, D. M. 1998. Chiropractic: Origins, Controversies, and Contributions. (review). American Medical Association.

Karpouzis, F., Bonello, R. and Pollard, H. 2010. Chiropractic care for paediatric and adolescent Attention-Deficit/Hyperactivity Disorder: A systematic review. *Chiropractic and Osteopathy,* 18: 1-11.

Keating, J. C. 1992. The Evolution of Palmer's Metaphors and Hyptheses. *Philosophical Constructs for the Chiropractic Profession,* 2 (1): 9-19.

Keating, J. C. 1995. D.D Palmer's Forgotten Theories of Chiropractic. (presentation). Association for the History of Chiropractic.

Keating, J. C., Cleveland, C. S. and Menke, M. 2004. Chiropractic History: A Primer. (write-up). Association for the History of Chiropractic.

Kelly, D. D. and Holt, K. 2010. Resolution of Vertigo, Migraines and Neck Pain in a 12-Year-Old Boy Receiving Chiropractic Care: A Case Study. *Journal of Pediatric, Maternal & Family Health:* 150-153.

Kendall, J. C., French, S. D., Hartvigsen, J. and Azari, M. F. 2018. Chiropractic treatment including instrument-assisted manipulation for non-specific dizziness and neck pain in community-dwelling older people: a feasibility randomised sham-controlled trial. *Chiropractic & Manual Therapies,* 26: 1-11.

Kessinger, R. and Boneva, D. 1998. Changes in Visual Acuity in Patients Receiving Upper Cervical Specific Chiropractic Care. *Journal of Vertebral Subluxation Research,* 2 (1): 1-7.

Kessinger, R. C. and Moe, C. 2015. Improvement in Chronic Hypertension Following a Single Upper Cervical Adjustment: A Case Report. *Journal of Upper Cervical Chiropractic Research:* 1-5.

Keyter, K. 2010. The Perceptions of South African Chiropractors, Regarding Their Professional Identity. M.Tech, Durban University of Technology.

Kim, H. and Mazza, J. 2011. Asthma. *Allergy & Clinical Immunology,* 7 (1): 1-9.

Kingston, J., Raggio, C., Spencer, K., Stalaker, K. and Tuchin, P. J. 2010. A review of the literature on chiropractic and insomnia. *Journal of Chiropractic Medicine,* 9: 121-126.

Kirby, K. J. 2011. Is Massage Therapy Effective as A Non-Pharmacologic Treatment for Individuals Suffering from Migraines. MSc, Philadelphia College of Osteopathic Medicine.

Kleingeld, S. 2016. An investigation into the diagnosis and management of patients presenting with selected headaches by chiropractors in the greater Durban area. M.Tech, Durban University of Technology.

Klougart, N., Nilsson, N. and Jacobsen, J. 1989. Infantile colic treated by chiropractors: A prospective study of 316 cases. *Journal of Manipulative and Physiological Therapeutics,* 12 (4): 281-288.

Kongsted, A., Aambakk, B., Bossen, S. and Hestbaek, L. 2014. Brief screening questions for depression in chiropractic patients with low back pain: Identification of potentially useful questions and test of their predictive capacity. *Chiropractic & Manual Therapies,* 22: 1-8.

Kramp, M. E. 2012. Combined Manual Therapy Techniques for the Treatment of Women with Infertility: A Case Series. *Journal of the American Osteopathic Association,* 112 (10): 680-684.

Labuschagne, Q., Matsaung, B. and Mametja, K. 2017. Overview and management of type 2 diabetes mellitus. *South African Pharmaceutical Journal,* 84 (6): 29-36.

Laferrière, E. 2016. Positive chiropractic treatment outcome of migraine without aura in a 6-year-old presenting with sleep bruxism and chronic sinus congestion: a case report. *Journal of Clinical Chiropractic Pediatrics,* 15 (3): 1309-1314.

Lamprecht, A. 2017. The epidemiology of work-related musculoskeletal injuries among chiropractors in the eThekwini municipality. M.Tech, Durban University of Technology.

Leach, R. A. 2004. *The Chiropractic Theories: A Textbook of Scientific Research.* 4th ed. Maryland: Lippincott Williams & Wilkins.

Leboeuf-Yde, C., Axen, I., Ahlefeldt, G., Lidefelt, P., Rosenbaum, A. and Thurnherr, T. 1999. The types and frequencies of improved nonmusculoskeletal symptoms reported after chiropractic spinal manipulative therapy. *Journal of Manipulative and Physiological Therapeutics,* 22: 559-564.

Leboeuf-Yde, C., Pedersen, E. N., Bryner, P., Cosman, D., Hayek, R., Meeker, W. C., Shaik, J., Terrazas, O., Tucker, J. and Walsh, M. 2005. Self-reported nonmusculoskeletal responses to chiropractic intervention: a multination survey. *Journal of Manipulative and Physiological Therapeutics,* 28: 294-302.

Lee, S., McCann, D. and Messenger, J. C. 2007. Gender, Age and Working Time, In *Working Time Around the World Trends in Working Hours, Laws and Policies in a Global Comparative Perspective.* Geneva: international Labour Office: 22-63.

LeFebvre, R., Peterson, D. and Haas, M. 2012. Evidence-Based Practice and Chiropractic Care. *Journal of Evidence-Based Complementary & Alternative Medicine,* 18 (1): 75-79.

Lind, D. A., Marchal, W. G. and Mason, R. D. 2004. *Statistical Techniques in Business and Economics.* 11th ed. New Year: McGraw Hill.

Lombardi, P. and Revels, K. 2015. Resolution of Infertility Following Subluxation Based Chiropractic Care: A Case Study. *Vertebral Subluxation Research:* 99-107.

Madhu, S. V. and Srivastava, S. 2015. Diabetes Mellitus: Diagnosis and Management Guidelines. *Journal International Medical Sciences Academy,* 28 (1): 47-50.

McGregor, M., Puhl, A. A., Reinhart, C., Injeyan, H. S. and Soave, D. 2014. Differentiating intraprofessional attitudes toward paradigms in health care delivery among chiropractic factions: results from a randomly sampled survey. *BMC Complementary and Alternative Medicine,* 14: 1-8.

McLeod, S. A. 2007. *What is Validity?* (article). Available: http://www.simplypsychology.org/validity.html (Accessed June 2015).

McMasters, K. L., Wang, J., York, J., Hart, J., Neely, C. and Delaine, R. J. 2013. Blood pressure changes in African American patients receiving chiropractic care in a teaching clinic: a preliminary study. *Journal of Chiropractic Medicine,* 12: 55-59.

Mercer, C. A. 1999. A study to determine the efficacy of chiropractic spinal adjustments as a treatment protocol in the management of infantile colic. M.Tech, Technikon Natal.

Miller, J. E., Newell, D. and Bolton, J. E. 2012. Efficacy of Chiropractic Manual Therapy on Infant Colic: A Pragmatic Single-Blind, Randomized Controlled Trial. *Journal of Manipulative and Physiological Therapeutics,* 35 (8): 600-607.

Moore, C., Adams, J., Leaver, A., Lauche, R. and Sibbritt, D. 2018. The treatment of migraine patients within chiropractic: analysis of a nationally representative survey of 1869 chiropractors. *BMC Complementary and Alternative Medicine,* 17: 1-10.

Moosa, S. 2002. The Chiropractic Treatment of Primary Dysmenorrhea. M.Tech, Technikon Witwatersrand.

Morgan, J. P., Dickey, J.L., Hunt, H. H. and Hudgins, P. M. 1985. A controlled trial of spinal manipulation in the management of hypertension. *Journal of the American Osteopathic Association,* 85 (5): 308-313.

Muir, J. M. 2012. Chiropractic management of a patient with symptoms of attention-deficit/hyperactivity disorder. *Journal of Chiropractic Medicine,* 11: 221-224.

Mullinder, L. 2017. *Registrar: Allied Health Professions Council of South Africa. Personal communication.* June 2017.

Muncie, H. L., Sirmans, S. M. and James, E. 2017. Dizziness: Approach to Evaluation and Management. *American Family Physician,* 95 (3): 154-162.

Ndetan, H., Hawk, C., Ka Sekhon, V. and Chiusano, M. 2016. The Role of Chiropractic Care in the Treatment of Dizziness or Balance Disorders: Analysis of National Health Interview Survey Data. *Journal of Evidence-Based Complementary and Alternative Medicine,* 21 (2): 138-142.

Neally, R. and Alcantara, J. 2015. Resolution of Chronic Nocturnal Enuresis in Children with Asperger's Syndrome Following Subluxation Based Chiropractic Care: A Case Series. *Journal of Pediatric, Maternal & Family Health:* 131-139.

Newton, J. L. and Jones, E. J. 2010. Making sense of fatigue. *Occupational Medicine,* 60 (5): 326-329.

Noriega, A., Chung, J. and Brown, J. 2012. Improvement in a 6-year-old Child with Autism-Spectrum Disorder and Nocturnal Enuresis under Upper Cervical Chiropractic Care. *Journal of Upper Cervical Chiropractic Research:* 1-8.

Olafsdottir, E., Forshei, S., Fluge, G. and Markestad, T. 2001. Randomised controlled trial of infantile colic treated with chiropractic spinal manipulation. *Archives of Disease in Childhood,* 84 (2): 138-141.

Palmer, D. D. 1910. *The Chiropractor's Adjuster: A Textbook of the Science, Art and Philosophy of Chiropractic for Students and Practitioners.* Portland, OR: Portland Printing House.

Palmer, R. H. 2009. An investigation into patient management protocols for low back pain by chiropractors in the greater Durban area. M.Tech, Durban University of Technology.

Parkinson, J., Lau, J., Kalirah, S. and Gleberzon, B. J. 2011. Attitudes of clinicians at the Canadian Memorial Chiropractic College towards the chiropractic management of non-musculoskeletal conditions. *The Journal of the Canadian Chiropractic Association,* 55: 107-119.

Parnell, C. and Nekoomand, A. 2011. Improvement of Chronic Constipation in a 5-Year-Old Female after Chiropractic Treatment. *Journal of Clinical Chiropractic Pediatrics,* 12 (2): 924-926.

Pastellides, A. N. 2009. The Effect of Cervical and Thoracic Spinal Manipulations on Blood Pressure in Normotensive Males. M.Tech, Durban University of Technology.

Philips, R. B. 2001. The Chiropractic Paradigm. *Journal of Chiropractic Education,* 15 (2): 49- 52.

Pikalov, A. A. and Kharin, V. V. 1994. Use of spinal manipulative therapy in the treatment of duodenal ulcer: a pilot study. *Journal of Manipulative and Physiological Therapeutics,* 17 (5): 310-313.

Pohlman, K. A. and Holton-Brown, M. S. 2012. Otitis media and spinal manipulative therapy: a literature review. *Journal of Chiropractic Medicine,* 11 (3): 160-169.

Porter, N. S., Jason, L. A., Boulton, A., Bothne, N. and Coleman, B. 2010. Alternative Medical Interventions Used in the Treatment and Management of Myalgic Encephalomyelitis/Chronic Fatigue Syndrome and Fibromyalgia. *The Journal of Alternative and Complementary Medicine,* 16 (3): 238-249.

Quarterly Employment Statistics. (online). 2005. Available: http://www.statssa.gov.za>QES_JUN_05 (Accessed November 2015).

Rampersad, S. R. 2008. The Short-Term Relative Effectiveness of Two Manual Interventions in the Management of Chronic Moderate Asthma. M.Tech, Durban University of Technology.

Reed, W. R., Beavers, S., Reddy, S. K. and Kern, G. 1994. Chiropractic management of primary nocturnal enuresis. *Journal of Manipulative and Physiological Therapeutics,* 17 (9): 596-600.

Reis, C. A. A. S., Hardy, E. and de Sousa, M. H. 2010. The effectiveness of connective tissue massage in the treatment of primary dysmenorrhea among young women. *Revista Brasileira de Saúde Materno Infantil,* 10 (2): 247-256.

Rice, A. D., King, R., Reed, E. D., Patterson, K., Wurn, B. F. and Wurn, L. J. 2013. Manual Physical Therapy for Non-Surgical Treatment of Adhesion-Related Small Bowel Obstructions: Two Case Reports. *Journal of Clinical Medicine,* 2: 1-12.

Roberto, F. and Sousley, E. 2011. Resolution of Type 2 Diabetes Mellitus in a Patient Undergoing Subluxation Based Chiropractic care and Dietary Recommendations: A Case Study. *Vertebral Subluxation Research:* 73-81.

Rome, P. L. 2009. Neurovertebral Influence on Visceral and ANS Function: Some of the Evidence to Date – Part II: Somatovisceral. *Chiropractic Journal of Australia,* 39 (1): 9-33.

Rowell, R. M., Lawrence, D. J. and Hawk, C. 2006. Relief of depressive symptoms in an elderly patient with low back pain. *Clinical Chiropractic,* 9: 34-38.

Rubin, D. and Istok, M. 2013. Resolution of Infantile Colic, Torticollis, Plagiocephaly & Feeding Difficulties Following Subluxation Based Chiropractic: A Case Report. *Journal of Pediatric, Maternal & Family Health:* 24-27.

Rupert, R. L. 2000. A Survey of Practice Patterns and the Health Promotion Attitudes of US Chiropractors. Maintenance Care: Part 1. *Journal of Manipulative and Physiological Therapeutics,* 23 (1): 1-9.

Ryan, I. and Rollette, D. 2013. Improvement of Chronic Sinusitis, Constipation and Pharyngitis in a Child Following Chiropractic Care: A Case Report. *Journal of Pediatric, Maternal & Family Health:* 18-23.

Salehi, A., Hashemi, N., Imanieh, M. H. and Saber, M. 2015. Chiropractic: Is it Efficient in Treatment of Diseases? Review of Systematic Reviews. *International Journal of Community Based Nursing and Midwifery,* 3 (4): 244-254.

Saturni, S., Bellini, F., Braido, F., Paggiaro, P., Sanduzzi, A., Scichilone, N., Santus, P. A., Morandi, L. and Papi, A. 2014. Randomized controlled trials and real-life studies.

Approaches and methodologies: a clinical point of view. *Pulmonary Pharmacology & Therapeutics,* 27: 129-138.

Senzon, S. A. 2014. Chiropractic Professionalization and Accreditation: An Exploration of the History of Conflict Between Worldviews Through the Lens of Developmental Structuralism. *Journal of Chiropractic Humanities,* 21 (1): 25-48.

Shah, S. V. 2008. *Diseases of The Brain and Nervous System.* India: Team Spirit Pvt. Ltd.

Simpson, J. K. 2012. The Five Eras of Chiropractic & the future of chiropractic as seen through the eyes of a participant observer. *Chiropractic & Manual Therapies,* 20: 1-8.

Singh, D. 2015. *Biostatistician: Physics Department at the Durban University of Technology. Personal Communications with J Pillay.* April 2015.

Skugor, M. 2017. Medical Treatment of Diabetes Mellitus. *Cleveland and Clinic Journal of Medicine,* 84 (1): 57-61.

Skyes, L. M., Evans, W. G., Harryparsad, A., Gani, F. and Vally, Z. I. 2017. In my hands: Part 9: The case for Case Reports. *South African Dental Journal.* 72 (4): 184-187.

Spears, L. G. 2005. A Narrative Review of Medical, Chiropractic, and Alternative Health Practices in the Treatment of Primary Dysmenorrhea. *Journal of Chiropractic Medicine,* 4 (2): 76-88.

Strahinjevich, B., Simpson, J. K. 2018. The schism in chiropractic through the eyes of a 1st year chiropractic student. *Chiropractic & Manual Therapies,* 26: 1-12.

Strunk, R. G. and Hawk, C. 2009. Effects of chiropractic care on dizziness, neck pain, and balance: a single-group, preexperimental, feasibility study. *Journal of Chiropractic Medicine,* 8: 156-164.

Sweidan, M. J. 2015. A Pilot Study to determine the preliminary effects of Spinal Manipulative Therapy on functional dyspepsia in adults. M.Tech, Durban University of Technology.

Takeda, Y., Arai, S. and Touichi, H. 2002. Long Term Remission and Alleviation of Symptoms in Allergy and Crohn's Disease Patients Following Spinal Adjustment for Reduction of Vertebral Subluxations. *Journal of Vertebral Subluxation Research,* 4 (4): 129-141.

The Allied Health Professions Council of South Africa. 2013. Mandate of the Allied Health Professions Council of South Africa (AHPCSA) and related matters. Pretoria: AHPCSA.
The Chiropractic Association of South Africa. 2015-2016. A closer look at the world of Chiropractic.

Till, G. 2018. A brief history of Chiropractic in South Africa: 1926-1989. *The Chiropractic Clinician,* 1 (1): 1-6.

Torns, S. 2012. Atlas Vertebra Realignment and Arterial Blood Pressure Regulation in 42 Subjects. *Journal of Upper Cervical Chiropractic Research:* 40-45.

Tortora, G. J. and Derrickson, B. 2014. *Principles of anatomy & physiology.* 14th ed. United States of America: Wiley.

Trivedi, M. H. 2004. The link Between Depression and Physical Symptoms. *Primary Care Companion to the Journal of Clinical Psychiatry,* 6 (1): 12-16.

Tuchin, P. J., Pollard, H. and Bonello, R. 2000. A Randomized Controlled Trial of Chiropractic Spinal Manipulative Therapy for Migraine. *Journal of Manipulative and Physiological Therapeutics,* 23 (2): 91-95.

Van Lingen, C. 2003. A study to determine if the prevalence of spinal joint dysfunctions is influenced by whether or not infants suffer from infantile colic. M.Tech, Durban Institute of Technology.

Van Teijlingen, E. R. and Hundley, V. 2001. *The importance of pilot studies.* (online). Available: http://sru.soc.surrey.ac.uk/SRU35.html (Accessed 7 March 2016).

Vernon, H. 2010. Historical overview and update on subluxation theories. *Journal of Chiropractic Humanities,* 17: 22-32.

Wardle, J. L., Sibbritt, D. W. and Adams, J. 2013. Referrals to chiropractors and osteopaths: a survey of general practitioners in rural and regional New South Wales, Australia. *Chiropractic & Manual Therapies,* 21: 1-9.

Wearing, J., Beaumont, S., Forbes, D., Brown, B. and Engel, R. 2016. The Use of Spinal Manipulative Therapy in the Management of Chronic Obstructive Pulmonary Disease: A Systematic Review. *The Journal of Alternative and Complementary Medicine,* 22 (2): 108-114.

Whedon, E. 2013. Upper Cervical Specific Chiropractic Management of a Patient with Hypertension: A Case Report and Selective Review of the Literature. *Journal of Upper Cervical Chiropractic Research:* 1-13.

Wiberg, J. M. M., Nordsteen, J. and Nilsson, N. 1999. The short-term effect of spinal manipulation in the treatment of infantile colic: A randomized controlled clinical trial with a blinded observer. *Journal of Manipulative and Physiological Therapeutics,* 22: 517-522.

Wiles, M. R. and Diakow, P. 1982. Chiropractic and visceral disease: a brief survey. *Journal of CCA,* 26 (2): 65-68.

Willemse, I. 2009. *Statistical Methods and Calculation Skills.* 3rd ed. Cape Town: Juta % Co.

World Federation of Chiropractic (WFC) Report. 2012. *The Current Status of the Chiropractic Profession.* (report). Available: https://www.wfc.org (Accessed June 2018).

World Health Organization (WHO). 2010. *Benchmarks for Training in Osteopathy: Benchmarks for training in traditional/ complementary and alternative medicine.* Switzerland: WHO Press.

Wyatt, L. H. and Ferrance, R. J. 2006. The musculoskeletal effects of diabetes mellitus. *Journal of the Canadian Chiropractic Association,* 50 (1): 43-50.

Wyatt, L. H., Perle, S. M., Murphy, D. R. and Hyde, T. E. 2005. The necessary future of chiropractic education: A North American perspective. *Chiropractic and Osteopathy,* 13: 1-5.

Zhang, J. Q. and Snyder, B. J. 2004. Effect of the Toftness Chiropractic Adjustments for Children with Acute Otitis Media. *Journal of Vertebral Subluxation Research*: 1-4.

APPENDICES

Appendix A

Ethical approval

DUT DURBAN UNIVERSITY OF TECHNOLOGY

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

P O Box 1334, Durban, South Africa, 4001

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

www.dut.ac.za

16 May 2017

IREC Reference Number: **REC 98/16**

Ms J Pillay
P O Box 1211
Hyper by the Sea
Durban North
4051

Dear Ms Pillay

The management of non-musculoskeletal disorders by chiropractors in the eThekwini District

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

We are pleased to inform you that the questionnaire has been APPROVED; you may now proceed with data collection on the proposed project.

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

In addition, the IREC acknowledges approval from the Allied Health Professionals Council of South Africa

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

Yours Sincerely

Professor J K Adam
Chairperson: IREC

DUT DURBAN UNIVERSITY OF TECHNOLOGY
2017 -05- 16
INSTITUTIONAL RESEARCH ETHICS COMMITTEE
P O BOX 1334 DURBAN 4000 SOUTH AFRICA

Appendix B

Research Questionnaire

DUT
DURBAN UNIVERSITY OF TECHNOLOGY

Questionnaire

The Management of **Non-Musculoskeletal Disorders** (NMSD^s) by chiropractors in the eThekwini District

SECTION A – Your Demographics & Personal information
SECTION B – The management of NON –MUSCULOSKELETAL DISORDERS (NMSD^s) as the PRIMARY complaint

The questions in SECTION B relate to **non-musculoskeletal disorders** (NMSD^s) which you may manage in your Chiropractic practice; when these NMSD^s are the **primary presenting complaint** (i.e. the reason the patient presented and the main goal of the management plan).

SECTION C – The management of MUSCULOSKELETAL DISORDERS (MSD^s) as the PRIMARY complaint with NON-MUSCULOSKELETAL responses to treatment

The questions in SECTION C relate to **musculoskeletal disorders** (MSD^s) which you manage in your Chiropractic practice; when these MSD^s are the **primary presenting complaint** and are associated with unexpected or expected positive non-musculoskeletal effects/ responses.

Please answer **all the questions**, placing a tick in the relevant box like this ☐√

If you change your mind just cross out your old response and make your new choice. Your responses will be kept strictly **confidential**. **Thank you for your time.**

A. PARTICIPANT DEMOGRAPHICS

1. **What is your age?** _____Years

2. **What is your gender?**

Male	Female

3. **How many years have you been in practice?**
(If less than 1 year, please specify the number of months _____months**)**

0-5	6-10	11-15	16-20	21-30	>30

4. **What tertiary qualifications do you have (chiropractic and other)?**

MTech: Chiropractic	D.C
Post-grad qualifications (please specify)	

5. **If you have done other courses/ certifications, please stipulate what these courses were (e.g. kinesiotaping)**

_____

_____

_____

6. **Place of study of chiropractic**

Name of College/ University	
Country	

7. **Philosophical orientation**

Straight	Mixer		
(Solely believes in a spinal health care model where a subluxation may lead to nerve interference and therefore leads to disease). (Parkinson et al., 2011)	(Sets out to treat patients in a more holistic manner and who bases their practice on evidence-based research). (Parkinson et al., 2011)	No adjustments	Other (please specify) _____ _____

8. **Do you get referrals for Non-musculoskeletal complaints?**

No	**Yes** (please specify from whom)

9. **Are you in full-time or part-time practice?**

Full-time	Part-time (If so, please name the other occupation)
"are those (permanent, temporary or casual) who normally work the agreed hours i.e. 40 hours or more per week" (*Quarterly Employment Statistics*, 2005:3)	"are those (permanent, temporary or casual) who usually work less than 40 hours week" (*Quarterly Employment Statistics,* 2005:3)

SECTION B: The management of NON –MUSCULOSKELETAL (NMSD[s]) as the PRIMARY complaint

1. Do you manage any of the conditions listed below in your practice?
(Where the condition is the patient's **primary presenting complaint**)
E.g. A patient comes to you complaining of constipation (their primary presenting complaint).

1	**ADHD/ Learning disabilities**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
2	**Allergies**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
3	**Asthma**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
4	**Bladder disorders**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
5	**Bowel dysfunction (e.g. IBS)**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
6	**Cerebral palsy**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
7	**Constipation**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
8	**Clinical depression**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
9	**Cushing's disease/ syndrome**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
10	**Diabetes mellitus**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
11	**Dizziness**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
12	**Dyspepsia/ reflux**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
13	**Dysmenorrhoea**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
14	**Fatigue**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
15	**Gynaecological conditions (specify)**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
16	**Headaches (excl. cervicogenic, tension)**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
17	**Hearing loss**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
18	**Heart disease (e.g. Angina)**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
19	**Hiatus hernia**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
20	**Thyroid conditions**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
21	**Hypertension**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
22	**Infantile colic**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
23	**Infertility**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
24	**Inguinal/ femoral hernias**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
25	**Nocturnal enuresis**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
26	**Otitis media**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
27	**Parkinson's disease**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
28	**Peptic ulcers**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
29	**Respiratory tract infections**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
30	**Sinus-related conditions (excl. h/a's)**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
31	**Skin disorders (e.g. Psoriasis)**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
32	**Sleep disorders (e.g. Insomnia)**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
33	**Tinnitus**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
34	**Tonsillitis**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
35	**Ulcerative colitis and Crohn's disease**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
36	**Vertigo**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
37	**Vision disorders**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS

Other (please list below)…

38		NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
39		NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
40		NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
41		NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
42		NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS

2. NMSDs managed by you

From the list of 37+ NMSD[s] on the previous page (including those added by you), please select those conditions which you manage most frequently (from the 3rd column onwards ie: Sometimes; Very often; Always).
You may select up to a maximum of 5.

Please insert the name of the condition in the relevant places below and answer the questions for each condition. (Please try to list them in order of priority).

2.1 Name of NMSD _____

2.1.1 Into which age-group category/ies do your patients with this condition most often fall?
(You may select more than one)

Infant	Toddler	Adolescent	Adult	Geriatrics	Unsure

2.1.2 What is the gender of the majority of your patients presenting with this condition?

Female	Male	Unsure	Both

2.1.3 Please select all the treatment modalities/management protocols which you typically make use of when managing patients with this condition.
(Please circle option a. if adjustments/ SMT are your primary mode of treatment)

a. Adjustment (HVLA) / Spinal Manipulative Therapy (SMT)	
b. Soft tissue therapy (e.g. massage/ ischemic compression)	
c. Electrical-modalities (Please specify) _____	
d. Joint mobilisation	
e. Rehabilitation, stretching and/or strengthening	
f. Dry needling of myofascial trigger points	
g. Strapping/ Taping	
h. Nutritional advice	
i. Lifestyle modification advice	
j. NeuroImpulse Protocol	
k. Craniosacral therapy	
l. Referral (Please specify to whom)	
m. Other (Please specify)	

2.1.4 On **average**, how many consultations are required to manage this condition (or an episode associated with this condition):

1-3	4-6	7-9	10+	Unsure

2.2 Name of NMSD _____

2.2.1 Into which age-group category/ies do your patients with this condition most often fall?
(You may select more than one)

Infant	Toddler	Adolescent	Adult	Geriatrics	Unsure

2.2.2 What is the gender of the majority of your patients presenting with this condition?

Female	Male	Unsure	Both

2.2.3 Please select all the treatment modalities/management protocols which you typically make use of when managing patients with this condition.
(Please circle option a. if adjustments/ SMT are your primary mode of treatment)

a. Adjustment (HVLA) / Spinal Manipulative Therapy (SMT)	
b. Soft tissue therapy (e.g. massage/ ischemic compression)	
c. Electrical-modalities (Please specify) _____	
d. Joint mobilisation	
e. Rehabilitation, stretching and/or strengthening	
f. Dry needling of myofascial trigger points	
g. Strapping/ Taping	
h. Nutritional advice	
i. Lifestyle modification advice	
j. NeuroImpulse Protocol	
k. Craniosacral therapy	
l. Referral (Please specify to whom)	
m. Other (Please specify) _____	

2.2.4 On **average**, how many consultations are required to manage this condition (or an episode associated with this condition):

1-3	4-6	7-9	10+	Unsure

2.3 Name of NMSD _____

2.3.1 Into which age-group category/ies do your patients with this condition most often fall?
(You may select more than one)

Infant	Toddler	Adolescent	Adult	Geriatrics	Unsure

2.3.2 What is the gender of the majority of your patients presenting with this condition?

Female	Male	Unsure	Both

2.3.3 Please select all the treatment modalities/management protocols which you typically make use of when managing patients with this condition.
(Please circle option a. if adjustments/ SMT are your primary mode of treatment)

a. Adjustment (HVLA) / Spinal Manipulative Therapy (SMT)	
b. Soft tissue therapy (e.g. massage/ ischemic compression)	
c. Electrical-modalities (Please specify) _____	
d. Joint mobilisation	
e. Rehabilitation, stretching and/or strengthening	

f. Dry needling of myofascial trigger points	
g. Strapping/ Taping	
h. Nutritional advice	
i. Lifestyle modification advice	
j. NeuroImpulse Protocol	
k. Craniosacral therapy	
l. Referral (Please specify to whom)	
m. Other (Please specify) _____	
_____	

2.3.4 On **average**, how many consultations are required to manage this condition (or an episode associated with this condition):

1-3	4-6	7-9	10+	Unsure

2.4 Name of NMSD _____

2.4.1 Into which age-group category/ies do your patients with this condition most often fall?
(You may select more than one)

Infant	Toddler	Adolescent	Adult	Geriatrics	Unsure

2.4.2 What is the gender of the majority of your patients presenting with this condition?

Female	Male	Unsure	Both

2.4.3 Please select all the treatment modalities/management protocols which you typically make use of when managing patients with this condition.
(Please circle option a. if adjustments/ SMT are your primary mode of treatment)

a. Adjustment (HVLA) / Spinal Manipulative Therapy (SMT)	
b. Soft tissue therapy (e.g. massage/ ischemic compression)	
c. Electrical-modalities (Please specify) _____	
d. Joint mobilisation	
e. Rehabilitation, stretching and/or strengthening	
f. Dry needling of myofascial trigger points	
g. Strapping/ Taping	
h. Nutritional advice	
i. Lifestyle modification advice	
j. NeuroImpulse Protocol	
k. Craniosacral therapy	
l. Referral (Please specify to whom)	
m. Other (Please specify) _____	
_____	

2.4.4 On **average**, how many consultations are required to manage this condition (or an episode associated with this condition):

1-3	4-6	7-9	10+	Unsure

2.5 Name of NMSD _____

2.5.1 Into which age-group category/ies do your patients with this condition most often fall?
(You may select more than one)

Infant	Toddler	Adolescent	Adult	Geriatrics	Unsure

2.5.2 What is the gender of the majority of your patients presenting with this condition?

Female	Male	Unsure	Both

2.5.3 Please select all the treatment modalities/management protocols which you typically make use of when managing patients with this condition.
(Please circle option a. if adjustments/ SMT are your primary mode of treatment)

a. Adjustment (HVLA) / Spinal Manipulative Therapy (SMT)	
b. Soft tissue therapy (e.g. massage/ ischemic compression)	
c. Electrical-modalities (Please specify) _____	
d. Joint mobilisation	
e. Rehabilitation, stretching and/or strengthening	
f. Dry needling of myofascial trigger points	
g. Strapping/ Taping	
h. Nutritional advice	
i. Lifestyle modification advice	
j. NeuroImpulse Protocol	
k. Craniosacral therapy	
l. Referral (Please specify to whom)	
m. Other (Please specify) _____	

2.5.4 On **average**, how many consultations are required to manage this condition (or an episode associated with this condition):

1-3	4-6	7-9	10+	Unsure

SECTION C: The management of MUSCULOSKELETAL DISORDERS (MSD[5]) as the PRIMARY complaint with NON-MUSCULOSKELETAL responses to treatment

1. Do you manage any of the conditions listed below in your practice?

(In your practice, when treating MSD[5] as the PRIMARY complaint; do your patients experience relief from any of the NMSD[5] listed below?)

E.g. A patient comes to you complaining of low back pain and after treatment, they report relief from constipation.

1	**ADHD/ Learning disabilities**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
2	**Allergies**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
3	**Asthma**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
4	**Bladder disorders**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
5	**Bowel dysfunction (e.g. IBS)**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
6	**Cerebral palsy**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
7	**Constipation**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
8	**Clinical depression**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
9	**Cushing's disease/ syndrome**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
10	**Diabetes mellitus**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
11	**Dizziness**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
12	**Dyspepsia/ reflux**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
13	**Dysmenorrhoea**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
14	**Fatigue**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
15	**Gynaecological conditions (specify)**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
16	**Headaches (excl. cervicogenic, tension)**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
17	**Hearing loss**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
18	**Heart disease (e.g. Angina)**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
19	**Hiatus hernia**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
20	**Thyroid conditions**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
21	**Hypertension**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
22	**Infantile colic**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
23	**Infertility**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
24	**Inguinal/ femoral hernias**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
25	**Nocturnal enuresis**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
26	**Otitis media**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
27	**Parkinson's disease**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
28	**Peptic ulcers**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
29	**Respiratory tract infections**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
30	**Sinus-related conditions (excl. h/a's)**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
31	**Skin disorders (e.g. Psoriasis)**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
32	**Sleep disorders (e.g. Insomnia)**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
33	**Tinnitus**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
34	**Tonsillitis**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
35	**Ulcerative colitis and Crohn's disease**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
36	**Vertigo**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
37	**Vision disorders**	NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS

Other (please list below)…

38		NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
39		NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
40		NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
41		NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS
42		NO (NEVER)	RARELY	SOMETIMES	VERY OFTEN	ALWAYS

2. Non-musculoskeletal disorders managed by you

From the list of 37+ NMSD[5] on the previous page (including those added by you), please select those conditions which you manage **(as Non-musculoskeletal responses in the management of musculoskeletal disorders)** most frequently (from the 3rd column onwards ie: Sometimes; Very often; Always). You may select up to a maximum of 5.

Please insert the name of the condition in the relevant places below and answer the questions for each condition. (Please try to list them in order of priority).

2.1 Name of NMSD _____

2.1.1 Into which age-group category/ies do your patients with this condition most often fall?
(You may select more than one)

Infant	Toddler	Adolescent	Adult	Geriatrics	Unsure

2.1.2 What is the gender of the majority of your patients presenting with this condition?

Female	Male	Unsure	Both

2.1.3 Please select all the treatment modalities/management protocols which you typically make use of when managing patients with this condition.
(Please circle option a. if adjustments/ SMT are your primary mode of treatment)

a. Adjustment (HVLA) / Spinal Manipulative Therapy (SMT)	
b. Soft tissue therapy (e.g. massage/ ischemic compression)	
c. Electrical-modalities (Please specify) _____	
d. Joint mobilisation	
e. Rehabilitation, stretching and/or strengthening	
f. Dry needling of myofascial trigger points	
g. Strapping/ Taping	
h. Nutritional advice	
i. Lifestyle modification advice	
j. NeuroImpulse Protocol	
k. Craniosacral therapy	
l. Referral (Please specify to whom)	
m. Other (Please specify) _____	

2.1.4 On **average**, how many consultations are required to manage this condition (or an episode associated with this condition):

1-3	4-6	7-9	10+	Unsure

2.2 Name of NMSD _____

2.2.1 Into which age-group category/ies do your patients with this condition most often fall?
(You may select more than one)

Infant	Toddler	Adolescent	Adult	Geriatrics	Unsure

2.2.2 What is the gender of the majority of your patients presenting with this condition?

Female	Male	Unsure	Both

2.2.3 Please select all the treatment modalities/management protocols which you typically make use of when managing patients with this condition.
(Please circle option a. if adjustments/ SMT are your primary mode of treatment)

a. Adjustment (HVLA) / Spinal Manipulative Therapy (SMT)	
b. Soft tissue therapy (e.g. massage/ ischemic compression)	
c. Electrical-modalities (Please specify) _____	
d. Joint mobilisation	
e. Rehabilitation, stretching and/or strengthening	
f. Dry needling of myofascial trigger points	
g. Strapping/ Taping	
h. Nutritional advice	
i. Lifestyle modification advice	
j. NeuroImpulse Protocol	
k. Craniosacral therapy	
l. Referral (Please specify to whom)	
m. Other (Please specify) _____	

2.2.4 On **average**, how many consultations are required to manage this condition (or an episode associated with this condition):

1-3	4-6	7-9	10+	Unsure

2.3 Name of NMSD _____

2.3.1 Into which age-group category/ies do your patients with this condition most often fall?
(You may select more than one)

Infant	Toddler	Adolescent	Adult	Geriatrics	Unsure

2.3.2 What is the gender of the majority of your patients presenting with this condition?

Female	Male	Unsure	Both

2.3.3 Please select all the treatment modalities/management protocols which you typically make use of when managing patients with this condition.
(Please circle option a. if adjustments/ SMT are your primary mode of treatment)

a. Adjustment (HVLA) / Spinal Manipulative Therapy (SMT)	
b. Soft tissue therapy (e.g. massage/ ischemic compression)	
c. Electrical-modalities (Please specify) _____	
d. Joint mobilisation	
e. Rehabilitation, stretching and/or strengthening	
f. Dry needling of myofascial trigger points	

g. Strapping/ Taping	
h. Nutritional advice	
i. Lifestyle modification advice	
j. NeuroImpulse Protocol	
k. Craniosacral therapy	
l. Referral (Please specify to whom)	
m. Other (Please specify) _____	
_____	

2.3.4 On **average**, how many consultations are required to manage this condition (or an episode associated with this condition):

1-3	4-6	7-9	10+	Unsure

2.4 Name of NMSD _____

2.4.1 Into which age-group category/ies do your patients with this condition most often fall?
(You may select more than one)

Infant	Toddler	Adolescent	Adult	Geriatrics	Unsure

2.4.2 What is the gender of the majority of your patients presenting with this condition?

Female	Male	Unsure	Both

2.4.3 Please select all the treatment modalities/management protocols which you typically make use of when managing patients with this condition.
(Please circle option a. if adjustments/ SMT are your primary mode of treatment)

a. Adjustment (HVLA) / Spinal Manipulative Therapy (SMT)	
b. Soft tissue therapy (e.g. massage/ ischemic compression)	
c. Electrical-modalities (Please specify) _____	
d. Joint mobilisation	
e. Rehabilitation, stretching and/or strengthening	
f. Dry needling of myofascial trigger points	
g. Strapping/ Taping	
h. Nutritional advice	
i. Lifestyle modification advice	
j. NeuroImpulse Protocol	
k. Craniosacral therapy	
l. Referral (Please specify to whom)	
m. Other (Please specify) _____	
_____	

2.4.4 On **average**, how many consultations are required to manage this condition (or an episode associated with this condition):

1-3	4-6	7-9	10+	Unsure

2.5 Name of NMSD _____

2.5.1 Into which age-group category/ies do your patients with this condition most often fall?
(You may select more than one)

Infant	Toddler	Adolescent	Adult	Geriatrics	Unsure

2.5.2 What is the gender of the majority of your patients presenting with this condition?

Female	Male	Unsure	Both

2.5.3 Please select all the treatment modalities/management protocols which you typically make use of when managing patients with this condition.
(Please circle option a. if adjustments/ SMT are your primary mode of treatment)

a. Adjustment (HVLA) / Spinal Manipulative Therapy (SMT)	
b. Soft tissue therapy (e.g. massage/ ischemic compression)	
c. Electrical-modalities (Please specify) _____	
d. Joint mobilisation	
e. Rehabilitation, stretching and/or strengthening	
f. Dry needling of myofascial trigger points	
g. Strapping/ Taping	
h. Nutritional advice	
i. Lifestyle modification advice	
j. NeuroImpulse Protocol	
k. Craniosacral therapy	
l. Referral (Please specify to whom)	
m. Other (Please specify) _____	

2.5.4 On **average**, how many consultations are required to manage this condition (or an episode associated with this condition):

1-3	4-6	7-9	10+	Unsure

- END -

Appendix C

Letter of Information and Informed Consent

LETTER OF INFORMATION AND INFORMED CONSENT

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

Title of the Research Study: The management of non-musculoskeletal disorders by chiropractors in the eThekwini District.

Principal Investigator/s/researcher: Janice Pillay (B. Tech: Chiropractic)

Co-Investigator/s/supervisor/s: Dr. A van der Meulen (M. Tech: Chiropractic)
Dr. J Shaik (M. Tech: Chiropractic)

Brief Introduction and Purpose of the Study:
The possible relation between spinal manipulative therapy and the care of non-musculoskeletal disorders (NMSDˢ) has intrigued the chiropractic profession for many years. It is imperative to keep up to date with developments in the profession as well as to identify and embrace findings on the improvement in patient management and management protocols.
The aim of the study will be to determine the management of non-musculoskeletal disorders by chiropractors in the eThekwini District. The objectives will be the following:

- To determine the types of NMSDˢ presenting to chiropractors.
- To determine the management protocols of chiropractors for Non-musculoskeletal conditions.
- To determine the association between selected demographic characteristics (e.g. age, sex, qualification, place of study, number of years in practice, philosophical orientation) and the management of Non-musculoskeletal conditions.

Outline of Procedures: If you are willing and have signed the letter of informed consent (below), you are encouraged to complete the questionnaire which will be delivered to your practice. The questionnaire will take a short time to complete as it is limited to six pages.

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

Benefits: The study will indirectly benefit the participants because the study will fill in the paucity in the literature pertaining to the chiropractic care of NMSDˢ. This will allow chiropractors to be more open-minded in managing such disorders holistically in a South African context as well as assist in developing a greater understanding pertaining to this subject.

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

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

Costs of the Study: Participation in the study is not associated with any costs.

Confidentiality: Answers to the questionnaire are confidential and will not be linked to you. The letter of information and informed consent as well as the questionnaire will be stored in separate boxes as to maintain confidentiality. The questionnaire will be analysed by means of a statistician and the information will only be utilized for purposes of this research.

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

Your participation in my study will be much appreciated.
Please complete the consent form below should you wish to participate in the study.

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

Principle Researcher: Janice Pillay	076 052 3271
Supervisor: Dr. A van der Meulen	031 262 0776
Supervisor: Dr. J Shaik	031 373 2588
Insitutional Research Ethics administrator	031 373 2900
Complaints can be reported to the DVC: TIP, Prof F. Otieno on	031 373 2382 or dvctip@dut.ac.za

CONSENT

Statement of Agreement to Participate in the Research Study:

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

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

I, _____ (name of researcher) herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

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

Thank you for participating in the study.

Yours sincerely,
Janice Pillay.

Please note the following:
Research details must be provided in a clear, simple and culturally appropriate manner and prospective participants should be helped to arrive at an informed decision by use of appropriate language (grade 10 level - use Flesch Reading Ease Scores on Microsoft Word), selecting of a non-threatening environment for interaction and the availability of peer counseling (Department of Health, 2004)

If the potential participant is unable to read/illiterate, then a right thumb print is required and an impartial witness, who is literate and knows the participant e.g. parent, sibling, friend, pastor, etc. should verify in writing, duly signed that informed verbal consent was obtained (Department of Health, 2004).

If anyone makes a mistake completing this document e.g. wrong date or spelling mistake a new document has to be completed. The incomplete original document has to be kept in the participant file and not thrown away and copies thereof must be issued to the participant.

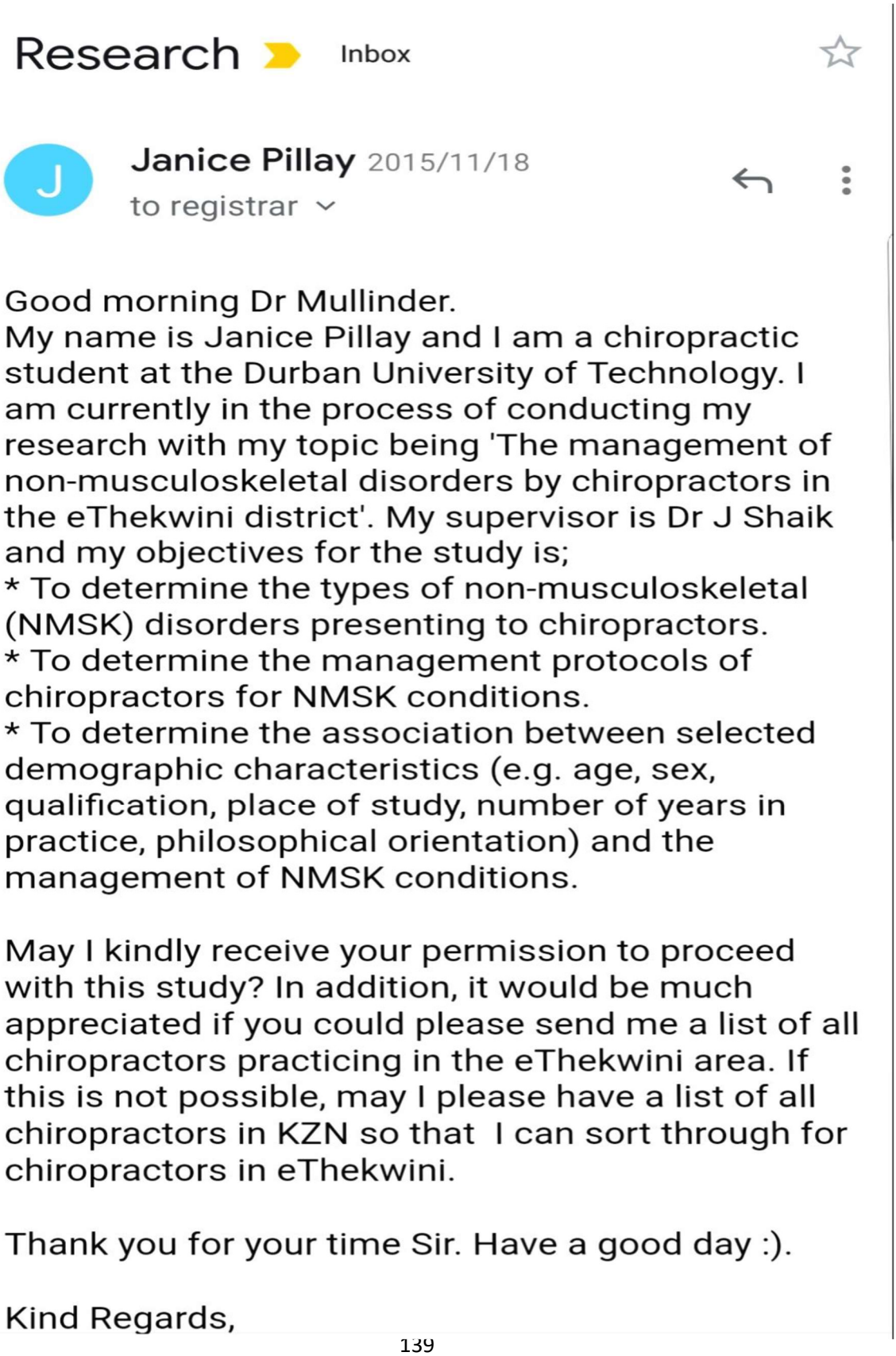
References:

Department of Health: 2004. *Ethics in Health Research: Principles, Structures and Processes* http://www.doh.gov.za/docs/factsheets/guidelines/ethics/

Department of Health. 2006. *South African Good Clinical Practice Guidelines*. 2nd Ed. Available at: http://www.nhrec.org.za/?page_id=14

Appendix D

Permission from the Registrar (AHPCSA) for the



Research Inbox

Janice Pillay 2015/11/18
to registrar

Good morning Dr Mullinder.
My name is Janice Pillay and I am a chiropractic student at the Durban University of Technology. I am currently in the process of conducting my research with my topic being 'The management of non-musculoskeletal disorders by chiropractors in the eThekwini district'. My supervisor is Dr J Shaik and my objectives for the study is;
* To determine the types of non-musculoskeletal (NMSK) disorders presenting to chiropractors.
* To determine the management protocols of chiropractors for NMSK conditions.
* To determine the association between selected demographic characteristics (e.g. age, sex, qualification, place of study, number of years in practice, philosophical orientation) and the management of NMSK conditions.

May I kindly receive your permission to proceed with this study? In addition, it would be much appreciated if you could please send me a list of all chiropractors practicing in the eThekwini area. If this is not possible, may I please have a list of all chiropractors in KZN so that I can sort through for chiropractors in eThekwini.

Thank you for your time Sir. Have a good day :).

Kind Regards,

recruitment of chiropractors

Dr. Louis Mullinder 2015/11/23

to me, camille

Dear Ms Pillay

Approved. My colleague, Ms Terry, will forward you the relevant practitioner list, thank you.

With kind regards

DR LOUIS MULLINDER

REGISTRAR: ALLIED HEALTH PROFESSIONS COUNCIL OF SOUTH AFRICA

6 CASTELLI, IL VILLAGGIO, 5 DE HAVILLAND CRESCENT SOUTH, PERSEQUOR PARK, PRETORIA

PRIVATE BAG X4, QUEENSWOOD 0121

TEL NUMBER: 012 349 2331/2332/2333, FAX NUMBER: 012 349 2327

FAX TO EMAIL: 086 507 4092

email: registrar@ahpcsa.co.za

Appendix E

Biostatics report

Biostatistics Unit

Faculty of Medicine and Health Sciences

Stellenbosch University

Janice Pillay

Chiropractic Department

DUT

25 October 2018

Re: Statistical analysis for your study

Dear Janice

Thank you for asking my opinion on the analysis of your study objective 3. In my opinion, statistical testing for associations between the various treatment protocols and demographics for each condition is in many cases not appropriate nor necessary.

Firstly, the issue of type I error rate needs to be considered. Individual hypothesis tests would need to be done for each condition, for each comparison, for each treatment modality. This would amount to hundreds of statistical tests. For each statistical test, the type I error rate is set at 0.05 or 5%. This is magnified when performing many tests, ie the test-wise error rate is multiplied by the number of tests to be performed. In your case the error rate would be unacceptably high, making the chances of false positive results too high. It would also not be feasible to control the type I error rate by using corrections for multiple testing like the Bonferroni correction method as your sample size of 73 is already small, and thus power would diminish, making type II error rate very high. Therefore type I and type II error rates prohibit the testing of all these associations.

Secondly, the assumptions of the tests would be violated in most cases due to the small counts and zero counts in many of the cells. Performing Fisher's exact tests would get around this problem to an extent but they have lower power than Chi square tests and this would contribute to the type II error problem mentioned above.

Additionally, I think it is not necessary for statistical testing to be performed. Descriptive analysis of the association between the demographic variables and the outcomes can be done by assessing trends in the tables and commenting on them without statistical inference. One needs to be cautious of overanalysing data for the sole purpose of generating p values which might not actually be valid. More useful information can be gained by describing the findings.

Yours sincerely

Tonya Esterhuizen, Biostatistician

Appendix F

Expanded tables for Objective 1

SECTION B (PRIMARY COMPLAINT)

ADHD

	Frequency	Percent	Valid Percent	Cumulative Percent
No	49	67.1	74.2	74.2
Rarely	8	11.0	12.1	86.4
Sometimes	5	6.8	7.6	93.9
Very Often	3	4.1	4.5	98.5
Always	1	1.4	1.5	100.0
Total	66	90.4	100.0	
99 (No response)	7	9.6		
Total	73	100.0		

Allergies

	Frequency	Percent	Valid Percent	Cumulative Percent
No	48	65.8	75.0	75.0
Rarely	9	12.3	14.1	89.1
Sometimes	6	8.2	9.4	98.4
Very Often	1	1.4	1.6	100.0
Total	64	87.7	100.0	
99	9	12.3		
Total	73	100.0		

Asthma

	Frequency	Percent	Valid Percent	Cumulative Percent
No	42	57.5	64.6	64.6
Rarely	14	19.2	21.5	86.2
Sometimes	7	9.6	10.8	96.9
Very Often	1	1.4	1.5	98.5
Always	1	1.4	1.5	100.0
Total	65	89.0	100.0	
99	8	11.0		
Total	73	100.0		

Bladder Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	52	71.2	77.6	77.6
Rarely	8	11.0	11.9	89.6
Sometimes	5	6.8	7.5	97.0

Very Often	1	1.4	1.5	98.5
Always	1	1.4	1.5	100.0
Total	67	91.8	100.0	
99	6	8.2		
Total	73	100.0		

Bowel Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	40	54.8	60.6	60.6
Rarely	5	6.8	7.6	68.2
Sometimes	16	21.9	24.2	92.4
Very Often	4	5.5	6.1	98.5
Always	1	1.4	1.5	100.0
Total	66	90.4	100.0	
99	7	9.6		
Total	73	100.0		

Cerebral Palsy

	Frequency	Percent	Valid Percent	Cumulative Percent
No	51	69.9	78.5	78.5
Rarely	8	11.0	12.3	90.8
Sometimes	3	4.1	4.6	95.4
Very Often	3	4.1	4.6	100.0
Total	65	89.0	100.0	
99	8	11.0		
Total	73	100.0		

Constipation

	Frequency	Percent	Valid Percent	Cumulative Percent
No	34	46.6	50.7	50.7
Rarely	14	19.2	20.9	71.6
Sometimes	13	17.8	19.4	91.0
Very Often	5	6.8	7.5	98.5
Always	1	1.4	1.5	100.0
Total	67	91.8	100.0	
99	6	8.2		
Total	73	100.0		

Clinical Depression

	Frequency	Percent	Valid Percent	Cumulative Percent
No	45	61.6	69.2	69.2
Rarely	10	13.7	15.4	84.6

Sometimes	10	13.7	15.4	100.0
Total	65	89.0	100.0	
99	8	11.0		
Total	73	100.0		

Cushing's

	Frequency	Percent	Valid Percent	Cumulative Percent
No	61	83.6	96.8	96.8
Rarely	2	2.7	3.2	100.0
Total	63	86.3	100.0	
99	10	13.7		
Total	73	100.0		

Diabetes Mellitus

	Frequency	Percent	Valid Percent	Cumulative Percent
No	55	75.3	87.3	87.3
Rarely	6	8.2	9.5	96.8
Sometimes	2	2.7	3.2	100.0
Total	63	86.3	100.0	
99	10	13.7		
Total	73	100.0		

Dizziness

	Frequency	Percent	Valid Percent	Cumulative Percent
No	18	24.7	26.9	26.9
Rarely	9	12.3	13.4	40.3
Sometimes	26	35.6	38.8	79.1
Very Often	10	13.7	14.9	94.0
Always	4	5.5	6.0	100.0
Total	67	91.8	100.0	
99	6	8.2		
Total	73	100.0		

Dyspepsia

	Frequency	Percent	Valid Percent	Cumulative Percent
No	35	47.9	51.5	51.5
Rarely	10	13.7	14.7	66.2
Sometimes	16	21.9	23.5	89.7
Very Often	6	8.2	8.8	98.5
Always	1	1.4	1.5	100.0
Total	68	93.2	100.0	
99	5	6.8		

Total	73	100.0		

Dysmenorrhea

	Frequency	Percent	Valid Percent	Cumulative Percent
No	41	56.2	63.1	63.1
Rarely	12	16.4	18.5	81.5
Sometimes	10	13.7	15.4	96.9
Very Often	1	1.4	1.5	98.5
Always	1	1.4	1.5	100.0
Total	65	89.0	100.0	
99	8	11.0		
Total	73	100.0		

Fatigue

	Frequency	Percent	Valid Percent	Cumulative Percent
No	31	42.5	46.3	46.3
Rarely	14	19.2	20.9	67.2
Sometimes	10	13.7	14.9	82.1
Very Often	11	15.1	16.4	98.5
Always	1	1.4	1.5	100.0
Total	67	91.8	100.0	
99	6	8.2		
Total	73	100.0		

Gynaecological Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	53	72.6	84.1	84.1
Rarely	6	8.2	9.5	93.7
Sometimes	4	5.5	6.3	100.0
Total	63	86.3	100.0	
99	10	13.7		
Total	73	100.0		

Headaches

	Frequency	Percent	Valid Percent	Cumulative Percent
No	4	5.5	5.8	5.8
Rarely	2	2.7	2.9	8.7
Sometimes	12	16.4	17.4	26.1
Very Often	28	38.4	40.6	66.7
Always	23	31.5	33.3	100.0
Total	69	94.5	100.0	

99	4	5.5		
Total	73	100.0		

Hearing Loss

	Frequency	Percent	Valid Percent	Cumulative Percent
No	48	65.8	73.8	73.8
Rarely	10	13.7	15.4	89.2
Sometimes	7	9.6	10.8	100.0
Total	65	89.0	100.0	
99	8	11.0		
Total	73	100.0		

Heart pathology

	Frequency	Percent	Valid Percent	Cumulative Percent
No	62	84.9	98.4	98.4
Rarely	1	1.4	1.6	100.0
Total	63	86.3	100.0	
99	10	13.7		
Total	73	100.0		

Hiatus Hernia

	Frequency	Percent	Valid Percent	Cumulative Percent
No	48	65.8	72.7	72.7
Rarely	10	13.7	15.2	87.9
Sometimes	6	8.2	9.1	97.0
Very Often	1	1.4	1.5	98.5
Always	1	1.4	1.5	100.0
Total	66	90.4	100.0	
99	7	9.6		
Total	73	100.0		

Thyroid Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	57	78.1	90.5	90.5
Rarely	6	8.2	9.5	100.0
Total	63	86.3	100.0	
99	10	13.7		
Total	73	100.0		

Hypertension

	Frequency	Percent	Valid Percent	Cumulative Percent

No	54	74.0	84.4	84.4
Rarely	5	6.8	7.8	92.2
Sometimes	5	6.8	7.8	100.0
Total	64	87.7	100.0	
99	9	12.3		
Total	73	100.0		

Infantile Colic

	Frequency	Percent	Valid Percent	Cumulative Percent
No	11	15.1	15.7	15.7
Rarely	8	11.0	11.4	27.1
Sometimes	25	34.2	35.7	62.9
Very Often	16	21.9	22.9	85.7
Always	10	13.7	14.3	100.0
Total	70	95.9	100.0	
99	3	4.1		
Total	73	100.0		

Infertility

	Frequency	Percent	Valid Percent	Cumulative Percent
No	45	61.6	70.3	70.3
Rarely	11	15.1	17.2	87.5
Sometimes	7	9.6	10.9	98.4
Very Often	1	1.4	1.6	100.0
Total	64	87.7	100.0	
99	9	12.3		
Total	73	100.0		

Inguinal/Femoral Hernia

	Frequency	Percent	Valid Percent	Cumulative Percent
No	56	76.7	87.5	87.5
Rarely	7	9.6	10.9	98.4
Sometimes	1	1.4	1.6	100.0
Total	64	87.7	100.0	
99	9	12.3		
Total	73	100.0		

Nocturnal Enuresis

	Frequency	Percent	Valid Percent	Cumulative Percent
No	49	67.1	73.1	73.1
Rarely	9	12.3	13.4	86.6
Sometimes	5	6.8	7.5	94.0

Very Often	1	1.4	1.5	95.5
Always	3	4.1	4.5	100.0
Total	67	91.8	100.0	
99	6	8.2		
Total	73	100.0		

Otitis Media

	Frequency	Percent	Valid Percent	Cumulative Percent
No	50	68.5	74.6	74.6
Rarely	8	11.0	11.9	86.6
Sometimes	6	8.2	9.0	95.5
Very Often	1	1.4	1.5	97.0
Always	2	2.7	3.0	100.0
Total	67	91.8	100.0	
99	6	8.2		
Total	73	100.0		

Parkinson's

	Frequency	Percent	Valid Percent	Cumulative Percent
No	55	75.3	84.6	84.6
Rarely	5	6.8	7.7	92.3
Sometimes	5	6.8	7.7	100.0
Total	65	89.0	100.0	
99	8	11.0		
Total	73	100.0		

Peptic Ulcers

	Frequency	Percent	Valid Percent	Cumulative Percent
No	56	76.7	86.2	86.2
Rarely	5	6.8	7.7	93.8
Sometimes	4	5.5	6.2	100.0
Total	65	89.0	100.0	
99	8	11.0		
Total	73	100.0		

Respiratory tract Infections

	Frequency	Percent	Valid Percent	Cumulative Percent
No	54	74.0	84.4	84.4
Rarely	5	6.8	7.8	92.2
Sometimes	4	5.5	6.3	98.4
Very Often	1	1.4	1.6	100.0
Total	64	87.7	100.0	

Missing	99	9	12.3		
		73	100.0		

Sinus related Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	24	32.9	35.8	35.8
Rarely	13	17.8	19.4	55.2
Sometimes	20	27.4	29.9	85.1
Very Often	6	8.2	9.0	94.0
Always	4	5.5	6.0	100.0
Total	67	91.8	100.0	
99	6	8.2		
Total	73	100.0		

Skin Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	55	75.3	85.9	85.9
Rarely	7	9.6	10.9	96.9
Sometimes	2	2.7	3.1	100.0
Total	64	87.7	100.0	
99	9	12.3		
Total	73	100.0		

Sleep Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	41	56.2	60.3	60.3
Rarely	12	16.4	17.6	77.9
Sometimes	10	13.7	14.7	92.6
Very Often	4	5.5	5.9	98.5
Always	1	1.4	1.5	100.0
Total	68	93.2	100.0	
99	5	6.8		
Total	73	100.0		

Tinnitus

	Frequency	Percent	Valid Percent	Cumulative Percent
No	26	35.6	39.4	39.4
Rarely	20	27.4	30.3	69.7
Sometimes	17	23.3	25.8	95.5
Very Often	2	2.7	3.0	98.5
Always	1	1.4	1.5	100.0
Total	66	90.4	100.0	

99	7	9.6		
Total	73	100.0		

Tonsillitis

	Frequency	Percent	Valid Percent	Cumulative Percent
No	63	86.3	96.9	96.9
Rarely	2	2.7	3.1	100.0
Total	65	89.0	100.0	
99	8	11.0		
Total	73	100.0		

Ulcerative Colitis/Crohn's Disease

	Frequency	Percent	Valid Percent	Cumulative Percent
No	56	76.7	87.5	87.5
Rarely	6	8.2	9.4	96.9
Sometimes	2	2.7	3.1	100.0
Total	64	87.7	100.0	
99	9	12.3		
Total	73	100.0		

Vertigo

	Frequency	Percent	Valid Percent	Cumulative Percent
No	22	30.1	32.8	32.8
Rarely	10	13.7	14.9	47.8
Sometimes	24	32.9	35.8	83.6
Very Often	9	12.3	13.4	97.0
Always	2	2.7	3.0	100.0
Total	67	91.8	100.0	
99	6	8.2		
Total	73	100.0		

Vision Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	47	64.4	73.4	73.4
Rarely	12	16.4	18.8	92.2
Sometimes	5	6.8	7.8	100.0
Total	64	87.7	100.0	
99	9	12.3		
Total	73	100.0		

SECTION C (SECONDARY COMPLAINT)

ADHD

	Frequency	Percent	Valid Percent	Cumulative Percent
No	40	54.8	63.5	63.5
Rarely	7	9.6	11.1	74.6
Sometimes	12	16.4	19.0	93.7
Very Often	3	4.1	4.8	98.4
Always	1	1.4	1.6	100.0
Total	63	86.3	100.0	
99	10	13.7		
Total	73	100.0		

Allergies

	Frequency	Percent	Valid Percent	Cumulative Percent
No	33	45.2	54.1	54.1
Rarely	11	15.1	18.0	72.1
Sometimes	14	19.2	23.0	95.1
Very Often	3	4.1	4.9	100.0
Total	61	83.6	100.0	
99	12	16.4		
Total	73	100.0		

Asthma

	Frequency	Percent	Valid Percent	Cumulative Percent
No	32	43.8	50.0	50.0
Rarely	9	12.3	14.1	64.1
Sometimes	18	24.7	28.1	92.2
Very Often	5	6.8	7.8	100.0
Total	64	87.7	100.0	
99	9	12.3		
Total	73	100.0		

Bladder Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	44	60.3	67.7	67.7
Rarely	10	13.7	15.4	83.1
Sometimes	6	8.2	9.2	92.3

Very Often	5	6.8	7.7	100.0
Total	65	89.0	100.0	
99	8	11.0		
Total	73	100.0		

Bowel Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	21	28.8	33.9	33.9
Rarely	9	12.3	14.5	48.4
Sometimes	18	24.7	29.0	77.4
Very Often	14	19.2	22.6	100.0
Total	62	84.9	100.0	
99	11	15.1		
Total	73	100.0		

Cerebral Palsy

	Frequency	Percent	Valid Percent	Cumulative Percent
No	52	71.2	88.1	88.1
Rarely	3	4.1	5.1	93.2
Sometimes	4	5.5	6.8	100.0
Total	59	80.8	100.0	
99	14	19.2		
Total	73	100.0		

Constipation

	Frequency	Percent	Valid Percent	Cumulative Percent
No	17	23.3	25.4	25.4
Rarely	12	16.4	17.9	43.3
Sometimes	22	30.1	32.8	76.1
Very Often	16	21.9	23.9	100.0
Total	67	91.8	100.0	
99	6	8.2		
Total	73	100.0		

Clinical Depression

	Frequency	Percent	Valid Percent	Cumulative Percent
No	32	43.8	51.6	51.6
Rarely	13	17.8	21.0	72.6
Sometimes	17	23.3	27.4	100.0
Total	62	84.9	100.0	
99	11	15.1		
Total	73	100.0		

Cushing's

	Frequency	Percent	Valid Percent	Cumulative Percent
No	60	82.2	98.4	98.4
Sometimes	1	1.4	1.6	100.0
Total	61	83.6	100.0	
99	12	16.4		
Total	73	100.0		

Diabetes Mellitus

	Frequency	Percent	Valid Percent	Cumulative Percent
No	57	78.1	93.4	93.4
Rarely	3	4.1	4.9	98.4
Very Often	1	1.4	1.6	100.0
Total	61	83.6	100.0	
99	12	16.4		
Total	73	100.0		

Dizziness

	Frequency	Percent	Valid Percent	Cumulative Percent
No	13	17.8	19.7	19.7
Rarely	7	9.6	10.6	30.3
Sometimes	28	38.4	42.4	72.7
Very Often	16	21.9	24.2	97.0
Always	2	2.7	3.0	100.0
Total	66	90.4	100.0	
99	7	9.6		
Total	73	100.0		

Dyspepsia

	Frequency	Percent	Valid Percent	Cumulative Percent
No	29	39.7	44.6	44.6
Rarely	10	13.7	15.4	60.0
Sometimes	18	24.7	27.7	87.7
Very Often	8	11.0	12.3	100.0
Total	65	89.0	100.0	
99	8	11.0		
Total	73	100.0		

Dysmenorrhea

	Frequency	Percent	Valid Percent	Cumulative Percent
No	31	42.5	48.4	48.4
Rarely	9	12.3	14.1	62.5
Sometimes	15	20.5	23.4	85.9
Very Often	9	12.3	14.1	100.0
Total	64	87.7	100.0	
99	9	12.3		
Total	73	100.0		

Fatigue

	Frequency	Percent	Valid Percent	Cumulative Percent
No	18	24.7	28.1	28.1
Rarely	9	12.3	14.1	42.2
Sometimes	20	27.4	31.3	73.4
Very Often	17	23.3	26.6	100.0
Total	64	87.7	100.0	
99	9	12.3		
Total	73	100.0		

Gynaecological Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	45	61.6	72.6	72.6
Rarely	13	17.8	21.0	93.5
Sometimes	2	2.7	3.2	96.8
Very Often	1	1.4	1.6	98.4
Always	1	1.4	1.6	100.0
Total	62	84.9	100.0	
99	11	15.1		
Total	73	100.0		

Headaches

	Frequency	Percent	Valid Percent	Cumulative Percent
No	8	11.0	11.8	11.8
Rarely	1	1.4	1.5	13.2
Sometimes	13	17.8	19.1	32.4
Very Often	36	49.3	52.9	85.3
Always	10	13.7	14.7	100.0
Total	68	93.2	100.0	

99	5	6.8		
Total	73	100.0		

Hearing Loss

	Frequency	Percent	Valid Percent	Cumulative Percent
No	39	53.4	62.9	62.9
Rarely	16	21.9	25.8	88.7
Sometimes	7	9.6	11.3	100.0
Total	62	84.9	100.0	
99	11	15.1		
Total	73	100.0		

Heart Pathology

	Frequency	Percent	Valid Percent	Cumulative Percent
No	58	79.5	95.1	95.1
Rarely	3	4.1	4.9	100.0
Total	61	83.6	100.0	
99	12	16.4		
Total	73	100.0		

Hiatus Hernia

	Frequency	Percent	Valid Percent	Cumulative Percent
No	48	65.8	77.4	77.4
Rarely	7	9.6	11.3	88.7
Sometimes	5	6.8	8.1	96.8
Very Often	1	1.4	1.6	98.4
Always	1	1.4	1.6	100.0
Total	62	84.9	100.0	
99	11	15.1		
Total	73	100.0		

Thyroid Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	58	79.5	95.1	95.1
Rarely	3	4.1	4.9	100.0
Total	61	83.6	100.0	
99	12	16.4		
Total	73	100.0		

Hypertension

	Frequency	Percent	Valid Percent	Cumulative Percent
No	40	54.8	64.5	64.5
Rarely	6	8.2	9.7	74.2

Sometimes	12	16.4	19.4	93.5
Very Often	3	4.1	4.8	98.4
Always	1	1.4	1.6	100.0
Total	62	84.9	100.0	
99	11	15.1		
Total	73	100.0		

Infantile Colic

	Frequency	Percent	Valid Percent	Cumulative Percent
No	25	34.2	39.7	39.7
Rarely	5	6.8	7.9	47.6
Sometimes	13	17.8	20.6	68.3
Very Often	14	19.2	22.2	90.5
Always	6	8.2	9.5	100.0
Total	63	86.3	100.0	
99	10	13.7		
Total	73	100.0		

Infertility

	Frequency	Percent	Valid Percent	Cumulative Percent
No	45	61.6	75.0	75.0
Rarely	10	13.7	16.7	91.7
Sometimes	4	5.5	6.7	98.3
Very Often	1	1.4	1.7	100.0
Total	60	82.2	100.0	
99	13	17.8		
Total	73	100.0		

Inguinal/Femoral Hernia

	Frequency	Percent	Valid Percent	Cumulative Percent
No	58	79.5	95.1	95.1
Rarely	3	4.1	4.9	100.0
Total	61	83.6	100.0	
99	12	16.4		
Total	73	100.0		

Nocturnal Enuresis

	Frequency	Percent	Valid Percent	Cumulative Percent
No	47	64.4	75.8	75.8
Rarely	3	4.1	4.8	80.6
Sometimes	7	9.6	11.3	91.9
Very Often	5	6.8	8.1	100.0

Total	62	84.9	100.0	
99	11	15.1		
Total	73	100.0		

Otitis Media

	Frequency	Percent	Valid Percent	Cumulative Percent
No	48	65.8	77.4	77.4
Rarely	7	9.6	11.3	88.7
Sometimes	5	6.8	8.1	96.8
Very Often	2	2.7	3.2	100.0
Total	62	84.9	100.0	
99	11	15.1		
Total	73	100.0		

Parkinson's

	Frequency	Percent	Valid Percent	Cumulative Percent
No	55	75.3	90.2	90.2
Rarely	3	4.1	4.9	95.1
Sometimes	3	4.1	4.9	100.0
Total	61	83.6	100.0	
99	12	16.4		
Total	73	100.0		

Peptic Ulcers

	Frequency	Percent	Valid Percent	Cumulative Percent
No	55	75.3	90.2	90.2
Rarely	4	5.5	6.6	96.7
Sometimes	1	1.4	1.6	98.4
Very Often	1	1.4	1.6	100.0
Total	61	83.6	100.0	
99	12	16.4		
Total	73	100.0		

Respiratory tract Infections

	Frequency	Percent	Valid Percent	Cumulative Percent
No	45	61.6	73.8	73.8
Rarely	9	12.3	14.8	88.5
Sometimes	5	6.8	8.2	96.7
Very Often	2	2.7	3.3	100.0
Total	61	83.6	100.0	
99	12	16.4		
Total	73	100.0		

Sinus related Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	19	26.0	29.7	29.7
Rarely	5	6.8	7.8	37.5
Sometimes	28	38.4	43.8	81.3
Very Often	10	13.7	15.6	96.9
Always	2	2.7	3.1	100.0
Total	64	87.7	100.0	
99	9	12.3		
Total	73	100.0		

Skin Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	50	68.5	82.0	82.0
Rarely	6	8.2	9.8	91.8
Sometimes	4	5.5	6.6	98.4
Very Often	1	1.4	1.6	100.0
Total	61	83.6	100.0	
99	12	16.4		
Total	73	100.0		

Sleep Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	20	27.4	29.9	29.9
Rarely	8	11.0	11.9	41.8
Sometimes	32	43.8	47.8	89.6
Very Often	7	9.6	10.4	100.0
Total	67	91.8	100.0	
99	6	8.2		
Total	73	100.0		

Tinnitus

	Frequency	Percent	Valid Percent	Cumulative Percent
No	24	32.9	38.7	38.7
Rarely	15	20.5	24.2	62.9
Sometimes	23	31.5	37.1	100.0
Total	62	84.9	100.0	
99	11	15.1		
Total	73	100.0		

Tonsillitis

	Frequency	Percent	Valid Percent	Cumulative Percent
No	56	76.7	91.8	91.8
Rarely	4	5.5	6.6	98.4
Sometimes	1	1.4	1.6	100.0
Total	61	83.6	100.0	
99	12	16.4		
Total	73	100.0		

Ulcerative Colitis/Crohn's Disease

	Frequency	Percent	Valid Percent	Cumulative Percent
No	53	72.6	88.3	88.3
Rarely	3	4.1	5.0	93.3
Sometimes	4	5.5	6.7	100.0
Total	60	82.2	100.0	
99	13	17.8		
Total	73	100.0		

Vertigo

	Frequency	Percent	Valid Percent	Cumulative Percent
No	22	30.1	34.4	34.4
Rarely	7	9.6	10.9	45.3
Sometimes	23	31.5	35.9	81.3
Very Often	10	13.7	15.6	96.9
Always	2	2.7	3.1	100.0
Total	64	87.7	100.0	
99	9	12.3		
Total	73	100.0		

Vision Disorders

	Frequency	Percent	Valid Percent	Cumulative Percent
No	40	54.8	64.5	64.5
Rarely	8	11.0	12.9	77.4
Sometimes	13	17.8	21.0	98.4
Very Often	1	1.4	1.6	100.0
Total	62	84.9	100.0	
99	11	15.1		
Total	73	100.0		

Appendix G

Expanded tables for Objectives 2 and 3

SECTION B (PRIMARY COMPLAINT)

- ALLERGIES

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	REHAB TOTAL	DN TOTAL	NUTRITION TOTAL	L/S TOTAL	REFERRAL TOTAL
Gender	Male- 1	1								
	Female- 1	1	1	1	1	1	1	1	1	1
Age	20 - 29- 1	1								
	30 - 39- 1	1	1	1	1	1	1	1	1	1
	40 - 49									
	50 - 59									
	60 - 69									
	70 - 79									
Years in Practice	0-5 1	1								
	6-10 1	1	1	1	1	1	1	1	1	1
	1 1 - 1 5									
	16-20									
	21-30									
	>30									

- CARDIOVASCULAR SYSTEM (CVS) (includes hypertension and heart pathology)

Participants did not respond to this question for heart pathology.

HYPERTENSION

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	NUTRITION TOTAL	L/S TOTAL	REFERRAL TOTAL
Gender	Male- 1			1		1		1	1	1	1
	Female- 1	1	1	1	1	1	1	1	1	1	
Age	20 - 29- 2	1	1	2	1	2	1	2	2	2	1
	30 - 39										
	40 - 49										
	50 - 59										
	60 - 69										
	70 - 79										
Years in Practice	0-5 (2)	1	1	2	1	2	1	2	2	2	1
	6 -1 0										
	1 1 - 1 5										
	16-20										
	21-30										
	>30										

- DISORDERS OF THE GUT (includes bowel disorders, dyspepsia, ulcerative colitis and Crohn's disease, peptic ulcers, constipation, hiatus hernia, inguinal and femoral hernia)

Participants did not respond to this question for ulcerative colitis and Crohn's disease, and for inguinal and femoral hernia.

BOWEL DISORDERS

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	NUTRITION TOTAL	L/S TOTAL	REFERRAL TOTAL
Gender	Male- 5	5	1	4	2	2	4	1	3	5	3
	Female- 1	1		1					1	1	
Age	20 - 29										
	30 - 39- 4	4		3	2	2	3	1	2	4	2
	40 - 49										
	50 - 59										
	60 - 69- 1	1		1					1	1	
	70 - 79- 1	1	1	1			1		1	1	1
Years in Practice	0-5										
	6 - 1 0 (3)	3		2	2	2	2	1	2	3	2
	1 1 - 1 5 (1)										
	16-20										
	21-30										
	>30 (2)	2	1	2			1		2	2	1

DYSPEPSIA

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL	REFERRAL TOTAL
Gender	Male- 4	4	1	1	1	1	1	2	3		1
	Female- 4	1	1	2	1	1		4	1	2	1
Age	20 - 29- 1							1		1	
	30 - 39- 5	3	2	2	2	1		4	2	1	1
	40 - 49- 2	2		1		1	1	1	2		1
	50 - 59										
	60 - 69										
	70 - 79										
Years in Practice	0-5 (3)	2	2	1	1			2	1	1	
	6-10 (1)			1		1		1	1		
	1 1 - 1 5 (2)	1			1			2		1	1
	16-20 (2)	2		1		1	1	1	1		1
	21-30										
	>30										

PEPTIC ULCERS

		SMT TOTAL	SMT MAIN TOTAL
Gender	Male-		
	Female- 1	1	1
Age	20 - 29- 1	1	1
	30 - 39		
	40 - 49		
	50 - 59		
	60 - 69		
	70 - 79		
Years in Practice	0-5 (1)	1	1
	6 -1 0		
	1 1 - 1 5		
	16-20		
	21-30		
	>30		

CONSTIPATION

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MOBS TOTAL	NUTRITION TOTAL	L/S TOTAL	CST TOTAL
Gender	Male- 1	1						
	Female- 5	4	2	4	2	4	3	1
Age	20 - 29- 2	2		1				
	30 - 39- 3	2	1	2	2	3	2	1
	40 - 49							
	50 - 59							
	60 - 69- 1	1		1		1	1	
	70 - 79							
Years in Practice	0-5 (4)	4	2	3	1	2	1	
	6 - 1 0 (1)				1	1	1	1
	1 1 - 1 5							
	16-20							
	21-30							
	>30 (1)	1						

HIATUS HERNIA

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	NUTRITION TOTAL	L/S TOTAL	REFERRAL TOTAL
Gender	Male- 2	1		2		1		1	1	
	Female- 2	2	1	2	1	1	1	1	1	1
Age	20 - 29-									
	30 - 39- 2	1		2		1		1	1	1
	40 - 49- 2	2	1	2	1	1	1	1	1	
	50 - 59									
	60 - 69									
	70 - 79									
Years in Practice	0-5 (1)	1		1		1		1	1	1
	6 - 1 0									
	1 1 - 1 5 (2)	1		2		1		1	1	
	16-20									
	21-30 (1)	1	1	1	1		1			
	>30									

- ENDOCRINE SYSTEM (includes diabetes mellitus, thyroid disorders, cushing's syndrome)

Participants did not respond to this question for thyroid disorders and cushing's syndrome.

DIABETES MELLITUS

		SMT TOTAL	STT TOTAL	MOBS TOTAL	L/S TOTAL	NIP TOTAL
Gender	Male-					
	Female- 1	1	1	1	1	
Age	20 - 29- 1	1	1	1	1	
	30 - 39					
	40 - 49					
	50 - 59					
	60 - 69					
	70 - 79					
Years in Practice	0-5 (1)	1	1	1	1	
	10-Jun					
	1 1 - 1 5					
	16-20					
	21-30					
	>30					

- EAR, NOSE AND THROAT (ENT) (includes sinus-related disorders, otitis media, tonsillitis, tinnitus, hearing loss)

Participants did not respond to this question for tonsillitis and hearing loss.

SINUS - RELATED DISORDERS

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	CST TOTAL	REFERRAL TOTAL
Gender	Male- 7	6	2	7		3	1	4	1	6	5	1	4
	Female- 12	10	4	11	5	4	2	9		7	8	2	1
Age	20 - 29- 4	3	1	4	1	1	1	3	1	3	2		2
	30 - 39- 4	3		4	1	2	2	3		3	3		1
	40 - 49- 8	7	3	7	3	4		6		4	5	1	1
	50 - 59- 1	1	1	1				1		1	1		
	60 - 69- 1	1		1						1	1	1	
	70 - 79- 1	1	1	1						1	1	1	1
Years in Practice	0-5 (4)	3	1	4	1	1	1	3	1	3	2		2
	6-10 (4)	4	1	4	1	3	2	2		4	4		1
	1 1 - 1 5(5)	4	1	4	2	2		5		2	3		1
	16-20 (3)	3	1	3	1	1		2		1	1		
	21-30 (1)	1	1	1				1		1	1		
	>30 (2)	2	1	2						2	2	2	1

OTITIS MEDIA

		SMT TOTAL	SMT MAIN TOTAL	MOBS TOTAL
Gender	Male-			
	Female- 1	1	1	1
Age	20 - 29			
	30 - 39			
	40 - 49- 1	1	1	1
	50 - 59			
	60 - 69			
	70 - 79			
Years in Practice	0-5			
	6-10 (1)	1	1	1
	1 1 - 1 5			
	16-20			
	21-30			
	>30			

TINNITUS

		SMT TOTAL	STT TOTAL	REHAB TOTAL	DN TOTAL	L/S TOTAL	NIP TOTAL
Gender	Male- 2	2	2		2	1	1
	Female- 1	1	1	1	1		
Age	20 - 29						
	30 - 39- 3	3	3	1	3	1	1
	40 - 49						
	50 - 59						
	60 - 69						
	70 - 79						
Years in Practice	0-5 (2)	2	2	1	2		
	6 - 1 0						
	1 1 - 1 5(1)	1	1		1	1	1
	16-20						
	21-30						
	>30						

- FATIGUE

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	REFERRAL TOTAL
Gender	Male- 7	7	3	4	1	1	5	2	1	3	4	2
	Female- 3	3		3	1	2	1	2		3	2	
Age	20 - 29- 1	1		1	1		1	1		1	1	1
	30 - 39- 5	5	2	2	1	2	3	2	1	3	2	1
	40 - 49- 1	1		1		1	1				1	
	50 - 59- 2	2	1	2			1	1		1	1	
	60 - 69- 1	1		1						1	1	
	70 - 79											
Years in Practice	0-5 (2)	2	1	1	1		2	1	1	1	1	1
	6-10 (2)	2		2	1	2	1	2		2	1	
	1 1 - 1 5 (3)	3	1	1		1	2			1	2	1
	16-20											
	21-30 (2)	2	1	2			1	1		1	1	
	>30 (1)	1		1						1	1	

- INFANTILE COLIC

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MOBS TOTAL	REHAB TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL	CST TOTAL	REFERRAL TOTAL
Gender	Male- 18	14	7	8	9	1	5	6		1	2
	Female- 29	25	11	15	14	1	13	7	5	2	2
Age	20 - 29- 7	5	4	5	3		4	1	2		
	30 - 39- 21	17	8	9	9	1	8	5	2	1	2
	40 - 49- 15	13	4	8	9	1	3	5	1	1	1
	50 - 59- 2	2	1		1			1			
	60 - 69- 1	1					1	1			
	70 - 79- 1	1	1	1			1			1	1
Years in Practice	0-5 (10)	8	6	8	4		5	1	2		
	6-10 (10)	9	3	3	6		5	3		1	
	1 1 - 1 5 (12)	9	4	5	5	1	4	4	2		1
	16-20 (8)	6	2	3	5	1	2	2	1	1	1
	21-30 (4)	4	1	2	2			2			
	>30 (3)	3	2	2	1		2	1		1	1

- DISORDERS OF THE BRAIN AND NERVOUS SYSTEM (Parkinson's Disease, dizziness, vertigo, headaches, cerebral palsy)

Participants did not respond to this question for Parkinson's Disease.

DIZZINESS

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL	REFERRAL TOTAL
Gender	Male- 11	11	7	9		1	3	6	1	4	4		3
	Female- 12	10	1	11	3	7	9	8	4	6	5	3	3
Age	20 - 29- 4	3	2	3	1	2	4	3	3	3	4	1	2
	30 - 39- 7	7	2	6		2	2	5	2	3	1	1	1
	40 - 49- 9	8	2	8	2	4	5	6		3	3	1	2
	50 - 59- 2	2	1	2			1	1					
	60 - 69- 1	1	1	1						1	1		1
	70 - 79												
Years in Practice	0-5 (7)	6	3	6	1	3	6	6	4	4	4	1	2
	6-10 (3)	3	1	3		2	1	2		2	2		1
	1 1 - 1 5 (4)	4	1	3	1	1	2	2	1	2		1	2
	16-20 (5)	4	1	4	1	2	2	3		1	2	1	
	21-30 (3)	3	1	3			1	2					
	>30 (1)	1	1	1						1	1		1

HEADACHES

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL	CST TOTAL	REFERRAL TOTAL
Gender	Male- 27	27	13	25	5	15	20	23	7	13	20			8
	Female- 32	29	17	32	17	20	22	30	12	22	26	3	2	7
Age	20 - 29- 11	9	8	11	6	5	9	11	4	7	9	1		3
	30 - 39- 27	27	13	26	10	15	19	25	12	12	20	1		7
	40 - 49- 16	15	7	15	5	12	11	16	3	11	11	1	1	4
	50 - 59- 2	2	1	2		1	1	1		1	1			
	60 - 69- 2	2		2		1	1			2	2		1	
	70 - 79- 1	1	1	1		1	1			1				1
Years in Practice	0-5 (17)	15	13	17	8	6	13	17	8	9	13	1		3
	6-10 (15)	15	6	15	8	12	11	13	4	10	14			5
	1 1 - 1 5 (13)	13	6	11	4	8	9	13	5	7	10	1		3
	16-20 (7)	6	3	6	1	4	4	6	2	3	3			2
	21-30 (4)	4	1	4	1	3	3	3		3	3			1
	>30 (3)	3	1	3		2	2			3	2		1	1

VERTIGO

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL	REFERRAL TOTAL
Gender	Male- 9	8	6	7		3	3	2	2	3		6
	Female- 7	3		6	2	2	4	6			2	
Age	20 - 29- 3	1		3	1		1	2			1	1
	30 - 39- 5	4	3	3		1	2	3			1	
	40 - 49- 6	4	1	4	1	3	2	3	1	1		3
	50 - 59											
	60 - 69- 1	1	1	1		1	1			1		1
	70 - 79- 1	1	1	1			1		1	1		1
Years in Practice	0-5 (5)	3	1	5	1	1	2	4			1	1
	6-10 (1)	1	1	1		1	1		1			1
	1 1 - 1 5(5)	4	2	3		1	1	3			1	1
	16-20 (3)	1		2	1	1	1	1		1		1
	21-30											
	>30 (2)	2	2	2		1	2		1	2		2

CEREBRAL PALSY

		SMT TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	STRAP TOTAL
Gender	Male-						
	Female- 2	2	2	2	1	2	1
Age	20 - 29- 1	1	1	1	1	1	
	30 - 39- 1	1	1	1		1	1
	40 - 49						
	50 - 59						
	60 - 69						
	70 - 79						
Years in Practice	0-5 (1)	1	1	1	1	1	
	6 - 1 0						
	1 1 - 1 5 1	1	1	1		1	1
	16-20						
	21-30						
	>30						

- PSYCHOLOGICAL DISORDERS (ADHD, clinical depression)

ADHD

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	NUTRITION TOTAL	NIP TOTAL	REFERRAL TOTAL
Gender	Male- 2	2	1				
	Female- 3	2	1	1	2	1	1
Age	20 - 29- 1	1					
	30 - 39- 4	3	2	1	2	1	1
	40 - 49						
	50 - 59						
	60 - 69						
	70 - 79						
Years in Practice	0-5 1	1					
	6-10 1	1		1			
	11-15- 3	2	2		2	1	1
	16-20						
	21-30						
	>30						

CLINICAL DEPRESSION

		SMT TOTAL	STT TOTAL	MODAL TOTAL	DN TOTAL	L/S TOTAL
Gender	Male-					
	Female- 1	1	1	1	1	1
Age	20 - 29- 1	1	1	1	1	1
	30 - 39					
	40 - 49					
	50 - 59					
	60 - 69					
	70 - 79					
Years in Practice	0-5 (1)	1	1	1	1	1
	10-Jun					
	1 1 - 1 5					
	16-20					
	21-30					
	>30					

- FEMALE REPRODUCTION SYSTEM (gynaecological disorders, dysmenorrhea, infertility)

DYSMENNHOREA

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	REFERRAL TOTAL
Gender	Male- 2	2		1		2	2	1			1
	Female- 3	3	3	3	1	2	3		1	1	1
Age	20 - 29- 1	1	1	1			1				
	30 - 39- 1	1	1	1	1	1	1		1	1	1
	40 - 49- 3	3	1	2		3	3	1			1
	50 - 59										
	60 - 69										
	70 - 79										
Years in Practice	0-5 (1)	1	1	1			1				
	6-10 (1)	1	1	1	1	1	1		1	1	1
	1 1 - 1 5										
	16-20 (2)	2		1		2	2	1			1
	21-30 (1)	1	1	1		1	1				
	>30										

GYNAECOLOGICAL DISORDERS

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	REHAB TOTAL	DN TOTAL	NUTRITION TOTAL	L/S TOTAL	REFERRAL TOTAL
Gender	Male-									
	Female- 1	1	1	1	1	1	1	1	1	1
Age	20 - 29									
	30 - 39- 1	1	1	1	1	1	1	1	1	1
	40 - 49									
	50 - 59									
	60 - 69									
	70 - 79									
Years in Practice	0-5									
	6-10 (1)	1	1	1	1	1	1	1	1	1
	1 1 - 1 5									
	16-20									
	21-30									
	>30									

INFERTILITY

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MOBS TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL
Gender	Male- 1	1	1	1	1			1	1
	Female- 1	1		1		1	1		1
Age	20 - 29								
	30 - 39- 1	1		1		1	1		1
	40 - 49								
	50 - 59								
	60 - 69- 1	1	1	1	1			1	1
	70 - 79								
Years in Practice	0-5								
	6-10 (1)	1		1		1	1		1
	1 1 - 1 5								
	16-20								
	21-30								
	>30 (5)	1	1	1	1			1	1

- RESPIRATORY SYSTEM (asthma, respiratory tract infections)

ASTHMA

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	NUTRITION TOTAL	L/S TOTAL
Gender	Male- 3	2	1	2	1		1	2	1	2
	Female- 1	1		1		1		1	1	1
Age	20 - 29- 1	1		1				1	1	1
	30 - 39- 3	2	1	2	1	1	1	2	1	2
	40 - 49									
	50 - 59									
	60 - 69									
	70 - 79									
Years in Practice	0-5 2	1		2	1		1	2	1	2
	6-10 1	1		1		1		1	1	1
	1 1 - 1 5 1	1	1							
	16-20									
	21-30									
	>30									

RESPIRATORY TRACT INFECTIONS

		STT TOTAL	DN TOTAL	NIP TOTAL	REFERRAL TOTAL
Gender	Male-				
	Female- 1	1	1	1	1
Age	20 - 29				
	30 - 39- 1	1	1	1	1
	40 - 49				
	50 - 59				
	60 - 69				
	70 - 79				
Years in Practice	0-5				
	6 - 1 0				
	1 1 - 1 5(1)	1	1	1	1
	16-20				
	21-30				
	>30				

- SKIN DISORDERS

Participants did not respond to this question for skin disorders.

- SLEEP DISORDERS

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL
Gender	Male- 1	1		1	1	1	1	1	1			
	Female- 4	3	2	3	1	1	2	2		2	4	1
Age	20 - 29- 2	2	2	2	1	1	2	2		1	2	
	30 - 39- 3	2		2	1	1	1	1	1	1	2	1
	40 - 49											
	50 - 59											
	60 - 69											
	70 - 79											
Years in Practice	0-5 (4)	4	2	4	2	2	3	3	1	2	3	
	6 - 1 0											
	1 1 - 1 5(1)										1	1
	16-20											
	21-30											
	>30											

- URINARY SYSTEM (nocturnal enuresis, bladder disorders)

BLADDER DISORDERS

		SMT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	REFERRAL TOTAL
Gender	Male- 1	1				
	Female- 1	1	1	1	1	1
Age	20 - 29- 1	1				
	30 - 39					
	40 - 49- 1	1	1	1	1	1
	50 - 59					
	60 - 69					
	70 - 79					
Years in Practice	0-5 (1)	1				
	6 - 1 0					
	1 1 - 1 5					
	16-20					
	21-30- 1	1	1	1	1	1
	>30					

NOCTURNAL ENURESIS

		SMT TOTAL	MOBS TOTAL	NIP TOTAL
Gender	Male- 1	1	1	
	Female- 1			1
Age	20 - 29			
	30 - 39- 2	1	1	1
	40 - 49			
	50 - 59			
	60 - 69			
	70 - 79			
Years in Practice	0-5			
	6 - 1 0			
	1 1 - 1 5(2)	1	1	1
	16-20			
	21-30			
	>30			

- VISION DISORDERS

Participants did not respond to this question for vision disorders.

SECTION C (SECONDARY COMPLAINT)

- ALLERGIES

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL
Gender	Male- 2	2	2	2	1	1	1	2	1	
	Female- 1							1	1	1
Age	20 - 29									
	30 - 39- 1							1	1	1
	40 - 49									
	50 - 59- 1	1	1	1			1	1		
	60 - 69- 1	1	1	1	1	1		1	1	
	70 - 79									
Years in Practice	0-5									
	6- 1 0									
	1 1 - 1 5(1)							1	1	1
	16-20									
	21-30 (1)	1	1	1			1	1		
	>30 (1)	1	1	1	1	1		1	1	

- CARDIOVASCULAR SYSTEM (CVS) (includes hypertension and heart pathology)

Participants did not respond to this question for heart pathology.

HYPERTENSION

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	NUTRITION TOTAL	L/S TOTAL	REFERRAL TOTAL
Gender	Male- 5	4	1	2		2		2	2	2	2
	Female- 2	2	2	2	2	1	1	2	1	1	
Age	20 - 29- 3	3	2	2	2	1	1	2	1	1	
	30 - 39- 1	1						1			
	40 - 49- 2	1		1		1		1	1	1	1
	50 - 59										
	60 - 69										
	70 - 79- 1	1	1	1		1			1	1	1
Years in Practice	0-5 (4)	4	2	2	2	1	1	3	1	1	
	6 - 1 0										
	1 1 - 1 5										
	16-20 (2)	1		1		1		1	1	1	1
	21-30										
	>30 (5)	1	1	1		1			1	1	1

- DISORDERS OF THE GUT (includes bowel disorders, dyspepsia, ulcerative colitis and Crohn's disease, peptic ulcers, constipation, hiatus hernia, inguinal and femoral hernia)

Participants did not respond to this question for peptic ulcers, hiatus hernia and inguinal and femoral hernia..

BOWEL DISORDERS

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL	REFERRAL TOTAL
Gender	Male- 5	5	3	5	2	3	4	3	1	4	4		1
	Female- 6	5	2	6	2		1	4		5	3	2	
Age	20 - 29												
	30 - 39- 6	6	2	6	3	2	5	5	1	5	4	1	
	40 - 49- 3	2	2	3	1			2		2	1	1	
	50 - 59												
	60 - 69- 1	1		1						1	1		
	70 - 79- 1	1	1	1		1				1	1		1
Years in Practice	0-5 (1)	1		1	1		1	1		1	1		
	6-10 (2)	2		2	1	1	2	1		2	1		
	1 1 - 1 5(3)	3	2	3	1	1	2	3	1	2	2	1	
	16-20 (3)	2	2	3	1			2		2	1	1	
	21-30												
	>30 (2)	2	1	2		1				2	2		1

DYSPEPSIA

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL	REFERRAL TOTAL
Gender	Male- 4	3	2	1	2			1	1		1
	Female- 4	3	1	3	1	1	3	3	2	2	
Age	20 - 29										
	30 - 39- 4	3	2	2	2		1	1		1	
	40 - 49- 4	3	1	2	1	1	2	3	3	1	1
	50 - 59										
	60 - 69										
	70 - 79										
Years in Practice	0-5 (1)	1	1								
	6- 1 0										
	1 1 - 1 5(4)	3	1	3	3	1	2	1		1	
	16-20 (3)	2	1	1			1	3	3	1	1
	21-30										
	>30										

U / C / CROHN'S

		SMT TOTAL	MOBS TOTAL
Gender	Male- 1	1	1
	Female-		
Age	20 - 29		
	30 - 39- 1	1	1
	40 - 49		
	50 - 59		
	60 - 69		
	70 - 79		
Years in Practice	0-5		
	6- 1 0		
	1 1 - 1 5(1)	1	1
	16-20		
	21-30		
	>30		

CONSTIPATION

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL
Gender	Male- 5	4	1	4	1	3	4	2	1	2	3	
	Female- 11	11	6	9	4	3	3	7	1	5	2	1
Age	20 - 29- 2	2		1	1		1					
	30 - 39- 7	6	3	6	1	3	3	5	1	3	3	1
	40 - 49- 7	7	4	6	3	3	3	4	1	4	2	
	50 - 59											
	60 - 69											
	70 - 79											
Years in Practice	0-5 (3)	3	1	2	1		1	1				
	6-10 (3)	2		3	1	2	2	1		2	2	
	1 1 - 1 5(6)	6	4	5	2	2	2	6	2	3	1	1
	16-20 (3)	3	2	3		1	2	1		2	2	
	21-30 (1)	1			1	1						
	>30											

- ENDOCRINE SYSTEM (includes diabetes mellitus, thyroid disorders, cushing's syndrome)

Participants did not respond to this question for all endocrine disorders.

- EAR, NOSE AND THROAT (ENT) (includes sinus-related disorders, otitis media, tonsillitis, tinnitus, hearing loss)

Participants did not respond to this question for tonsillitis and hearing loss.

SINUS - RELATED DISORDERS

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL	REFERRAL TOTAL
Gender	Male- 7	7		6	1	4	2	5		3	3		
	Female- 10	8	4	8	3	5	2	5	1	7	5	3	2
Age	20 - 29- 4	3	1	3	1	3		3		3	2	2	1
	30 - 39- 7	6	1	6	1	3	3	4		5	5	1	1
	40 - 49- 5	5	2	4	2	3	1	3	1	2	1		
	50 - 59- 1	1		1									
	60 - 69												
	70 - 79												
Years in Practice	0-5 (4)	3	1	3	1	3		3		3	2	2	1
	6-10 (5)	5	2	5	1	2	1	2		3	2		1
	1 1 - 1 5(5)	4	1	4	2	4	3	4	1	4	4	1	
	16-20 (1)	1		1				1					
	21-30 (2)	2		1									
	>30												

OTITIS MEDIA

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL
Gender	Male- 2	2	1	1
	Female-			
Age	20 - 29			
	30 - 39- 1	1	1	
	40 - 49- 1	1		1
	50 - 59			
	60 - 69			
	70 - 79			
Years in Practice	0-5			
	6- 1 0			
	1 1 - 1 5(1)	1	1	
	16-20 (1)	1		1
	21-30			
	>30			

TINNITUS

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	L/S TOTAL	NIP TOTAL
Gender	Male- 2	2	1	1			1	1		
	Female- 4	3	1	3	1	3	3	2	1	1
Age	20 - 29- 1									1
	30 - 39- 2	2	1	1		1	1	1	1	
	40 - 49- 3	3	1	3	1	2	3	2		
	50 - 59									
	60 - 69									
	70 - 79									
Years in Practice	0-5 (2)	1		1		1	1	1	1	10
	6- 1 0									
	1 1 - 1 5(3)	3	2	2	1	2	2	1		
	16-20									
	21-30 (1)	1		1			1	1		
	>30									

- FATIGUE

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL	REFERRAL TOTAL
Gender	Male- 8	8	3	5	1	4	5	4		3	5		2
	Female- 11	9	5	9	4	4	5	6	2	5	5	2	
Age	20 - 29- 4	3	1	2	1	1	2	2	1	2	2	1	
	30 - 39- 8	8	4	6	3	4	5	7	1	3	5		1
	40 - 49- 3	2	1	2	1	2	1					1	
	50 - 59- 2	2	1	2			1	1		1	1		
	60 - 69- 2	2	1	2		1	1			2	2		1
	70 - 79												
Years in Practice	0-5 (6)	5	3	4	2	1	3	4	1	3	3	1	
	6-10 (5)	5	2	4	2	4	3	4	1	2	3		1
	1 1 - 1 5(3)	3	1	2	1	2	2	1			1		
	16-20 (1)											1	
	21-30 (2)	2	1	2			1	1		1	1		
	>30 (2)	2	1	2		1	1			2	2		1

- INFANTILE COLIC

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL	REFERRAL TOTAL
Gender	Male- 4	3	3	1		2	1	1		
	Female- 10	8	4	6	1	4	5	2	2	1
Age	20 - 29- 3	2	1	1			2		1	
	30 - 39- 6	5	4	3		2	3	2	1	
	40 - 49- 4	3	2	2	1	3	1	1		1
	50 - 59									
	60 - 69- 1	1		1		1				
	70 - 79									
Years in Practice	0-5 (4)	3	1	2			2		1	
	6-10 (2)	2	2	1		1	1			
	1 1 - 1 5(4)	3	3	2		1	2	2	1	
	16-20 (3)	2	1	1	1	2	1	1		1
	21-30									
	>30 (1)	1		1		1				

- DISORDERS OF THE BRAIN AND NERVOUS SYSTEM (Parkinson's Disease, dizziness, vertigo, headaches, cerebral palsy)

Participants did not respond to this question for Parkinson's Disease and cerebral palsy.

DIZZINESS

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL	REFERRAL TOTAL
Gender	Male- 10	9	4	8	1	3	5	5	2	2	5		1
	Female- 11	10	7	9	3	5	6	6	5	2	2	1	
Age	20 - 29- 3	1	1	2	1	1	1	1	2	1	2	1	
	30 - 39- 9	9	5	7	2	4	6	5	3	2	4		
	40 - 49- 7	7	4	6	1	3	3	4	1	1	1		1
	50 - 59- 2	2	1	2			1	1					
	60 - 69												
	70 - 79												
Years in Practice	0-5 (6)	4	3	5	2	3	4	4	5	1	3	1	
	6-10 (4)	4	2	4	1	2	3	3	1	3	3		1
	1 1 - 1 5(6)	6	4	4	1	3	3	1			1		
	16-20 (2)	2	1	1				1	1				
	21-30 (3)	3	1	3			1	2					
	>30												

HEADACHES

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL	CST TOTAL	REFERRAL TOTAL
Gender	Male- 17	16	9	15	3	10	13	14	2	11	13			3
	Female- 23	22	14	23	11	15	18	22	9	16	19	2	1	1
Age	20 - 29- 6	5	4	6	4	4	5	6	3	5	6	2	1	1
	30 - 39- 19	18	9	18	8	9	16	18	6	13	15			
	40 - 49- 11	11	7	10	2	9	7	10	2	6	8			2
	50 - 59- 2	2	1	2			1	1		1	1			
	60 - 69- 1	1	1	1		1	1	1		1	1			
	70 - 79- 1	1	1	1		1	1			1	1			1
Years in Practice	0-5 (10)	9	7	10	6	7	8	10	5	6	9	2	1	1
	6-10 (12)	11	5	11	4	7	9	11	4	9	9			1
	1 1 - 1 5(9)	9	6	8	2	4	7	9	1	6	7			
	16-20 (3)	3	1	2	1	3	1	3		2	3			1
	21-30 (4)	4	2	4		1	3	2	1	1	1			
	>30 (2)	2	2	2		2	2	1		2	2			1

VERTIGO

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL	CST TOTAL	REFERRAL TOTAL
Gender	Male- 6	5	4	5		3	4	3	1	1	4			2
	Female- 5	5	2	5	3	2	3	3	2	3	4		2	1
Age	20 - 29- 3	3		3	2		2	2	1	2	3	1	1	1
	30 - 39- 3	3	2	2	1	2	2	1	2	1	2		1	
	40 - 49- 3	2	2	3		3	2	2		1	1			1
	50 - 59- 1	1	1	1				1			1			
	60 - 69													
	70 - 79- 1	1	1	1			1				1			1
Years in Practice	0-5 (3)	3		3	2		2	2	1	2	3	1	1	1
	6-10 (2)	2	2	2	1	2	2	2	1	2	2		1	
	1 1 - 1 5(2)	2	1	1		1	1		1		1			
	16-20 (2)	1	1	2		2	1	1						
	21-30 (1)	1	1	1				1			1			
	>30 (1)	1	1	1			1				1			1

- PSYCHOLOGICAL DISORDERS (ADHD, clinical depression)

ADHD

		SMT TOTAL	SMT MAIN TOTAL	REHAB TOTAL	NUTRITION TOTAL	NIP TOTAL
Gender	Male- 2	2	1	1		
	Female- 1				1	1
Age	20 - 29- 1	1				
	30 - 39- 2	1	1	1	1	1
	40 - 49					
	50 - 59					
	60 - 69					
	70 - 79					
Years in Practice	0-5 (2)	2	1	1	1	1
	6- 1 0					
	1 1 - 1 5(2)				1	1
	16-20					
	21-30					
	>30					

CLINICAL DEPRESSION

		SMT TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	NUTRITION TOTAL	L/S TOTAL	REFERRAL TOTAL
Gender	Male- 2	2	2		2	1	1	1	2	2
	Female- 1	1	1	1		1			1	
Age	20 - 29									
	30 - 39- 2	2	2		2	1	1	1	2	2
	40 - 49- 1	1	1	1		1			1	
	50 - 59									
	60 - 69									
	70 - 79									
Years in Practice	0-5									
	6-10 (1)	1	1		1	1	1	1	1	1
	1 1 - 1 5(1)	1	1		1				1	1
	16-20									
	21-30 (1)	1	1	1		1			1	
	>30									

- FEMALE REPRODUCTION SYSTEM (gynaecological disorders, dysmenorrhea, infertility)

Participants did not respond to this question for infertility.

DYSMENNHOREA

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	REFERRAL TOTAL
Gender	Male- 5	5	3	3		1	2	3		2	2	1
	Female- 3	3	2	3	1		1	2	1	1	2	
Age	20 - 29											
	30 - 39- 3	3	3	2	1		2	2	1		1	
	40 - 49- 3	3	1	2				3		1	2	1
	50 - 59											
	60 - 69- 2	2	1	2		1	1			2	1	
	70 - 79											
Years in Practice	0-5											
	6-10 (2)	2	2	1	1		1	1	1		1	
	1 1 - 1 5(1)	1	1	1			1	1				
	16-20 (3)	3	1	2				3		1	2	1
	21-30											
	>30 (2)	2	1	2		1	1			2	1	

GYNAECOLOGICAL DISORDERS

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL
Gender	Male- 2	2	1	1		1	1	1		1
	Female- 1	1	1	1	1	1	1	1	1	1
Age	20 - 29									
	30 - 39- 3	3	2	2	1	2	2	2	1	2
	40 - 49									
	50 - 59									
	60 - 69									
	70 - 79									
Years in Practice	0-5 (1)	1	1							
	6-10 (1)	1	1	1	1	1	1	1	1	1
	1 1 - 1 5(1)	1		1		1	1	1		1
	16-20									
	21-30									
	>30									

- RESPIRATORY SYSTEM (asthma, respiratory tract infections)

ASTHMA

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL
Gender	Male- 4	3	1	3	1	3	3	1	1	3	
	Female- 4	3	2	1	1	1	1	1	1	1	1
Age	20 - 29- 1										1
	30 - 39- 5	4	2	3	2	3	3	2	1	3	
	40 - 49- 1	1									
	50 - 59										
	60 - 69- 1	1	1	1		1	1		1	1	
	70 - 79										
Years in Practice	0-5 (1)										1
	6-10 (2)	2	1	2	2		2	2	1	2	
	1 1 - 1 5(3)	2	1	1		3	1			1	
	16-20										
	21-30 (1)	1									
	>30 (1)	1	1	1		1	1		1	1	

RESPIRATORY TRACT INFECTIONS

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	L/S TOTAL	REFERRAL TOTAL
Gender	Male-										
	Female- 1	1	1	1	1	1	1	1	1	1	1
Age	20 - 29- 1	1	1	1	1	1	1	1	1	1	1
	30 - 39										
	40 - 49										
	50 - 59										
	60 - 69										
	70 - 79										
Years in Practice	0-5 (1)	1	1	1	1	1	1	1	1	1	1
	6- 1 0										
	1 1 - 1 5										
	16-20										
	21-30										
	>30										

- SKIN DISORDERS

Participants did not respond to this question for skin disorders.

- SLEEP DISORDERS

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL	CST TOTAL
Gender	Male- 7	7	3	5	3	3	4	3	3	3	4		
	Female- 8	7	2	8	3	2	1	6	3	4	6	2	1
Age	20 - 29- 2	2	1	2	2	1	1	2	1	1	2		
	30 - 39- 7	7	2	5	3	3	4	4	5	5	6	1	
	40 - 49- 4	3	2	4	1	1		3		1	1	1	
	50 - 59- 1	1		1									
	60 - 69- 1	1		1							1		1
	70 - 79												
Years in Practice	0-5 (5)	5	3	4	4	2	3	4	3	2	4		
	6-10 (4)	4	2	4	2		1	3	1	2	2		
	1 1 - 1 5(2)	2		1		1	1	1	2	2	2	1	
	16-20 (2)	1		2		1		1		1	1	1	
	21-30 (1)	1		1									
	>30 (1)	1		1							1		1

- URINARY SYSTEM (nocturnal enuresis, bladder disorders)

BLADDER DISORDERS

		SMT TOTAL	STT TOTAL	MODAL TOTAL	MOBS TOTAL	REHAB TOTAL	DN TOTAL	STRAP TOTAL	NUTRITION TOTAL	L/S TOTAL	NIP TOTAL
Gender	Male- 2	2	1	1	1	1	1	1	1	1	
	Female- 2	2	2	1		1	2			1	1
Age	20 - 29- 1	1									
	30 - 39- 2	2	2	1	1	1	2	1	1	1	1
	40 - 49- 1	1	1	1		1	1			1	
	50 - 59										
	60 - 69										
	70 - 79										
Years in Practice	0-5 (2)	2	1	1	1	1	1	1	1	1	
	6- 1 0										
	1 1 - 1 5(1)	1	1				1				1
	16-20 (1)	1	1	1		1	1			1	
	21-30										
	>30										

NOCTURNAL ENURESIS

		SMT TOTAL	SMT MAIN TOTAL	STT TOTAL	REHAB TOTAL	NUTRITION TOTAL	L/S TOTAL	REFERRAL TOTAL
Gender	Male- 1	1	1	1		1	1	1
	Female- 1	1	1		1			
Age	20 - 29							
	30 - 39- 1	1	1		1			
	40 - 49							
	50 - 59							
	60 - 69							
	70 - 79- 1	1	1	1		1	1	1
Years in Practice	0-5							
	6- 1 0							
	1 1 - 1 5(1)	1	1		1			
	16-20							
	21-30							
	>30 (1)	1	1	1		1	1	1

- VISION DISORDERS

		SMT TOTAL	STT TOTAL
Gender	Male- 1	1	1
	Female-		
Age	20 - 29		
	30 - 39		
	40 - 49- 1	1	1
	50 - 59		
	60 - 69		
	70 - 79		
Years in Practice	0-5		
	6- 1 0		
	1 1 - 1 5		
	16-20		
	21-30 (1)	1	1
	>30		