Practice characteristics of chiropractic delegates attending the World Federation of Chiropractic's 12th Biennial Congress 2013

By

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

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DEDICATION

Lord, thank you for this extraordinary passion you've given me and I can only hope that through this profession I can serve You wholeheartedly. "God has given each of you a gift from his great variety of spiritual gifts. Use them well to serve one another" (1 Peter 4:10).

Colossians 3:17 "And whatever you do or say, do it as a representative of the Lord Jesus, giving thanks through Him to God the Father."

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ABSTRACT

Background:

Chiropractic is practiced in over 100 countries and is considered to be the fastest growing health care profession internationally. Several studies investigating the practice characteristics of chiropractors have been conducted in selected countries, however, as far as is known, no study has been conducted where chiropractors from countries across the globe are assessed for their practice characteristics in order to determine if regional differences exist. Gaining insight into chiropractic practice and its influencing factors, relating to both the profession itself and the chiropractor can enable organisations such as the World Federation of Chiropractic to have a greater understanding of how chiropractors are currently practicing and how the profession is being utilised by the public. Improved insight into the profession provides a baseline description for the public and other health care practitioners to fully comprehend what chiropractors can offer to the health care system.

Aim:

The aim of this study was to determine the demographic profile and practice characteristics of chiropractic delegates attending the World Federation of Chiropractic's 12th Biennial Congress 2013.

Method:

A pre-validated questionnaire and letter of information and consent was distributed to all registered chiropractic delegates (N = 406) attending the World Federation of Chiropractic Congress in Durban, Kwa-Zulu Natal 2013. The questionnaire was part of the delegate packages and they self-selected to participate. Due to a low response rate at the congress, the questionnaire was made available electronically on Survey Monkey®, for six weeks after the congress. Questions relevant to this study were coded, reduced where necessary and utilised for data analysis with IBM SPSS Version 21. Descriptive data was then summarised and presented using tables and graphs. The study was approved by the Durban University of Technology's Institutional Research Ethics committee.

Results:

The response rate was 34.72%, with 52.5% being female, mean age was 42 (SD ± 13) years, and all seven geographical regions were represented. The majority of respondents were from Africa (51.1%), followed by North America (22.7%) then Europe (14.2%). South Africa (48.6%) was the most represented country. Respondents held either a Master's degree in Chiropractic (51.8%) or a Doctor of Chiropractic (DC) degree (48.2%). The mean years since graduating as a chiropractor was 15.7 years (SD ± 3.6). The majority of respondents (71.2%) engaged in full-time clinical practice, for between 5 to 15 years (39.8%) with 51.4% purporting to have an evidence based philosophical approach to practice. The majority (72.5%) viewed the role of a chiropractor in the health care system as a primary health care practitioner with a focused scope of practice. The majority of respondents (n = 52) personally treated 50 patients or less per week, with approximately one third of the respondents (n = 34) having high volume practices (>100 patients weekly). The respondents favoured being one of two chiropractors (36.9%) in a practice setting followed by sole practices (31.6%). The top chiropractic technique utilised was the diversified technique (74.5%) followed by extremity adjusting (68.8%). Various adjunctive, active and passive, axillary techniques were utilised in the daily management of patients. The patient demographics were majority female (55.7%), older than 30 years of age (66.7%) and Caucasian (77%), complaining of head, neck, mid-back and low back pain, which was mostly acute in nature.

Trends suggested that females were more likely to select an evidence-based philosophical orientation than males. Females were more likely to delegate adjunctive therapies to non-chiropractic assistants (p = 0.029), and favoured sending patients to a physical therapist (p = 0.018), whereas males were more likely to refer to nutritionists and paediatricians (p = 0.030 and p = 0.038, respectively). Females were less likely to utilise mobilisation techniques (p = 0.008), massage therapy (p = 0.018) and nutritional counselling (p = 0.032). In terms of age, those selecting an evidence-based approach were significantly older than those who adopted a mixer approach to practicing (p = 0.002). The mean age of the respondents, irrespective of the region, was not significantly associated with the number of patients treated per week (p = 0.377) or the hours worked per week (p = 0.474). Trends show that the number of years spent in practice differed among the regions with North American

chiropractors spending more years in practice than those from Europe and Australasia. The respondents from South Africa spent fewer years in practice (15 years or less) than respondents from Asia, Australasia, Europe and North America. Geographic region was not significantly associated with practice setting (p = 0.182). The only chief complaint that differed between regions was patients presenting with headaches accompanied by neck pain (p = 0.007), where Asian and North American respondents reported seeing less patients than their colleagues from other regions. Trends suggested that the respondents who attained a Masters of Technology in Chiropractic were more inclined to select a mixer orientation whereas those with a DC qualification selected an evidence-based philosophical approach.

Conclusion:

The WFC congress provided a platform to successfully determine the demographic profile and practice characteristics of chiropractors from various regions. Similar demographics were evident, with males no longer showing dominance within the profession. Chiropractors adopting an evidence-based and mixer philosophical orientation are synonymous in the role that they play in the health care system and display similarities in chiropractic practice and patient management. Investigating chiropractors who adopt a straight philosophical approach would be beneficial as it will allow for better comparison of demographics and practice characteristics. It is evident that selected demographics do influence how one would opt to practice, with regional differences showing that the chiropractic profession in South Africa is still relatively young.

Key words:

Chiropractic; Practice; Characteristics; Questionnaire.

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LIST OF DEFINITIONS

Active adjunctive auxiliary procedure

Additional clinical methods used in conjunction with spinal manipulation for the successful treatment of patient conditions. Active procedures are those in which the patient is physically involved such as corrective exercises and rehabilitation.

Attitudes

Expression of feelings, thoughts and tendencies (Bergh and Theron, 1999). In the context of this research it refers to the attitude of the chiropractor and how it influences ones chiropractic practice.

Back school

A term for educational programs, often sponsored by industry, that emphasize body mechanics and ergonomic principles with the goal of preventing initial or recurring injuries to the spine (The Free Medical Dictionary, 2015).

Chiropractic

“A health care profession concerned with the diagnosis, treatment and prevention of disorders of the neuromusculoskeletal system and the effects of these disorders on general health. There is an emphasis on manual techniques, including joint adjustment and/or manipulation, with a particular focus on subluxations” (World Health Organisation, 2005).

Chiropractic Assistant

The chiropractic assistant (CA) assists the chiropractor in the two criteria for a successful office: patient management and office management. The CA may be actively involved in patient care by performing such tasks as a new patient review, education of the patient, performing an exam, taking x-rays etc. The CA also aids with office management by using the telephone to make appointments, collecting money, billing insurance companies and performing many other related tasks (Gard, 2015).

Clinical practice

Refers to the agreed-upon and customary means of delivering health care by doctors, nurses and other health professionals (The Free Medical Dictionary, 2015).

Coloured (Ethnicity)

A person of mixed ethnic parentage or descent (The Free Dictionary, 2015). For the purposes of this study, Coloured refers particularly to a South African ethnic term.

Complementary and Alternative Medicine

Health care professions, which do not form part of a country's main health care system (Carey et al., 2005).

Ethnicity

An ethnic group; a social group that shares common and distinctive culture, religion, language (Dictionary.com, 2015).

Evidence-based chiropractor

Makes use of the best available scientific literature, accumulated clinical knowledge and expertise to formulate a diagnosis and communicate different treatment plans to the patient, the aim of which is to alleviate pain and other symptoms. Evidence-based chiropractors would like to be incorporated into main stream health care and employ a broad scope of practice (Keating, 2005).

High Volume practice

A high volume practice constituted those respondents who were treating more than 100 patients weekly.

Holism

The theory that the determining factors in nature are organisms, which are whole and not mechanisms and are irreducible, autonomous, and functionally greater than the sums of their parts (Dorlands Illustrated Medical Dictionary, 2007).

Joint subluxation

The condition of a vertebra that has lost its proper juxtaposition with the one above or the one below, or both to an extent less than a luxation, which impinges nerves and interferes with the transmission of mental impulses (Stephenson, 1927).

Mainstream Medicine

Services which are part of the core health delivery system (Carey et al., 2005).

Mature-age

Matured-aged chiropractors refers to older, more experienced chiropractors who have been in practice for relatively long.

Mixer chiropractor

Mixer chiropractors acknowledge that the vertebral subluxation is one of many causes of disease (Keating et al., 2004). Mixer chiropractors integrate a variety of modalities in combination with adjustments (Chapman-Smith, 2000; Dagenais and Haldeman, 2011) and support the integration of chiropractic into mainstream medicine (Carey et al., 2005).

Non-chiropractic education

Non-chiropractic education refers to a senior certificate (high school) and/or any other qualifications or certificates that does not include a recognised chiropractic qualification (M.Tech, DC, MHSci, BHSci, B.App.Sci, BSc Chiropractic, MSc. ClinBio).

Passive adjunctive auxillary procedure

Additional clinical methods used in conjunction with spinal manipulation for the successful treatment of patient conditions. Passive procedures focus more on pain relief of the patient such as cryotherapy and trigger point therapy.

Postgraduate qualifications

For the purpose of this study, postgraduate qualifications refer to postgraduate certifications and/or diplomas. Postgraduate diplomas are awarded typically after a bachelor's degree whereas a postgraduate certification is the credential awarded to an individual upon completion of a higher education postgraduate program.

Postgraduate qualifications are designed to provide students with specialised knowledge that is at a master's level but less extensive.

Practice characteristics

In the context of this research, practice characteristics are specific parameters that outline the type, style and technique of operations of a particular chiropractic office.

Primary Health Care: Broad Scope

A health care provider who is the first point of access into the health care system for the patient. They take primary responsibility for the management of the patient in a broad scope of practice (Carey et al., 2005), e.g. General Practitioner.

Primary Health Care: Focused Scope

A health care provider which a patient may see without referral and who may take the primary responsibility for the patient and organise the management of the patient within the defined focused scope of practice (Carey et al., 2005), e.g. Dentist.

Scope of Practice

The extent and limits of the medical interventions that a health care provider may perform (The Free Medical Dictionary, 2015).

Specialist Care

A health care provider who has trained in both primary and specialist care; they practice on a referral basis in a focused scope of practice (WFC, 2005), e.g. Neurologist.

Straight chiropractor

Straight chiropractors focus on the detection and correction of the vertebral subluxation, with limited or no use of adjunctive auxillary procedures (Palmer, 1910; Chapman-Smith, 2000). The vertebral subluxation is seen as the cause of all "disease" and they view chiropractic as separate from medicine (Cooperstein and Gleberzon, 2004).

Vitalism

The doctrine that phenomena are only partly controlled by mechanical forces, and are in some measure self-determining. It is also defined as the doctrine that ascribes the functions of a living organism to a vital principle distinct from chemical and physical forces (Costello, 1991).

Work hardening

A rehabilitation program designed to restore functional and work capacities to the injured worker through application of graded work simulation. Included are activities designed to improve overall physical condition, including strength, endurance, and coordination specific to work activity, as well as means for coping with any remaining symptoms from the original problem, such as pain (The Free Medical Dictionary, 2015).

LIST OF SYMBOLS AND ABBREVIATIONS

%	Percentage
<	refers to a figure “less than” the figure reported
>	refers to a figure “greater than” the figure reported
ACA	American Chiropractic Association
AECC	Anglo-Euroepean College of Chiropractic
AHPCSA	Allied Health Professions Council of South Africa
ANZCO	Australian and New Zealand Classification of Occupations
ATM	Active Therapeutic Movement
ATRAD	Certified Shockwave Therapy Practitioner
B.App.Sci	Bachelor of Applied Science
BHSci	Bachelor of Health Science
BSc Chiro	Bachelor of Science in Chiropractic
BScMedSci	Bachelor’s Degree in Medical Sciences and Medical Honours
(c)	City
(co)	County
CA	Chiropractic Assistant
CAM	Complementary and Alternative Medicine
CASA	Chiropractic Association of South Africa
CCE	Council on Chiropractic Education
CCEA	Council on Chiropractic Education Australasia
CCEB	Canadian Chiropractic Examining Board
CCEI	Council on Chiropractic Education International
CCEP	Certified Chiropractic Extremity Practitioner
CCE-US	Council on Chiropractic Education – United States
CCFC	Certified Chiropractic Foot Care
CCSP	Certified Chiropractic Sports Physician
CE	Continuing Education
CEGEP	General and Vocational College

CHE	Council on Higher Education
CKTP	Certified Kinesio Tape Practitioner
CPD	Continued Professional Development
DABCN	Diplomate of the American Chiropractic Board of Clinical Nutrition
DABCO	Diplomate American Board of Chiropractic Orthopaedics
DACBR	Diplomate of the American Chiropractic Board of Radiology
DACBSP	Diplomate American Chiropractic Board of Sports Physicians
DC	Doctor of Chiropractic
DICCP	Diplomate in Clinical Chiropractic Pediatrics
DIT	Durban Institute of Technology
DUT	Durban University of Technology
(e)	Emirate
EBP	Evidence Based Practice/Practitioner
ECCE	European Council on Chiropractic Education
F	Variance of the group means/mean
FACO	Fellow of the American Academy of Chiropractic Orthopaedics
FCCSS	Fellow of the College of Chiropractic Sports Sciences
FICPA	Postgraduate Fellowship in Chiropractic Paediatrics
GCC	General Council on Chiropractic
HIO	Hole In One
ICC	International Convention Centre
ICSSD	International Certified Chiropractic Sports Science Practitioner
IREC	Institutional Research Ethics Committee
IVCA	International Veterinary Chiropractic Association
KDT	Kennedy Decompression Technique
LOIC	Letter of Information and Informed Consent
M	Mean
M. Dip. Chiro	Masters Diploma in Chiropractic
M.Tech. Chiro	Masters in Technology of Chiropractic
MET	Muscle Energy Technique

MHSci	Master of Health Science
Msc. Chiro	Master of Science in Chiropractic
MSc. ClinBio	Master of Science in Clinical Biomechanics
MVA	Motor Vehicle Accident
N	Total sample size
n	Sub sample size
NBCE	National Board of Chiropractic Examiners
NET	Neuro Emotional Technique
NGO	Non-governmental organisation
NIP	Neuroimpulse Protocol
ns	Not stated
NSA	Network Spinal Analysis
(p)	Province
p-value	probability value
PCP	Primary Contact Practitioner
PGCE	Postgraduate Certificate in Further Education and Training
PHC	Primary Health Care
PhD	Doctor of Philosophy
Q	Question
(r)	Region
RHDC	Research and Higher Degrees Committee
(s)	State
SA	South Africa
SAQA	South African Qualifications Authority
SD	Standard Deviation
SOT	Sacro Occipital Technique
t	*t* statistic
TPT	Trigger Point Therapy
TRT	Torque Release Technique
UJ	University of Johannesburg

UK	United Kingdom
US	United States
USA	United States of America
WFC	World Federation of Chiropractic
WHO	World Health Organisation

CHAPTER ONE

INTRODUCTION

1.1 Introduction to the study

Chiropractic, from the word “cheir” (Greek: done by hand), is a health care profession concerned with the diagnosis, treatment, and prevention of disorders of the neuromusculoskeletal system and the effects of these disorders on general health. Treatment emphasis is on manual techniques, including joint adjustment or manipulation, with a particular focus on joint subluxation/dysfunction (WFC, 2012). Chiropractic is considered to be the fastest growing health care profession internationally (Christensen et al., 2010), where it is placed third only to medicine and dentistry (Chapman-Smith, 2000). It is the largest, most regulated, and most well-known alternative health care profession especially in the United States (US) (Meeker and Mootz, 2005), with many medical providers acknowledging the presence and role of chiropractors in health care (Micozzi, 1998). This significant growth occurred from the profession’s roots in the United States of America (USA) to where it is currently practiced in over 100 countries (WFC, 2012).

Traditionally, chiropractic has existed as an isolated health profession which has struggled to obtain cultural authority and social acceptance (Keating, 1992; Chapman-Smith, 2000). It has been described as being at the crossroads between mainstream and alternative medicine (Meeker and Haldeman, 2002; Taylor, 2006; Villanueva-Russell, 2011). However, the demand for chiropractic care is slowly overshadowing the many misconceptions about the profession (Philips, 2005a). Increased accredited scientific publications (Dagenais and Haldeman, 2011) and clinical practice recommending guidelines (National Institute for Health and Clinical Excellence, 2009; Negrini et al., 2006; Dagenais and Haldeman, 2011) supporting the use of chiropractic care, has seen the profession shift from the periphery of the health care system (Chapman-Smith and Cleveland, 2005) towards its earned place in mainstream medicine (Villanueva-Russell, 2005; Woolf and Pfleger, 2010).

In order to aid integration into mainstream medicine, improve cultural authority and successfully give the profession one recognised voice, the World Federation of Chiropractic (WFC) was established in 1987 (Phillips, 2013) and by 1997 it was admitted into official relations with the World Health Organisation (WHO) as a non-governmental organisation (NGO) (Phillips, 2013). The WFC represents National Chiropractic Associations, with the aim to improve 'recognition and acceptance of chiropractic in every country on a universal minimum standard for education and scope of practice.' The WFC has become the profession's primary forum for developing consistency across all global regions to ensure that patients, especially those who travel abroad (outside their home country), receive uniform, high quality care, despite varying philosophical orientations and educational training of chiropractors. Biennially, the WFC hosts an international congress, which in 2013 was held in Durban, Kwa-Zulu Natal, South Africa.

Johnson (2010) reported that the profession currently finds itself in an opportune position to play a robust role in the health care system. This role can be substantiated by studies describing the practice characteristics of chiropractors (Imbos et al., 2004; Mootz et al., 2005). This then can guide the scope of the science, art and philosophy of the profession Several studies have investigated the practice characteristics of chiropractors in certain countries viz. Belgium (Ailliet et al., 2010); Australia (Eaton et al., 2012); the US (Mootz et al., 2005); the Netherlands (Imbos et al., 2004); the United Kingdom (GCC, 2004; Pollentier and Langworthy, 2007); Norway (Kvammen and LaBoeuf-Yde, 2014); Germany (Schwarz and Hondras, 2007) and Finland (Malmqvist and Leboeuf-Yde, 2008). These investigations aim to describe the parameters that outline the style of a chiropractic practice, the types of conditions patients seek chiropractic care for, techniques used by chiropractors and other elements specific to practice. Limited information is available for other countries where chiropractic is practiced i.e. countries in Africa, South America and Asia. Humphreys et al. (2010) suggested that establishing practice characteristics on a global scale could help to ensure that relevant key competencies particular to practice are covered in chiropractic education programs and curricula.

In order to obtain a description of the chiropractic profession, the present research set out to survey the chiropractic delegates at the WFC Biennial Congress in Durban 2013 to assess their practice characteristics and to determine if there are any

regional differences in the way that chiropractic is practiced, together with factors that may influence practice profiles. The congress, with its international platform, provided a unique opportunity to determine the practice characteristics of delegates from various countries in order to gain insight into the similarities and differences currently existing within the chiropractic profession. Through the information gathered from this study regarding the practice characteristics both in South Africa and internationally, it could assist in identifying the next steps that are needed to modify or alter the strategic direction of the profession's development in order to attain more social acceptance.

1.2 Aims and objectives

The aim of this study was to determine the demographic profile and practice characteristics of chiropractic delegates attending the World Federation of Chiropractic's 12th Biennial Congress 2013.

The objectives of this study were:

1. To determine the demographic profile of chiropractic delegates attending the WFC Congress 2013.
2. To determine the practice characteristics of the chiropractic delegates attending the WFC Congress 2013.
3. To determine associations between selected demographic profiles (gender, age, region, philosophical orientation, role in health care, qualifications and post-graduate certifications) and practice characteristics (years in practice, hours worked per week, number of patients treated, time spent on patient visits, reassessment intervals, practice setting, delegating adjunctive procedures, chiropractic techniques, adjunctive auxiliary procedures, use of diagnostic imaging, chief complaints and aetiologies).
4. To determine if there are any significant differences between the practice characteristics of South African chiropractors compared to their international counterparts.

1.3 Scope of the study

A structured, adapted questionnaire was administered to all chiropractic delegates at the WFC's 12th Biennial Congress 2013 held in Durban, South Africa. The delegates were informed about the nature of the study through a letter of information, and a written informed consent was obtained from all the participants. Due to the low initial response rate (25.36%; *n* = 103), the questionnaire was then made available on the internet via Survey Monkey® (SurveyMonkey.com, 2013). A request was made to the WFC secretary to inform all chiropractic delegates who attended the congress to complete the questionnaire on-line. Those that completed the questionnaires at the congress were informed not to complete the on-line survey to avoid duplication. A further 38 (9.4%) delegates completed the questionnaire electronically, resulting in a final response rate of 34.7% (*n* = 141). The data from returned questionnaires was captured on an excel spreadsheet using Microsoft Excel 2010 and analysed using the IBM SPSS Version 21. The results, including the demographics and practice characteristics of the chiropractic delegates who met the inclusion criteria, are reported and discussed in this mini-dissertation.

1.4 Structure of the dissertation

Following this introduction, Chapter Two presents and discusses the related literature pertinent to this study. Chapter Three describes the methods used to obtain the data for the study, while the results are presented in Chapter Four. The results are discussed in Chapter Five and the dissertation concludes with Chapter Six containing conclusions and recommendations for future studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Chiropractic is practiced in over 40 countries around the world (Phillips, 2012) and is sought by many patients to treat ailments of the musculoskeletal system. Many factors may influence the practice of chiropractic, there are those factors related to the profession and those related to the individual. Factors related to the profession include the historical context, the development of the profession over time, the profession's position in health care, and the legislation governing the profession and its scope of practice, while those related to the individual chiropractor, include their chiropractic education, their philosophical approach to chiropractic, techniques and modalities they utilise in their practice, type of patients seen and the inter-professional relationships they have made. In this chapter these factors will be discussed.

2.2 Factors related to the profession of chiropractic and the individual chiropractor that may influence practice characteristics

2.2.1 A historical context of the chiropractic profession

Chiropractic was founded by the magnetic healer, Daniel David (DD) Palmer, 120 years ago. Reports suggest that Palmer learned joint manipulative techniques from Jim Atkinson (Palmer, 1910) as well as from the founder of osteopathy, Andrew Taylor Still (Baer, 2006) and adapted these techniques based on the principles of "osteology, neurology and functions and manifestations of impulses" to develop chiropractic (Palmer, 1910). He was respected for his knowledge and understanding of the human body despite receiving no formal training. Palmer resided in Davenport, Iowa, US, and it was here that the first chiropractic school was officially opened in 1897 (Keating, 1992).

At this time, alternative health care was considered to be an art or craft rather than the organised body of knowledge that it is today (Chapman-Smith, 2000). During this time many new groups of alternative healers emerged whose focus was to develop minimally-invasive techniques which emphasised the body's inherent ability to heal itself (Chapman-Smith, 2000). This included healing practitioners such as bonesetters (Anderson, 1983; Haldeman, 2005), homeopaths (Chapman-Smith, 2000), osteopaths (WHO, 2006) and naprapaths (Zarbuck, 1986; Basmajian and Nyberg, 1993; Haldeman, 2005; WHO, 2006).

The first reported chiropractic patient was a janitor, Harvey Lillard, who had reportedly become deaf after a fall (Palmer, 1910). Palmer explained to Lillard that his deafness was possibly due to an injury to his spine (Palmer, 1910; Keating, 2005) and proceeded to treat him with manual therapy application, later known as spinal manipulation. Following this intervention Lillard reported having his hearing restored (Palmer, 1910; Wardwell, 1992; Gleberzon et al., 2005). Subsequent to this encounter Palmer theorised that the joints in the spine had been "racked out of place" thus disturbing the flow of "Universal Intelligence" (God) through the nervous system, which he called "innate intelligence" (Fuller, 1989; Keating, 2005). In order to restore health the vertebrae needed to be "racked into place" by delivering a spinal manipulation (Keating, 1995; Kaptchuk and Eisenberg, 1998). This theory, with its vitalistic underpinning, formed the foundation of the chiropractic profession along with other concepts like holism, naturalism, humanism and therapeutic conservatism (Coulter, 1999).

DD Palmer opened the first chiropractic school, which was later taken over by his son BJ Palmer. The teachings focused on the detection and correction of the vertebral subluxation, with it being the cause of all "disease" and its elimination resulting in the restoration of health (Palmer, 1910). Any care administered by chiropractors beyond this was branded as "medical" (Keating, 2005). Rival schools opened where the vertebral subluxation was not seen as the cause of all disease, but was considered to be one of the many causes of disease and as such taught and integrated a variety of treatment modalities in addition to manipulations into patient management regimes (Palmer, 1910; Chapman-Smith, 2000; Keating et al., 2004). Graduates from these opposing schools were labelled as "mixer" chiropractors, and were later seen to support the integration of chiropractic into mainstream medicine (Carey et al., 2005).

This was in opposition to the more “classical” approach of the Palmer scholars, who were called the “straights.” They were seen as focussing on spinal manipulations only and stated that “it was neither their responsibility nor interest to perform a diagnosis.” They viewed chiropractic as separate from medicine and fought for it to be its own profession (Cooperstein and Gleberzon, 2004; Carey et al., 2005).

Differences between these schools of thought resulted in the profession failing to unite around a common set of principles (Keating, 2005). This led to a split in the profession (Chapman-Smith, 2000) as the tension between the “straights versus mixers” grew, and formed the basis for the lack of internal congruency and thus resulted in a perceived lack of professional identity for the chiropractic profession (Villanueva-Russell, 2011).

Meanwhile, medicine had moved into an era of scientific investigation, which challenged the vitalistic foundations of the chiropractic profession (Phillips, 2005). The straight/mixer split was further challenged with the “mixers” embracing science and philosophy, whilst the “straights” held on to the vitalistic principles of the profession (Charlton, 2005; Villanueva-Russell, 2005). Chiropractic colleges and associations differed in their philosophical emphasis and teaching (Wardwell, 1992; Charlton, 2005; Morrison, 2009; Simpson, 2012) further facilitating the divide. The philosophical stance adopted by chiropractors may henceforth influence the practice characteristics of chiropractic populations.

2.2.2 Legislation and scope of practice

For several decades, chiropractic predominantly existed within the USA (Chapman-Smith, 2000) and the status of the profession was strongly dependent upon the growth in this region, as relatively few countries outside of North America had laws which recognized chiropractic practice (Chapman-Smith and Cleveland, 2005; Phillips, 2013). Today, the licensing and regulation of chiropractic has expanded globally (Sandefur and Coulter, 1997). Chiropractic licensure firmly defines the scope of practice and, more significantly, legitimises the chiropractic profession (Sandefur and Coulter, 1997).

Licensing laws for chiropractic vary across regions due to the level of establishment of the chiropractic profession within that region as well as chiropractors adopting different philosophies and viewpoints at different times (Adams, 2013). The scope of practice of chiropractic varies across regions due to the local authorities' definition of chiropractic care (Morrison, 2009), the governing statutes and regulations in the country, state or province (Chapman-Smith, 2000; Huijbregts, 2007). In addition, the scope of practice and the legislation is considerably dependent on the state of the profession in that jurisdiction at that time. For example, when the laws were drafted for the mid-west states of the USA, these laws were liberal and provided a wide scope, even including minor surgery (The Iowa Legislature, 2015); this is in contrast to states like Michigan where at the time of drafting the legislation the chiropractic profession was predominantly straight in its philosophical orientation and therefore only manipulation was allowed to be performed (viz. the practitioner may not diagnose any medical conditions and may not treat with any other modality outside of manipulation) (Department of Licensing and Regulatory Affairs, 2015).

The practice of chiropractic is recognised and regulated by law or recognised by national authorities in more than 40 national jurisdictions, as shown in **Table 2.1**, where the right to practice is legislated (Phillips, 2012). Most legislation defines the scope of practice for chiropractors as primary care practitioners (PCP), which allows a chiropractor to have direct access to patients; the right and duty to perform a diagnosis; to use spinal manipulation and a range of other manual and therapeutic modalities; to provide or order diagnostic imaging; and to practice without drugs or surgery (Chapman-Smith, 2000).

Table 2.1 Countries or regions where chiropractors are recognised by national health authorities

	Regions						
	African	**Middle East and Mediterranean**	**European**	**North American and Caribbean**	**Asian**	**Pacific**	**Central and South America**
Legislation	Botswana Lesotho Namibia Nigeria South Africa Swaziland Zimbabwe	Cyprus Saudi Arabia	Belgium Denmark England Finland Iceland Liechtenstein Norway Sweden Switzerland	Barbados Canada Leeward Islands Mexico Puerto Rico United States	China Hong Kong Philippines	Australia Guam New Zealand	Panama
General law	Ethiopia Kenya Mauritius	Egypt Greece Israel Jordan Lebanon Libya Morocco Qatar Turkey United Arab Emirates	Croatia Germany Hungary Ireland Netherlands Russian Federation Slovakia	Bahamas Belize Bermuda British Virgin Islands Cayman Islands Jamaica Trinidad & Tobago US Virgin Islands	Japan Malaysia Singapore Taiwan	Fiji New Caledonia Papua New Guinea	Argentina Bolivia Brazil Chile Columbia Costa Rica Ecuador Guatemala Honduras Peru Venezuela
De facto recognition			Italy Portugal		Thailand		

In areas where there is no official recognition, chiropractors practice under general law without specific chiropractic legislation. This can be confirmed by governmental ruling, the decisions of courts or by general legislation, under umbrella legislation that authorises many types of health care providers. Alternatively, where legislation has not been achieved, chiropractors have *de facto* recognition whereby the practice of chiropractic is technically in breach of medical practice law, but the value of chiropractic care is acknowledged and unobstructed by national health authorities (Chapman-Smith, 2000; Phillips, 2013).

The chiropractic scope of practice varies between countries with much debate about whether the PCP role should be broad, focused or specialist care (d'Hotman de Villiers, 2015). Some authorities, for example the Chiropractic Association of South Africa (CASA) (CASA, 2014), advocate a focused scope of practice. Many chiropractors view themselves as neuromusculoskeletal spine or back/neck pain experts (mostly mixers), showing a focused scope of care (Mootz, 2007; Murphy et

al., 2008). Others oppose this view and feel that the profession should not limit itself to back and neck complaints (Carey et al., 2005), but rather view themselves as specialist care where they deliver highly specialised care in the form of manipulation, not only for back and neck pain but to detect and correct vertebral subluxations that can result in poor health care, this view is aligned with a straight philosophical approach. This is, however, further confounded by inclusion of debates around evidence-based practice, what constitutes evidence and the focus on patient-based care (Haynes et al., 2002; Murray et al., 2007). Chiropractors supporting an evidence-based practice approach would limit themselves to a specific symptom/condition for which there is available evidence to support their treatment.

An international survey of the chiropractic profession (*n* = 3689) conducted by the WFC (Carey et al., 2005) found that the chiropractic respondents would like to be viewed as PCP with a focused scope. Due to the low response rate this finding cannot be extrapolated to the broader chiropractic community. Interestingly, in this study, the respondents reported that they felt that the medical profession viewed them as specialist care, which is in opposition to how they viewed their role. Similar findings were found in a study of South African chiropractors (Keyter, 2010).

In addition, some members of the chiropractic profession seek expansion of the profession to the point of abandoning the drugless stipulation of alternative medicine (Villanueva-Russell, 2011). This can be seen in amendments to the chiropractic scope of practice laws in Switzerland (Robert, 2003) and New Mexico (Clum, 2010). However, other countries shun medication prescription being included in chiropractic service delivery (Clum, 2013; Richards, 2011) which reflects the differences in philosophical orientation of the chiropractor (McDonald et al., 2004; Villanueva-Russell, 2011), as well as differences in the law.

Co-morbid pathologies often occur with musculoskeletal conditions such as low back pain (Evans and Rupert, 2006), and a PCP role would enable chiropractors to assess patients holistically and address lifestyle issues in patient management. Wellness education has been incorporated into the chiropractic curriculum since 2006 (CCE, 2014) to ensure that the principles of health promotion are adequately addressed and to successfully establish chiropractors as PCPs in the health care system (Gatterman, 2006). This was a positive addition to the curriculum, however, the

interpretation of wellness education has been shaped by the philosophical stance of the respective chiropractic colleges within the USA (Logan University, 2015; Parker University, 2015). In the details of the WFC Identity survey (Carey et al., 2005), 83% (*n* = 3061) of chiropractors admitted to the most desirable image for the profession was as a “wellness doctor.”

Regardless of whether a chiropractor has adopted a focused or broad scope of practice, a specialist or wellness approach, the profession needs to define consistent parameters when providing care that is not based on a “chiropractic philosophy” position but rather on a socially accepted paradigm that is understood by society in order to develop and gain cultural authority (Hawk, 2005). As a collective, if the profession insists on retaining the focus on which paradigm is better for the profession/chiropractor, the profession will lose the most in that patients will not receive the care that they want and need, eroding any credibility or cultural authority that may have been built (Haynes et al., 2002).

2.2.3 Education and philosophical orientation of chiropractors

Councils on Chiropractic education (CCE) in different regions collectively form the Council on Chiropractic Education International (CCEI), which emphasises quality chiropractic education and accredits chiropractic institutions ensuring a set standard of education (CCEI, 2013). The CCE requires that accredited colleges teach a curriculum that is synchronised with legislated standards (Keating, 2005) within their respective jurisdictions, to successfully maintain accreditation (Morrison, 2009). To further emphasise the importance of the standardisation of curricula the WFC together with the WHO, developed the ‘Guidelines of Basic Training and Safety in Chiropractic’ in 2005 which emphasised that chiropractic care was the conservative management of the neuromusculoskeletal system without the use of drugs and surgery, and formed the basis of a common understanding between chiropractors and other health care providers associated with the WHO (WHO, 2005).

The minimum requirement for professional registration in most jurisdictions is a four year full-time academic programme, followed by mandatory postgraduate clinical training and possible licensing exams applicable for certain countries (WFC, 2012). The chiropractic qualification varies depending on the region in which it was

obtained. In the US and Japan a Doctor of Chiropractic (DC) degree is awarded (Japan Chiropractic Registers, 2014; CCE-US, 2015), whereas in Australia and most European countries a Bachelors in Chiropractic degree (BSc) is awarded (Murdoch University, 2015). In South Africa, the minimum requirement for registration is a Masters in Chiropractic (Durban University of Technology Handbook, 2014).

Although the curriculum is determined by CCEI (CCEI, 2013), the WHO guidelines (WHO, 2005), the local jurisdictional requirements (e.g. in South Africa, Act 63 of 1982 (as amended)) and the local educational legislation (e.g. in South Africa (CHE, 2004)), colleges can still influence the curriculum based on their predominant philosophical stance (Huijbregts, 2007). “Mixer” colleges ensure that their students are schooled in a broad-based curriculum which emphasises diagnostic ability as well as the teaching of spinal and extremity manipulation with modality use for the overall benefit of the patient (Meeker and Haldemann, 2002; Keating, 2005). Conversely, there are a few “straight” colleges, where vitalistic philosophy is the basis of chiropractic care (Sherman College of Chiropractic, 2015). These colleges tend to only teach spinal manipulation and have repeatedly disagreed and taken a stand against the development of education standards, which require students to “develop a diagnosis” (Winterstein, 2002). Therefore, education and the manner in which it promotes or negates the development of certain philosophical views held by practitioners within the profession is likely to either promote or negate the ongoing disparity that has arisen out of the profession’s history (Morrison, 2009).

Historically, chiropractic education mostly occurred at private colleges due to a lack of access to traditional universities, but advances in chiropractic has seen the educational programs being incorporated into the higher educational infrastructure at university levels in varying parts of the world including South Africa, the UK, Spain, Australia and Brazil (Byfield, 2010). This has positively impacted the profession as it promotes access to public funding, improved research opportunities and helps establish inter-professional relationships with fellow health care providers.

There are two institutions in South Africa offering the chiropractic qualification (viz. Durban University of Technology (DUT) (in the province of KwaZulu Natal) and University of Johannesburg (UJ) (in the province of Gauteng). Both institutions have national, and international accreditation with the European Council on Chiropractic

Education (ECCE) (CASA, 2014). Students graduate with a Master's Degree in Chiropractic after five years of higher education and clinical training (University of Johannesburg Chiropractic Handbook, 2014; Durban University of Technology Chiropractic Handbook, 2014). Chiropractic training at these institutions ensures that graduates are able to work within multidisciplinary teams, through evidence-based practice and the application of primary health care principles and practices in a biopsychosocial model for the furtherance of holistic patient care (Durban University of Technology, 2015; University of Johannesburg, 2015). This is not unlike the training colleges in Switzerland and southern Denmark. At these schools chiropractic students train with medical students for the first three years, before entering into their own professional programs for clinical training (WFC, 2012). These early educational relationships help to reduce health care factionalism and allow for sufficient cohesiveness amongst health care professionals. This leads to improved inter-professional communication and subsequently high quality patient care (Puhl et al., 2014).

This contrasts with chiropractic schools such as Sherman College (Sherman College of Chiropractic, 2015) and New Zealand College of Chiropractic (New Zealand College of Chiropractic, 2015); where the chiropractic curricula have more "classical" foundation, with the central focus of chiropractic training being that of the vertebral subluxation and spinal manipulation. This may result in practitioners graduating from these institutions to adopt a "straight" philosophical stand point of not incorporating a variety of treatment modalities in patient management and being less likely to focus on establishing early educational relationships with various health care practitioners.

Further to the basic chiropractic education, practitioners may have obtained previous qualifications in other disciplines or postgraduate certifications or qualifications to further their knowledge and skills. Mootz et al. (2005) reported that 40% (*n* =115) of chiropractors in Arizona and Massachusetts undertook postgraduate certification programs. In a North American study, 19% (*n* = 25) of chiropractors had a postgraduate certification related to chiropractic, with a further 25% (*n* = 33) having other non-chiropractic certifications (Coulter and Shekelle, 2005). Similar percentages were seen in Victoria, Australia (French et al., 2013) and South Africa (Keyter, 2010) where 34.6% (*n* = 18) and 37.5% (*n* = 45) of chiropractors held postgraduate certifications. In contrast, according to Humphreys et al. (2010)

postgraduate certifications are not as common in Switzerland as all Swiss chiropractors are required to complete a practice-based full time two year postgraduate assistantship program. It is suggested that these additional qualifications may impact on the chiropractors' world view and thus their style of practice as specialised techniques may be utilised in patient management (Coulter, 1999).

2.2.4 Demographic characteristics of chiropractors

2.2.4.1 Gender

Although the chiropractic profession has traditionally been male-dominated (Australian and New Zealand Classification of Occupations (ANZCO), 2006), recent studies, have shown that the number of female practitioners has increased **(Table 2.2)**. A similar trend was seen in a chiropractic survey in the UK, in the late 1970's where 8% of respondents were female (Breen, 1976), compared to a study conducted in 2000 where 46% (*n* = 375) of respondents were female (Wilson, 2003). In Australasia, the ANZCO (2006) census observed that in 1996, 75% of chiropractors were male, whereas in 2006, 65% were male. In Norway a similar trend was seen with female chiropractors increasing from 29% to 36% (Kvammen and LeBoeuf-Yde, 2014). Complementary and alternative medical (CAM) professions have been reported to be favoured by women who expressed a greater interest in CAM participation (MacLennan and Wilson, 1996; Härtela and Volgera, 2004, National Centre for Complementary and Alternative Medicine, 2004).

In South Africa, the chiropractic programme at DUT has had more female than male graduates (Kisten, 2009), leading one to expect a higher number of female practitioners (De Gouveia, 2009). Yet in most studies on chiropractic populations in South Africa, there were more male chiropractic respondents (Fletcher, 2005; Mathews, 2006; Bunge, 2007; Keyter, 2010). Furthermore, the WFC (Carey et al., 2005) had a predominantly male response (80%; *n* = 2951) in their international identity of chiropractic consult survey. The studies reflecting this demographic had low response rates and are therefore not necessarily a good reflection of the whole population. Alternatively, females may be more likely to discontinue or limit practice due to family growth and commitments (Maharaj, 2009).

Table 2.2 Studies done on the practice characteristics of chiropractors reporting the mean age and gender distribution in selected countries

Reference	Country	*n**	Response rate (%)*	Mean age*	Gender (%)*	
					Male	Female
Leboeuf-Yde et al. (1997)	Sweden	66	78	-	70	30
Wilson (2003)	United Kingdom	816	58	40	54	46
GCC (2004)	United Kingdom	860	42.5	40	54	46
Imbos et al. (2004)	The Netherlands	113	70	38	68	32
Coulter and Shekelle (2005)	North America	131	71	40.6	83	17
Mootz et al. (2005)	USA (Arizona)	170	76	42	81	19
Mootz et al. (2005)	USA (Massachusetts)	118	94	43	70	30
Waalen and Mior (2005)	Canada	731	43	-	76	24
ANZCO (2006)	Australasia (Australia and New Zealand)	-	-	-	65	35
Schwarz and Hondras (2007)	Germany	49	72	38	63	37
Malmqvist and Leboeuf-Yde, (2008)	Finland	44	88	-	80	20
Ailliet et al. (2010)	Belgium	80	79.2	44	75	25
Humphreys et al., (2010)	Switzerland	183	70	-	71	29
Keyter (2010)	South Africa	120	30	-	61	39
Eaton et al. (2012);	Australia	225	16.7	-	76	24
French et al. (2013)	Australia	52	33	42.3	73	27
Kvammen and LaBoeuf-Yde, (2014)	Norway	320	61	38	64	36

***Data was reported as described in the studies**

2.2.4.2 Age

The majority of surveyed chiropractors across regions were between 38 and 44 years of age (**Table 2.2**). Although the mean age was not specified, the majority of respondents of Keyter (2010) **(Table 2.2)** were between 30-39 years. This is in keeping with other South African studies which involved respondents who were chropractors (De Gouveia, 2009; Gordon, 2011) but slightly disimilar to that reported

by Fletcher (2005), Mathews (2006) and Bunge (2007) who observed that the majority of South African chiropractic respondents were 25-37 years of age and concluded that South African chiropractors are younger than their international counterparts. This could be as a result of low response rates or the South African chiropractic profession being relatively young as it has only been established in the last 25 years (Korporaal pers. Comms, 2015), whereas US chiropractic institutions have existed since the birth of chiropractic. It is, therefore, more likely that there is a greater number of mature-aged chiropractors who have been in practice for longer compared to countries like Brazil where chiropractic has only been taught since 2001 (McNabb, 2004). Minimal data was available regarding the differences in the mean age between genders; however, Horn (1998) and Imbos et al. (2004) noted that a younger mean age was identified for female practitioners.

2.2.4.3 Ethnicity

The ethnic representation of chiropractors is not well documented with only limited studies enquiring about the ethnicity of their respondents. In North America (Coulter and Shekelle, 2005; Mootz et al., 2005) and South Africa (Keyter, 2010) the majority of respondents were White, with under representation from other ethnic groups. The chiropractic course commenced in 1989 during the apartheid era at the Technikon Natal, now known as Durban University of Technology, and access to university programmes was restricted to non-Whites, especially Black Africans. Furthermore, the cost of tertiary education and lack of funding may significantly influence whether one is able to enrol in university programmes. In addition, manual therapy has not historically been part of traditional African medicine and, therefore, it is theorised that the African population are less likely to pursue a career in a health care profession in which there is little related or cultural background (Korporaal and Talmage, 2008).

2.3 Chiropractic practice characteristics

2.3.1 Years in active practice

Chiropractic population studies from North America (Coulter and Shekelle, 2005), Norway (Kvammen and LeBoeuf-Yde, 2014), Switzerland (Humphreys et al., 2010), Germany (Schwarz and Hondras, 2007), Canada (Waalen and Mior, 2005), along with the international WFC identity consult (Carey et al., 2005) found that most respondents were in active practice for 5-15 years. Studies in Australia and Belgium

reported a mean of 16.3 (French et al., 2013) and 18 years (Ailliet et al., 2010) in active practice for their respondents respectively. In contrast, South African (Keyter, 2010) and UK studies (GCC, 2004) reported that the majority were in practice for an average of five years or less. New graduates may have more time available to answer questionnaires (although there is no evidence to support this) which may skew the results in favour of less years in practice. The South African studies also reported a younger age for their respondents (**Section 2.2.4.2**). Years in practice would influence practice characteristics as the longer one is in practice, the more established the practice would be with reference to patient numbers and patient management.

2.3.2 Hours worked per week

In general, most chiropractors surveyed across the regions worked between 31-40 hours per week (Imbos et al., 2004; Coulter and Shekelle, 2005; Waalen and Mior, 2005; Schwarz and Hondras, 2007; Ailliet et al., 2010; Humphreys et al., 2010; Eaton et al., 2012; Kvammen and LeBoeuf-Yde, 2014). Chiropractors in Victoria, Australia (French et al., 2013), Arizona and Massachusetts (Mootz et al., 2005) worked slightly less hours, with the majority working between 27-30 hours weekly. A typical working week can be influenced by the number of patients seen as well as the length of time spent on each treatment visit. The practitioners practice style and lifestyle choices (Lockley et al., 2007), together with constraints of physical and mental fatigue which accompany a manual profession weighed against effective performance may influence time in practice.

Practitioners may practice less and engage in part-time lecturing or research. Alternatively, practicing part-time could be due to family commitments (Gittel et al., 2010; Hughes and Wingard, 2006; Smith and Eckert, 2006; Tatalias, 2006; Wilson et al., 2007). Waalen and Mior (2005) found that female chiropractors were more likely to work less hours than males.

2.3.3 Number of patients seen per week, time spent on initial and follow-up consultations

Apart from those chiropractors in Switzerland and North America, studies show that the majority of chiropractors, on average, were treating less than 100 patients during a typical working week. Chiropractors in Finland (Malmqvist and Leboeuf-Yde, 2008)

reported the lowest mean across the regions at 59 patients per week. This is possibly due to the Finnish chiropractic profession being relatively young and not fully accepted by the local health care authorities (Malmqvist and Leboeuf-Yde, 2008), resulting in chiropractic services not being firmly established and utilised. Succeeding this, the UK (GCC, 2004), Victoria (French et al., 2013) and Massachusetts (Mootz et al., 2005) also had a low mean, with German chiropractors treating 88 (mean) patients per week (Schwarz and Hondras, 2007).

In contrast, Swiss chiropractors were more likely to have high-volume practices, with 69% (*n* = 126) treating greater than 100 patients weekly, with just less than a quarter of respondents (22%; *n* = 40) treating 200 patients or more each week (Humphreys et al., 2010). Although the respondents commonly worked between 31-40 hours/week, 43% (*n* = 79) of respondents reported working more than 40 hours per week. The chiropractic profession in Switzerland is integrated into health care and is a recognised medical profession (Humphreys et al., 2010). From the high number of patients that are being treated weekly it would indicate that it is a popular choice for health care in that country, and suggests that integration allows greater access to patients.

In North America a third of chiropractors reported working in high-volume practices, treating between 100-200 patients each week and a further 12% (*n* = 16) treating more than 200 patients weekly (Coulter and Shekelle, 2005). High-volume practices are often associated with a practice philosophy that is underpinned by a straight approach to chiropractic care, while lower volume practices reflect more of a mixer approach to practice style.

When assessing time spent on initial and subsequent visits, apart from the UK, the majority of chiropractors, spent on average between 30-45 minutes with new patients for an initial consultation (GCC, 2004; Imbos et al., 2004; Malmqvist and Leboeuf-Yde, 2008; Alliet et al., 2010; Humphreys et al., 2010; Kvammen and LeBoeuf-Yde, 2014). Chiropractors in the UK reportedly spent slightly more time with their new patients (GCC, 2004). Differences were noted regarding subsequent visits, with practitioners in Switzerland (Humphreys et al., 2010), North America (Coulter and Shekelle, 2005), Australia (French et al., 2013) and The Netherlands (Imbos et al., 2004) spending a shorter period of time on follow ups (15 minutes or less) than those

from Belgium (Ailliet et al., 2010), the UK (GCC, 2004) and Finland (Malmqvist and Leboeuf-Yde, 2008). Chiropractors may limit or extend their time spent with a patient on subsequent visits depending on their philosophical approach. A “straight” chiropractor would only treat vertebral subluxations and may then only see the patient for a short duration, in contrast to a mixer chiropractor who may include a range of modalities (Keating et al., 2004) which would require longer time duration for treatment.

Additionally, the presence of chiropractic assistants may influence the time that chiropractors spend with their patients, as adjunctive auxiliary procedures are often delegated to a non-chiropractic staff member. In Switzerland, 49% (*n* = 90) of chiropractors primarily delegated the administration of adjunctive therapies to non-chiropractic staff (Humphreys et al., 2010), with 69% (*n* = 90) of North American chiropractors employing one or more chiropractic assistants (Coulter and Shekelle, 2005) in their practices, which could substantiate the decreased time spent and high patient numbers seen. Similar practices were seen in a Finnish chiropractic population (14%; *n* = 6), but at a much lower rate (Malmqvist and Leboeuf-Yde, 2008).

2.3.4 Chiropractic therapies and adjunctive auxiliary techniques used in practice

2.3.4.1 Manual therapies

Traditionally, the vertebral subluxation has been treated utilising short lever, high velocity, low amplitude manipulative techniques to restore normal vertebral motion and alignment (Chapman-Smith, 2000; Leach, 2004; WFC, 2013). Gradually, as the chiropractic profession has advanced, different manipulative techniques have been developed and used to treat patients (Cooperstein and Gleberzon, 2004). The Bergmann classification **(Figure 2.1)** of manual therapies helps one to successfully review and understand the manipulative procedures that chiropractors use in patient management.

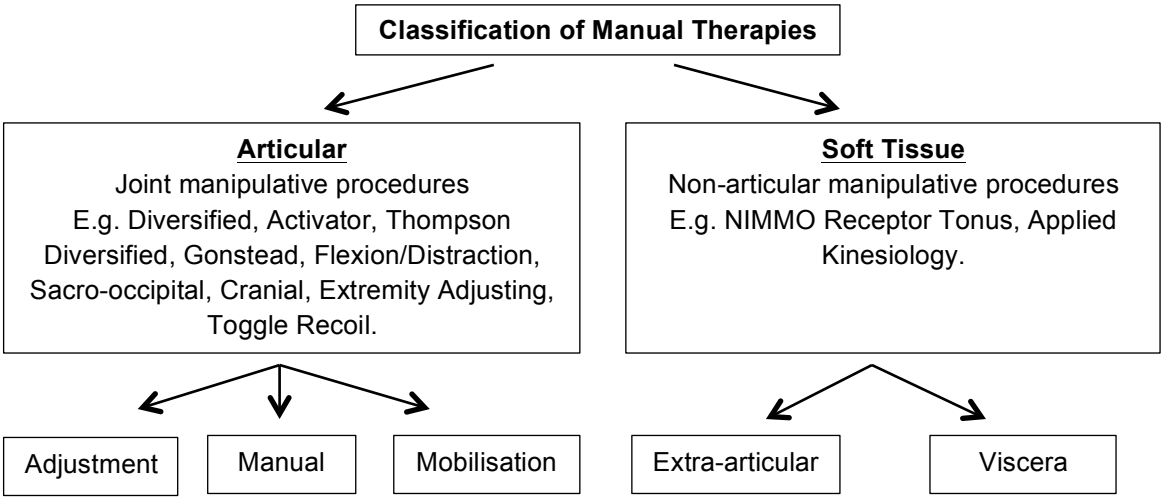

Figure 2.1 Bergmann classification of manual therapies (Bergmann and Peterson, 2011)

A variety of manipulative techniques allows the chiropractor to choose an appropriate technique to suit the patients, the patient's age, morphological characteristics, the presenting complaint and/or the presence of co-morbid pathologies (Davies, 2000; Gatterman, 2003; Murray et al., 2007). If the chiropractor is injured or unable to perform a high velocity/low amplitude manipulation, technique modification or alternative techniques are available for him/her to still deliver care (Cuppusamy, 2014). The choice of manual therapy by the practitioner may be influenced by the educational background and philosophical underpinnings of the chiropractor, where the institution of graduation governs what skills and techniques are included within the curricula. Furthermore, postgraduate qualifications or certifications can broaden the skill set obtained in undergraduate training (Keyter, 2010). Numerous courses are available such as Certified Chiropractic Extremity Practitioner (CCEP); Certified Chiropractic Sports Physician® (CCSP®); Diplomate American Chiropractic Board of Sports Physicians® (DACBSP®); Diplomate in Clinical Chiropractic Pediatrics (DICCP); Electrodiagnostics Certificate Program; Neurology Diplomate Program (Palmer College of Chiropractic, 2014).

In South Africa, chiropractic students are trained principally in the diversified technique and also extremity adjusting (University of Johannesburg Handbook, 2014; Durban University of Technology Handbook, 2014). The use of diversified technique is seen to prevail in most of the literature on practice characteristics (Wilson, 2003; Coulter and Shekelle, 2005; Waalen and Mior, 2005; Schwarz and Hondras 2007; Malmqvist and Leboeuf-Yde, 2008; Ailliet et al., 2010; Humphreys et al., 2010;

Keyter, 2010; Christensen et al., 2010) as this technique uses the high velocity/low amplitude thrust and is taught in the majority of chiropractic educational institutions.

The second most-utilised technique varies between regions with Belgian (Ailliet et al., 2010), South African (Keyter 2010), Australian (French et al., 2013), Finnish (Malmqvist and Leboeuf-Yde, 2008), Canadian (Waalen and Mior, 2005), Arizona and Massachusetts (Mootz et al., 2005) respondents favouring the Activator method. This is in contrast to those in the UK (Wilson, 2003) and Germany (Schwarz and Hondras, 2007) where Toggle Recoil and Sacro-occipital Technique ranked second. In North America (Coulter and Shekelle, 2005), techniques of adjusting such as Cox Flexion and Nimmo-Tonus were also commonly employed (Christensen et al., 2010).

2.3.4.2 Adjunctive auxiliary therapy

The use of adjunctive auxiliary procedures to spinal manipulation is influenced by several factors, thus allowing for the utilisation of a wide array of manual and other clinical methods for the successful treatment of neuromusculoskeletal conditions. The philosophical orientation of the practitioner as “straights”, where a more classical approach to treatment is taken, would result in the focus being on spinal manipulation with limited or no use of adjunctive procedures; whilst “mixers” would integrate a variety of modalities in combination with adjustments (Palmer 1910, Chapman-Smith, 2000; Dagenais and Haldeman, 2012).

Adjunctive auxiliary techniques commonly used include passive treatments such as cryotherapy and trigger point therapy, to active procedures such as corrective exercises and rehabilitation, as well as health promotion and wellness care (Christensen et al., 2010). The Swiss study reported that advice on activities of daily living, trigger point therapy, therapeutic exercises, mobilisation techniques and the application of physical therapy modalities were commonly utilised by chiropractors (Humphreys et al., 2010). This substantiates that although the chiropractors in Switzerland seem to have a high-volume practice, this is not borne out of a straight philosophical approach, but rather from pragmatic adaptation by using CA’s and from good integration in the health care system in Switzerland.

In the US trigger point therapy as well as therapeutic exercises were among the most commonly-used adjunctive procedures, accounting for 86.8% and 96.8%,

respectively (Christensen et al., 2010). These results corresponded with those from Belgium, where trigger point therapy was utilised in 79% of cases and exercise therapy in 81% of cases (Ailliet et al., 2010). Similarly, 80% (*n* = 256) of Norwegian chiropractors utilised trigger point therapy (Kvammen and LeBoeuf-Yde, 2014) and 81% (*n* = 40) of German chiropractors focused on rehabilitation exercises as a common intervention for treatment of patients (Schwarz and Hondras, 2007).

Belgian chiropractors generally did not use physical modalities or electrotherapeutic techniques (Ailliet et al., 2010). This is in contrast to the regional practice in North America where thermal modalities and electrical stimulation were provided at approximately 20% of visits in Arizona and 30% of visits in Massachusetts, whilst manual traction and ultrasound were used during approximately 10% to 15% of visits (Mootz et al., 2005). Coulter and Shekelle (2005) reported that electrical therapy and ultrasound was used by 71% (*n* = 93) and 67% (*n* = 88) of chiropractors, respectively. Ultrasound and other electrotherapeutic modalities also ranked higher than other adjunctive procedures when considering chiropractors in Canada (Waalen and Mior, 2005). Results regarding adjunctive procedures differed in Finland where cryotherapy was most commonly used by 46% (*n* = 20) of practitioners (Malmqvist and Leboeuf-Yde 2008).

In a South African context, it was noted that chiropractors applied a range of modalities in practice, with dry needling for trigger point therapy being the most popular (84.5%; *n* = 101), followed by cryotherapy (55.2%; *n* = 66) and therapeutic ultrasound (36.2%; *n* = 43) (Keyter 2010).

Regional differences may occur due to the licensing laws of the region determining the scope of practice and, therefore, determine what procedures may or may not be utilised in practice. For example, in Michigan State, chiropractors may not treat with any modality except manipulation (Chapman-Smith, 2000).

Numerous factors are responsible for the utilisation of such a wide variety of adjunctive procedures within the chiropractic profession. Different philosophical and academic backgrounds, evidence-based practice, legal requirements, practitioners' personal preferences, influence from other colleagues, exposure and training in a particular modality or technique can influence the extent to which chiropractors utilise

adjunctive procedures when treating patients. Additionally, inter-professional relationships influence a practitioner's use of adjunctive auxiliary procedures as they may refer to other health care practitioners when necessary. It is evident that there is a varying standard of practice within the chiropractic profession and further substantiates why the public and other health care professionals struggle to fully understand what chiropractic entails (Shaik, pers. Comms, 2015).

2.4 Patient profile

The health care preferences that patients have are a primary driving force in the demand for chiropractic services (Gaumer et al., 2002). Various definitions and perceptions of chiropractic care embody inconsistent views and this often leaves the public and other health care professionals feeling confused about what chiropractic has to offer and what treatment to expect (Morrison, 2009). Myburgh and Mouton (2007) who reported that patients, in South Africa particularly, were unclear regarding the professional reputation of chiropractors and whether or not the chiropractic profession was integrated with mainstream medicine. Despite the uncertainty, patients seek chiropractic care (van Haselen et al., 2004; Greene et al., 2006) and the specialized treatments that only chiropractors seem to provide (National Centre for Complementary and Alternative Medicine, 2004).

2.4.1 Demographic profile of chiropractic patients

2.4.1.1 Gender

Patients seeking chiropractic care are observed to have a similar demographic profile irrespective of the geographical location. A slight predominance of female patients exists in many regions including North America (Coulter et al., 2002; Coulter and Shekelle, 2005; Mootz et al., 2005), Switzerland (Humphreys et al., 2010); Germany (Schwarz and Hondras, 2010); Sweden (LeBoeuf-Yde et al., 1997); the UK (GCC, 2004), Europe (Pederson, 1994; Christensen et al., 1994); Belgium (Alliet et al., 2010); Denmark (Sorensen et al., 2006); Netherlands (Rubinstein et al., 2000) and Australia (French et al., 2013). Van der Valk et al. (1995) found that females were more likely to present with chronic back complaints and other studies (MacLennan and Wilson, 1996; National Centre for Complementary and Alternative Medicine, 2004; Tatalias, 2006; Brown et al., 2007) have reported that women were more likely

to seek CAM than males. The non-invasive nature of CAM, with its fewer side effects (MacLennan and Wilson, 1996; National Centre for Complementary and Alternative Medicine, 2004; Tatalias, 2006) may be more appealing to women.

2.4.1.2 Age

The most popular age group receiving chiropractic care was similar in various countries, with the mean age in different studies ranging between 41-45 years in North America (Coulter et al., 2002; Coulter and Shekelle, 2005), Denmark (Sorensen et al., 2006), Belgium (Alliet et al., 2010), the Netherlands (Rubinstein et al., 2000), Arizona and Massachusetts (Mootz et al., 2005). In Switzerland (Humphreys et al., 2010) and Ontario, Canada (Waalen and Mior, 2005), it was reported that the majority of patients are between the ages of 31-50 and 34-50 years of age respectively. This indicates that most chiropractors were treating the working population. Chiropractors in South Africa are trained to treat paediatric to geriatric populations (Durban University of Technology Handbook, 2014), but the treatment of these groups was limited (Waalen and Mior, 2005; Schwarz and Hondras, 2007; Ailliet et al., 2010; Humphreys et al., 2010; French et al., 2013). It is recommended that chiropractors should take a greater interest in the musculoskeletal health of children and adolescents (Hestbaek et al., 2009) as back pain in childhood is a strong predictor of back pain later in life (Hestbaek et al., 2006).

2.4.1.3 Ethnicity

There is a paucity of literature available on this demographic but it was noted that chiropractors are seen to treat predominantly a white populace (Coulter et al., 2002; Coulter and Shekelle, 2005; Keyter, 2010). In South Africa, there are four main ethnic groups (Blacks, Coloured, Indians and Whites) yet chiropractors are still known to have a predominantly white clientele. Chiropractic services are chiefly available in the private health care sectors with very few chiropractors having hospital privileges (Myburgh and Mouton, 2007); this makes chiropractic services inaccessible to a large percentage of the population due to costs involved in the treatment and the lack of chiropractors in the public health care sectors.

Any patient presenting to a medical professional has an expectation based on their previous experience (Bergh and Theron, 1999), knowledge of medicine (Hayes, 1994; Eysenck and Keane, 1996), knowledge of the profession (Coulter, 1999) as

well as the perception of the profession through the lens of society (Robbins, 1996). Therefore, it is possible that patient's expectations are either met or not met when they visit a chiropractor for the first time (Wardwell, 1989), and the patient's perception may differ greatly from the chiropractors' perception. For example, on one side of the spectrum, chiropractors may fail to deliver the care that patients and public health expect, such as a patient expecting to be fully assessed then treated but only receiving an adjustment ("straights"). Conversely, in other cases, chiropractors may positively surpass the expectation of the public such as a patient anticipating an adjustment only but instead receives treatment in the form of a wide array of modalities in addition to an adjustment ("mixers").

2.4.2 Chief complaints and aetiology

Chiropractic services are mostly seen to be used for the management of musculoskeletal conditions (Ernst, 2008), and most patients, as well as the general public, strongly perceive chiropractors as being back specialists (Gaumer et al., 2002). In some studies (Langworthy and Birkelid, 2001; Cambron et al., 2007) patients and general practitioners unanimously agreed that chiropractors are capable of treating spine-related problems, yet were sceptical when asked about the treatment of other conditions such as headaches, pregnancy difficulties, extremity and non-musculoskeletal complaints.

The most common reported conditions chiropractors treat are neck and back pain (New Zealand Consumers" Institute, 1997; Fanuele et al., 2000; Rubinstein et al., 2000; Cooper and Mckee, 2003; Vinci and Peterson, 2003; Wilson, 2003; McDonald et al., 2004; Coulter and Shekelle, 2005; Leboeuf-Yde et al., 2005; Mootz et al., 2005; Waalen and Mior, 2005; Sorensen et al., 2006; Schwarz and Hondras, 2007; Alliet et al., 2010; Humphreys et al., 2010; Eaton et al., 2012; French et al., 2013). Low back and neck pain are a significant public health issue (Martin et al., 2008; Odole et al., 2011) leading to high levels of disability (Baskerville and Keenan, 2005), economic burden on individuals, families, and industries (Kent et al., 2005; Steenstra et al., 2005; Thelin et al., 2008); and reportedly the most expensive industrial musculoskeletal injury (Fanuele et al., 2000). Additionally, it has been found that the prevalence of neck and low back pain is reportedly higher in females and peaks in middle age (Fejer et al., 2006; Binder, 2007; Fernandez-de-las-Pernas et al., 2011),

coinciding with the patient demographic profile presenting to chiropractic practices (Rubinstein et al., 2000; Vinci and Peterson, 2003; Wilson, 2003; McDonald et al., 2004; Coulter and Shekelle, 2005; Leboeuf-Yde et al., 2005; Mootz et al., 2005; Waalen and Mior, 2005; Sorensen et al., 2006; Schwarz and Hondras, 2007; Alliet et al., 2010; Humphreys et al., 2010; Eaton et al., 2012; French et al., 2013).

It is necessary to ensure that chiropractic care is not restricted to back and neck pain alone (ACA, 2008). Although musculoskeletal conditions are primarily treated by chiropractors, according to Rubinstein et al., (2000) less than 2% of patients sought treatment for non-musculoskeletal complaints, which is consistent with results reported in Italy (Vinci and Peterson, 2003) and Belgium (Alliet et al., 2010). In North America, it was found that 10.3% of patients present to the chiropractor with non-musculoskeletal complaints (Mootz et al., 2005). Similarly, 60% of chiropractors in Norway reported that 10-50% of their patients presented with complaints unrelated to the spine (Kvammen and LeBoeuf-Yde, 2014). Digestion, circulation and allergies were commonly reported positive reactions from patients receiving chiropractic treatment for non-musculoskeletal conditions (Leboeuf-Yde et al., 2005). However, the scientific evidence supporting chiropractic treatment of non-musculoskeletal conditions is scant and further research in this area is necessary (Hawk et al., 2007).

Overuse or repetitive stress, activities of daily living, sports and exercise are among the most commonly reported aetiologies by chiropractic patients (Christensen and Kollasch, 2005; Humphreys et al., 2010; Christensen et al., 2010). However, in studies on American chiropractors (Coulter and Shekelle, 2005; Mootz et al., 2005; Christensen and Kollasch, 2005), non-work related injuries and motor vehicle accidents (MVAs) were also common causes of chief complaints. Humphreys et al. (2010) noted that MVAs were not a common aetiology for patient symptoms in Switzerland possibly due to patients commuting via efficient public transportation systems in European regions.

It is evident that the public perception of chiropractic is that of a musculoskeletal health care profession, characterised by manipulation (Leboeuf-Yde et al., 2005; Hawk et al., 2007). The proposed lack of focus on non-musculoskeletal disorders by some chiropractors is at odds with the “straight” chiropractic philosophy.

Another example of a difference in opinion between the public and chiropractors is their perception of public health for most chiropractors envisage public health as being the promotion of musculoskeletal and general health in their patients (Ford, 2013). This for the straights would include manipulating the spine in order for the "innate intelligence" to allow proper functioning of the body to withstand external stressors. The "mixers" on the other hand would see themselves as contributing to public health by means of addressing patient education, ergonomics (work and recreational) and addressing specific musculoskeletal aspects of lifestyle – like exercise prescription.

2.4.3 Symptom duration

Conditions are classified into three main categories dependent on duration. Acute conditions are those lasting from initial injury up to four weeks duration (0-4 weeks); subacute refers to conditions lasting from four weeks to three months duration (4-12 weeks); and chronic conditions are longer than three months (>12 weeks) (Primary Care Reports, 2008). Symptom duration of the presenting chief complaints is seen to vary between regions depending on the level of establishment and acceptance of the chiropractic profession. Coulter and Shekelle (2005) noted that less than half of the patients (45%) in North America had experienced their chief complaints for less than three weeks, with 58% having no previous conservative care for their ailments prior to presenting to the chiropractor. This may indicate that patients sought chiropractic services promptly and possibly viewed chiropractors as primary contact providers.

In Denmark, 64% of patients had experienced symptoms for less than four weeks upon visiting a chiropractor (Sorensen et al., 2006). Similarly, 70% (n = 128) of Swiss chiropractors reported that 26-100% of their patients displayed symptoms for the duration of between 0-4 weeks (Humphreys et al., 2010); and in Sweden, the highest percentage (30%) of patients presented with a symptom duration of less than one week (Leboeuf-Yde et al., 1997).

In contrast, in the Netherlands, despite the existence of chiropractic for over 30 years, it is still considered to be an ambiguous form of therapy with no formal recognition (Rubinstein et al., 2000). Three quarters (75%; n = 625) of the patients presenting to chiropractors with neuromusculoskeletal complaints had previously

received conservative care elsewhere for their complaints, with one third receiving multiple forms of conservative care. Patients tended to delay their visits to chiropractors as 77% (*n* = 641) had complaints that exceeded three months, with only 9% and 5% presenting in the acute and subacute phases, respectively (Rubinstein et al., 2000).

Canadian chiropractors reportedly treated a greater number of chronic conditions with a 2:1 ratio in relation to acute conditions (Waalen and Mior, 2005). When critically evaluating chiropractic care, the main reasons as to why patients may not consult chiropractors or prolong their symptoms before consultation include the fear of adverse effects as well as the purported lack of scientific proof of treatment (Menke, 2003). However, there are numerous randomized clinical trials supporting chiropractic treatment for acute, subacute or chronic low back pain (van Tulder et al., 1997; Descarreaux et al., 2004; Hoiriis et al., 2004; Muller and Giles, 2005; Santilli et al., 2006; Bronfort et al., 2008). Patients seem to be unsure as to when it is necessary to seek chiropractic care and fail to understand the benefits of the care which a chiropractor can successfully provide.

Despite the time duration for seeking chiropractic services, patient satisfaction following chiropractic treatment is seen to be exceptionally high (Gemmell and Hayes, 2001). Posner and Glew (2002) noted that chiropractic patients expressed more satisfaction with chiropractic care than with any other forms of treatment received, and these patients were also more likely to return to their chiropractor if their ailments or symptoms recurred (Landmark Healthcare, 1999). Coulter and Shekelle (2005) reported that patients expressed an 87.4% satisfaction rate after receiving chiropractic care; 42% of patients rewarded a 10/10 score for overall satisfaction and confidence regarding the received treatment, with 93% of patients ensuring that they would return for care if necessary. Garner et al. (2008) reported that the health care team, consisting of all physicians, nurse practitioners and degree trained nurses, communicated the success of chiropractic care and noted that patient response to chiropractic treatment was almost always successful and that patient feedback was exceedingly positive.

2.5 Diagnostic imaging

Chiropractors, where legislation allows, are licensed to diagnose medical conditions (Chapman-Smith, 2000). In order to do so successfully, practitioners may require blood tests, diagnostic imaging as well as other special tests or further investigations (Ferri, 2014). Diagnostic imaging is the most commonly utilised procedure to aid diagnosis (Yochum and Rowe, 2004; Marchiori, 2014). Radiographs have been utilised in chiropractic since its inception (Peterson and Hsu, 2005) to confirm a diagnosis, examine for contra-indications for treatment and aid in determining the prognosis (Van Tulder et al., 1997). Therefore, access to diagnostic imaging is important to the chiropractic profession (van de Veen et al., 2005).

Certain chiropractic techniques such as Gonstead technique (Herbst, 1980; Cooperstein, 2003) rely on the use of radiographs as an integral part of the assessment, diagnosis and management of the patient; therefore those practitioners using these techniques would be more likely to have their own radiographic equipment (Herbst, 1980; Cooperstein and Gleberzon, 2004). In Arizona and Massachusetts, plain film radiographic imaging was the most frequently utilised diagnostic procedure, with 17% and 6% of patient visits involving a radiograph, respectively (Mootz et al., 2005). In Switzerland, radiographs were deemed necessary less than 20% of the time by the majority of chiropractors (Humphreys et al., 2010).

Certain countries, like South Africa (Allied Health Service Professions Act, 63 of 1982, as amended) and Norway (Kvammen and LaBoeuf-Yde, 2014) allow chiropractors to perform, and/or order limited diagnostic imaging (Chapman-Smith, 2000), with some chiropractors opting to have their own radiographic facilities, instead of referring to radiology practices. A Norwegian report found that although chiropractors have the ability to obtain their own radiographs, imaging equipment was not common in practices and chiropractors preferred to refer patients to hospitals or private centres (Kvammen and LeBoeuf-Yde, 2014). Similarly, in Holland, 81% (*n* = 92) did not have access to radiographic facilities in their clinic(s) (Imbos et al., 2004).

The high costs involved in purchasing radiographic equipment, the increased responsibility of diagnosing pathology on radiographs and the need to facilitate inter-professional relationships may deter chiropractors from purchasing their own radiographic equipment. In contrast, 59.4% of chiropractors in the USA (Christensen et al., 2010), 55% (*n* = 101) of Swiss chiropractors (Humphreys et al., 2010) and 35% (*n* = 286) of chiropractors in the UK (Wilson, 2003) had radiographic facilities in their practices. In Finland (Malmqvist and Leboeuf-Yde, 2008), Belgium (Ailliet et al., 2010) and Sweden (Westin et al., 2013) chiropractors are not able to take radiographs due to a lack of supporting legislation. Only 40% (*n* = 18) of Finnish chiropractors had the opportunity to indirectly refer patients for x-ray examination via medical practitioners (Malmqvist and Leboeuf-Yde 2008).

Despite the influence of factors such as legislation, cultural authority and the degree of which the profession is integrated into the health care system, the philosophical underpinnings of the chiropractor may explain why certain chiropractors opt to have their own x-ray equipment. Chiropractors with a relatively “straight” philosophy have tended to train and practice in isolation from other medical professions and are more likely to have x-ray facilities at their practices in order to maintain their self-reliance. In contrast, those with a “mixer” philosophy support the integration of chiropractic into mainstream health care (Carey et al., 2005) and view x-ray referral as more favourable in cultivating referral networks with other practitioners and hence have a decreased likelihood to have personal x-ray facilities.

2.6 Type of practice, inter-professional relationships and referral patterns

Due to the chiropractic professions’ relative isolation from mainstream medicine, the opportunities for multidisciplinary practices have been limited. General practitioners i.e. medical doctors, have the ability to influence their patients’ health care choices; therefore their perceptions of chiropractic could be a significant factor influencing how the public view chiropractic (Westin et al., 2013). Poor knowledge and scepticism regarding the chiropractic profession may impair the ability to build successful multidisciplinary practices. In order to maximise patient benefit, professionals need to work cohesively and develop an improved knowledge base about one another’s

principles, formation, attitudes, qualifications and basic skills (Bower-Hulme et al., 1988).

Garner et al. (2008) and Branson (2009) found that the inclusion of a chiropractor into a health care team of traditional medical professionals showed changes in the attitude of the health care providers towards chiropractic. Positive responses were expressed by these medical professionals regarding legitimacy, safety and effectiveness of chiropractic, despite the initial scepticism. Furthermore, it was reported that the presence of a chiropractor on the health care team resulted in an overall effective impact on their practice, positive patient outcomes and promoted an improved understanding of the chiropractic profession and scope of practice. This indicated that misconceptions and poor knowledge of a profession can create barriers to team collaboration. Successful alliances between health care professionals ensure that patients are not disadvantaged in terms of appropriate treatment or financially in terms of national health schemes with regards to reimbursement issues or cost efficacy (Langworthy and Birkelid, 2001).

Most chiropractors practiced either on their own (i.e. solo) or in a group practice with other chiropractors or in a multidisciplinary practice setting, which includes a group of health care workers who are members of different disciplines, each providing specific services to the patient (Dorland's Illustrated Medical Dictionary, 2007). In South Africa, there is legislation preventing health care practitioners who are registered with the AHPCSA from sharing a room with CAM therapists (Health Professions Act 56 of 1974). Therefore, legislation within a region can influence the type of practice setting a chiropractor chooses because it may be unlawful to practice with other health care professionals.

The international trend is not clear as studies show that chiropractors opt for solo practices in Arizona, Massachusetts, Germany, Finland, Belgium and Switzerland (Mootz et al., 2005; Schwarz and Hondras, 2007; Malmqvist and Leboeuf-Yde, 2008; Ailliet et al., 2010; Humphreys et al., 2010) whereas in the Netherlands (Imbos et al., 2004), Norway (Kvammen and LeBoeuf-Yde, 2014), Australia (French et al., 2013) and the United Kingdom (GCC, 2004) group practices are favoured.

Furthermore, Ailliet et al. (2010) observed that those who practiced for less than five years showed a strong tendency toward group practices, either with fellow chiropractors or other health care professionals. The novice practitioner may benefit from group practices in terms of sharing of costs and human resources (e.g. receptionist), as well as the support that working with various health care professionals may offer. Caplan (2007) recommended that the number of multidisciplinary practices increase to improve inter-professional collaborations and patient health.

In the Netherlands poor referral systems were found between medical doctors and chiropractors due to bad experiences, use of confusing terminology, stereotyping, and a lack of knowledge of chiropractic, with only 13% of general practitioners knowing “very well” what chiropractic was, and with 46% knowing a “little” about the chiropractic profession (Brussee et al., 2001). It is, however, not clear how “very well” and “little” were defined for this study. Similar results were found in a Norwegian population of general practitioners where approximately 47% knew “something” about the chiropractic profession, with only 5% claiming to have good knowledge of the discipline (Langworthy and Birkelid, 2001). A follow-up study reported a significant improvement to 17% (Westin et al., 2013). This may indicate that chiropractic in Norway may have become a more established and recognised health care profession between 2001 and 2012 resulting in improved inter-professional perceptions.

Referral to chiropractors from general practitioners is more common in Switzerland than in both the United States and United Kingdom (Humphreys et al., 2010) possibly due to its integration. In Denmark, the percentage of referrals to chiropractors more than doubled from 1999 (23%) to 2002 (51%). Of this, referrals from medical practitioners increased from 11% to 17%, respectively, with the remaining referrals coming from friends, family and other health care providers (physiotherapists and reflexologists). This reflects the effort through which chiropractors and health authorities are targeting successful integration of chiropractic care into the primary health care system (Sorenson et al., 2006). Better dialogue and exchange of information between practitioners from different disciplines may improve patient management and increase public confidence in the chiropractic profession.

A factor that can influence inter-professional relationships and understanding is the availability of chiropractic training in the country. Many chiropractors have been trained abroad (especially those not residing in the USA, Canada or Europe), either out of choice or due to the lack of legislation, educational training or support of chiropractic within selective countries for example the Netherlands (Rubinstein et al., 2000), Finland (Malmqvist and Leboeuf-Yde, 2008) and Sweden (Leboeuf-Yde et al., 1997). This may result in exposure to different philosophical underpinnings, academic standards, group dynamics, jargon, as well as diversity in treatment approaches (Brussee et al., 2001). A wide diversity of practice and lack in standardisation in academic teaching (Busse et al., 2011) may also contribute to misinterpretation within the health care system and contribute to unfavourable professional relationships (Brussee et al., 2001).

There is increased popularity for the usage of and referral to CAM therapists, especially chiropractors as observed in the USA (Greene et al., 2006), Canada (So, 1997; Kelner et al., 2006) and the UK (GCC, 2004). In selected regions, word of mouth, via friends and family, is a key source of patient referral, suggesting that the chiropractic profession is also consumer-driven (Eaton et al., 2012). In addition, patient referrals to chiropractors came from other health care practitioners, although these percentages were much lower in comparison (Imbos et al., 2004; Mootz et al., 2005; Sorensen et al., 2006; Schwarz and Hondras, 2007; Ailliet et al., 2010; Humphreys et al., 2010; Eaton et al., 2012; Westin et al., 2013). This is substantiated by Assendelft et al. (1995) and Menke (2003) that 90% of chiropractic patients are self-referred. Rubinstein et al. (2000) found that general practitioners in the Netherlands refer 17% of patients to chiropractors, but the majority of referrals (71%) were from family and friends. The low referrals from general practitioners could be attributed to their reluctance to refer their patients to chiropractors, instead preferring to refer them to manual therapists (Daams, 1996). This is due to chiropractic being viewed as an obscure form of therapy due to the lack of formal recognition of the profession. In Sweden, chiropractors are restricted from referring to medical specialists and vice versa, as chiropractic is not included in the public health care sector (Westin et al., 2013).

2.7 Conclusion

Throughout chiropractic history, it is evident that a split exists between those who espouse a straight philosophy versus those with a mixer philosophical perspective. These diverse schools of thought have provided avenues for misinterpretation and miscommunication between chiropractors, the public and other health care practitioners, resulting in the profession being at the crossroads between main stream and alternative medicine. In a milieu where chiropractic is seeking unity, greater integration and legitimacy, it is important to investigate the practice characteristics of chiropractors across regions in order to evaluate and revise the knowledge base of chiropractic care, as well as maintain common international standards which have been successfully achieved through the WFC and CCEI. Understanding the demographic and practice profiles, together with the underlying factors influencing these profiles can significantly aid in shaping the development of the profession globally.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter describes the methodology utilised to meet the aims and objectives of this study. It provides the details of the study design; methodology used; sampling procedures employed; the inclusion and exclusion criteria; research procedure and statistical analysis for the collected data.

3.2 Study design and setting

3.2.1 Study design

This study utilised a quantitative descriptive survey design. The study was done in conjunction with a fellow researcher, registered for a M.Tech Chiropractic qualification, where a survey was utilised to obtain data from the population. One of the research projects was this dissertation and the other was titled "The perception, knowledge and utilisation of research and its role in the Chiropractic profession as determined by Chiropractors attending the World Federation of Chiropractic Biennial Conference 2013". In order to prevent the delegates having to complete the demographic section twice, it was decided to have a combined questionnaire for the two studies.

Chiropractic delegates attending the WFC's 12th Biennial Congress 2013 in Durban, South Africa were requested to complete a structured questionnaire **(Appendix G)**. This approach was selected as descriptive studies enable the researcher to gather necessary information from a sample population; it does not aim to show cause and effect but rather to describe a phenomenon as it naturally occurs (Brink, 2012). This design is similar to other studies investigating chiropractic practice characteristics (GCC, 2004; Humphreys et al., 2010; Christensen et al., 2010).

The research was approved by the Faculty of Health Sciences Research Committee and ethical clearance was obtained from the Institutional Research Ethics Committee (IREC) **(Appendix A)** and the WFC **(Appendix C)**.

3.2.2 Setting

The study setting was the International Convention Centre (ICC) in Durban, South Africa, and approval to conduct the research at this site was given by the ICC manager (**Appendix D**).

3.3 Study population

All 406 registered chiropractic delegates who attended the WFC's 12th Biennial Congress in Durban held 10-13 April, 2013.

3.4 Advertising

No formal advertising was required for this study as the total population (i.e. all the chiropractic delegates) were invited to participate. At the start of the congress, and at each session, the Chair made an announcement to the delegates about the research and encouraged delegates to participate.

3.5 Sampling procedure

3.5.1 Sample Size

The organising committee for the WFC congress was contacted to determine how many people had registered for the Congress by March 2013. It was estimated that 750 delegates had registered, which included students and promotional personnel. It was further estimated that there would be 600 delegates holding a chiropractic qualification. This number was subject to change due to late registrations. A minimum response rate of 70% would be needed to allow for generalisations to be made about the sample population and to minimise selective bias (Esterhuizen, 2014). On conclusion of the Congress, the WFC confirmed that a total of 406 chiropractic delegates attended the congress.

3.5.2 Inclusion and exclusion criteria

The inclusion and exclusion criteria of the study were:

3.5.2.1 Inclusion Criteria

- The participant had to be a registered delegate of the WFC's 12th Biennial Congress 2013.
- The participant had to have obtained a chiropractic qualification (e.g. DC, M.Tech. Chiro, MSc (Chiro), BSc (Chiro)).
- The participant had to provide written informed consent **(Appendix F)**.

3.5.2.2 Exclusion Criteria

- Any person who attended the conference as a promotional person; chiropractic assistant; sponsor; exhibitor; catering or administrative staff. This was elucidated by those that were not on the chiropractic delegate list.

3.6 Questionnaire development

A questionnaire was utilised as it is an effective means of reaching larger numbers of a target population in a brief period of time (Jones et al., 2008). Furthermore, similar studies (GCC, 2004; Christensen et al., 2010; Humphreys et al., 2010) investigating practice characteristics also utilised a questionnaire, thus making it easier to compare and contrast results once the data had been quantified.

In order for the questionnaire to meet the aims and objectives of this study, the researcher reviewed similar research to determine the appropriate format for the survey. Every five to seven years, The National Board of Chiropractic Examiners (NBCE) (Christensen et al., 2010) conducts a job analysis of chiropractors in the USA using a specific questionnaire. This questionnaire has been adapted and used by Humphreys et al. (2013) for a Swiss study on practice characteristics and was deemed suitable for this study. Henceforth, the researcher obtained permission from both the NBCE and Humphreys et al. (2013) to utilise their questionnaire in this

research **(Appendix B).** The researcher then adapted the NBCE survey by omitting the section related to “Type of conditions” as this referred to a full systems review which was not relevant for this study. “Professional functions” was also omitted. There were seven questions found in the Humphreys et al. (2013) questionnaire which were not in the original NBCE questionnaire but were included for this study as these questions provided necessary information for this study. The demographic section was modified to suite an international audience.

The final questionnaire **(Appendix G)** consisted of three parts:

1. Demographic characteristics and practitioner information; their educational background.
2. Section A: Questions pertaining to practice characteristics of the respondents.
3. Section B: Questions pertaining to research perception, utilisation and knowledge, and their opinion on the future direction of research in Chiropractic (this section did not pertain to the present study).

The questionnaire utilised for this study (excluding Section B) did not go through a focus group because all the questions came from one of two previously utilised questionnaires and no further alterations were made as the questionnaire met the necessary aims and objectives of this study. The questionnaire was pilot tested using four chiropractors in clinical practice in order to determine its usability and to ascertain that the research question was answered adequately (Gordon, 2011) **(Appendix E)**.

3.7 Research procedure

Pre-Congress:

Prior to the start of the Congress, the researcher placed the questionnaire **(Appendix G)** together with Letter of Information and Consent (LOIC) **(Appendix F)** in the delegate folders. These were handed out to the chiropractic delegates during registration, thus ensuring that the delegates received a copy of the questionnaire and LOIC.

During the Congress:

Before the Congress proceedings of each day, an announcement was made by the Congress Chair to request that chiropractic delegates voluntarily complete the

questionnaire and LOIC and place it in the sealed and marked collection boxes that were available at the registration table. There were two separate boxes: one marked for the informed consent forms and the other for the completed questionnaires. The researcher was at the registration table to ensure that both the questionnaire and letter of information were deposited into the correct boxes. At the end of each day the boxes were removed, and stored in a closed, secure room in the ICC. The following morning (prior to Congress proceedings commenced) the boxes were then placed in the same place as the day before. The questionnaires were also given to any delegate who did not receive one for any particular reason. The possible reasons for this included failure to place the questionnaire into the delegate folder due to human error or delegates misplacing the questionnaire. The researcher was available at the registration table to issue these questionnaires and to answer any questions pertaining to the study.

Post-Congress:

The completed questionnaires were kept in a secure, locked cabinet which was accessible only to the researchers and the supervisors. At the end of the congress the collection boxes were opened revealing 103 questionnaires. This resulted in a response rate of 25.36%.

Post-Congress electronic survey:

An application was made through the Research and Higher Degrees Committee (RHDC) and IREC to amend the research data collection procedure to include the administration of an electronic survey using Survey Monkey®. The WFC agreed to distribute an e-mail to all registered delegates **(Appendix I)** to inform them about the online survey. Following approval from the IREC (**Appendix H**), Survey Monkey® (SurveyMonkey.com, 2013) was used to compile an electronic version of the questionnaire (Privacy Policy, **Appendix K**). The email containing the letter of information **(Appendix J)** with the link to the questionnaire on Survey Monkey® was then distributed to the WFC delegates. The letter of information and consent highlighted the following:

- Delegates who previously completed the questionnaire at the Congress should refrain from completing it a second time.
- Only those meeting the inclusion criteria could partake.

The questionnaire was made available online for an additional six weeks. Following this, the researcher accessed the results on the Survey Monkey® site via a created profile that was password protected. The electronic survey allowed for an additional response rate of 9.36%, resulting in an overall response rate of 34.72%.

3.8 Data management

Only those questions relevant to this study were coded and utilised for data analysis. On completion of the study, all the data were reduced and coded in the following way:

1. Demographics

- Question two (age) – the actual ages of the respondents were recorded in order to determine the mean age, age was not categorised.
- Question three (ethnicity) – each respondent stated their ethnicity and each ethnic category was then coded.
- Question five (country and state/province/canton) – respondents wrote down the country and state they came from, then each response was coded.
- Question eight (institution) – respondents wrote down the institution that conferred their chiropractic degree and each institution was coded.
- Question nine (chiropractic qualification) – each respondent wrote down the chiropractic qualification for licensure. Due to the variety reported, M. Chiropractic and M. Dip. Chiropractic were combined with M.Tech Chiropractic and coded together as they represent similar qualifications. The other qualifications were coded for separately.
- Question 12 (post-graduate qualifications) – There was a variety of post-graduate qualifications stated by the respondents. Firstly, the data were coded based on the respondents “yes” or “no” answer to obtaining a post graduate qualification, then each qualification was stated.
- Question 15 (role in chiropractic) – respondents were able to tick more than one option for this question; this resulted in the formation of numerous additional categories. No categories were collapsed, but additional combination categories were formed and the data captured and coded in correlation to the stated responses for the respondents.

2. Practice characteristics (Section A):

- Question two (hours in practice) – an additional category was included, 40-49 hours, as it was originally omitted but many respondents added this category personally. The data was then coded for based on the categories.

For all the other questions, a code was given to each option.

3.9 Statistical analysis of the questionnaire

Data was coded and captured and entered into a Microsoft Excel spreadsheet for statistical analysis. IBM SPSS Version 21 was used for analysis of the data. A *p*-value of <0.05 was considered as statistically significant. Descriptive data was summarised and presented using tables and graphs. Chi square tests were used to analyse the categorical data. ANOVA testing was used where there were more than two independent group means being compared. Independent samples t-tests were used to compare continuous normally distributed measurements between two independent groups (Esterhuizen, 2014).

3.10 Ethical considerations

Approval was obtained from all relevant authorities before the study commenced. Participation was purely voluntary and by consent. All questions were kept confidential, no identifying data could be obtained from the completed questionnaires in keeping with the ethical principle of non-maleficence. To ensure autonomy the participants gave informed consent. There was no prejudice in terms of who could participate in line with the principle of justice.

The completed hardcopy questionnaires and informed consent forms are stored in a secure cupboard at the Department of Chiropractic and Somatology at the Durban University of Technology, and will be shredded after a period of five years.

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter presents the results obtained from statistical analysis of the data collected. Tables and figures are used to present the data, along with a description. The results will be presented according to the research objectives.

4.2 Abbreviations specific to this chapter

BSc:	Bachelor of Science
(c):	City
CE/CPD:	Continuing education/ Continued Professional Development
(co):	County
(e):	Emirate
HIO:	Hole in One
IQR:	Interquartile range
M:	Mean
M.Tech:	Masters of Technology
N:	Population size
n:	Sample size
ns:	Not stated
(p):	Province
p value:	probability value
Q:	Question
(r):	Region
(s):	State
SD:	Standard deviation
SOT:	Sacro-occipital Therapy
USA:	United States of America
WFC:	World Federation of Chiropractic

4.3 Response rate

A total of 141 questionnaires (N = 406) were returned resulting in an overall 34.7% response rate. The number of responses obtained from the two methods of data collection is illustrated in **Table 4.1**.

Table 4.1 Response rate according to method of data collection

	n	**%**
At the congress	103	25.36
Electronically	38	9.36
Total	**141**	**34.72**

4.4 Objective one: To determine the demographic profile of the chiropractic delegates attending the WFC Congress 2013

4.4.1 Demographic characteristics

4.4.1.1 Gender (Question 1)

There was a slight preponderance of female respondents (52.5%; *n* = 73). Data was not available for two respondents.

4.4.1.2 Age (Question 2)

The mean age of the respondents was 42 (SD ± 13) years, ranging from 23 to 76 years of age. There was missing data for two respondents.

4.4.1.3 Ethnicity (Question 3)

The majority of respondents (93.5%; *n* = 116) were White with the remaining 6.5% (*n* = 8) comprising of other ethnic groups viz. Indian, Coloured, Hispanic, Mexican, Asian and Maltese. Data was not available for 17 respondents.

4.4.1.4 Geographical representation (Questions 4 & 5)

The geographical representation of the respondents is shown in **Table 4.2**. The majority of the respondents were from Africa, with almost half of the respondents from South Africa, mostly from the province of Kwa-Zulu Natal **(Appendix L)**. Eight of the nine provinces in South Africa were represented, with no respondents from the North West province. Namibia was the only neighbouring country of South Africa which was represented, with no chiropractic representation from Zimbabwe, Swaziland, Botswana, Lesotho or Mozambique. North America and Europe were the next most represented regions. Respondents from the United States of America (USA) were from only ten of the 50 states, with only four cities in Canada being represented. From the European Union, eight countries were represented, three of which were Scandinavian countries. Australasia, Asia and South America accounted for the remaining regions, with Asia and South America being under-represented. There was missing data for three respondents for question five.

Table 4.2 Geographic representation of the respondents (*n* = 141 for Q4; *n* = 138 for Q5)

Region	*n*	%	Country	*n*	%	Province/State/City/Region
Africa	72	51.1	South Africa	67	48.6	Kwa-Zulu Natal (*p)*
						Gauteng (*p)*
						Western Cape (*p)*
						Mpumalanga (*p)*
						Limpopo (*p)*
						Eastern Cape (*p)*
						Northern Cape (*p)*
						Free State (*p)*
			Mauritius	1	0.7	*ns*
			Namibia	3	2.2	Khomas *(r)*
Asia	5	3.5	South Korea	1	0.7	Chung Nam *(p)*
			Philippines	1	0.7	Manilla *(c)*
			Singapore	2	1.4	*ns*
			United Arab Emirates	1	0.7	Dubai *(e)*
Australasia	10	7.1	Australia	8	5.8	Queensland *(s)*
						New South Wales *(s)*
						Western Australia *(s)*
						Victoria *(s)*
			New Zealand	2	1.4	Canterbury *(r)*
Europe	20	14.2	Belgium	1	0.7	Antwerp *(c)*
			Denmark	3	2.2	*ns*
			France	1	0.7	Auvergne *(r)*
			Netherlands	1	0.7	*ns*
			Norway	3	2.2	Akershus *(co)*
						Aust Agder *(co)*
			Sweden	3	2.2	*ns*
			Switzerland	3	2.2	Fribourg *(c)*
			United Kingdom	5	3.6	South Glamorgan *(co)*
North America	32	22.7	Canada	13	9.4	Alberta *(p)*
						Ontario *(p)*
						Quebec *(p)*
						Saskatchewan *(p)*
			United States	16	11.6	California *(s)*
						Connecticut *(s)*
						Georgia *(s)*
						Idaho *(s)*
						Missouri *(s)*
						New Jersey *(s)*
						New Mexico *(s)*
						New York *(s)*
						Ohio *(s)*
						Oregon *(s)*
			Mexico	1	0.7	Mexico City *(c)*
South America	2	1.4	Brazil	2	1.4	Rio De Janeiro *(c)*

(p) = province; (s) = state; (co) = county; (c) = city; (r) = region; (e) = emirate; ns = not stated

4.4.2 Educational characteristics

4.4.2.1 Institution that conferred the respondents' chiropractic degree (Question 8)

Half of the respondents (50.1%; *n* = 61) obtained their chiropractic qualification from one of two South African institutions viz. the Durban University of Technology or the University of Johannesburg **(Table 4.3)**. The region with the highest number of institutions represented was the USA with 27.9% (*n* = 34) of respondents receiving their chiropractic qualification from an American institution. Chiropractic qualifications were also obtained at institutions in Canada, Brazil, Australia, Denmark and the UK, but were represented to a lesser degree. There were 19 respondents who did not answer this question.

Table 4.3 Institution that conferred the respondent's chiropractic degree (*n* = 122)

Location	Institution	*n*	%
South Africa	Durban University of Technology*	44	36.1
	University of Johannesburg**	17	14.0
Canada	Canadian Memorial Chiropractic College	10	8.2
	Universite du Quebec a Trois-Rivieres	2	1.6
United States of America	Palmer College (Davenport)	12	9.9
	Life University (Chiropractic College)	5	4.1
	Southern California University of Health Sciences	3	2.5
	National University of Health Sciences	3	2.5
	Western States	3	2.5
	Parker University	2	1.6
	Logan University	2	1.6
	North West Health Science University	2	1.6
	Texas Chiropractic College	1	0.8
	New York Chiropractic College	1	0.8
Brazil	Anhembi Morumbi	1	0.8
Australia	Royal Melbourne Institute of Technology	5	4.1
	Sydney (Macquire) University	2	1.6
Denmark	University of Southern Denmark	2	1.6
United Kingdom	Anglo-European College of Chiropractic	5	4.1

*Includes Technikon Natal and Durban Institute of Technology (DIT)
**Includes Technikon Witwatersrand

4.4.2.2 Chiropractic qualifications of the respondents (Question 9)

Approximately half the respondents held an M. Tech. Chiropractic qualification followed by the Doctor of Chiropractic qualification **(Table 4.4)**. Four respondents failed to provide information on their qualification.

Table 4.4 Specific chiropractic qualifications of the respondents (*n* = 137)

Qualification	*n*	%
Master of Technology in Chiropractic (M. Tech.)	69	50.4
Doctor of Chiropractic (DC)	57	41.7
Bachelor of Health Science (BHSci)	1	0.7
Bachelor of Applied Science (B.App.Sci)	4	2.9
Master of Health Science (MHSci)	1	0.7
Bachelor of Science (BSc) (Chiropractic)	4	2.9
Master of Science in Clinical Biomechanics (MSc. ClinBio)	1	0.7
Total	**137**	**100**

4.4.2.3 The number of years since the awarding of the chiropractic qualification (Question 10)

The mean of the years since graduating as a chiropractor was 15.7 years (SD ± 3.6). This data was further categorised as seen in **Table 4.5**. Two thirds of respondents (66.9%; *n* = 91) had graduated within the last two decades. Five respondents failed to answer this question.

Table 4.5 Years since respondents graduated (*n* = 136)

Years since graduating	*n*	%
0-10	60	44.1
11-20	31	22.8
21-30	23	16.9
31-40	15	11.0
41+	7	5.2
Total	**136**	**100**

4.4.2.4 Highest level of non-chiropractic education (Question 11)

The highest level of non-chiropractic education obtained by the respondents is tabulated in **Table 4.6**. Of the 122 respondents that answered this question, 51.6% (*n* = 63) had obtained qualifications in addition to their chiropractic qualification. Those

who indicated 'Other' listed examples such as General and Vocational College (CEGEP) training, National Diploma's (e.g. therapeutic aromatherapy) and Chiropractic diplomat training (e.g. International Chiropractic Sports Science Diploma). There were 19 respondents that did not answer this question.

Table 4.6 Highest level of non-chiropractic education (*n* = 122)

Highest level of non-chiropractic education	*n*	%
High School	59	48.4
Bachelor's Degree	31	25.4
Master's Degree	17	13.9
Doctorate	8	6.6
Other	7	5.7
Total	**122**	**100**

4.4.2.5 Postgraduate qualifications (Question 12)

There was a variety of postgraduate studies which included diplomas, fellowships and certifications. Sports medicine and orthopaedics were the most common areas of interest. Eight respondents (6.6%) reportedly had PhD qualifications. Of those respondents that answered this question (*n* = 48; 38.4%), 16 failed to provide identification of their postgraduate studies.

The postgraduate qualifications that were listed included:

Sports-related:

- Fellow of the College of Chiropractic Sports Sciences (FCCSS)
- International Certified Chiropractic Sports Science Practitioner (ICSSD)
- Certified Chiropractic Sports Physician (CCSP)

Orthopaedics:

- Knee-Chest Upper Cervical Technique (Orthospinology)
- Diplomate American Board of Chiropractic Orthopaedics (DABCO)
- Postgraduate Certificate in Orthopaedics
- Fellow of the American Academy of Chiropractic Orthopaedics (FACO)

Paediatrics:

- Chiropractic Paediatrics (Kiro Kids)
- Postgraduate fellowship in Chiropractic Paediatrics (FICPA)

Other:

- Certified Chiropractic Foot Care (CCFC)
- Canadian Chiropractic Examining Board (CCEB)
- Diplomate of the American Chiropractic Board of Clinical Nutrition (DABCN)
- Postgraduate Certificate in Further Education and Training (PGCE)
- Postgraduate Certificate in Professional Chiropractic Practice
- Foundations in Biokinetic Sciences
- Animal Chiropractic Education - International Veterinary Chiropractic Association (IVCA)
- Bachelor's Degree in Medical Sciences and Medical Honours (BScMedSci)
- Certified Kinesio Tape Practitioner (CKTP)
- Certified Shockwave Therapy Practitioner (ATRAD)
- Fellow of Canadian Chiropractic Rehabilitation Board
- Clinical Neurology
- Diplomate of the American Chiropractic Board of Radiology (DACBR)
- Master of Science in Physiology

4.4.2.6 Continuing education credits (Questions 13 & 14)

The majority of respondents (*n* = 64; **Figure 4.1**), had either met or exceeded their continued education practice requirements over the period from April 2012 to April 2013 (Question 13). There was missing data for 17 respondents for this question. The respondents reported that they obtained their continuing education hours through reading journals (73.6%; *n* = 92) and attending various conferences and seminars (96.7%; *n* = 119) (question 14). Respondents seldom participated in the other listed opportunities such as practice-based research; attending hospital staff continuing education (CE)/continued professional development (CPD) meetings; online credit courses or quality circles. There was missing data for 20 respondents (Question 14).

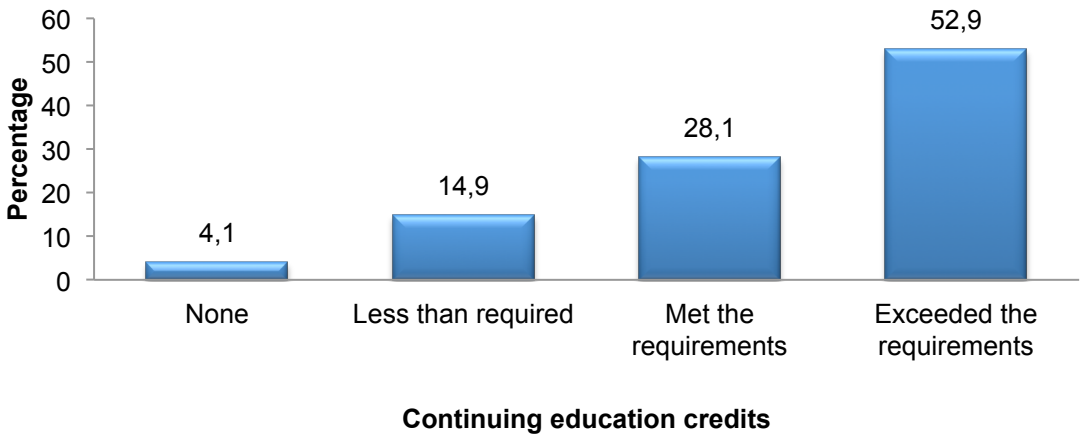

Figure 4.1 Continuing education credits between April 2012 – April 2013 (*n* = 124)

4.4.3 Characteristics related to chiropractic

4.4.3.1 Respondents' role in chiropractic (Question 15)

The majority of respondents (71.2%; *n* = 89) engaged in full-time clinical practice **(Figure 4.2)**. Respondents who were in part-time clinical practice were also involved in academic and/or research roles. Other roles included involvement in politics, committees and seminars although further details regarding these roles in relation to chiropractic were unclear by the respondents. Sixteen of the respondents did not practice and were reportedly involved in either academia, research, or other roles.

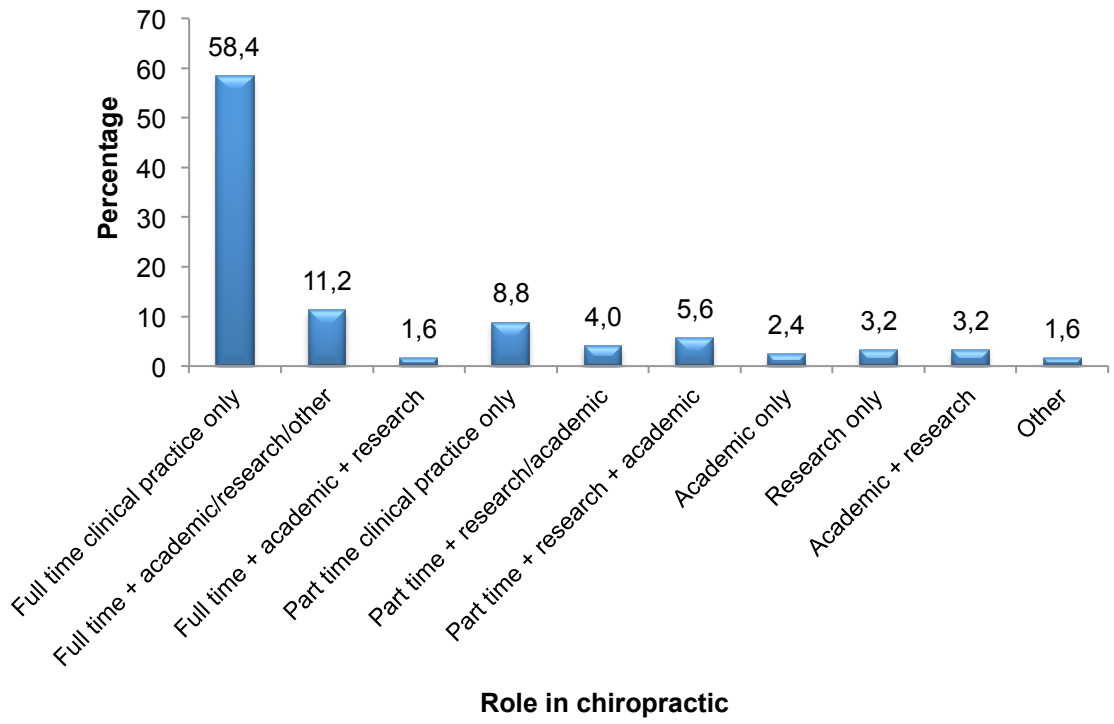

Figure 4.2 Respondents' role in chiropractic

(*n* = 125)

4.4.3.2 Philosophical orientation (Question 6)

An evidence-based philosophical approach to chiropractic was the most popular philosophical orientation. Those with a straight philosophical approach were under-represented, as seen in **Figure 4.3**. Only one respondent failed to answer this question, whilst two respondents answered incorrectly by selecting two options. Therefore, the data from these two respondents was excluded from the analysis.

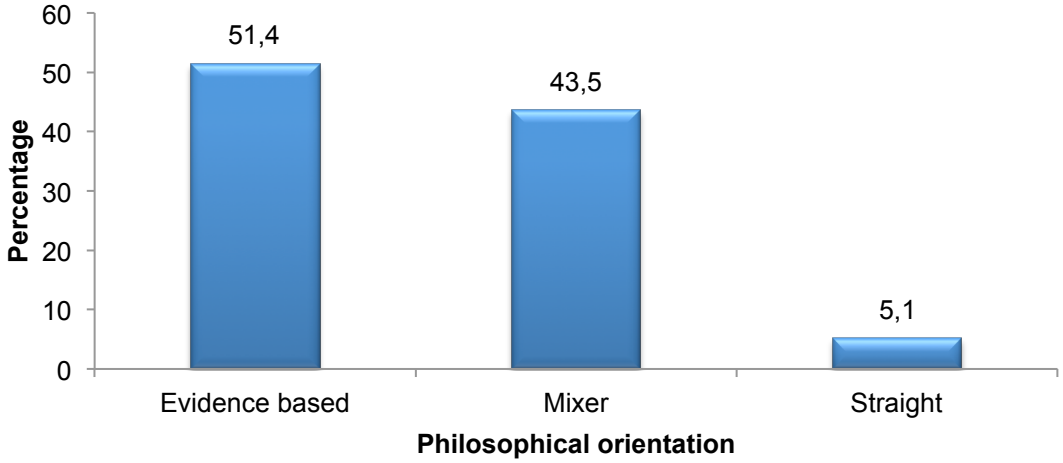

Figure 4.3 Philosophical orientations of the respondents

(*n* = 138)

4.4.3.3 Chiropractors' role in the health care system (Question 7)

The majority (72.5%; *n* = 100) of respondents were of the view that the role of a chiropractor in the health care system was that of a primary health care practitioner with a focused scope of practice. This was followed by 21.7% (*n* = 30) of respondents perceiving the role of a chiropractor to be a primary health care practitioner with a broad scope. Only 5.8% (*n* = 8) of the respondents believed that chiropractors offered specialist care. There was missing data for three respondents.

4.5 Objective two: To determine the practice characteristics of the chiropractic delegates attending the WFC 2013

Following the demographic section, only those respondents that were in active practice were eligible to answer the questions presented in Section A (*n* = 114).

4.5.1 Practice characteristics (Section A) (Questions 1 – 6, 8 – 10, 12 & 13)

4.5.1.1 Years in practice (Question 1)

The majority of respondents had been in practice (full or part time) between 5-15 years (*n* = 45), as seen in **Figure 4.4**. Interestingly, one fifth of the respondents were in practice for more than 26 years (*n* = 23). One respondent failed to answer this question.

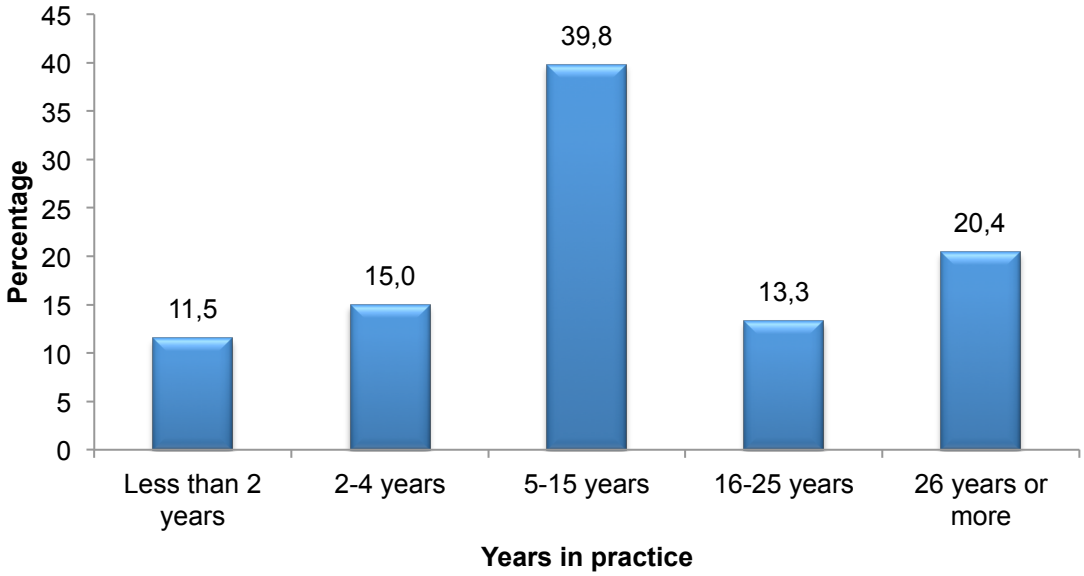

Figure 4.4 Years in practice

(*n* = 113)

4.5.1.2 Hours per week spent in practice (Question 2)

The majority of respondents (*n* = 81) practiced for less than 40 hours per week as illustrated in **Figure 4.5**. Interestingly, almost one fifth of respondents were working >50 hours weekly, indicating that they work for long hours daily or possibly have a six day working week. One respondent failed to answer this question.

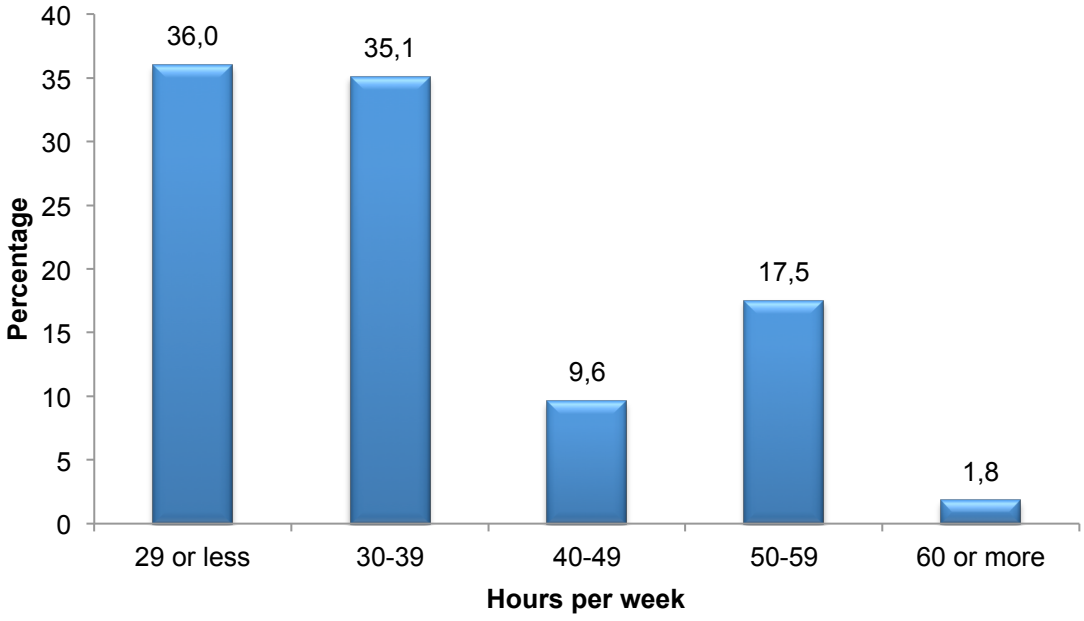

Figure 4.5 Hours per week spent in practice

(*n* = 113)

4.5.1.3 Patient visits per week and patient referral source (Questions 3, 4 & 9)

The majority of respondents (*n* = 52) personally treated 50 patients or less on a weekly basis. About a third of the respondents (*n* = 34) had high volume practices (>100 patients weekly) (Question 3), with the majority of respondents (64%) seeing between one and six new patients per week (Question 4), as shown in **Table 4.7**. One respondent from the United Kingdom reportedly saw no new patients but had a high volume practice. More than 60% of respondents attributed the source of their new patients to word-of-mouth referrals, followed by signage, the location of the practice and referrals from medical practitioners (Question 9) **(Appendix M)**.

Table 4.7 Total number of patients and new patients, seen per week (*n* = 114)

		n	**%**
Number of patients	≤ 50	52	45.6
	51-99	28	24.6
	100-149	26	22.8
	150-199	6	5.3
	200-249	2	1.7
	≥ 250	0	0.0
Total		**114**	**100**
Number of new patients	0	1	0.9
	1-3	38	33.3
	4-6	35	30.7
	7-9	17	14.9
	10-12	13	11.4
	13-15	8	7.0
	16-20	2	1.8
	>20	0	0.0
Total		**114**	**100**

4.5.1.4 Time spent with patients (Questions 5 & 6)

The time spent with a new patient for more than two thirds of the respondents (*n* = 78) was 31-60 minutes (Question 5), on subsequent visits, the majority (*n* = 102) spent less than 30 minutes with their patients (question 6) **(Table 4.8)**.

Table 4.8 Time spent on first (new patient) and subsequent visits (*n* = 114)

	Minutes	*n*	%
Time spent with new patient	11-15	2	1.8
	16-30	23	20.1
	31-45	44	38.6
	46-60	34	29.8
	61-75	9	7.9
	76-90	2	1.8
Total		**114**	**100**
Time spent on subsequent visit	0-5	2	1.8
	6-10	14	12.3
	11-15	30	26.3
	16-30	56	49.1
	31-45	12	10.5
Total		**114**	**100**

4.5.1.5 Patient reassessment (Question 8)

Almost all respondents (97.4%; *n* = 111) reassessed new patients **(Appendix N)**. Reassessments mainly occurred at either the second or third (31.6%; *n* = 36) or the fourth or fifth (29.8%; *n* = 34) visits. There was no missing data for this question.

4.5.1.6 Allocation of time for tasks (Question 10)

The percentage time spent by the respondents on various functions within a practice setting is shown in **Figure 4.6**. Direct patient care accounted for the majority of time spent during a typical working week. The respondents spent the rest of their time on patient education, business management and documentation of care.

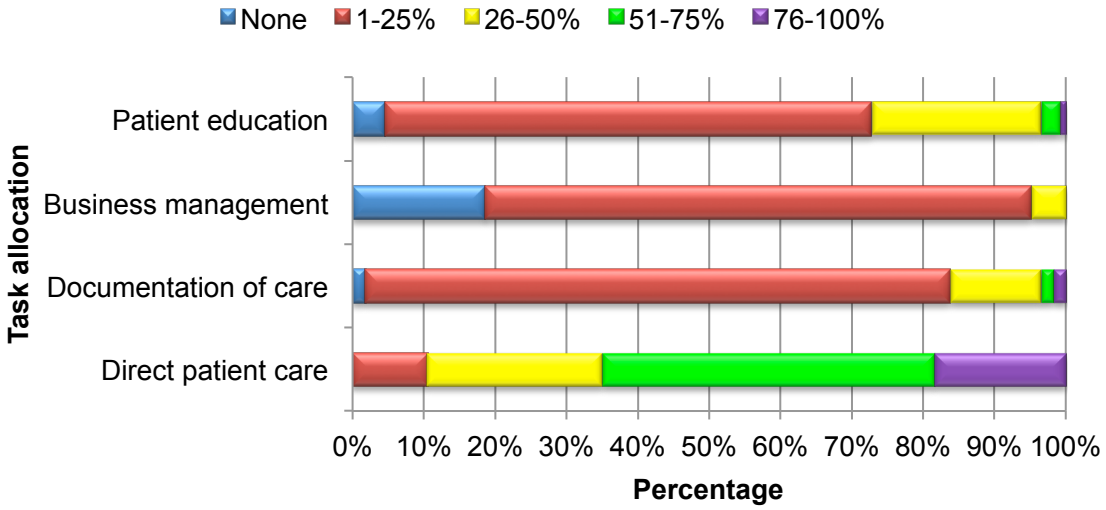

Figure 4.6 Percentage of time spent on functions during a typical week

4.5.1.7 Practice setting (Questions 12 & 13)

There was minimal difference between three out of the four practitioner office roles of the respondents as seen in **Figure 4.7**, with the slight majority of respondents favouring working in a practice as one of two chiropractors. Only 2.6% reported to be junior associates or examining doctors in a practice (Question 12). The vast majority (79%; *n* = 79) of the respondents practiced in one location (missing data count = 14), but 36.4% (*n* = 40) did deliver chiropractic care outside a practice setting such as in a patient's home (missing data count = 4) (Question 13). Few respondents (8.2%; *n* = 9) had staff privileges at a hospital (Question 13). Four respondents failed to answer this question.

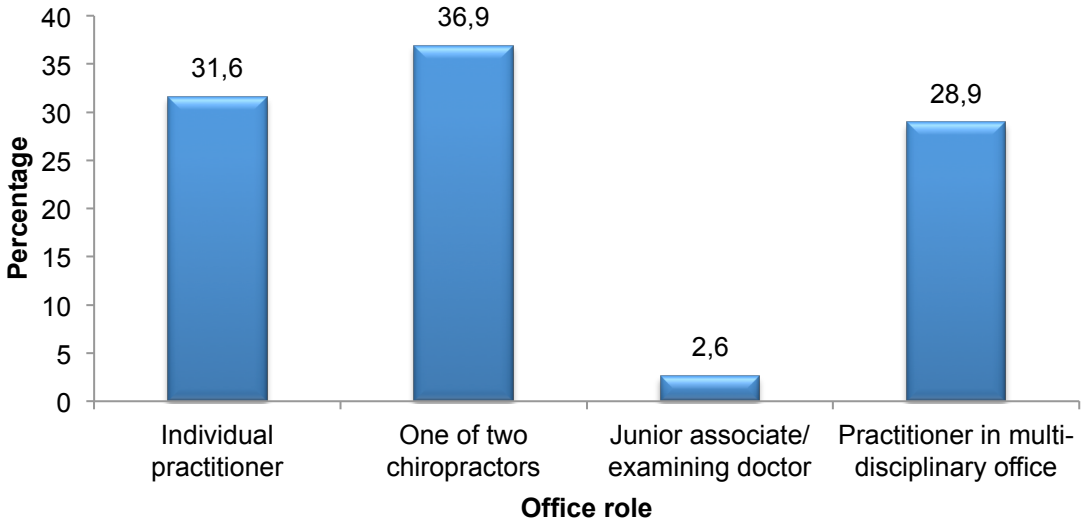

Figure 4.7 Respondents' practitioner role in the office
(*n* = 114)

4.5.1.8 Utilisation of diagnostic imaging (Questions 14 – 16)

Most respondents referred patients for x-rays (83.2%; *n* = 94) to a diagnostic imaging facility or hospital, with 13.3% (*n* = 15) taking x-rays at their own practices. Only a minority of respondents (3.5%; *n* = 4) utilised both options of taking x-rays at their practice and others at an alternative facility (Question 14). One respondent failed to answer this question.

When x-rays were taken and/or developed, the majority did not delegate the taking of x-rays (91.2%; *n* = 93), or the developing of x-rays to a chiropractic assistant (89.2%; *n* = 91) (Question 16). Furthermore, most respondents preferred to interpret the diagnostic images and draw their own conclusions despite having access to a radiologist's report (92.9%; *n* = 105) (Question 15) **(Appendix O)**. There was missing data for one respondent.

4.5.1.9 Inter-professional relationships (Questions 17 & 18)

The respondents were more likely to receive weekly referrals (≥ one per week) from massage therapists, family practitioners and other chiropractors. The respondents often referred patients to massage therapists (35.2%; *n* = 38) and family practitioners (27.4%; *n* = 29) on a weekly basis, but only sometimes or rarely referred to other chiropractors. Other observed inter-professional referrals included homeopaths, biokineticists, optometrists, clinical nurses and pharmacists **(Appendix P)**.

4.5.1.10 Patient management (Questions 19 – 22)

Technique approaches used in practice (Question 19):
There were a variety of technique approaches utilised by the respondents to treat their patients, with the top three being Diversified Technique (used routinely by 74.5% of respondents; *n* = 82), Extremity Adjusting (used 51-100% of the time by 68.8% of the respondents; *n* = 75) and Gonstead Technique (utilised routinely by 14.9% of respondents; *n* = 15). Other technique approaches that were utilised by respondents included Thompson Technique, Cox Flexion Distraction and NIMMO Receptor Tonus. Activator and adjustive instruments were only used routinely by 9.1% (*n* = 9) of respondents **(Appendix Q)**. Additional techniques utilised that were not listed as options included:

- Torque Release Technique (TRT)
- Neuroimpulse Protocol (NIP)
- Kennedy Decompression Technique (KDT)
- Active Therapeutic Movement (ATM)
- Muscle Energy Technique (MET)
- Neuro Emotional Technique (NET)
- Network Spinal Analysis (NSA)

Adjunctive auxiliary procedures used in patient management (Question 20):
The majority of respondents routinely focused on physical fitness or exercise promotion (54.1%; *n* = 60) and ergonomic/postural advice (51.4%; *n* = 57), followed by self-care strategies (42.9%; *n* = 48). Nutritional or dietary recommendations were also utilised often (42.9%; *n* = 48) by respondents when treating their patients. There was minimal focus on disease prevention and early screening advice (9.9%; *n* = 11) in comparison to the other adjunctive procedures **(Appendix R)**.

Active adjunctive auxiliary procedures for patient management (Question 21):
It was observed that 39.1% (*n* = 43) of respondents utilised corrective or therapeutic exercise routinely in practice, with 32.7% (*n* = 36) focusing on their patients' activities of daily living. One third frequently utilised some form of rehabilitation, spinal or extremity joint stabilisation. Back school and work hardening were used in the minority of cases, with 56% and 52% of respondents never utilising these procedures in practice respectively **(Appendix S)**. A quarter of the respondents (26.4%; *n* = 29) delegated the administration of these adjunctive therapies to a non-chiropractic staff member. There was only missing data for four respondents.

Passive adjunctive auxiliary procedures for patient management (Question 22):
Passive adjunctive procedures for patient management included trigger point therapy for myofascial pain and dysfunction (40.0%; *n* = 44), followed by massage therapy (24.5%; *n* = 27) and mobilisation therapy (22.9%; *n* = 25). Respondents preferred cryotherapy over moist heat (31.2%; *n* = 34). The majority of respondents rarely or never used modalities such as diathermy (98.2%), hydrotherapy (98.2%), infrared-baker (94.5%), electrodiagnosis (94.5%), vibration therapy (83.5%) and therapeutic ultrasound (77.1%) **(Appendix T)**.

4.5.2 Patient profile (Questions 7, 11, 23 & 24)

4.5.2.1 Patient demographic characteristics (Question 7 & 11)

Chiropractic patients were reportedly more likely to be female (55.7%), older than 30 years of age (66.7%) **(Figure 4.8)** and Caucasian (77%). Black/African American,

Indian, Asian, Hispanic, Cape Coloured, Native American and Pacific Islander constituted the remainder of the patients.

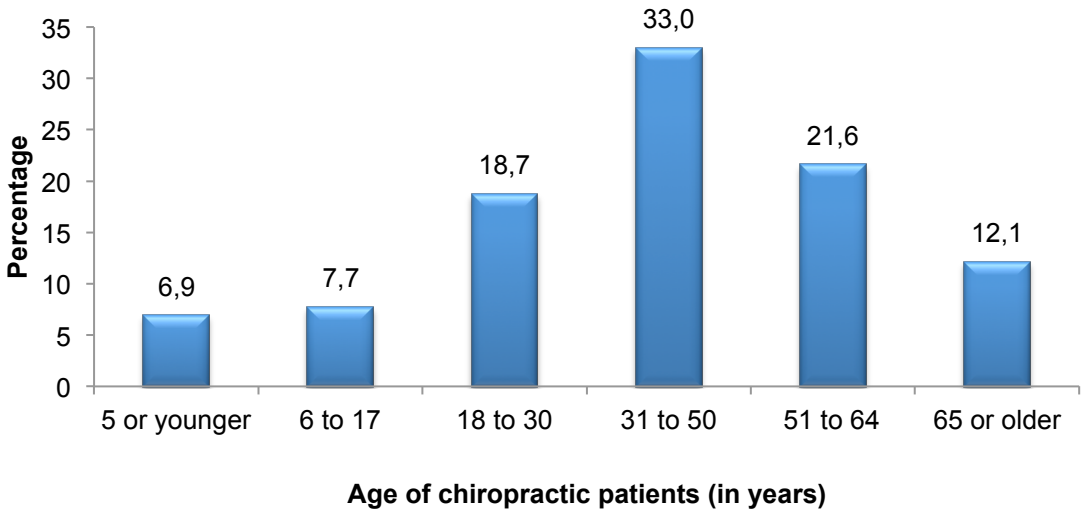

Figure 4.8 Age of patients seen by the respondents
(*n* =109)

4.5.2.2. Symptom duration

The majority of respondents had patients presenting to their office in the acute phase **(Figure 4.9)**, followed by those in the subacute phase. Chronic patients were less frequently seen, as only 10.5% of respondents indicated that they saw chronic patients 51-75% of the time. Sixty percent of respondents had 1-25% of their patients present to their practice asymptomatic (refer to **Appendix U** for 5-12 weeks).

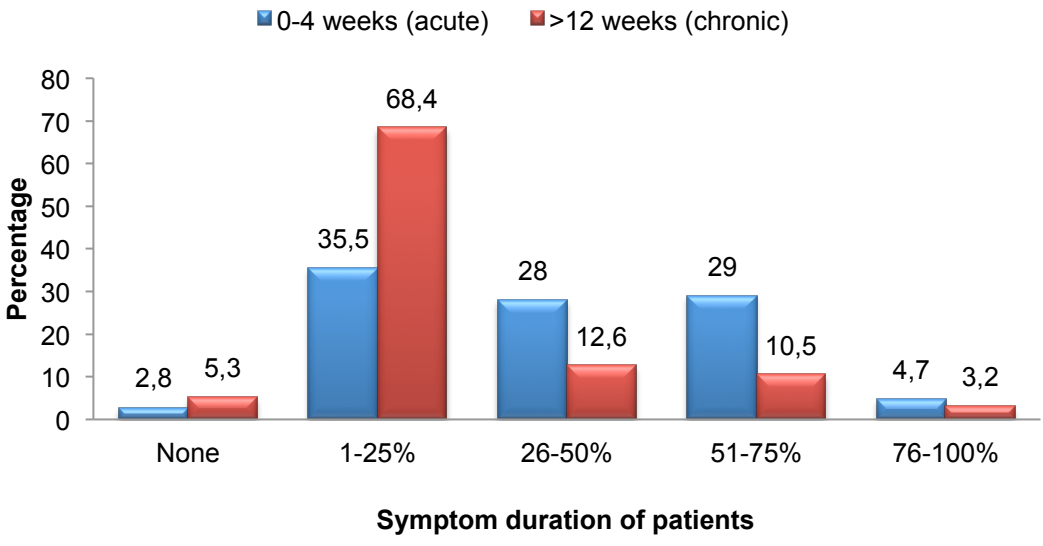

Figure 4.9 Acute and chronic symptom duration
(*n* = 107 and 95 for acute and chronic respectively)

4.5.2.3 Chief complaints and aetiologies of chiropractic patients (Questions 23 & 24)

The respondents reported that most of their patients presented with a chief complaint related to spinal pain, with low back being seen more commonly than neck pain. Interestingly, headaches with neck pain, was seen more frequently than neck pain alone. All of the respondents indicated that they had patients present with a chief complaint related to "other non-musculoskeletal injuries". Wellness/preventative care made up 20% of the patient's chief complaints for 64% the respondents as seen in **Figure 4.10**.

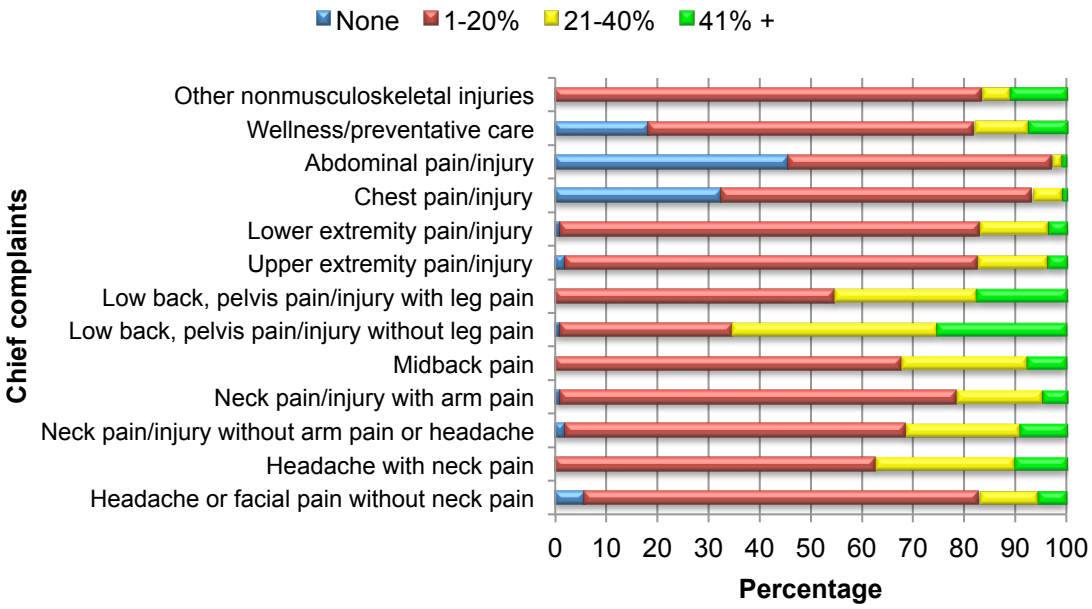

Figure 4.10 Chief complaints

The primary aetiologies of the complaints were most commonly from overuse or repetitive stress, activities of daily living, sports and exercise recreation **(Figure 4.11)**. Acute and chronic illness pathologies and environmental stressors were less likely to be the cause of the presenting complaints. Furthermore, it was noted that emotional stress also played a significant role in possibly exacerbating patient complaints when presenting to the chiropractor.

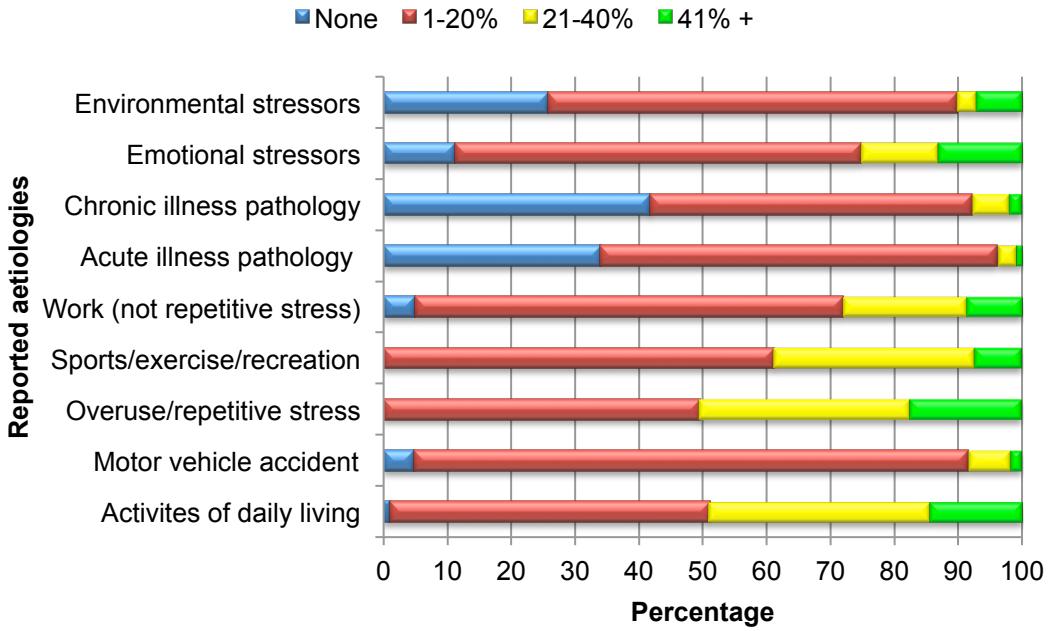

Figure 4.11 Reported aetiologies of chief complaints

4.6 Objective three: To determine associations between selected demographic and practice characteristics of the chiropractic delegates attending the WFC 2013, and Objective four: To determine if there were any significant differences between the practice characteristics of South African chiropractors compared to their international counterparts.

In order to prevent duplication of the results objectives three and four will be presented simultaneously.

Note: When discussing region in order to meet objective four of this study, the data for Africa was sub grouped into South Africa and Africa (which excluded the data from South Africa). Due to low cell counts in some of the analysis, bivariate tests were invalid and trends were assessed and presented unless otherwise stated.

4.6.1 The association of gender with philosophical orientation, years in practice, hours worked, delegation of adjunctive therapy, referrals to health care professionals, chiropractic techniques and adjunctive procedures utilised.

4.6.1.1 Gender and philosophical orientation

Female respondents were more likely to select an evidence-based philosophical orientation, compared to their male counterparts who favoured a mixer philosophical orientation **(Figure 4.12)**.

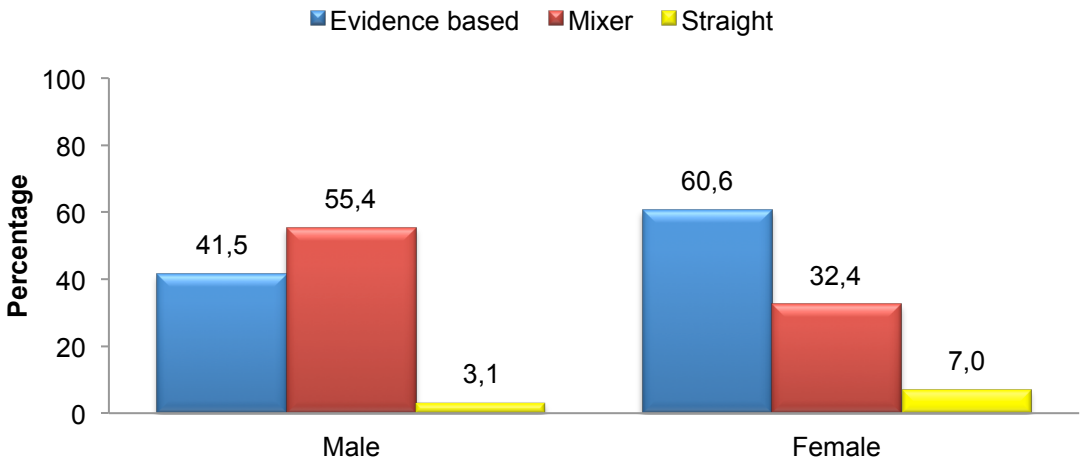

Figure 4.12 Relationship between gender and philosophical orientation (*n* = 136)

4.6.1.2 Gender and region

Gender distributions of the respondents per region showed that South Africa and South America were the only regions with male dominance as seen in **Figure 4.13**.

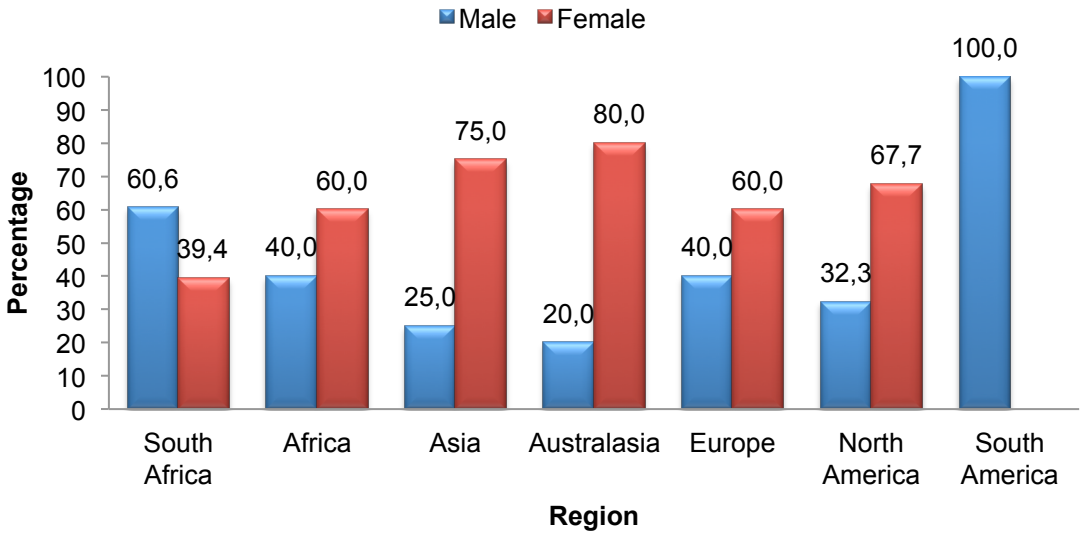

Figure 4.13 Gender distributions within the regions

(*n* = 138)

4.6.1.3 Gender, years in practice and hours worked per week

The number of years in practice and the hours worked per week were not significantly associated with gender (χ^2 (5,139) = 8.726, p = 0.120 and χ^2 (4,112) = 2.889, p = 0.577, respectively).

4.6.1.4 Gender and delegation of adjunctive therapies

Females were significantly more likely to delegate adjunctive therapies to non-chiropractic assistants (p = 0.029, one-sided Fisher's exact test). This is descriptively represented in **Figure 4.14**.

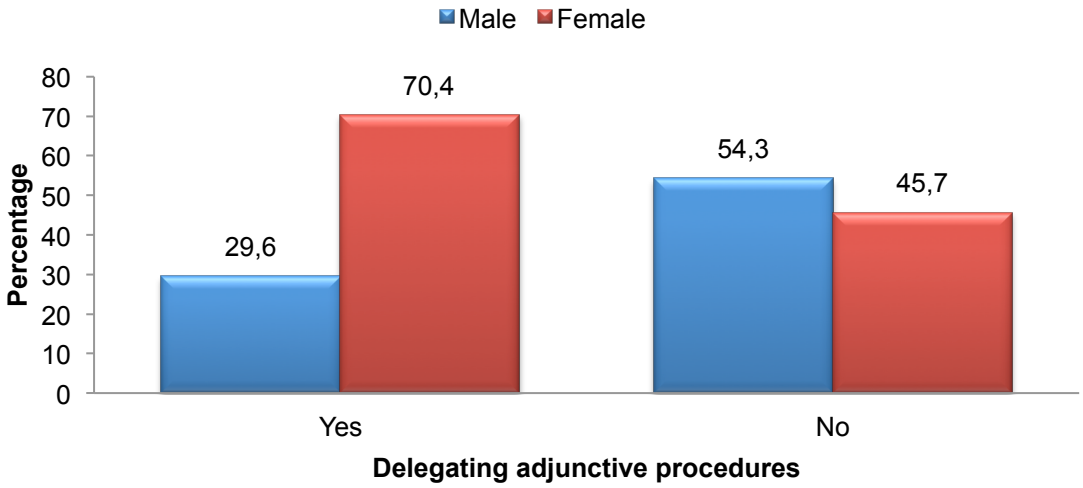

Figure 4.14 Relationship between gender and delegating adjunctive procedures (*n* = 108)

4.6.1.5 Gender and referrals to health care professionals

Males were more likely to refer to nutritionists and paediatricians (p = 0.030 and p = 0.038, respectively, one-sided Fisher's exact test), and females favoured referrals to a physical therapist (p = 0.018, one-sided Fisher's exact test). This trend is tabulated in **Table 4.9**. There were no other significant associations found between gender and referral to other health care professionals

Table 4.9 Relationship between gender and referrals to healthcare professionals

		Gender				Total	
		Male		Female			
		n	%	*n*	%	*n*	%
Nutritionist	Never/rarely	27	39.7	41	60.3	68	100
	Sometimes to routinely	22	61.1	14	38.9	36	100
	Total	49	47.1	55	52.9	104	100
Paediatrician	Never/rarely	35	42.7	47	57.3	82	100
	Sometimes to routinely	13	68.4	6	31.6	19	100
	Total	48	47.5	53	52.5	101	100
Physical Therapist	Never/rarely	32	55.2	26	44.8	58	100
	Sometimes to routinely	15	32.6	31	67.4	46	100
	Total	47	45.2	57	54.8	104	100

4.6.1.6 Gender, chiropractic techniques and adjunctive auxiliary procedures

Gender was significantly associated with the following adjustive techniques:

- Males had a higher utilisation of cranial technique (p = 0.028, one-sided Fisher's exact test).
- Females were less likely to utilise mobilisation techniques (p = 0.008, one-sided Fisher's exact test), massage therapy (p = 0.018, one-sided Fisher's exact test) and nutritional counselling/therapy or supplementation (p = 0.032 one-sided Fisher's exact test). Of the respondents that did not utilise the latter two mentioned procedures, variance existed between genders. Four males versus 14 females and three males versus 11 females never used massage therapy or nutritional counselling, respectively. When these procedures were utilised by the respondents, male and female percentages were on par with one another.

4.6.2 The association of mean age with philosophical orientation, region, hours worked, number of patients treated, and auxiliary adjunctive procedures.

4.6.2.1 Mean age of the respondents and philosophical orientation

Mean age of the respondents was significantly associated with philosophical orientation (ANOVA; F (2,135) = 7.439, p = 0.001), with the *post-hoc* Bonferroni test showing that those selecting an evidence-based approach were significantly older than those who adopted a mixer approach to practicing (p = 0.002) as shown in **Table 4.10.**

Table 4.10 Relationship between the mean age and philosophical orientation of respondents (n = 136)

Philosophical Orientation	*n*	Mean Age	SD
Evidence-based	71	45.1	14.1
Mixer	58	37.3	10.2
Straight	7	49.0	10.8
Total	**136**	**42.0**	**13.0**

4.6.2.2 Mean age of the respondents and region

In terms of the mean age of the respondents per region, there was a significant association (ANOVA; F (6,137) = 13.191, $p < 0.001$) with the *post-hoc* Bonferroni test showing that the respondents from South Africa were younger than those respondents from Australasia, Europe and North America ($p < 0.001$), as seen in **Table 4.11**.

Table 4.11 Mean age of respondents across the regions (*n* = 138)

Region	*n*	Mean Age	SD
South Africa	66	34.3	7.1
Africa	4	37.3	3.9
Asia	4	48.8	11.2
Australasia	10	50.9	14.0
Europe	20	47.8	12.3
North America	32	51.9	13.9
South America	2	42.0	12.7
Total	**138**	**42.0**	**13.0**

4.6.2.3 Mean age, hours worked per week and number of patients treated per week

The mean age of the respondents, irrespective of the region, was not significantly associated with the number of patients treated per week (ANOVA; F (4,112) = 1.065, $p = 0.377$) or the hours worked per week (ANOVA; F (4,112) = 0.888, $p = 0.474$).

4.6.2.4 Mean age of the respondents and adjunctive auxiliary procedures

Only nutritional/dietary recommendations from the adjunctive procedures was significantly related to the age of the respondents (t (109) = 2.12, p= 0.036) with those respondents utilising nutritional/dietary recommendations being younger (40.2 years of age; ± SD 11.1) than those that rarely made use of this procedure (47.4 years of age; ± SD 15.6). In terms of passive procedures, the age of those respondents that never used mobilisation therapy was significantly older (49.8 years of age; ± SD 13.9) than those who did make use of it (39.8 years of age; ± SD 11.3); t (106) = 2.73, $p = 0.007$.

4.6.3 The association of region with chiropractic role in health care, years in practice, number of patients treated, time spent on new patients and subsequent visits, reassessment intervals, practice setting, delegating adjunctive procedures, diagnostic imaging, referrals, chiropractic techniques, adjunctive auxiliary procedures, chief complaints and philosophical orientation.

4.6.3.1 Region and chiropractic role in health care

When the respondents' choice of a chiropractor's role in health care was compared to the geographical region, there were no significant associations found ($p > 0.05$). The respondents, irrespective of the region, were more likely to view their role as a primary health care practitioner with a focused scope ($p = 0.568$).

4.6.3.2 Region and years in practice

Trends show that the number of years spent in practice differed among the regions **(Figure 4.15)**. North American chiropractors had spent more years in practice than those from Europe and Australasia. The respondents from South Africa had spent fewer years in practice (15 years or less) than respondents from Asia, Australasia, Europe and North America (16 years or more).

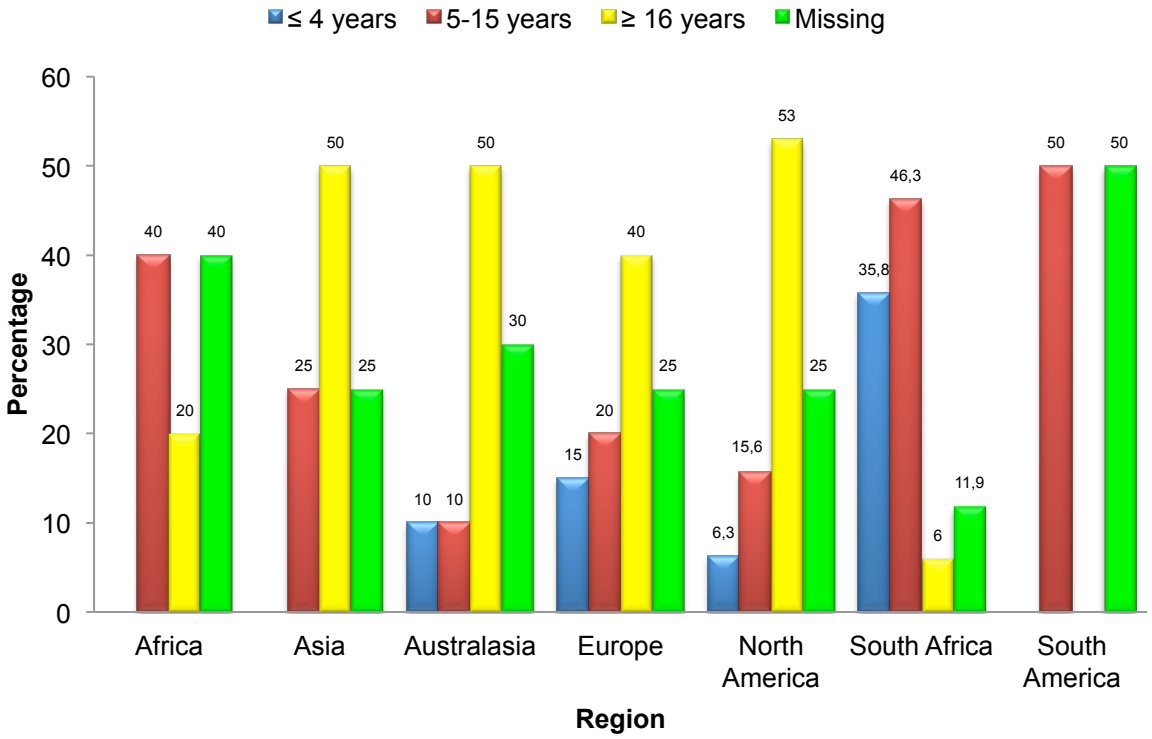

Figure 4.15 Relationship between region and years in practice (*n* = 113)

4.6.3.3 Region and number of patients treated per week

Trends show that the number of patients treated per week differed in South Africa compared to the other regions. It was observed that 83% (*n* = 49) of South African respondents were treating <100 patients per week, whereas respondents from North America (*n* = 11) and Europe (*n* = 10) were treating ≥100 patients per week **(Figure 4.16)**. Those respondents from Asia, Australasia and South America, were more likely to treat <100 patients weekly.

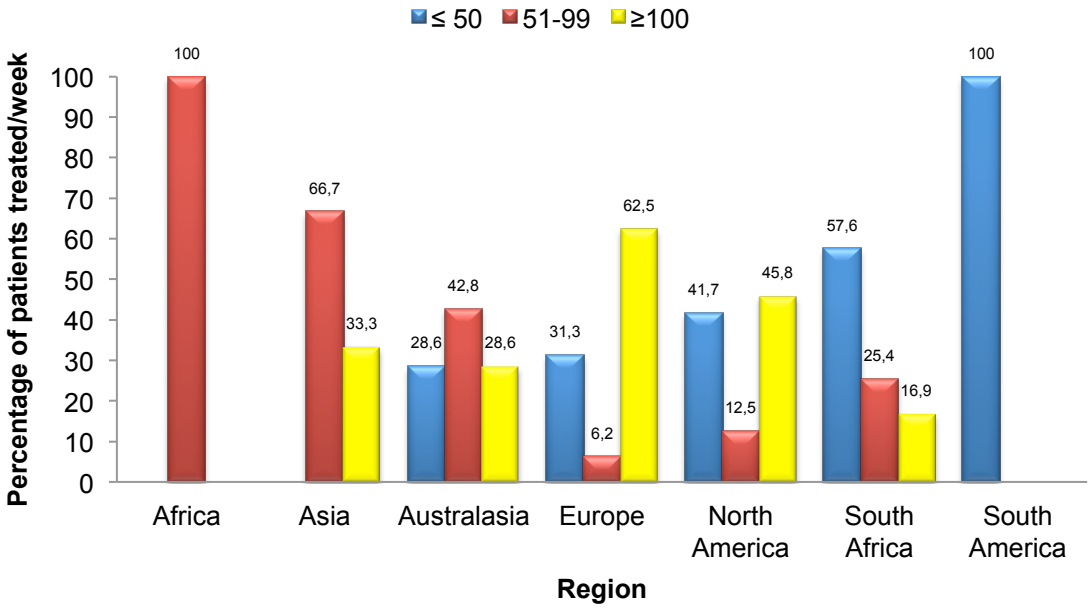

Figure 4.16 Relationship between region and patients treated per week (*n* = 113)

4.6.3.4 Region and time spent on new patients and for subsequent visits

There were no significant differences between South African respondents and their international counterparts when pertaining to the amount of time spent with a new patient (X^2 (30, 113) = 38.762, p = 0.131). However, during subsequent visits, the time spent by the respondents was notably different when comparing South African respondents to those from other regions. As displayed in **Figure 4.17**, the majority (*n* = 41) of South African respondents spent 16-30 minutes with a patient on a follow up treatment. This is in contrast to Australasia, North America and Europe, where the respondents were more likely to spend less than 15 minutes treating follow up patients.

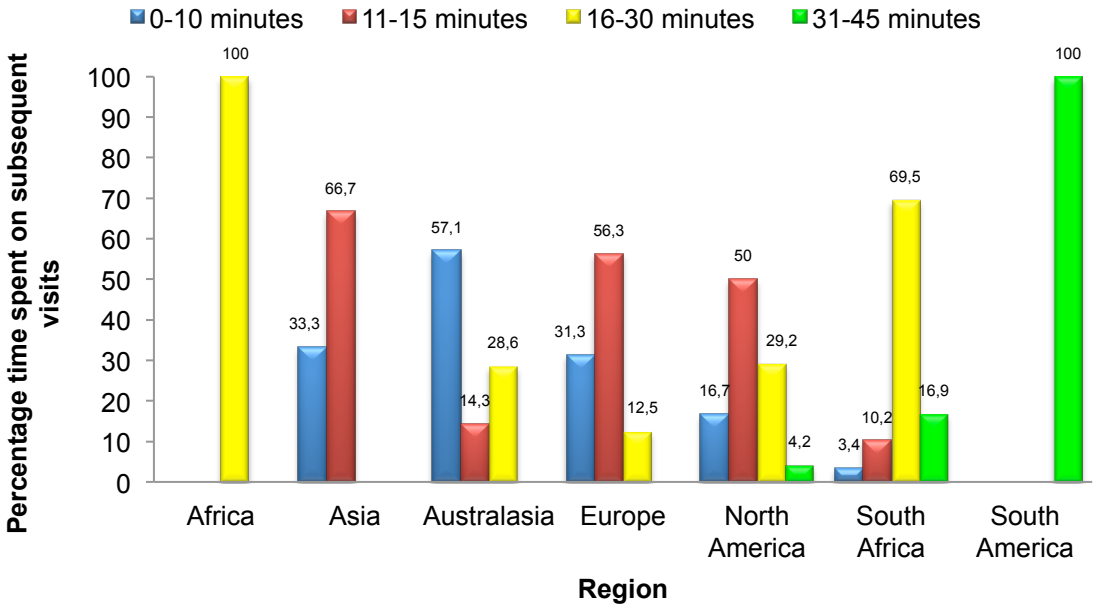

Figure 4.17 Relationship between region and time spent on subsequent visits (*n* = 113)

4.6.3.5 Region and reassessment interval for patients

When analysing the trends presented in **Table 4.12**, it can be observed that 97.3% (*n* = 110) of respondents, irrespective of region, reassess their patients (refer to 4.5.1.5), with a further 91% (*n* = 100) doing so before the tenth visit. The majority (*n* = 55) of respondents from South Africa reassessed their patients within five visits, which was similar to those in Europe and other African countries.

Table 4.12 Trends between region and patient reassessment intervals (*n* = 113)

Region	Reassessment intervals									
	1		**2-5**		**6-9**		**≥10**		**Do not reassess**	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
South Africa	13	22.0	42	71.2	3	5.1	0	0.0	1	1.7
Asia	1	33.3	0	0.0	0	0.0	2	66.7	0	0.0
Australasia	1	14.3	2	28.6	2	28.6	2	28.6	0	0.0
Europe	1	6.25	14	87.5	1	6.25	0	0.0	0	0.0
North America	3	12.5	9	37.5	4	16.7	6	25.0	2	8.3
South America	0	0.0	0	0.0	1	100	0	0.0	0	0.0
Africa	1	33.3	2	66.7	0	0.0	0	0.0	0	0.0

4.6.3.6 Region and practice setting

Geographic region was not significantly associated with the office role of the respondent (χ^2 (18, 113) = 23.232, p = 0.182). The respondents, irrespective of the region, were more likely to be practicing as individual practitioners or in a practice with another chiropractor. Europe was the only region in which more than half (56.3%; n = 9) of the respondents were practitioners in a multi-disciplinary office.

Of those respondents (n = 8) who had staff privileges at a hospital, 37.5% were from North America (n = 3) and South Africa (n = 3) and the remaining 25% (n = 2) were from Asia. None of the respondents from Australasia, Europe, South America and the rest of Africa had access to hospitals.

4.6.3.7 Region and delegating adjunctive procedures

Although there was no significant association between the geographical region and the delegation of adjunctive procedures, it was observed that respondents from Asia, Europe and South America were more likely to delegate adjunctive procedures to a non-chiropractic assistant than respondents from the other regions **(Figure 4.18)**.

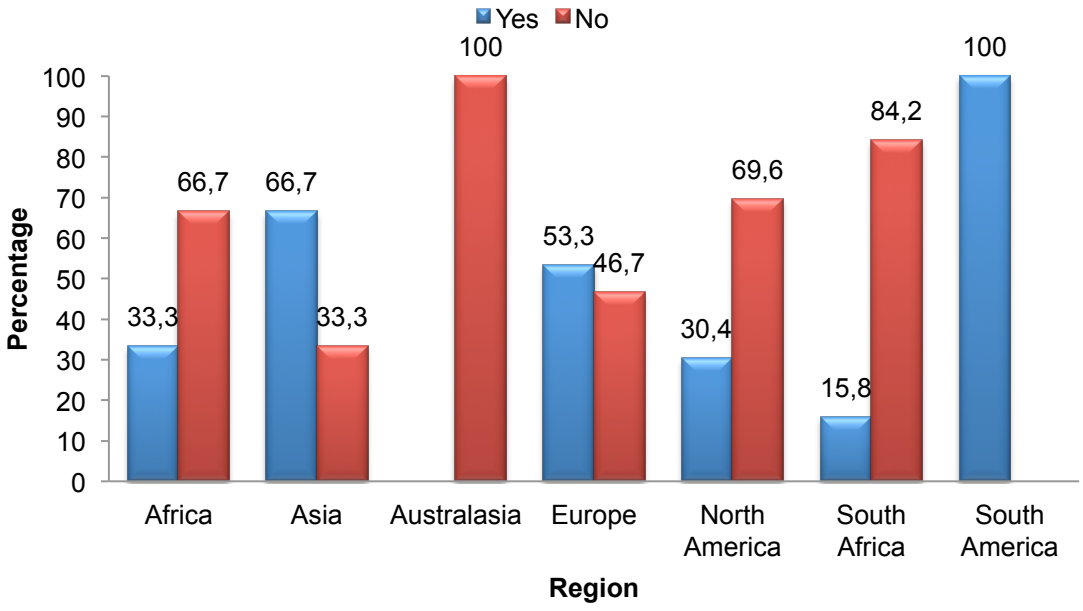

Figure 4.18 Delegating adjunctive procedures in different regions

(n = 109)

4.6.3.8 Region and diagnostic imaging

As previously noted, the majority of respondents referred for x-rays at a diagnostic imaging facility or hospital (refer to **4.5.1.8**). Trends show that those respondents that took x-rays at their own practices were more likely to be from North America and Europe, as seen in **Figure 4.19**, indicating that these chiropractors were in possession of their own x-ray equipment.

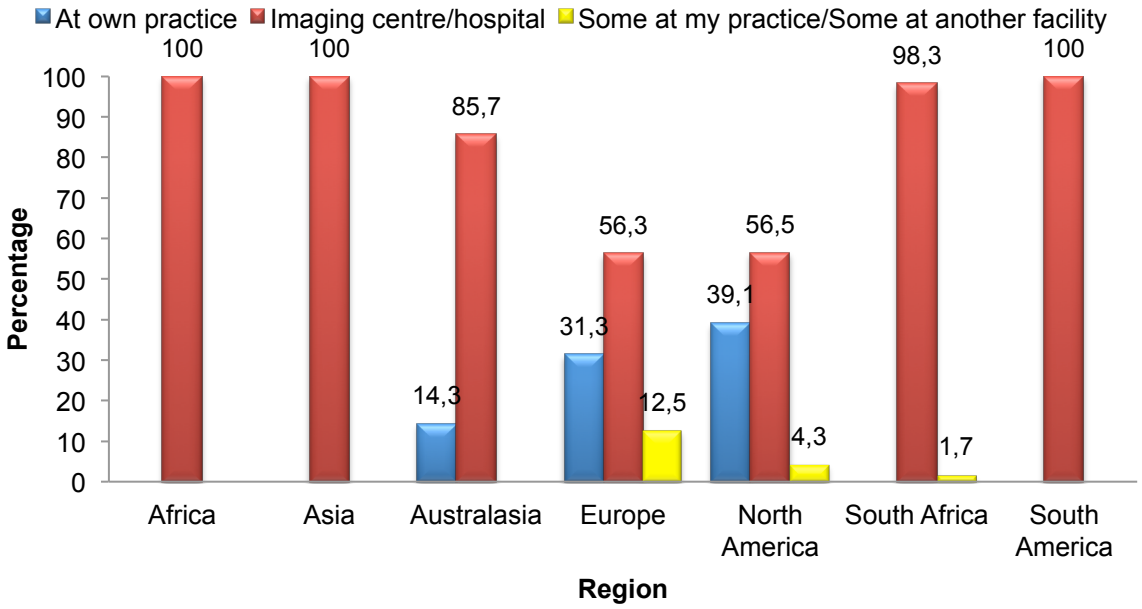

Figure 4.19 Location where x-rays are taken across different regions (*n* = 112)

4.6.3.9 Region and referrals from respondents to other health care professionals

When assessing referral patterns amongst the respondents, a difference was noted when referring to acupuncturists, dentists and physiatrists. Trends show that 50% (*n* = 11) of respondents from North America and Asia (*n* = 1) sometimes-to-routinely referred to an acupuncturist. When referring to a dentist, respondents from South America (*n* = 1) and Africa (*n* = 2), although few, were more likely to refer sometimes-to-routinely, whereas those respondents from other regions never or rarely referred to a dentist.

4.6.3.10 Region and chiropractic techniques

Irrespective of their geographic representation, respondents utilised similar technique approaches when treating patients. Trends show that only one chiropractic technique, namely NIMMO Receptor Tonus, showed a difference across the regions. The majority of respondents from each region never utilised this technique approach in practice **(Figure 4.20)**. However, a number of respondents from Australasia (*n* = 7) and Europe (*n* = 13) utilised this technique.

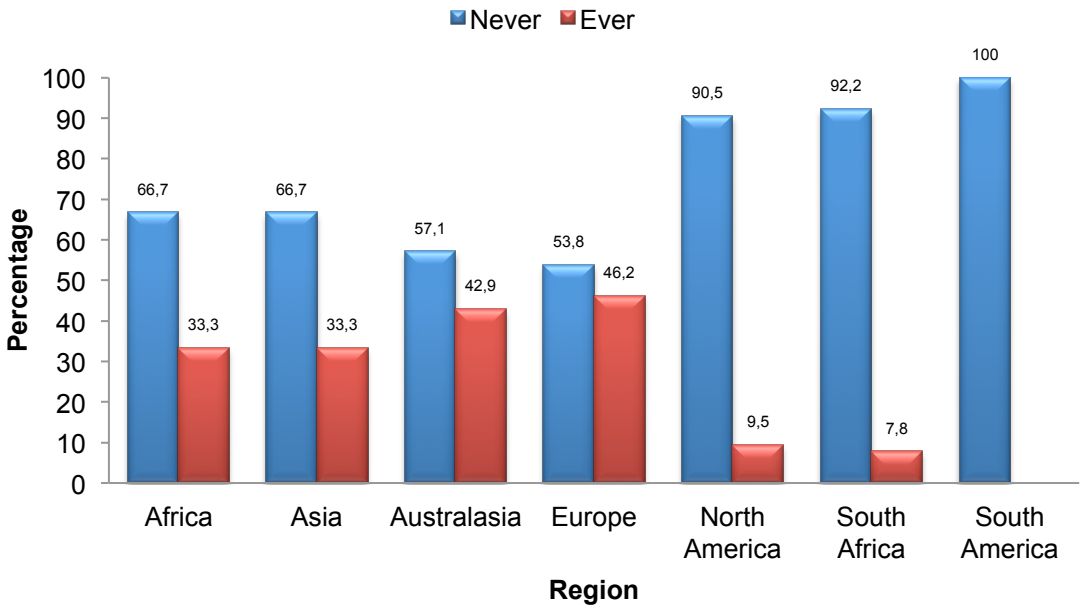

Figure 4.20 Use of NIMMO Receptor Tonus technique across the regions (*n* = 99)

4.6.3.11 Region and adjunctive auxiliary procedures

There were no significant associations ($p > 0.05$) between the geographic representation of the respondent with the following adjunctive procedures viz. changing risky and/or unhealthy behaviour; disease prevention and early screening advice; ergonomic and postural advice; nutritional/dietary recommendations; physical fitness and exercise promotion; relaxation and/or stress reduction recommendations; and self-care strategies. Respondents were utilising these procedures on 26-100% of their patients.

There were no significant differences between the use of trigger point therapy (p = 0.863), cryotherapy (p = 0.338), mobilisation therapy (p = 0.433), nutritional counselling or supplementation (p = 0.517) and massage therapy (p = 0.065), and the geographical representation of the respondents.

4.6.3.12 Region and chief complaints

All chief complaints treated by the respondents were similar irrespective of the geographical representation. The only significant difference noted was with patients presenting with headaches accompanied by neck pain (p = 0.007, Kruskal-Wallis test), where Asia and North American respondents reported seeing less patients with this chief complaint **(Table 4.13)**.

Table 4.13 Median and interquartile range (IQR) of reported headache with accompanying neck pain across regions

Region	*n*	Median	IQR
South Africa	58	3.5	2
Asia	3	2.0	2
Australasia	7	3.0	3
Europe	12	3.0	1
North America	22	2.0	1
South America	1	4.0	0
Africa	3	3.0	1

4.6.3.13 Region and philosophical orientation

Trends show that the respondents from international regions favoured an evidence-based approach, as more than 50% of the respondents from these areas selected this philosophical orientation. This is in contrast to those from Africa, specifically South Africa (62.1%; n = 41), who were more likely to adopt a mixer philosophical orientation as seen in **Figure 4.21**.

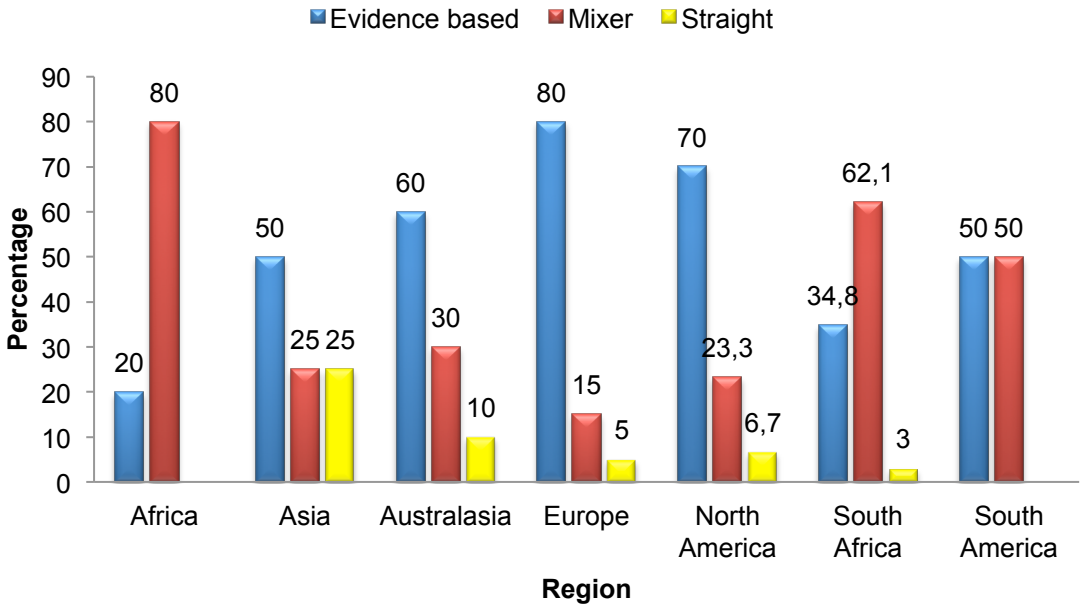

Figure 4.21 Relationship between region and philosophical orientation (*n* = 137)

4.6.4 The association of philosophical orientation and qualification, post-graduate certifications, number of patients treated weekly, chiropractic techniques, and adjunctive auxiliary procedures.

4.6.4.1 Philosophical orientation and qualification

Chiropractic education influenced the respondents' choice of philosophical orientation. The respondents who attained a Masters of Technology in Chiropractic were more inclined to select a mixer orientation whereas those with a DC qualification selected an evidence-based philosophical approach **(Figure 4.22)**. Of the seven respondents that adopted a straight philosophical orientation, all had a DC qualification. Although the sample was small for those who obtained a Bachelor of Applied Science (B.App.Sci), all the respondents who held this qualification favoured an evidence-based practice.

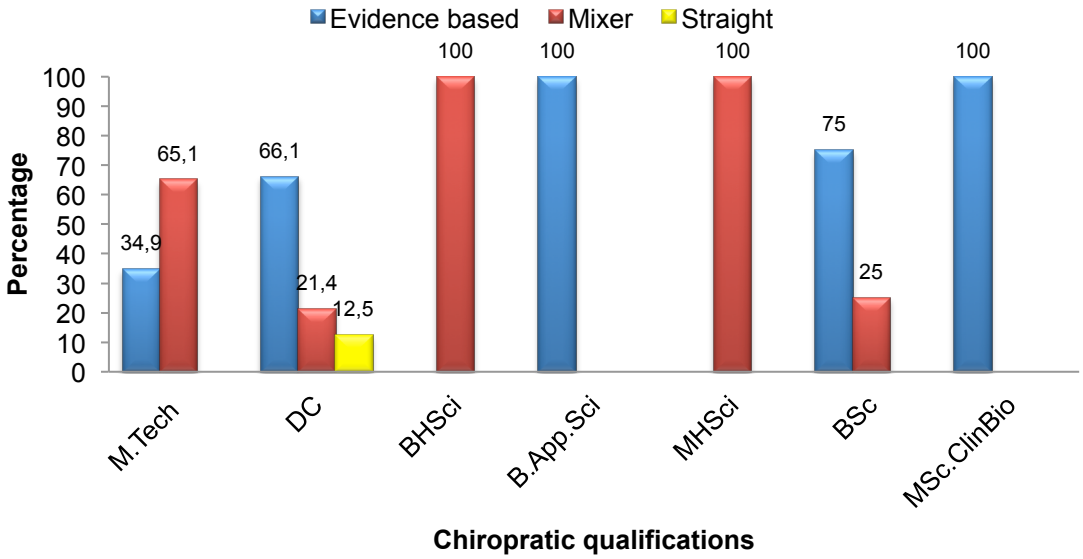

Figure 4.22 Relationship between chiropractic qualifications and philosophical orientation

(*n* = 138)

M.Tech = Masters of Technology in Chiropractic; DC = Doctor of Chiropractic; BHSci = Bachelor of Health Science; B.App.Sci = Bachelor of Applied Science; MHSci = Masters of Health Science; BSc = Bachelor of Science; MSc.ClinBio = Master of Science in Clinical Biomechanics

4.6.4.2 Philosophical orientation and postgraduate certifications

Those respondents who had postgraduate certifications (*n* = 47) were more inclined to associate themselves with an evidence-based philosophical approach (χ^2 (2,122) = 7.586, *p* = 0.023). Of the six respondents (6/47) that adopted a straight approach to practice, five of these respondents (5/47; 10.6%) had postgraduate qualifications **(Figure 4.23)**.

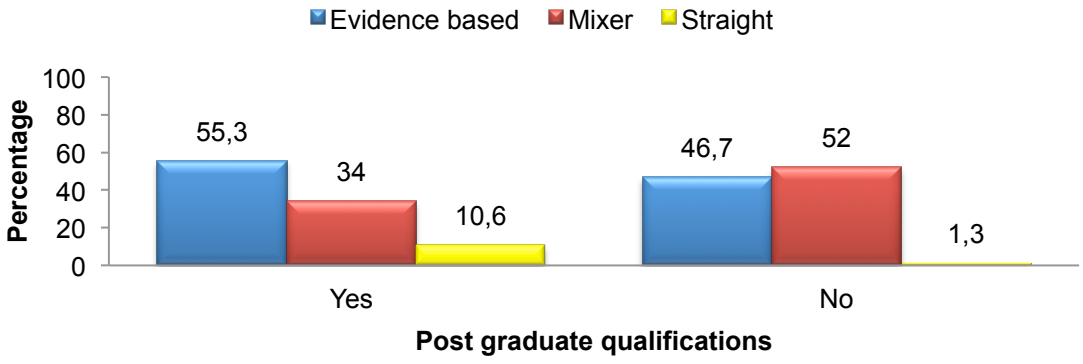

Figure 4.23 Relationship between post graduate qualifications and philosophical orientation

(*n* = 122)

4.6.4.3 Philosophical orientation and number of patients treated weekly

Trends suggest that having an evidence-based or mixer philosophical approach one would be more likely to treat < 100 patients per week **(Figure 4.24)**. In contrast, 50% (*n* = 3) of those selecting a straight philosophical approach, although under-represented, had high volume practices, of which 33.3% (*n* = 2) were treating as many as 150-199 patients in a week.

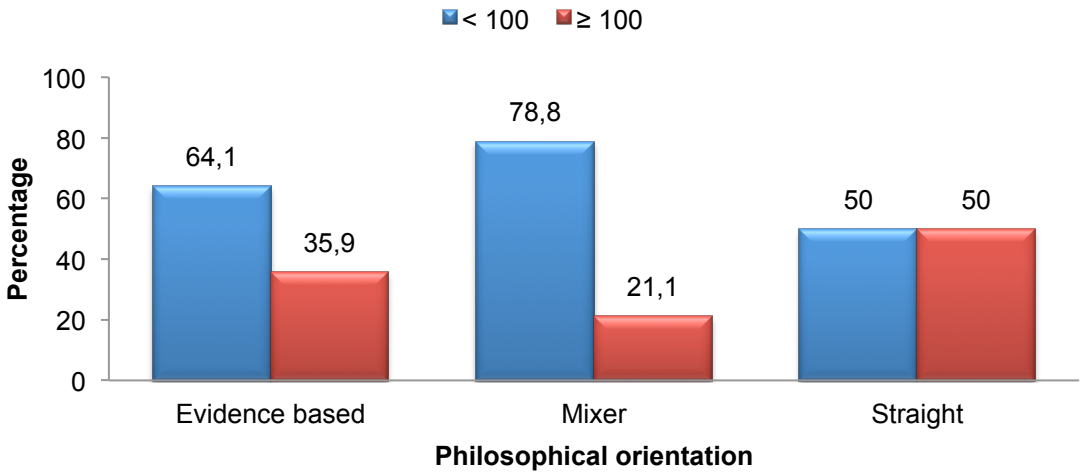

Figure 4.24 Relationship between philosophical orientation and number of patients treated weekly
(*n* = 111)

4.6.4.4 Philosophical orientation and chiropractic techniques

There were significant trends noted between the philosophical orientation of the respondents and the technique approaches utilised by them, notably:

- Evidence-based and mixer practitioners were less likely to utilise activator methods, with only 14.9% (*n* = 7) and 16.7% (*n* = 8), respectively, using this technique sometimes-to-routinely, whereas 50% (*n* = 3) of straight practitioners utilised this technique routinely in practice.
- Diversified technique was utilised by almost all the evidence-based and mixer practitioners, 100% (*n* = 50) and 98.1% (*n* = 51), respectively, whereas 66.7% (*n* = 4) of straight practitioners never utilised this approach.
- Similar to the results pertaining to diversified technique, a parallel trend was observed for extremity adjusting where the vast majority of evidence based and mixer practitioners utilised this technique sometimes to routinely (90%

and 92.1%, respectively) when treating patients, whereas straight practitioners never made use of this technique (66.7%; *n* = 4).

4.6.4.5 Philosophical orientation and adjunctive auxiliary procedures

The trends between philosophical orientation and the use of adjunctive procedures are as follows:

- Cryotherapy was utilised sometimes-to-routinely by evidence-based (72%; *n* = 36) and mixer practitioners (76.5%; *n* = 39), whereas 80% (*n* = 4) of straight practitioners never utilised this adjunctive procedure.
- The use of massage therapy differed amongst all three philosophical orientations. Mixers favoured this adjunctive procedure with 86.6% (*n* = 45) utilising it sometimes-to-routinely in practice. Evidence-based practitioners did utilise massage therapy but not as frequently as mixers (68%). However, 100% (*n* = 5) of straight practitioners never made use of this adjunctive procedure when treating patients.
- Evidence-based and mixer practitioners frequently utilised mobilisation therapy, whereas 100% (*n* = 5) of straight practitioners failed to use this technique.
- Utilisation of nutritional counselling and/or supplementation was favoured by mixers with 80.7% (*n* = 42) using this procedure sometimes-to-routinely. Slightly more than half of the evidence-based (53%) and straight (60%) practitioners never-to-rarely used this adjunctive procedure in practice.
- Tapping/strapping was not utilised by any of the straight practitioners, whereas slightly more than half (54.9%; *n* = 28) of the evidence-based and mixer practitioners used this adjunctive procedure sometimes-to-routinely in practice.
- Straight practitioners did not utilise traction therapy, whereas 52% (n = 26) and 47.3% (n = 24) of evidence-based and mixers, respectively, made use of traction therapy sometimes-to-routinely.
- Trigger point therapy (TPT) was a commonly utilised adjunctive procedure by evidence-based and mixer practitioners. In contrast, 80% (*n* = 4) of straight practitioners never utilised TPT, with the remaining 20% (*n* = 1) only using it sometimes in practice.

4.6.5 The association of chiropractic role in health care and overuse/repetitive stress aetiologies.

The chiropractic role did not significantly affect the reported aetiologies of chief complaints; however there was one exception noted. Chiropractors with a primary health care-focused scope were more likely to see patients presenting with overuse and repetitive stress injuries (p = 0.032; Kruskal-Wallis test), as seen in **Table 4.14**.

Table 4.14 Median and interquartile range (IQR) of chiropractic role in health care and overuse/repetitive stress aetiologies

Chiropractic role	*n*	Median	IQR
PHC broad scope	23	3.0	1
PHC focussed scope	77	4.0	2
Specialist care	7	6.0	2
Total	**107**	**4.0**	**-**

PHC = Primary health care

CHAPTER FIVE

DISCUSSION

5.1 Introduction

This chapter aims to discuss the results in relation to the current literature.

5.2 Response rate

Prior to the commencement of the study a minimum response rate of 70% (*n* = 284) was required for generalisability (Esterhuizen, 2013), a final response rate of only 34.7% (*n* = 141) was achieved. Survey-type research is associated with difficulties in obtaining responses (Dyer, 1997), where a response rate as little as 10% (Carey et al., 2005) or 20% (Mearns and Reader, 2007) may be regarded as strong, particularly for a voluntary survey without incentive. The WFC Identity Consultation response rate was 12.7% (Carey et al*.,* 2005), with other studies on chiropractic populations achieving response rates between 16.7% and 94% (LeBoeuf-Yde et al., 1997; Wilson, 2003; GCC, 2004; Imbos et al., 2004; Coulter and Shekelle, 2005; Mootz et al., 2005; Waelen and Mior, 2005; ANZCO, 2006; Schwarz and Hondras, 2007; Malmqvist and Leboeuf-Yde, 2008; Ailliet et al., 2010; Humphreys et al., 2010; Keyter, 2010; Eaton et al., 2012; French et al., 2013; Kvammen and Leboeuf-Yde, 2014). Most of these studies only used one method of achieving response.

In this study the original method of data collection was amended to allow for electronic distribution of the questionnaire in an attempt to maximise the response rate. Fan and Yan (2009) and Millar and Dillman (2011) found that paper surveys in addition to electronic surveys led to better response rates, as was seen in this study. It was anticipated that the delegates would have been willing to partake in the research but preoccupation with congress proceedings, presentations and events may have resulted in little time to complete the questionnaire. The questionnaire was long, due to the two research studies using one questionnaire, and respondent fatigue may have resulted in some delegates not finishing the questionnaire, thereby

reducing the response rate. The amendment of the methodology approved by the IREC to electronically distribute the questionnaire resulted in a two month delay after the congress and this may have impacted on the willingness of delegates to participate.

The response rate achieved in this study was similar to other studies using chiropractic respondents. Its representation of the broader population who attended the congress will be discussed in each of the following sections.

5.3 Discussion on demographic profile of the chiropractic delegates attending the WFC 2013

5.3.1 Gender

The chiropractic profession has traditionally been regarded as male dominated (Ailliet et al., 2010; Humphreys et al., 2010; Eaton et al., 2012; French et al., 2013), with the number of female practitioners growing steadily (Wilson, 2003; GCC, 2004; ANZCO, 2006; Kvammen and LeBoeuf-Yde, 2014). Females reportedly show a greater interest in CAM than males (MacLennan and Wilson, 1996; National Centre for Complementary and Alternative Medicine, 2004; Tatalias, 2006; Brown et al., 2007) and may therefore be attracted to a profession like chiropractic. A chiropractic student survey conducted by Newell and Cunliffe (2003) in the UK found that more females were enrolling in chiropractic. It has been reported that female students display a stronger patient-centred attitude than their male counterparts (Krupat et al., 1999), and this may attract them to a profession like chiropractic due to its holistic patient-centred paradigm. Additionally, a profession such as this provides flexibility for females to work around their family commitments as patients can be scheduled accordingly.

Geographical differences were observed in that there was a preponderance of male respondents from SA with the remaining regions displaying female dominance (Section 4.6.1.2; Figure 4.13). A similar pattern of male dominance was seen in other South African chiropractic population studies (Fletcher, 2005; Mathews, 2006; Bunge, 2007; Keyter, 2010). The male dominated perception, together with the

physical nature of the profession may deter females from seeking chiropractic as a profession in SA, however, the low response rate may have skewed the result.

5.3.2 Age

The mean age of the respondents in this study was 42 years (Section 4.4.1.2), which was similar to that found in the WFC Identity Consultation (mean age of 40 years) (Carey et al., 2005). This correlates with other studies on chiropractic populations done in countries such as Belgium (Ailliet et al., 2010), Australia (French et al., 2013), the United Kingdom (GCC, 2004), Canada (Waalen and Mior, 2005) and North America (Mootz et al., 2005; Coulter and Shekelle, 2005), where the mean age ranged from 40 - 44 years.

Contrary to the above mean age, chiropractors in Finland (Malmqvist and Leboeuf-Yde, 2008), the Netherlands (Imbos et al., 2004), Germany (Schwarz and Hondras, 2007), and Norway (Kvammen and LeBoeuf-Yde, 2014) have been found to have a lower mean age (38 years). This may be due to the lack of chiropractic education training facilities in these regions, leading to less exposure to chiropractic. Countries where chiropractic is well established showed a greater number of mature-aged chiropractors, especially where the institutions have existed for extended periods, as seen in North America (Christensen et al., 2010).

Similarly, the South African respondents in this study were significantly ($p < 0.001$; Section 4.6.2.2; Table 4.11) younger (34 years) than those from Australia, Europe and North America. Studies on South African chiropractors have reported a young mean age (De Gouveia, 2009; Keyter, 2010; Gordon, 2011). The first chiropractic legislation was passed in SA in 1982, which provided formal provision for the registration of new chiropractors. It was only in 1984 that actual registration for licensure of new chiropractors opened and a chiropractic educational program at the Technikon Natal was established in 1989 (Till, 1991).

The North American respondents in this study were reportedly older (51 years); this finding deviated from published studies conducted on chiropractors in North America (Coulter et al., 2002; Coulter and Shekelle, 2005; Mootz et al., 2005). The respondents in this survey were attending an international conference, whereas in

the other studies the chiropractic population were practicing in a specific area rather than travelling abroad, indicating that the external validity of the study may be jeopardised by the low response rate.

5.3.3 Ethnicity

The ethnic representation of chiropractors is not well documented in the literature. Studies that have included ethnicity noted that the majority of the chiropractic profession were White, 94% (*n* = 193) in North America (Coulter and Shekelle, 2005; Mootz et al., 2005) and 89.2% (*n* = 107) in SA (Keyter, 2010), respectively, with minimal representation from other ethnic groups. A similar ethnic representation was evident in this study (Section 4.4.1.3). Chiropractic programs in SA began during the era of apartheid in which black population faced many restrictions which prevented them from enrolling in university programs (Winberg, 2004) thus a preponderance of white graduates from SA in this study. Additionally, the cultural background of non-whites, particularly the African population does not include manual therapy as part of traditional African medicine and therefore it is asserted that the African population may not seek a career in a health care profession in which there is little cultural background (Korporaal and Talmage, 2008). Further extrapolation was limited as other studies failed to report this demographic variable.

5.3.4 Geographical representation

All seven continental regions were represented in this study (Section 4.4.1.4; Table 4.2). The majority of respondents were from the African continent, specifically South Africa, followed by North America. The congress was held in Durban, South Africa, and on the African continent for the first time, making it appealing and accessible to the local practitioners.

Travel expenses and distance may have impacted international delegates' choices to attend, with poor representation from South America, Asia and Australasia. Chiropractic is a growing profession in these areas with the first chiropractic program opening in 2001 in Brazil, South America (McNabb, 2004), and in 2005, in Japan (CCE-Aus, 2015). Currently, there are three chiropractic programs that hold

accredited status with the CCEA including Hanseo University (Korea), Tokyo College of Chiropractic (Japan) and International Medical University (Malaysia) (CCE-Aus, 2015). Some countries in Asia and South America still practice chiropractic under general law, for example Brazil (**Table 2.1**) (Chapman-Smith, 2000) with no specific legislation regulating the profession. This results in an ill-defined scope of practice which may deter people from seeking chiropractic as a career choice, in contrast to Western regions such as North America, where the chiropractic profession is well established (Coulter and Shekelle, 2005; Mootz et al., 2005; Coulter et al., 2002; Meeker and Haldemann, 2002), with the largest population of chiropractors and chiropractic institutions (Chapman-Smith and Cleveland, 2005) yet in this study less than a quarter of the respondents were from North America. Apart from travel expenses, this reason is unclear.

Following South African and North American representation, 14.2% and 7.1% of respondents were from Europe and Australasia, respectively. Interestingly, the respondents from Europe were more likely to represent countries where chiropractic studies have formerly been conducted such as Belgium (Alliet et al., 2010), Netherlands (Imbos et al., 2004), Norway (Kvammen and LaBoeuf-Yde, 2014), Sweden (LeBoeuf-Yde et al., 1997), Switzerland (Humphreys et al., 2010) and the UK (Wilson, 2003; GCC, 2004).

Regionally, results depict that there were no representatives from the North West Province or neighbouring countries (to South Africa) that participated in this study. However, when viewing the delegate list, these regions were represented at the congress but did not constitute a large proportion of delegates; hence the likelihood of receiving completed questionnaires from these regions was low.

The statutes and regulations in each country, state or province result in the scope of chiropractic practice varying from region to region (Chapman-Smith, 2000). Thus, regional origin can influence how the respondents may practice as legislation within a particular region will govern the procedures, actions and processes that chiropractors are permitted to undertake.

5.3.5 Educational characteristics

5.3.5.1 Institution that conferred the respondents' chiropractic degree

The respondents in this study represented 21 countries across the globe but when looking at their place of graduation; the respondents obtained their chiropractic qualifications from chiropractic colleges within only seven countries (Section 4.4.2.1; Table 4.3). Chiropractic is a growing profession in many developing regions of the world, due to a lack of access to training in one's home country students may seek training internationally.

The majority of respondents graduated from South African institutions viz. the DUT or the UJ, which supported the geographical distribution of the respondents. Graduates from DUT constituted a higher percentage as this institution has offered chiropractic training since 1989, whereas UJ only opened in 1993 (DUT Chiropractic Handbook, 2013; UJ Chiropractic Handbook, 2011), resulting in more South African chiropractors having graduated from DUT. The conference was also located in Durban which potentially made it more accessible to those who graduated from DUT and remained within the Durban area.

Interestingly, there were 16 chiropractors from the USA yet 34 chiropractors reported to have graduated from American institutions, with Palmer College constituting 35% (*n* = 12) of those graduates. Palmer College of Chiropractic in Davenport, Iowa, is considered the birth place of chiropractic and it is also the oldest chiropractic training institution in the world (Palmer College of Chiropractic, 2014), therefore students may have elected to attend this college due to its rich chiropractic history, then return to practice in their country of origin.

5.3.5.2 Chiropractic qualifications of the respondents

The most common qualification held was a Master's degree in Chiropractic which was awarded from one of the two SA institutions. This was followed by the Doctor of Chiropractic (DC) degree which is awarded by most international chiropractic educational facilities (Section 4.4.2.2; Table 4.4). The DC degree according to the South African Qualifications Authority (SAQA) conversion is equivalent to a Bachelor's degree (Korporaal pers. Comms, 2015). There are a few chiropractic colleges and universities that offer master degrees such as Odense University

(Denmark), Logan University (United States), Southern California University of Health Sciences (United States), University of Surrey (United Kingdom), Macquarie University (Australia) and AECC (United Kingdom) (Gradschools.com, 2015). Some of these educational institutions were represented in this sample population, which may explain why some respondents indicated that they had obtained a Master of Science in Clinical Biomechanics qualification. The increase in Masters qualifications suggests that the profession is building research capacity, thus providing long term sustainability through establishing sound research principles.

The trends of the philosophical orientation of the respondents relative to their qualifications showed that the majority of those with a Masters qualification favoured a mixer approach. In contrast, the majority of those with a DC qualification adopted an EBP approach to practice (Section 4.6.4.1; Figure 4.22). This finding is interesting as it was anticipated that those with a master's degree would opt for an EBP approach due to the influence of the research component of a master's degree. However, it cannot be extrapolated that those adopting a mixer approach do not practice EBP.

Institution of graduation may have influenced the respondents' choices of philosophy as the curriculum is often based on the institutions predominant philosophical stance (Huijbrechts, 2007). Individuals graduating from institutions with a more "classical" foundation are more likely to adopt a "straight" philosophy focusing solely on spinal manipulation and may not consider the use of other modalities in patient management, whilst those schooled in a broad based curriculum, with sound research principles may adopt a mixer/EBP approach and therefore emphasize diagnostic ability as well as the teaching of spinal and extremity manipulation with modality use for the overall benefit of the patient (Meeker and Haldemann, 2002; Keating, 2005). Thus, education may influence the way a chiropractor perceives the profession and the manner in which they practice.

Furthermore, the time of graduation may further influence the respondents' choice of philosophy as the evidence-based movement started in the 1990s (Sackett et al., 2000), therefore people graduating post mid- 90s would have been influenced by this movement and should have had experience of the principles of EBP (Walker et al., 2014). This is evident in the current study as the majority of the respondents

graduated within the last 20 years (Section 4.4.2.3; Table 4.5). This may indicate that respondents are applying these principles in practice, which influences the treatment protocols that are being utilised in management of patients' complaints.

5.3.5.3 Highest level of non-chiropractic education and postgraduate qualifications

According to Haldemann (2005), the number of chiropractors with postgraduate qualifications, particularly PhD and Master degrees, is growing. Less than 10% of respondents held PhDs in this study, with more having obtained a Masters degree (13.9%) (Section 4.4.2.4; Table 4.6), indicating that the profession is still young in its development. It is unclear if those respondents with non-chiropractic education degrees had obtained them prior to, or after becoming a chiropractor. Following the completion of high school education, individuals may face uncertainty when choosing a career, or life events could make a person seek out a career different to the one they already have.

Postgraduate degrees and certificates are available to chiropractors, like other health care professionals, in order to gain further education or to specialise. Interestingly, most of the postgraduate qualifications listed by the respondents were certificates or diplomas with very few pursuing further academic qualifications. The majority of the respondents were involved in private practice, with a minority being involved in academia and/or research positions. Private practitioners may be less inclined to pursue postgraduate academic qualifications, as unlike in the corporate sector, there is little additional financial reward. As can be seen by the types of qualifications listed, most respondents sought to improve clinical practice or obtain specialities like sports and paediatrics (Section 4.4.2.5), which would aid their patient management.

There was a significant relationship between those who selected an EBP philosophical approach and those who had obtained postgraduate qualifications (p = 0.023) (Section 4.6.4.2; Figure 4.23). The majority of the respondents who selected an EBP philosophical approach had obtained a DC qualification. Postgraduate qualifications for chiropractors are readily available in Australia, North America and Europe, as a result these respondents had greater access than those from countries like SA. Evidence based practitioners seek evidence by actively engaging in

exploring up-to-date information in an academic environment (Shaik pers. Comms, 2015). Post graduate qualifications require independent work, critical thinking and proficiency, allowing an individual to develop accredited expertise and subsequently applying the best evidence when making decisions about the care of individual patients (Sackett et al., 1996).

5.3.5.4 Continuing education

Respondents were active in continuing education (CE) activities, preferentially through attending conferences and reading journals (Section 4.4.2.6). Previous studies on chiropractic populations (Schwarz and Hondras, 2007; Suter et al., 2007; Gordon, 2011; Walker et al., 2014) found that reading journals was common among chiropractors, however, the type and quality of the journals were not specified. CE is mandated in most countries (Bolton, 2002), with South Africa making it a legal requirement from 2014 (Allied Health Professions Council of South Africa, 2014). It is postulated that through regular attendance at conferences and by reading journals, particularly on research-based practice; chiropractors are able to gain current knowledge pertaining to the profession and how to improve patient management. This provides the opportunity for chiropractors to implement new ideas into their practices and furthermore encourage an EBP model of health care. However, the influence of CE activities on chiropractic practice requires further investigation.

5.3.6 Characteristics related to chiropractic

5.3.6.1 Respondents role in chiropractic

Respondents in this study were predominantly in full time clinical practice (Section 4.4.3.1; Figure 4.2), which is in agreement with other studies (GCC, 2004; WFC, 2005; Keyter, 2010). In South Africa, it is required that practitioners in active practice maintain their CPD points in order to keep their registration and therefore the majority would have utilised the unique opportunity of the WFC congress to gain international exposure as well as to maintain their CPD points. Individuals pursing a chiropractic career would be more likely to study with the intention to seek a clinical setting as opposed to an academic or administrative role (Keyter, 2010) due to the clinical nature of the course. There is minimal information in other previously published studies pertaining to the chiropractors' role in terms of academia and/or clinical practice, whether full or part time. Very few respondents were in part-time practice or

involved in other aspects of the profession such as academia or research, possibly due to family commitments and advancing age. The time spent in active practice would influence the practitioner's experience and exposure of treating more patients, with those practicing part-time being more likely to see fewer patients than those in full time practice. Respondents involved in academia or research only would not have active practices, and were therefore excluded, so as to not skew the results.

5.3.6.2 Philosophical orientation

The majority (95%) of respondents selected indicated an evidence based or mixer philosophical orientation, with underrepresentation of chiropractors adopting a straight philosophy (Section 4.4.3.2; Figure 4.3). The WFC Biennial congress has been established to be "one of the world's leading original research meetings" for chiropractors. The WFC values high standards of professionalism in particular areas, one being research, in order to guide the growth and development of the chiropractic profession (WFC, 2013). This would result in attracting delegates who share a similar research ethos. This particular core value of research may have deterred chiropractors adopting a straight philosophy from attending such a congress, instead electing to attend congresses arranged by organisations more aligned with the professionalism associated with a straight philosophy (d'Hotman de Villiers, 2015).

Although marginally more than half the respondents selected an evidence-based approach, 43.5% stated that they saw themselves as mixers. This representation of mixers could be due to the amount of South Africans that attended the 2013 congress as the students in South Africa are schooled in a broadly based curriculum adhering to the norms and standards of Chiropractic Education (Meeker and Haldemann, 2002; Keating, 2005). Therefore, graduates from these institutions (DUT and UJ) would have similar views on chiropractic practice. Evident trends in this study support these assumptions as two thirds of respondents with a Masters qualification adopted a mixer philosophical approach. Furthermore, the chiropractic profession in South Africa has adopted an approach to examination, diagnosis, and treatment, based on the best available research and clinical evidence (CASA, 2014), thus aligning the profession with a mixer and/or evidence based philosophy. These results were congruent with Keyter's study (2010) which showed an even split between evidence-based and a mixer philosophical orientation, with very few chiropractors (17.5%; n = 21) adopting a straight philosophy.

The practice profile would be influenced by the philosophical orientation of the respondent as those selecting an evidence based or mixer philosophical approach would be more likely to integrate a variety of modalities in combination with adjustments (Palmer 1910, Chapman-Smith, 2000; Dagenais and Haldeman, 2012), as well as focus on comprehensive management of the patients health which may include advice on nutrition, exercise, personal hygiene (Ndetan et al., 2010) and other relevant areas based on the biopsychosocial approach to health care (Burdick, 2013). It is expected that those selecting a straight approach would use manipulation as a principle modality in successful patient management (Chapman-Smith, 2000) and henceforth spend a shorter time on patient consultations. This approach allows for increased practice volumes.

The question asking respondents to select one philosophical orientation may have been ambiguous and answered inaccurately as it is possible to be a straight evidence-based practitioner or a mixer evidence-based practitioner. The respondents' paradigm of thinking may have further influenced the manner in which this question was answered as those with a Masters qualification could possibly be more inclined to logically select an evidence-based philosophical orientation due to research components within the chiropractic program. However, as mentioned above, this statement is not supported by the results as trends showed that two thirds of respondents with a Masters qualification adopted a mixer philosophical approach.

It was found that female chiropractors were more likely to select an evidence-based approach to practice, with males favouring a mixer approach (Section 4.6.1.1; Figure 4.12). This trend was expected because South African chiropractors showed a male dominance, as well as a younger mean age. This substantiates the significance that mixer chiropractors were also seen to be younger in comparison to evidence-based practitioners (p = 0.002). Further comparisons between gender and philosophical orientation was limited as other studies failed to report this finding.

5.3.6.3 Chiropractors role in the health care system

The chiropractic profession observes much debate regarding the role that a chiropractor plays in the health care sector (WFC, 2005; Mootz, 2007; Murphy et al., 2008). The chiropractors' perspective of their role in health care can be influenced by

the philosophical paradigm of the practitioner as well as the legal scope of practice within the region he/she practices. In most countries, chiropractors are legislated as primary contact practitioners (PCP) (Ailliet et al., 2010; Humphreys et al., 2010; CASA, 2014; Kvammen and LeBoeuf-Yde, 2014) which is congruent with how the respondents in this study viewed a chiropractic role in health care (Section 4.4.3.3). Few respondents supported a broad scope, with most advocating a focused scope of practice. The region of residence or type of chiropractic practice had little effect on this finding. Similar results were found in studies on chiropractic populations in South Africa (Keyter, 2010), US (Smith and Carber, 2009), and in the international survey of the chiropractic profession (WFC, 2005). The Palmer College of Chiropractic is also in favour of this role, as seen in the adaptation of their identity statement which defines the chiropractor as "The primary care professional for spinal health and well-being" (Palmer College of Chiropractic, 2014), emphasizing a focused scope of spinal health. The WFC has also, in its definition of chiropractic, indicated a PCP focused scope as chiropractors being "concerned with the diagnosis, treatment and prevention of mechanical disorders of the musculoskeletal system, and the effects of these disorders on the function of the nervous system and general health. There is an emphasis on manual treatments including spinal adjustment and other joint and soft-tissue manipulation" (WFC, 2012).

5.4 Discussion on practice characteristics of the chiropractic delegates attending the WFC 2013

5.4.1 Years in practice

The majority of respondents had been in active practice for between 5-15 years (Section 4.5.1.1; Figure 4.4) which is similar to the results seen in the WFC consultation (2005), where the average years spent in active practice equated 13 years, with 74% of chiropractors being in active practice for 20 years or less. Similar patterns were seen in studies in North America (Coulter and Shekelle, 2005), Norway (Kvammen and LeBoeuf-Yde, 2014), Switzerland (Humphreys et al., 2010), Germany (Schwarz and Hondras, 2007) and Canada (Waalen and Mior, 2005). Literature is presented for other countries in Europe and Australasia with Belgian (Ailliet et al., 2010) and Australian (French et al., 2013) chiropractors being in active practice for

longer than 15 years. UK registered chiropractors (GCC, 2004) had spent on average five years or less in active practice.

Regional differences were observed, with the majority of South African respondents having been in practice for less than 15 years (Section 4.6.3.2; Figure 4.15), in comparison to all other regions where the majority had been in practice for 16 years or more. Although different year allocations were used, these results correlate well with other studies conducted on South African chiropractic populations where the majority of respondents were in active practice for less than 10 years (Fletcher, 2005; Mathews, 2006; Bunge, 2007; De Gouveia, 2009; Keyter, 2010). Chiropractic education has only been available in South Africa since 1989 at DUT and 1993 at UJ, with the first chiropractic cohort graduating in 1994, making the profession relatively young in terms of practice years. This is in contrast to the USA, which is considered the birth place of chiropractic (Chapman-Smith, 2000; Keating, 2005; Palmer College of Chiropractic, 2014) and embodies the largest population of chiropractors and chiropractic institutions (Chapman-Smith and Cleveland, 2005), hence chiropractors would have been in active practice for longer. The large number of SA respondents may have skewed the years in practice in favour of fewer years than would be the norm in other countries.

The number of years spent in practice correlates with the mean age of South African chiropractors that was reportedly lower than those chiropractors residing and practicing in other regions. The mean age of the South African respondents was 34 years, which allows for the assumption that most chiropractors had started practice soon after graduating or commenced studying chiropractic promptly after high school. The 35.8% of respondents (Section 4.6.3.2; Figure 4.15) that had been practicing for four years or less may have started studying or practicing at a later age due to numerous factors including: chiropractors started studying the course later than the usual age of 18 years old; exploration of other career paths before pursuing chiropractic; taking gap years post school; the chiropractic course extending more than the minimum of five years due to individual reasons; qualified chiropractors taking extended leave due to personal or health reasons; or to possibly explore further career opportunities (Keyter, 2010). The formative years in practice are required to develop a professional persona, astuteness and build a practice, thus the

number of patients seen may not be as well established as for those who have been in practice for longer.

When assessing whether gender influenced years in practice, this study found no significant relationship (p = 0.120; Section 4.6.1.3). Most studies (GCC, 2004; Coulter and Shekelle, 2005; Waalen and Mior, 2005; Schwarz and Hondras, 2007; Ailliet et al., 2010; Humphreys et al., 2010; French et al., 2013; Kvammen and LeBoeuf-Yde, 2014) did not report if gender influenced the number of years in active practice, except for one study done in Ontario, where males had been in practice for approximately seven years longer than their female colleagues (Waalen and Mior, 2005). Chiropractic has traditionally been viewed as a male dominated profession (Ailliet et al., 2010; Humphreys et al., 2010; Eaton et al., 2012; French et al., 2013), leading one to expect males to be in active practice for longer.

5.4.2 Hours worked per week

The majority of practitioners in this study worked 39 hours or less per week (71.1%) (Section 4.5.1.2; Figure 4.5), which is consistent with previous reports of chiropractors working between 27 - 40 hours per week (Imbos et al., 2004; Coulter and Shekelle, 2005; Mootz et al., 2005; Waalen and Mior, 2005; Schwarz and Hondras, 2007; Ailliet et al., 2010; Humphreys et al., 2010; Eaton et al., 2012; French et al., 2013; Kvammen and LeBoeuf-Yde, 2014). Almost one fifth (19.3%) of respondents worked 50 hours or more per week which may suggest that these practitioners may have had high volume practices or well established practices due to being in practice for a long period of time. In contrast, more than one third (36.0%) of respondents worked 29 hours or less. This may be from choice to work half a day or as a result of other commitments like part-time academia, research or family commitments. Gender differences in hours worked have been reported by Waalen and Mior (2005), with females working slightly less hours than males, but in the present study gender was not associated with hours worked per week (p = 0.577, section 4.6.1.3). Similarly age did not influence hours worked per week (p = 0.474; section 4.6.2.3). Further comparisons could not be attained as other studies did not report this finding.

5.4.3 Number of patients treated per week and source of new patient referrals

The majority of respondents were treating less than 100 patients in a typical working week (Section 4.5.1.3; Table 4.7). Previous studies across other regions have shown that on average, chiropractors were treating between 59 - 89 patients weekly (GCC, 2004; Mootz et al., 2005; Schwarz and Hondras, 2007; Malmqvist and Leboeuf-Yde, 2008; French et al., 2013). This differs in North America (Coulter and Shekelle, 2005) and Switzerland (Humphreys et al., 2010) where chiropractors are more likely to have high volume practices. Almost half the respondents treated 50 patients or less, which was much less than the mean reported for North American and Swiss studies. It can be assumed that those who have spent fewer years in active practice may be less likely to have a large patient base as they would still be growing their practices. Additionally, trends in this study show that those adopting an evidence-based or mixer philosophical approach were less likely to have high volume practices (Section 4.6.4.3; Figure 4.24). Although straight chiropractors were underrepresented, half had high volume practices, as the management of patients is through a philosophy of practice that is underpinned by a "straight approach" to chiropractic care, focusing on principally spinal manipulation with the use of no other modalities (Palmer, 1910; Chapman-Smith, 2000). Hence, high volume practices are associated with subluxation-based chiropractors (i.e. straight philosophical approach).

Regional differences occurred when South Africa was compared to North American and European respondents with South African chiropractors seeing fewer patients on average (Section 4.6.3.3; Figure 4.16), but still reporting to work similar hours per week to those who had higher volume practices. South African respondents in this study spent relatively longer time treating patients on subsequent visits than their international counterparts; as a result less patients would be able to be seen in an average working week.

The most common source of new patients for chiropractors in this study was from word-of-mouth referrals from family and friends which indicates that chiropractic is a consumer-driven profession (Eaton et al., 2012). This is consistent with previous studies on chiropractic populations in Switzerland (Humphreys et al., 2010), the Netherlands (Rubinstein et al., 2000) and the UK (GCC, 2004). The satisfaction that

patients receive following chiropractic care has been reported as exceptionally high (Gemmell and Hayes, 2001; Posner and Glew, 2002; Coulter and Shekelle, 2005) and consequently, satisfied patients are more likely to refer friends and family. Other sources of referral included signage and location of the chiropractic practice.

Similar to other studies (Imbos et al., 2004; Mootz et al., 2005; Sorensen et al., 2006; Schwarz and Hondras, 2007; Ailliet et al., 2010; Humphreys et al., 2010; Eaton et al., 2012; Westin et al., 2013), referral from general practitioners (i.e. medical doctors) to chiropractors did occur, however, these percentages were much lower than those represented by word-of-mouth referrals. This may be due to scepticism, bad experiences, use of confusing terminology, stereotyping, and a lack of knowledge of chiropractic (Brussee et al., 2001; Langworthy and Birkelid, 2001). The close working relationship between chiropractors and family practitioners has also been reported in Switzerland (Humphreys et al., 2010) and the UK (GCC, 2004). However, referrals from medical doctors are far more common in Switzerland than in either the UK, US (Humphreys et al., 2010) and in this study, suggesting that the respondents are not fully integrated into mainstream medicine. When looking further at the inter-professional referrals between chiropractors and other health care practitioners, there was mutual referral on a weekly basis between massage therapists and family practitioners according to the respondents in this study.

5.4.4 Time spent on new and subsequent patient visits

Respondents in this study spent 31-45 minutes on initial patient consultations (Section 4.5.1.4; Table 4.8), with no significant differences occurring between the different regions (p = 0.131; Section 4.6.3.4). This is similar to previous studies done on chiropractic populations in Belgium (Ailliet et al., 2010), Switzerland (Humphreys et al., 2010), Finland (Malmqvist and Leboeuf-Yde, 2008), Norway (Kvamann and LeBoeuf-Yde, 2014) and the Netherlands (Imbos et al., 2004),

Almost half of the chiropractors in this study spent 16 - 30 minutes on subsequent visits (Section 4.5.1.4; Table 4.8), which is in contrast to studies on North American (Coulter and Shekelle, 2005), Australian (French et al., 2013), Swiss (Humphreys et al., 2010) and Dutch (Imbos et al., 2004) populations, where chiropractors were treating patients in fifteen minutes or less, with 57.1% of chiropractors from

Australasia taking 0-10 minutes for follow up visits. This is consistent with the observations of previous studies (Imbos et al., 2004; Coulter and Shekelle, 2005; Humphreys et al., 2010; French et al., 2013). This study had a large number of younger practitioners and, therefore, additional time may be required to treat patients due to less experience and work refinement. Additionally, the respondents in this study selected an evidence-based or mixer philosophical approach, along with being primary contact practitioners with a focused scope. This philosophical and practice model would allow for a wide array of techniques and modalities to be used in treating patients, which would require a longer time duration to deliver treatment (Keating et al., 2004).

South African chiropractors in particular spent relatively longer on subsequent visits than their international counterparts (Section 4.6.3.4; Figure 4.17). South African chiropractors were younger, had fewer years in practice and were more likely to adopt a mixer philosophical orientation. Additionally, there is a large focus on soft tissue therapy which is time consuming, whereas internationally there is more emphasis on adjustments.

Similar to chiropractors in other countries, within these visits, results show that the majority of the respondents' time is devoted to direct patient care (Section 4.5.1.6; Figure 4.6) and patient reassessment was most likely to occur within five follow up visits (Section 4.5.1.5) which indicatives good practice. In addition, slightly more than one third of respondents also delivered chiropractic care outside of their office setting; with less than 10% having staff privileges in a hospital. Myburgh and Mouton (2007) noted that chiropractic, in South Africa particularly, has minimal hospital privileges being absent from formal public health settings, this is supported in the current study.

5.4.5 Practice setting and inter-professional relationships

The majority of respondents opted to practice in one office location as one of two chiropractors in a practice setting, followed by solo practitioner and multidisciplinary practice settings (Section 4.5.1.7; Figure 4.7). No significant differences were observed between the regions. These findings are in contrast to studies in the Netherlands (Imbos et al., 2004), Norway (Kvammen and LeBoeuf-Yde, 2014),

Australia (French et al., 2013), and the United Kingdom (GCC, 2004) where group practices were preferred, and in Belgium (Ailliet et al., 2010), North America (Mootz et al., 2005), Switzerland (Humphreys et al., 2010), Germany (Schwarz and Hondras, 2007) and Finland (Malmqvist and Leboeuf-Yde, 2008) where solo practices dominated.

When observing chiropractors practicing with other health care practitioners, studies in Switzerland (Robert, 2003; Humphreys et al., 2010) Germany (Schwarz and Hondras, 2007), the Netherlands (Imbos et al., 2004) and North America (Mootz et al., 2005) showed that only 6-11% of chiropractors were working with other health care practitioners. In this study 28.9% (*n* = 33) of respondents worked with other health care practitioners, suggesting that respondents are attempting to establish legitimacy by being closely associated with the medical profession and recognising patient benefits due to the ability to receive multidisciplinary care. Furthermore, it supports that the chiropractic profession is becoming incorporated into mainstream medicine (Villanueva-Russell, 2005; Woolf and Pfleger, 2010). Keyter (2010) reported a third (37.5%; *n* = 45) of chiropractors practicing in a multi-disciplinary setting in South Africa, which was much higher than other international studies. Although no significant regional differences were seen in this study, the dominance of South Africans attending this congress may have influenced the outcome.

5.4.6 Utilisation of diagnostic imaging

Radiographs have been utilised and beneficial to chiropractors since the professions inception (Peterson and Hsu, 2005) therefore access to diagnostic imaging is important to the profession. Most respondents referred their patients to diagnostic facilities for imaging (Section 4.5.1.8), which is similar to studies in Norway (Kvammen and LeBoeuf-Yde, 2014) and the Netherlands (Imbos et al., 2004). Only 13.3% of respondents reportedly took radiographs at their own practices which was comparatively lower than reported studies from the United States (Christensen et al., 2010), Switzerland (Humphreys et al., 2010) and the UK (Wilson, 2003) where 59.4%, 55% and 35% of chiropractors had radiographic facilities in their practices, respectively. Trends show that North American and European respondents made up this 13.3% (Section 4.6.3.8; Figure 4.19). Radiographic equipment is expensive to purchase and maintain which provides a possible explanation for the decreased

likelihood of respondents having personal radiographic facilities. Radiographic referrals also allows for developing referral networks with other practitioners.

Despite having access to a radiologist's report, 92.9% of respondents reported that they reviewed and interpreted diagnostic images of their patients. This supports the role of chiropractors as PCPs as they are responsible for the overall wellbeing of the patient (WFC, 2005) and are trained to analyse radiographs (Ferri, 2014).

5.4.7 Patient management

5.4.7.1 Chiropractic techniques

Chiropractors are seen as holistic health care professionals considering a variety of approaches in patient health and management (Waalen and Mior, 2005). In this study diversified technique was the favoured chiropractic technique (Section 4.5.1.10) which is similar to previous studies (Wilson, 2003; Coulter and Shekelle, 2005; Waalen and Mior, 2005; Schwarz and Hondras 2007; Malmqvist and Leboeuf-Yde, 2008; Ailliet et al., 2010; Humphreys et al., 2010; Keyter, 2010; Christensen et al., 2010). In South Africa, the chiropractic curriculum focuses on diversified technique with various other techniques being offered as postgraduate courses (University of Johannesburg, 2011; Durban University of Technology, 2013). These courses, although available, may often be inaccessible due to the high costs involved in traveling internationally, whereas those from other regions, especially Australia, USA, Canada and Europe, have easier access to these courses. Various institutions across the USA teach a plethora of techniques to students (Ndetan et al., 2009), indicating that place of graduation may influence the techniques used in practice.

The second most frequently used technique was extremity adjusting. This finding was interesting as respondents reported that only 1-20% of their patients sought care from an extremity condition (Section 4.5.2.3; Figure 4.10), indicating that respondents may be utilising extremity adjusting in the management of spinal complaints. This is supported by Bergman et al. (2004) who demonstrated that spinal manipulation accelerated the recovery from shoulder symptoms. Many chiropractors will assess the kinematic chain in treating spinal problems and would therefore correct biomechanical aberrations either through manipulative techniques or other treatment interventions (Hillerman et al., 2006; de Luca et al., 2011). The National Board of

Chiropractic examiners stated that in the last decade, conditions involving the extremities have responded well to manual therapy (Christensen et al., 2010).

Studies conducted in Australia, Belgium (Ailliet et al., 2010), Canada (Waalen and Mior, 2005), Finland (Malmqvist and Leboeuf-Yde, 2008), South Africa (Keyter, 2010), Arizona and Massachusetts (Mootz et al., 2005) reported Activator technique as the second most commonly utilised technique, whereas studies in the US (Coulter and Shekelle, 2005; Christensen et al., 2010) saw Cox/Flexion Distraction and NIMMO receptor tonus techniques rank second to diversified technique. In this study only a small percentage of respondents used NIMMO receptor tonus technique routinely in practice, with those from Australasia and Europe being more likely to utilise this technique compared to other regions where it was never used. Trends in this study showed that evidence-based and mixer practitioners were less likely to utilise activator methods, which may be why it did not rank within the top five (Section 4.6.4.4). The only techniques where gender was a factor were cranial and mobilisation techniques, seeing more males utilising these in practice (p = 0.028 and p = 0.008 respectively; section 4.6.1.6), the reason for this was unclear and requires further investigation.

Despite the 15 techniques listed in this study, an additional seven techniques were added by the respondents. This demonstrates an assortment of techniques which have been established as the chiropractic profession has developed (Cooperstein and Gleberzon, 2004).

Trends in the data suggest that the philosophical orientation of the respondent may influence the utilisation of chiropractic techniques and patient management (Section 4.6.4.4 and Section 4.6.4.5). However, these results may be skewed due to the underrepresentation of straight chiropractors who participated in this study. Almost all evidence-based and mixer practitioners were seen to utilise diversified technique in contrast to two thirds of straight practitioners never utilising it. A similar trend was noted for extremity adjusting, as straights only focus on vertebral subluxations (Palmer, 1910; Cooperstein and Gleberzon, 2004; Keating, 2005).

5.4.7.2 Adjunctive auxiliary procedures

Adopting the role of a primary health care practitioner emphasizes the importance of chiropractors to consider the overall wellbeing of the patient and hence concentrating on health promotion and addressing patient lifestyles. Studies worldwide have confirmed that a wide array of adjunctive auxiliary procedures accompany spinal manipulation (Schwarz and Hondras, 2007; Ailliet et al., 2010; Christensen et at., 2010; Humphreys et al., 2010; Keyter, 2010; Kvammen and LeBoeuf-Yde, 2014). The majority of chiropractors in this study routinely focused on physical fitness or exercise promotion, followed by ergonomic and postural advice, and self-care strategies (Section 4.5.1.10). These adjunctive procedures often accompany active care advice given to patients with low back and neck pain. Nutritional or dietary recommendations were also frequently used particularly by the younger chiropractors (p = 0.036; section 4.6.2.4) with females being less likely to recommend these in practice (p = 0.032; section 4.6.1.6). The study of nutritional education has only been included in the chiropractic curriculum in the last few decades (Phillips, 2006). No regional differences were observed for adjunctive auxiliary procedures indicating that chiropractors, irrespective of where they practice, use adjunctive procedures in the management of patients.

The use of active and passive adjunctive auxiliary procedures in chiropractic practice has previously been reported as being relatively common, with particular procedures being more favourable than others. A quarter (26.4%) of respondents chose to delegate the administration of these therapies to a non-chiropractic staff member, with females being more likely to do so (p = 0.029; section 4.6.1.4; Figure 4.14). Chiropractic assistants are qualified and enable the chiropractor to focus on delivering manipulations while they can provide lifestyle and exercise advice. Consequently, chiropractors will spend less time on patient visits and therefore may have high volume practices due to more time available. Respondents were more inclined to utilise trigger point therapy, massage and mobilisation therapy; and routinely focused on corrective/therapeutic exercises and addressing activities of daily living (Section 4.5.1.10). These findings are consistent with procedures utilised in the United States (Christensen et al., 2010), Switzerland (Humphreys et al., 2010), Belgium (Ailliet et al., 2010) and Norway (Kvammen and LeBoeuf-Yde, 2014). Massage therapy was seen to be less favoured by female respondents in this study

(p = 0.018; section 4.6.1.6). It is unclear as to why males may favour massage therapy.

Chiropractors in this study, similarly to the situation in Belgium, never or rarely utilised physical or electrotherapeutic modalities such as therapeutic ultrasound, electrodiagnosis, hydrotherapy or vibration therapy. However, previous studies on chiropractors in the US (Mootz et al., 2005; Christensen et al., 2010), Canada (Waalen and Mior, 2005) and Switzerland (Humphreys et al., 2010) identified electrotherapeutic modalities as being among the most commonly used passive adjunctive therapies. As previously reported, a large percentage of respondents had been in active practice for less than five years and modalities of this nature may be too expensive to acquire for new practitioners. Despite previous literature, findings in this study showed no significant differences in the use of passive adjunctive procedures across the regions.

The inclusion of a wide array of manual and clinical methods for patient management by this study population is consistent with the majority selecting an evidence based or mixer philosophical orientation, as well as the majority graduating from institutions that teach a mixer orientated curriculum. It is evident that chiropractors in this study are not solely focusing on the correction of vertebral subluxations but are applying primary health care principles and practices in a biopsychosocial model for the betterment of holistic patient care. The integration of a variety of modalities in combination with spinal manipulation show that chiropractors are using their full scope of practice to manage patients effectively and not solely relying on spinal manipulation.

5.4.8 Patient profile

5.4.8.1 Patient demographic characteristics

The results in this study support that chiropractors treat a wide variety of patients, from paediatrics to geriatrics, with the majority of patients being in the working population (Section 4.5.2.1; Figure 4.8). Similar findings were reported in other studies (Christensen et al., 1994; Pederson, 1994; LeBoeuf-Yde et al., 1997; Rubinstein et al., 2000; Coulter et al., 2002; GCC, 2004; Coulter and Shekelle, 2005; Mootz et al., 2005; Sorensen et al., 2006; Schwarz and Hondras, 2007; Alliet et al.,

2010; Keyter, 2010; Humphreys et al., 2010; French et al., 2013). It was noted that only a small percentage of chiropractors in this study treated children/adolescents (14.7%) or those over 65 years of age (12.1%), which was consistent with previous reports noting that paediatric and geriatric populations represent a marginal portion of chiropractic patients (Cherkin et al., 2002; Waalen and Mior, 2005; Schwarz and Hondras, 2007; Alliet et al., 2010; Humphreys et al., 2010; French et al., 2013).

Previous studies have reported that the prevalence of neck and low back pain is reportedly higher in females and peaks in middle age (van der Valk et al., 1995; Fejer et al., 2006; Binder, 2006; Fernandez-de-las-Pernas et al., 2011). A similar profile was reported in the current study with the majority of patients between 31-50 years of age, with the chief complaint related to spinal pain in general; low back complaints were the most common, followed by neck pain accompanied by headaches (Section 4.5.2.3; Figure 4.10). It was also reported that more females sought care possibly due to the non-invasive nature of CAM, with its fewer side effects.

5.4.8.2 Symptom duration

Most of the patients seen by chiropractors in this study population were in the acute phase of their complaint, with symptoms of between 0 to 4 weeks. Following this, patients presented in the subacute phase (4-8 weeks), with the chronic patient being the least likely category of patient presenting to the respondents practice (Section 4.5.2.2; Figure 4.9). These findings are supported by other studies conducted on chiropractors in Switzerland (Humphreys et al., 2010), North America (Coulter and Shekelle, 2005), Denmark (Sorensen et al., 2006) and Sweden (Leboeuf-Yde et al., 1997). These results indicate that patients are resorting to chiropractic services promptly, without numerous forms of conservative treatment for their ailments. This suggests that patients possibly view chiropractors as primary care practitioners rather than an alternative form of care (Coulter and Shekelle, 2005). Effective inter-professional relationships between chiropractors and medical practitioners could further explain why more patients present to a chiropractor sooner, as noted by Humphreys et al. (2010). Conversely in this study; referrals of new patients from medical practitioners represented a marginal percentage.

Menke (2003) reported that patients prolong their symptoms or do not consult chiropractors for reasons such as fear of adverse effects or the purported lack of

scientific proof of chiropractic treatment. The minority of chronic pain patients in this study can suggest a positive change in the patients' perception of chiropractors as the public begin to understand the benefits of chiropractic care.

5.4.8.3 Chief complaints and aetiology

The respondents in this study reported seeing patients whose primary chief complaint originated in the spine (Section 4.5.2.3; Figure 4.10). Similar results were found in numerous studies and reports (New Zealand Consumers" Institute, 1997; Rubinstein et al., 2000; Cooper and Mckee, 2003; Vinci and Peterson, 2003; Wilson, 2003; Coulter and Shekelle, 2005; Mootz et al., 2005; Waalen and Mior, 2005; Sorensen et al., 2006; Schwarz and Hondras, 2007; Alliet et al., 2010; Eaton et al., 2012; Humphreys et al., 2010; French et al., 2013). More specifically, low back pain was most commonly seen, followed by a large percentage of patients presenting with headaches and neck pain concurrently (Section 4.5.2.3; Figure 4.10). It has been documented that the public view chiropractors as back pain specialists (Gaumer et al., 2002), therefore would seek chiropractic care for back pain.

Due to the desire to be regarded as a profession that is not limited to only neck and back complaints, it was anticipated that respondents would be seeing a higher percentage of patients seeking wellness and preventative care. However, 81.1% of respondents expressed that only 20% or less of their patients sought this type of care. Neck pain accompanied by headaches was seen to be the only chief complaint significantly associated with the geographical region of the respondents (p = 0.007; Section 4.6.3.12; Table 4.13) where those from North America and Asia reported few patients with this chief complaint. Reasons behind this result are unclear.

The common aetiologies for the chief complaints reported by respondents in this study are similar to those reported in Swiss and American populations (Christensen and Kollasch, 2005; Christensen et al., 2010; Humphreys et al., 2010). Overuse or repetitive stress, activities of daily living, sports and exercise are the most common causes of patient symptoms (Section 4.5.2.3; Figure 4.11). Additionally, American chiropractors reported that motor vehicle accidents (MVA) were amongst the common cause of patient complaints (Christensen and Kollasch, 2005; Coulter and Shekelle, 2005; Mootz et al., 2005), yet this differed in the current study and in the Swiss study (Humphreys et al., 2010). Swiss citizens commute using efficient public

transportation systems which may lower the likelihood of MVAs. It is unclear as to why there is a low MVA aetiology in this study, particularly due to high road accidents and poor transportation systems in SA. Aetiologies were seen to be similar, despite the different regions represented in this study.

In the treatment of musculoskeletal conditions, more emphasis is being placed on yellow flags to identify psychosocial and occupational factors which may have an indirect effect on the patients presenting chief complaint (Australian Acute Musculoskeletal Pain Guidelines Group, 2003). This is evident in the present study as emotional stressors were also responsible for causing numerous patient symptoms.

The overall demograhical profile and practice characteristics of the chiropractic delegates are highlighted throughout this chapter. Despite the limitations, it is evident that there are some trends between selected demographics and practice characteristics and interestingly, there are many similarities between local (South African) and international chiropractors.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The aim of this study was to determine the demographic profile and practice characteristics of chiropractic delegates attending the World Federation of Chiropractic's (WFC) 12th Biennial Congress 2013 and to assess for trends in the data between selected demographic profiles and practice characteristics. The demographic characteristics of the respondents showed that there were slightly more females than males attending the congress, with the mean age being 42 years. The majority were in active practice for a duration of less than 20 years. Seven regions of the world were represented with the majority residing in South Africa (48.6%; *n* = 67). This indicates that many South African chiropractors took the opportunity to attend the congress, resulting in a large representation from this region.

The respondents received their chiropractic training from various institutions across the regions, with a Masters degree in chiropractic being the most awarded degree. Less than one third had obtained additional postgraduate qualifications in various fields like sports medicine and orthopaedics. The respondents were active in achieving their continual educational requirements with most exceeding them.

The respondents favoured an evidence-based or mixer philosophical approach to practice, with an underrepresentation of those selecting a straight philosophical approach, possibly due to the nature of the congress. The majority of the respondents felt that the role of chiropractic in health care was that of a primary health care practitioner with a focused scope, practicing as one of two chiropractors in a practice, for between 5-15 years and working 39 or less hours per week. On average, the respondents were treating less than 100 patients weekly, with notable regional differences seen in the North American and European respondents as they reportedly treated between 100-149 patients weekly. In terms of patient management, this study's results were similar to reports from other countries where the respondents predominantly used Diversified Techniques accompanied by trigger

point therapy, massage or mobilisation techniques. Extremity adjusting was the subsequent technique favoured by the respondents above other techniques such as Gonstead, Thompson and Activator techniques. Physical fitness and exercise promotion, and ergonomic and postural advice in combination with corrective or therapeutic exercise were common adjunctive auxiliary procedures used in patient management. Initial patient consultation typically lasted 31-45 minutes with follow up treatments being 16-30 minutes in duration. Regional differences occur with the South African respondents spending slightly longer on subsequent patient visits.

This is the first study to investigate WFC congress delegates in the chiropractic profession in order to determine if there are similarities and/or differences in chiropractic practice regionally. The data gathered from this study would be beneficial to the chiropractic profession as it enables organisations such as the WFC to have a greater understanding of how chiropractors are currently practicing and through establishing practice characteristics on a global scale it could help to guide educational emphasis by focusing on relevant key competencies particular to practice. Furthermore, this research can aid in further obtaining a baseline description of the profession to allow the public and other health care practitioners to fully comprehend what chiropractors can contribute to the health care paradigm.

6.2 Recommendations

6.2.1 Chiropractic profession

1. A similar study should be undertaken at a congress with a ‘straight chiropractic’ philosophical orientation, in order to ascertain the practice characteristics of ‘straight chiropractors’, to see if they are similar to those of this study.
2. International bodies such as the WFC should periodically conduct studies of this nature to assess if the practice of chiropractic is similar across regions.
3. Further research is necessary into the chiropractic management of conditions that chiropractors can treat, particular non-musculoskeletal complaints, as scientific evidence can further legitimise the profession amongst the public and other health care practitioners.
4. Findings in this study that were unclear require further investigation to provide a better understanding of practice characteristics and influencing factors.

6.2.2 Recommendations regarding the methodology and questionnaire used in the study

1. The questionnaire was long which may have attributed to the respondents not completing the questionnaire due to fatigue. Future studies of this nature should have shorter questionnaires, especially if administered at a congress.
2. The following changes are recommended for the questionnaire:
    - Question 3 of the demographics section, racial group rather than ethnicity should have been used with an explanation on why this is needed for statistical reasons.
    - Question 6 of the demographics section, there should have been more options to select a combination of philosophical orientations such as an evidence based and straight or mixer and straight approach.
    - Section A, question 2 should have included the option of 40-49 hours worked per week.
    - Section A, question 13 – Yes No heading should have been clearly placed above the table as the first question was often omitted.
    - Section A, question 21 should have included a small definition of terms which may have been unknown to respondents such as ‘back school’ and ‘work hardening’.
    - Section A, question 23 and 24 should have had a simple selection of options as the percentages used made it difficult for respondents to answer effectively.

6.3 Limitations of this study

1. The poor response rate in this study limited the generalisibility of the results. Some regions were poorly represented which only allowed for trends to be assessed, as results were insignificant.
2. Quantitative surveys do not allow for in-depth interrogation of factors such as reasons why a particular option was selected.
3. The time frame between issuing the questionnaire at the Congress and making it available electronically was delayed and may have resulted in delegates becoming disinterested.

4. The omission of category of 40-49 hours per week in the questionnaire may have possibly skewed the data for this question as some respondents would have selected the provided options, whilst other respondents took the initiative of adding this category to their questionnaire.
5. Poor categorisation for philosophical orientation of the chiropractor may have created restrictions when answering this question, resulting in the delegates being unsure which option to select.

This study aimed to determine the practice characteristics of delegates attending the World Federation of Chiropractic's 12th Biennial Congress in Durban 2013. Despite limitations noted in this study, there is an improved understanding of the characteristics of chiropractic practice in South Africa, and internationally, highlighting the growth and development of the profession over the years. This aids the public and other health care practitioners in comprehending how this profession can positively contribute to the health care sector.

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APPENDICES

Appendix A: Institutional Research Ethics Committee (IREC) full approval of proposal

DURBAN UNIVERSITY of TECHNOLOGY

INSTITUTIONAL RESEARCH ETHICS COMMITTEE (IREC)

8 April 2013

IREC Reference Number: **REC 25/13**

Ms L L Bezuidenhout
P O Box 39437
Queensburgh
4070

Dear Ms Bezuidenhout

Practice characteristics of Chiropractic delegates attending the World Federation of Chiropractic's 12th Biennial Congress 2013

I am pleased to inform you that Full Approval has been granted to your proposal REC 25/13, subject to the following:

1. Advertising: Whilst the entire population attending the conference is invited, it would be a kind gesture to place at least 1 advertising leaflet within the conference centre so that participants are aware of a research study being undertaken as well as highlighting that participation is voluntary.
2. Procedure: The research information letter together with the data collection tools is included in the conference package. Additionally, it is noted that an announcement will be made requesting the delegates to complete the questionnaire. When this request is made it should be clearly stated by the person making the announcement that participation is voluntary; the request to complete of the questionnaire should not be misconstrued as an instruction to do so by conference organisers.

The following additional comments have been made for consideration:

3. Inclusion criteria: Kindly clarify how an MSc or BSc qualification is related to Chiropractic.
4. Clarify consultation with a biostatistician.
5. Since there are 2 studies targeting the same population, the questionnaire and information letters should not include both section A and section B for 2 different studies. Each study should have a separate questionnaire and information letter.

The Proposal has been allocated the following Ethical Clearance number **IREC 022/13**. Please use this number in all communication with this office.

Approval has been granted for a period of one year, before the expiry of which you are required to apply for safety monitoring and annual recertification. Please use the Safety Monitoring and Annual Recertification Report form which can be found in the Standard Operating Procedures [SOP's] of the IREC. This form must be submitted to the IREC at least 3 months before the ethics approval for the study expires.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the IREC according to the IREC SOP's. In addition, you will be responsible to ensure gatekeeper permission.

Appendix B: Permission to utilise questionnaire

From: Dr. Mark Christensen [mailto:mchristensen@NBCE.org] **Sent:** 18 March 2013 06:07 PM **To:** Laura Wilson <lauraw@dut.ac.za> **Cc:** Mr. Horace Elliott <elliott@NBCE.org>; Dr. Martin Kollasch - IBCE <mkollasch@IBCE.org> **Subject:** RE: Request to use questionnaire used in the Practice Analysis of Chiropractors undertaken by the NBCE

Dr. Wilson,

Permission to use the questionnaire as described is granted with credit being given to the NBCE.

Regards,

Mark G. Christensen, Ph.D.
Assistant Executive Vice President and Director of Testing
National Board of Chiropractic Examiners
901 54th Avenue
Greeley, Colorado 80634
mchristensen@nbce.org
970-356-9100 ext. 120 (Direct)
800-964-6223 ext. 120 (Toll Free)
970-395-0021 (Fax)

From: Laura Wilson [mailto:lauraw@dut.ac.za] **Sent:** Wednesday, March 13, 2013 11:45 PM **To:** Dr. Mark Christensen **Subject:** RE: Request to use questionnaire used in the Practice Analysis of Chiropractors undertaken by the NBCE

Dear Dr Christensen

I have a Master's research student who has approached the WFC to conduct an analysis of practice characteristics of Chiropractic delegates attending the WFC in Durban. When searching the literature the two studies which best describe what she would like to find out are the NBCE practice study and the study done by Humphrey's et al (who utilised the

NBCE questionnaire). Therefore we were hoping that we would be able to utilise the same questionnaire, however we would need to modify it slightly by reducing the length, and maybe add some of the questions they used in the Humphrey et al study. Appropriate recognition would be given to the NBCE for developing the questionnaire.

Looking forward to your response.

Regards
Laura

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Appendix C: WFC Letter of Authority

WORLD FEDERATION OF CHIROPRACTIC | FÉDÉRATION MONDIALE DE CHIROPRATIQUE | FEDERACIÓN MUNDIAL DE QUIROPRÁCTICA

1246 Yonge Street, Suite 203, Toronto, Ontario, Canada M4T 1W5
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DENMARK

John Triano DC PhD
CANADA

March 13, 2013

Dr Laura Wilson,
M.Tech. Chiropractic
Chiropractic Program
Durban University of Technology

Dear Dr Wilson,

Re: Durban University of Technology Research Studies at the WFC Congress 2013

Further to earlier discussions, on behalf of the World Federation of Chiropractic (WFC) I grant the authority for the following two studies to take place at our 12th Biennial Congress to be held in Durban, South Africa, April 10-13, 2013:

- Research and its impact on the chiropractic profession: Preception of international delegates attending the World Federation of Chiropractic Congress 2013.
- Practice charactersitiscs of international delegates attending the World Federation of Chiropractic Congress 2013.

Please contact us for any further information you may require.

Kind Regards,

[redacted]

Christina Davis
WFC Executive Secretary

c.c. WFC Executive

Appendix D: Letter of Permission – ICC

From: Delia Samuel [mailto:DeliaS@icc.co.za]

Sent: 25 March 2013 10:13 AM

To: Laura Wilson

Subject: RE: Permission from ICC to do research on the premises

Hi Laura,

Please take as confirmed.

The researchers will need to remain in the area that is designated for the conference.

Regards,

Delia Samuel

SENIOR SALES AND EVENTS COORDINATOR

ICC DURBAN

INTERNATIONAL CONVENTION CENTRE

INKOSI ALBERT LUTHULI ICC COMPLEX

DURBAN SOUTH AFRICA

CONVENTION CENTRE · ARENA · EXHIBITION CENTRE

45 Bram Fischer Rd, Durban, 4001. PO Box 155, Durban, 4000, South Africa

Tel (+27) 31-360 1204 fax (+27) 86 5328 318

Mobile (+27) 0795106305

E-mail: delias@icc.co.za www.icc.co.za

From: Laura Wilson [mailto:lauraw@dut.ac.za]

Sent: 25 March 2013 10:11

To: Delia Samuel

Subject: FW: Permission from ICC to do research on the premises

Dear Ms Samuel

The email below refers, please can you advise as to whom I must speak to in order to get approval to conduct research on the premises of the ICC during the WFC conference?

Regards
Dr Laura Wilson

From: Laura Wilson
Sent: 19 March 2013 11:36 AM
To: 'Delias@icc.co.za'
Subject: Permission from ICC to do research on the premises

Dear Ms Samuel

The WFC has given 2 research students permission to hand out a research questionnaire at the WFC conference, however we will require permission from the ICC to allow research to be conducted on their premises. Would it be possible for you to give us a letter of permission allowing the research to take place at the ICC?

Regards
Laura

Appendix E: Post expert group questionnaire

Dear Chiropractor

Please read the following questions and answer accordingly. Where appropriate, please mark your chosen answer with a tick (√).

Demographic details

1. Gender:

Female 1	Male 2

2. Please state age at last birthday: ___enter age in years_____yrs
3. Please state ethnicity (for statistical reasons):_____you can code these by alphabetic order for eg Black = 1, indian =2, white =3 etc_____
4. In which region do you reside:

Tick (√)	Region
1	Africa
2	Asia
3	Australasia
4	Europe
5	North America
6	South America

5. Please specify the state/province/canton where you reside:
   _____perhaps just enter this as a text string
   _____
6. Indicate the philosophical orientation that best describes your philosophy of chiropractic (only tick one option):

Tick (√)	Philosophical orientation:
1	Evidence based: Make use of the best available scientific literature and accumulated clinical knowledge and expertise to interpret, retrieve and apply the results of scientific studies to establish a diagnosis and communicate different treatment plans to the patient. Evidence based chiropractors seek to be incorporated into main stream health care[1].
2	Mixer: Believe subluxation is one of the many causes of disease and they incorporate many different treatments including soft tissue therapy, electromodalities, dry needling etc. Mixers generally want to be integrated into mainstream medicine[1].
3	Straight: Believe that vertebral subluxation leads to interference with the innate intelligence within the nervous system and is a primary underlying risk factor for almost any disease. Their treatment follows the traditional chiropractic lexicon: spinal analysis, detect subluxation, correct with adjustment. Straight chiropractors prefer to remain separate and distinct from mainstream health care[1].

7. Indicate how you see the role of a chiropractor in health care (only tick one option):

Tick (√)	Role of a chiropractor in health care:
1	Primary Health Care Broad Scope: Direct access; broad scope of practice; overall responsibility for patient and coordination of care. Example: Family MD/GP
2	Primary Health Care Focused Scope: Direct access; focused scope of practice; may have overall responsibility for patient and coordination of care within scope of practice. Example: dentist, optometrist.
3	Specialist Care: Primary care and specialist training; focused scope of practice; practice on referral. Example: orthopaedic surgeon, radiologist.

[1]Wold Federation of Chiropractic Identity Consult (2005)

8. Please state the institution/alma Mata that conferred your Chiropractic degree for registration as a Chiropractor:___enter as a text string _____

9. Please specify the qualification you hold in Chiropractic for licensure? E.g. DC/MChiro _____if there are limited categories here try to code them numerically.

   _____

10. What year were you awarded the Chiropractic degree? ____enter actual year_____

11. Highest level of non-chiropractic education:

Tick (√)	Non-chiropractic education
1	High School
2	Bachelors' degree
3	Masters' degree
4	PhD or equivalent
5	Other, Specify:
	Leave a column for this and type in whatever is written here

12. Please specify any post graduate qualification such as through a national qualification board:

    _____i think just enter as a text string _____

13. In which of the following continuing education opportunities do you participate? (may answer more than one):

Tick (√)	Continuing education opportunities
1 or 0	Read journals
1 or 0	Practice based research
1 or 0	Attend conferences or seminars
1 or 0	Attend hospital staff CE/CPD meetings
1 or 0	Online credit courses
1 or 0	Quality circles
1 or 0	Other, please specify:

14. How many hours of continuing education credits have you earned during the past year?

Tick (√)	Continuing education credits have you earned during the past year
1	None
2	Less than required

3	Have met the requirements
4	Exceed the requirements

15. Which if the following best describes your role in chiropractic (Tick the appropriate box/s)

Tick (√)	My role in chiropractic is best described as:
1/0	Academic
1/0	Full time clinical practice
1/0	Part time clinical practice
1/0	Research
1/0	Other, please specify:

IF YOU ARE NOT CURREMTLY PRACTICING PLEASE PROCEED TO SECTION B

Section A[2]

Practice details

1. Years in practice:

	Less than 2 years	2-4 years	5-15 years	16-25 years	26 years or more
Tick (√)	1	2	3	4	5

2. Hours per week you practice chiropractic:

	29 or less	30-39	50-59	60 or more
Tick (√)	1	2	3	4

3. Number of patients you personally treat per week:

	≤50	50-99	100-149	150-199	200-249	250-300	≥300
Tick (√)	1	2	3	4	5	6	7

4. Number of new patients you personally see per week:

No.	0	1-3	4-6	7-9	10-12	13-15	16-20	>20
Tick (√)	1	2	3	4	5	6	7	8

5. How much time on average do you spend with a NEW patient on the first visit?

Minutes	0-5	6-10	11-15	16-30	31-45	46-60	61-75	1hour 16 min to 1 hour 30 min	More than 1½ hours
Tick (√)	1	2	3	4	5	6	7	8	9

6. How much time on average do you spend with a patient on SUBSEQUENT visits?

Minutes	0-5	6-10	11-15	16-30	31-45	46-60	61-75	1hour 16 min to 1	More than

								hour 30 min	1½ hours
Tick (√)	1	2	3	4	5	6	7	8	9

7. What percentage of your patients that you saw IN THE PAST MONTH presented with the following symptom duration:

	None	1-25%	26-50%	51-75%	76-100%
Symptom free	1	2	3	4	5
0-4 weeks	1	2	3	4	5
4-8 weeks	1	2	3	4	5
8-12 weeks	1	2	3	4	5
More than 12 weeks	1	2	3	4	5

8. At what visit interval do you reassess your patients for whom you are providing ongoing care?

Visit	1	2-3	4-5	6-7	8-9	After 10 visits or more	I do not reassess
Tick (√)	1	2	3	4	5	6	7

[2] Permission was obtained from the National Board of Chiropractic Examiners and Humphries et al (2013) to utilise their questionnaires in this study.

9. Please identify the source of your new patients and the approximate percentage received from each source.

	Approximate %
Association website	Enter the percentage
Your own personal website	
Sign/location of your practice	
Advertising in local paper	
Word of mouth/patient referrals	
Chiropractic patients association	
Referral from medical practitioner	
Referral from other chiropractor	
Referral from other health care practitioner	
Other	
Don't know	

10. Approximately what percentage of your time is spent on each of the following functions during a typical week? (Total should be approximately 100%)

	None	1-25%	26-50%	51-75%	76%-100%
Direct patient care	1	2	3	4	5
Documentation of care	1	2	3	4	5
Business management (personnel, marketing etc.)	1	2	3	4	5
Patient education	1	2	3	4	5

11. Of the patients that you saw in your practice during this past year, how many are from each of the following gender, age and ethnic categories?

		% seen in last year
Gender:	Female	Enter the percentage
	Male	
Age:	5 or younger	
	6-17	
	18-30	
	31-50	
	51-64	
	65 or older	
Ethnicity:	Asian	
	Pacific Islander	
	Black/ African American	
	Caucasian/White	
	Hispanic	
	Native American	
	Indian	
	Other e.g. Marui, Aboriginals Please specify:	

Work environment

12. Which description best characterises your role in the office where you work (Tick (√) appropriate box)?

1	Individual practitioner/only one chiropractor in office
2	One of two chiropractors in office
3	Junior associate or examining doctor
4	Practitioner in a multi-disciplinary office

13. Please place a tick (√) in the appropriate box:

Do you practice in more than one office location?	YES	NO
Do you primarily delegate administration of adjunctive therapies to a non-chiropractic member of your office staff?	1	2
Do you ever deliver chiropractic care outside an office setting, such as a patient's home?	1	2
Do you have staff privileges at a hospital?	1	2

14. When radiographs are indicated for your patients, where are they done? (Tick (√) appropriate box)

1	Nearly all are taken at my practice
2	At an imaging centre or hospital
3	Some are taken at my practice and others are referred to another facility

15. Who interprets the diagnostic images of your patients? (Tick (√) appropriate box)

1	I generally interpret all of the images on my patients, even if I have a radiologist's

	report
2	I only interpret the images that I take in my practice and rely on the report for images taken elsewhere
3	I do not interpret any of the images on my patients, relying solely on a radiologists' report
4	The interpretation is generally done by a radiologist, but I always draw my own conclusions in addition to the radiologist's report

16. Please answer the following question by placing a tick (√) in the appropriate box:

	YES	NO
Do you primarily delegate taking x-rays to a chiropractic assistant?	1	2
Do you primarily delegate developing x-rays to a chiropractic assistant?	1	2

17. How frequently have the following health professionals made referrals to you during the past year?

	Never	Rarely (<1/mo)	Sometimes (1-3/mo)	Often (1-2)/wk	Routinely (>2/wk)
Acupuncturist	1	2	3	4	5
Dentist	1	2	3	4	5
Family practitioner	1	2	3	4	5
Internist	1	2	3	4	5
Massage therapist	1	2	3	4	5
Nutritionist	1	2	3	4	5
OB/BYN	1	2	3	4	5
Orthopedic surgeon	1	2	3	4	5
Neurologist	1	2	3	4	5
Neurosurgeon	1	2	3	4	5
Other Chiropractor	1	2	3	4	5
Paediatrician	1	2	3	4	5
Physical therapist	1	2	3	4	5
Physiatrist	1	2	3	4	5
Orthopedic technician	1	2	3	4	5
Podiatrist	1	2	3	4	5
Psychologist/Psychiatrist	1	2	3	4	5
Surgeon	1	2	3	4	5
Other: Specify	1	2	3	4	5

18. How frequently have you made referrals to the following health professionals during the past year?

	Never	Rarely	Sometimes	Often	Routinely

		(<1/mo)	(1-3/mo)	(1-2)/wk	(>2/wk)
Acupuncturist	1	2	3	4	5
Dentist	1	2	3	4	5
Family practitioner	1	2	3	4	5
Internist	1	2	3	4	5
Massage therapist	1	2	3	4	5
Nutritionist	1	2	3	4	5
OB/BYN	1	2	3	4	5
Orthopedic surgeon	1	2	3	4	5
Neurologist	1	2	3	4	5
Neurosurgeon	1	2	3	4	5
Other Chiropractor	1	2	3	4	5
Paediatrician	1	2	3	4	5
Physical therapist	1	2	3	4	5
Physiatrist	1	2	3	4	5
Orthopedic technician	1	2	3	4	5
Podiatrist	1	2	3	4	5
Psychologist/Psychiatrist	1	2	3	4	5
Surgeon	1	2	3	4	5
Other: Specify	1	2	3	4	5

Treatment procedures

19. Please indicate the primary technique approach that you use in your practice: (mark only one)

	Never 0%	Rarely 1-25%	Sometimes 26-50%	Frequently 51-75%	Routinely 76-100%
Activator methods	1	2	3	4	5
Adjustive instrument	1	2	3	4	5
Applied Kinesiology	1	2	3	4	5
Cox/flexion distraction	1	2	3	4	5
Cranial	1	2	3	4	5
Diversified	1	2	3	4	5
Extremity adjusting	1	2	3	4	5
Gonstead	1	2	3	4	5
Logan Basic	1	2	3	4	5
Meric	1	2	3	4	5
NIMMO/receptor	1	2	3	4	5

tonus					
Plamer upper cervical/HIO	1	2	3	4	5
Pierce-Stilwagon	1	2	3	4	5
SOT	1	2	3	4	5
Thompson	1	2	3	4	5
Other: Specify	1	2	3	4	5

20. For what percentage of patients during the last year did you utilise the following adjunctive procedures? (You may have utilised more than one procedure on a given patient)

	Never 0%	Rarely 1-25%	Sometimes 26-50%	Frequently 51-75%	Routinely 76-100%
Changing risky/unhealthy behaviours	1	2	3	4	5
Disease prevention/early screening advice	1	2	3	4	5
Ergonomic/postural advice	1	2	3	4	5
Nutritional /dietary recommendations	1	2	3	4	5
Physical fitness/exercise promotion	1	2	3	4	5
Relaxation/stress reduction recommendations	1	2	3	4	5
Self-care strategies	1	2	3	4	5

21. For what percentage of patients during the past year did you utilise the following health promotion and wellness procedures? (You may have utilised more than one procedure on a given patient)

ACTIVE procedures	Never 0%	Rarely 1-25%	Sometimes 26-50%	Frequently 51-75%	Routinely 76-100%
Activities of daily living	1	2	3	4	5
Back school (formal program)	1	2	3	4	5
Corrective or therapeautic exercise	1	2	3	4	5
Foot orthotics	1	2	3	4	5
Rehabilitation/Spinal or extremity joint stabilisation	1	2	3	4	5
Work hardening	1	2	3	4	5

22. For what percentage of patients, during the past year, did you utilise the following adjunctive procedures? (You may have utilised more than one procedure on a given patient)

PASSIVE procedures	Never 0%	Rarely 1-25%	Sometimes 26-50%	Frequently 51-75%	Routinely 76-100%

Acupressure or meridian therapy	1	2	3	4	5
Acupunture with needles	1	2	3	4	5
Biofeedback	1	2	3	4	5
Bed rest	1	2	3	4	5
Bracing with lumbar support, cervical collar etc.	1	2	3	4	5
Casting	1	2	3	4	5
Diathermy – shortwave or microwave	1	2	3	4	5
Direct current, electrodiagnosis or iontophoresis	1	2	3	4	5
Electrical stimulation	1	2	3	4	5
Heel lifts	1	2	3	4	5
Homoeopathic remedies	1	2	3	4	5
Hot pack/moist heat	1	2	3	4	5
Ice pack/cryotherapy	1	2	3	4	5
Infrared-baker, heat lamp or hot pad	1	2	3	4	5
Massage therapy	1	2	3	4	5
Mobilization therapy	1	2	3	4	5
Nutritional counselling, therapy or supplementation	1	2	3	4	5
Paraffin bath	1	2	3	4	5
Taping/strapping	1	2	3	4	5
Traction	1	2	3	4	5
Trigger point therapy	1	2	3	4	5
Ultrasound	1	2	3	4	5
Vibration therapy	1	2	3	4	5
Whirlpool or hydrotherapy	1	2	3	4	5
Other: Specify	1	2	3	4	5

Chief Complaint and etiology

Instruction: This section lists areas of chief complaint and possible etiologies. Please indicate the approximate percentage of patients in your practice during the past year who presented with each chief complaint and the percentage of patients represented by each primary etiology.

23. What percentage of your patients in the past year presented with the following chief complaints? (Total should be approximately 100%)

%	None	1-10	11-20	21-30	31-40	41-50	51-60	70-80	81-90

Headache or facial pain without neck pain	1	2	3	4	5	6	7	8	9
Headache with neck pain	1	2	3	4	5	6	7	8	9
Neck pain/injury without arm pain or headache	1	2	3	4	5	6	7	8	9
Neck pain/injury with arm pain	1	2	3	4	5	6	7	8	9
Midback pain/injury	1	2	3	4	5	6	7	8	9
Low back, pelvis pain/injury without leg pain	1	2	3	4	5	6	7	8	9
Low back, pelvis pain/injury with leg pain	1	2	3	4	5	6	7	8	9
Upper extremity pain/injury	1	2	3	4	5	6	7	8	9
Lower extremity pain/injury	1	2	3	4	5	6	7	8	9
Chest pain/injury	1	2	3	4	5	6	7	8	9
Abdominal pain/injury	1	2	3	4	5	6	7	8	9
Wellness/preventative care	1	2	3	4	5	6	7	8	9
Other nonmusculoskeletal condition. Specify	1	2	3	4	5	6	7	8	9

24. What percentage of your patients in the past year presented with the following primary etiologies for their chief complaints? (Total should be approximately 100%)

%	None	1-10	11-20	21-30	31-40	41-50	51-60	70-80	81-90
Activities of daily living (eg. In and around home)	1	2	3	4	5	6	7	8	9
Motor vehicle accident	1	2	3	4	5	6	7	8	9
Overuse/repetitive stress	1	2	3	4	5	6	7	8	9
Sports/exercise/recreation	1	2	3	4	5	6	7	8	9
Work (not repetitive stress)	1	2	3	4	5	6	7	8	9
Acute illness pathology (eg. Colds, ear infections)	1	2	3	4	5	6	7	8	9
Chronic illness pathology (eg. Cardiovascular, diabetes)	1	2	3	4	5	6	7	8	9
Emotional stressors	1	2	3	4	5	6	7	8	9
Environmental stressors, including dietary	1	2	3	4	5	6	7	8	9
Other. Specify:	1	2	3	4	5	6	7	8	9

Section B

Agree or disagree with the following statements:		Agree	Disagree
1	Grounded theory is a quantitative method of research design	1	2
2	Key terms are necessary in a publication	1	2
3	Randomized control trials are qualitative methods of research design	1	2
4	Case reports are considered a good source of evidence	1	2
5	Coding and themes are used in qualitative research	1	2
6	A value of p=0.34 is better than a value of p=0.87	1	2
7	Systematic reviews are seen as the highest form of credible evidence	1	2
8	Statistics are not always necessary in quantitative research	1	2
9	Intervention studies on small sample sizes (e.g. n=8)are generalizable	1	2
10	A peer reviewed research article means my colleagues in practice commented on the research article	1	2

	Answer the following questions in relation to Chiropractic research: **Please indicate your chosen answer with a tick (√)**	Strongly Agree				Strongly Disagree
1	Improves patient care	1	2	3	4	5
2	Promotes acceptance of the chiropractic profession among patients	1	2	3	4	5
3	Research is fundamental to practicing	1	2	3	4	5
4	I feel that I don't have time due to my busy schedule to keep up to date with research findings	1	2	3	4	5
5	Aids to improve the clinical knowledge of practitioners	1	2	3	4	5
6	Assists in evaluating existing treatments and their efficacy	1	2	3	4	5
7	My practice changes due to evidence found	1	2	3	4	5
8	Increases collaboration and integration of chiropractic	1	2	3	4	5
9	Influences legislation	1	2	3	4	5
10	Should be a mandatory component of clinical training in chiropractic schools	1	2	3	4	5
11	Aids to improve the clinical skills of practitioners	1	2	3	4	5
12	Promotes acceptance of chiropractic by third party payers e.g. Workers compensation	1	2	3	4	5
13	Is of benefit to chiropractic as a profession	1	2	3	4	5
14	Stimulates critical thinking	1	2	3	4	5
15	It is important to use ICD-10 coding correctly as this information directly affects reimbursement from health insurance	1	2	3	4	5
16	Informs teaching curricula					
17	Adds credibility to the chiropractic profession	1	2	3	4	5
18	Influences scope of practice	1	2	3	4	5
19	Promotes acceptance of chiropractic among other health care disciplines	1	2	3	4	5

20	EBP is a waste of time	1	2	3	4	5
21	I stick to tried and trusted methods rather than changing new methods according to the latest evidence	1	2	3	4	5
22	Helps to establish practice parameters/guidelines	1	2	3	4	5
23	Promotes acceptance of chiropractic by health insurance e.g. NHS	1	2	3	4	5
24	I feel that research is essential to the progression of the chiropractic profession	1	2	3	4	5
25	Health Management organisations use research to determine reimbursement schemes	1	2	3	4	5

Research Utilization

Please indicate your chosen answer with a tick (√)

Personal use of research		Always	Sometimes	Rarely	Never
1.1	I read research articles: to assist with patient education	1	2	3	4
1.2	:for my own knowledge	1	2	3	4
1.3	: to look up specific patient conditions	1	2	3	4
1.4	: on areas of special interest	1	2	3	4
2	I apply research findings in my practice	1	2	3	4
3	I don't like reading research articles	1	2	3	4
4	I use research findings to enhance clinical practice	1	2	3	4
5	I use research to change my approach to conditions, policies or practices in my area of chiropractic	1	2	3	4
6	I use research for self-development	1	2	3	4
7	I discuss research findings with my colleagues	1	2	3	4
How often do you use the following research resources?		At least once/wk	1-3 times per month	less than once/month	Never
1	Clinical practice guidelines	1	2	3	4
2	Cochrane Database of Reviews	1	2	3	4
3	Colleagues	1	2	3	4
4	Google	1	2	3	4
5	Peer-reviewed journals	1	2	3	4
6	PubMed / Medline / other databases	1	2	3	4
7	Textbooks / Handbooks	1	2	3	4
8	Scientific Journal Web sites	1	2	3	4
9	Other, specify:	1	2	3	4
		1	2	3	4
		1	2	3	4
		1	2	3	4

The future of Chiropractic research: In your opinion what are the important areas to focus research on for the next 5 years are: **Please indicate your chosen answer with a tick (√)**	Strongly agree	Agree	Disagree	Strongl disagre

1	Chiropractic education	1	2	3	4
2	The effectiveness of chiropractic care for various musculoskeletal conditions	1	2	3	4
3	Evaluating the validity and reliability of chiropractic techniques, procedures and equipment	1	2	3	4
4	The nature of the subluxation complex, and /or the physiological effects of adjustments.	1	2	3	4
5	Evaluating the efficacy of chiropractic care for various "visceral" conditions	1	2	3	4
6	Research on chiropractic in the health industry (e.g. cost-effectiveness)	1	2	3	4
7	Other, please specify below:	1	2	3	4
		1	2	3	4
		1	2	3	4
		1	2	3	4

In what direction would you like the Chiropractic profession to progress (you may tick (√) more than one):		√
1	Focus on the art of Chiropractic	1 or 0
2	Focus on the science of Chiropractic	1 or 0
3	Focus on the philosophy of Chiropractic	1 or 0
4	Chiropractic should integrate as an independent profession e.g. General Practitioner	1 or 0
5	Chiropractic should look for limited integration e.g. specialist	1 or 0
6	Chiropractic should remain as a Complimentary alternative profession	1 or 0
7	The scope should increase to include injectable and drugs e.g. anti-inflammatory medicine	1 or 0
8	The scope should remain as conservative management of musculoskeletal conditions	1 or 0
9	Other, please specify:	1 or 0

Thank you for your participation, time and patience in completing this questionnaire.

Appendix F: Letter of information and informed consent (LOIC)

Dear Chiropractor

Thank you for participating in this research. This research consists of two research projects (using the same questionnaire) that are being conducted for Masters in Technology, Chiropractic.

The titles are:

- *The Perception of Chiropractors Attending the World Federation of Chiropractic's 12th Biennial congress 2013 on Research and its Role in the Chiropractic Profession.*
  Principal researcher: Jason d'Hotman de Villiers, B. Tech: Chiropractic
  Supervisor: Dr L. O'Connor, M. Tech: Chiropractic
  The aim of this study is to determine the perception of Chiropractic delegates attending the World Federation of Chiropractic (WFC) congress 2013 toward research and its role in the profession, and to determine in which area future research should concentrate (Ethical clearance REC 26/13).

- *Practice Characteristics of Chiropractic Delegates attending World Federation of Chiropractic 12th Biennial congress 2013*
  Principal researcher: Lauren Bezuidenhout, B. Tech: Chiropractic
  Supervisor: Dr L. Wilson, M. Tech Chiropractic
  Co-Supervision: Dr J. Shaik, M. Tech Chiropractic, M. Med. Sci. (SM)
  This study aims to determine the practice characteristics of the Chiropractic delegates as well as their demographic profiles, and the association between the two (Ethical clearance REC 25/13).

Brief Introduction and Purpose of the Study:

Since the beginning of Chiropractic there have been many changes that have occurred in the profession and in health care. There has been a shift in medicine towards evidence based practice and chiropractic has not been exempt from this shift. Many chiropractic colleagues are incorporating evidence based practice into their curricula with many

encouraging master and doctoral qualifications. Although many professionals may agree that research is valuable, do they use it in practice? As Chiropractic has grown and spread over the globe there are different factors that have influenced the way it is practiced. Studies investigating practice characteristics of chiropractors have found some similarities and some differences. The WFC biennial congress presents an ideal opportunity to survey chiropractors from several different countries to discover how these chiropractors are practicing.

Study procedure:

The study is designed as a descriptive questionnaire study. In order to participant you will be required to read this letter of information and sign informed consent. The questionnaire should take between 15 to 20 minutes to complete, please do not make any marks on the questionnaire that would identify you. Please complete the questionnaire in its entirety and in pen. There will be two boxes available at the registration table, please place the signed consent form in the one box and the completed questionnaire in the other box. This is to ensure your responses are anonymous.

Benefits:

The information generated by this research will give an indication of how chiropractors feel about research and practice characteristics of chiropractors globally; this information can be used by associations and educational bodies to facilitate workshops or seminars if necessary on evidence based practice, using research and curriculum development.

Remuneration:

There will be no financial compensation partaking in the study.

Costs of the Study:

There are no costs to you in partaking in the study.

Confidentiality:

All information you supply is anonymous, your name will not appear in any report or publication of the research. All letters of information and consent and research questionnaires will be kept confidential and in a safe place in the Chiropractic programme for a period of 15 years thereafter they will be shredded.

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

Researcher: Jason d'Hotman de Villiers and Lauren Bezuidenhout (+27 31 3732205)

Supervisor/s: Dr Laura O'Connor (+27 31 373 2923) and Dr Junaid Shaik (+27 31 3732094)

Institutional Research Ethics administrator: Ms L. Deonarian (+27 31 373 2900). Complaints can be reported to the DVC: TIP, Prof F. Otieno (+27 31 373 2382) or dvctip@dut.ac.za.

Thank you for participating in this research.

Yours sincerely,

_____	_____
Jason d'Hotman de Villiers	Lauren Bezuidenhout
Researcher	Researcher
_____	_____
Dr L. Wilson	Dr Junaid Shaik
M.Tech: Chiropractic	M. Tech Chiropractic,
M. Med. Sci. (SM)	

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

Appendix G: Study questionnaire

Dear Chiropractor

Please read the following questions and answer accordingly. Where appropriate, please mark your chosen answer with a tick (√).

Demographic details

15. Gender:

Female	Male

16. Please state age at last birthday: _____yrs
17. Please state ethnicity (for statistical reasons):_____
18. In which region do you reside:

Tick (√)	Region
	Africa
	Asia
	Australasia
	Europe
	North America
	South America

19. Please specify the state/province/canton where you reside:

_____

20. Indicate the philosophical orientation that best describes your philosophy of chiropractic (only tick one option):

Tick (√)	Philosophical orientation:
	Evidence based: Make use of the best available scientific literature and accumulated clinical knowledge and expertise to interpret, retrieve and apply the results of scientific studies to establish a diagnosis and communicate different treatment plans to the patient. Evidence based chiropractors seek to be incorporated into main stream health care[1].
	Mixer: Believe subluxation is one of the many causes of disease and they incorporate many different treatments including soft tissue therapy, electromodalities, dry needling etc. Mixers generally want to be integrated into mainstream medicine[1].
	Straight: Believe that vertebral subluxation leads to interference with the innate intelligence within the nervous system and is a primary underlying risk factor for almost any disease. Their treatment follows the traditional chiropractic lexicon: spinal analysis, detect subluxation, correct with adjustment. Straight chiropractors prefer to remain separate and distinct from mainstream health care[1].

21. Indicate how you see the role of a chiropractor in health care (only tick one option):

Tick (√)	Role of a chiropractor in health care:
	Primary Health Care Broad Scope: Direct access; broad scope of practice; overall responsibility for patient and coordination of care. Example: Family MD/GP
	Primary Health Care Focused Scope: Direct access; focused scope of practice; may have overall responsibility for patient and coordination of care within scope of practice. Example: dentist, optometrist.
	Specialist Care: Primary care and specialist training; focused scope of practice; practice on referral. Example: orthopaedic surgeon, radiologist.

[1]Wold Federation of Chiropractic Identity Consult (2005)

22. Please state the institution/alma Mata that conferred your Chiropractic degree for registration as a Chiropractor:_____
23. Please specify the qualification you hold in Chiropractic for licensure? E.g. DC/MChiro

    _____
24. What year were you awarded the Chiropractic degree? _____
25. Highest level of non-chiropractic education:

Tick (√)	Non-chiropractic education
	High School
	Bachelors' degree
	Masters' degree
	PhD or equivalent
	Other, Specify:

26. Please specify any post graduate qualification such as through a national qualification board:

    _____
    _____
27. In which of the following continuing education opportunities do you participate? (may answer more than one):

Tick (√)	Continuing education opportunities
	Read journals
	Practice based research
	Attend conferences or seminars
	Attend hospital staff CE/CPD meetings
	Online credit courses
	Quality circles
	Other, please specify:

28. How many hours of continuing education credits have you earned during the past year?

Tick (√)	Continuing education credits have you earned during the past year
	None
	Less than required
	Have met the requirements
	Exceed the requirements

29. Which of the following best describes you role in chiropractic? (Tick appropriate box/s)

Tick	My role is best described as:
	Academic
	Full time clinical practice
	Part time clinical practice
	Research
	Other, please specify:

IF YOU ARE NOT CURRENTLY PRACTICING PLEASE PROCEED TO SECTION B

Section A
Practice details

1. Years in practice:

	Less than 2 years	2-4 years	5-15 years	16-25 years	26 years or more

Tick (√)					

2. Hours per week do you practice chiropractic:

	29 or less	30-39	40-49	50-59	60 or more
Tick (√)					

3. Number of patients you personally treat per week:

	≤50	50-99	100-149	150-199	200-249	250-300	≥300
Tick (√)							

4. Number of new patients you personally see per week:

No.	0	1-3	4-6	7-9	10-12	13-15	16-20	>20
Tick (√)								

5. How much time on average do you spend with a NEW patient on the first visit?

Minutes	0-5	6-10	11-15	16-30	31-45	46-60	61-75	1hour 16 min to 1 hour 30 min	More than 1½ hours
Tick (√)									

6. How much time on average do you spend with a patient on SUBSEQUENT visits?

Minutes	0-5	6-10	11-15	16-30	31-45	46-60	61-75	1hour 16 min to 1 hour 30 min	More than 1½ hours
Tick (√)									

7. What percentage of your patients that you saw IN THE PAST MONTH presented with the following symptom duration:

	None	1-25%	26-50%	51-75%	76-100%
Symptom free					
0-4 weeks					
4-8 weeks					
8-12 weeks					
More than 12 weeks					

8. At what visit interval do you reassess your patients for whom you are providing ongoing care?

Visit	1	2-3	4-5	6-7	8-9	After 10 visits or more	I do not reassess
Tick (√)							

9. Please identify the source of your new patients and the approximate percentage received from each source.

	Approximate %
Association website	
Your own personal website	
Sign/location of your practice	
Advertising in local paper	
Word of mouth/patient referrals	
Chiropractic patients association	
Referral from medical practitioner	
Referral from other chiropractor	

Referral from other health care practitioner	
Other	
Don't know	

10. Approximately what percentage of your time is spent on each of the following functions during a typical week? (Total should be approximately 100%)

	None	1-25%	26-50%	51-75%	76%-100%
Direct patient care					
Documentation of care					
Business management (personnel, marketing etc.)					
Patient education					

11. Of the patients that you saw in your practice during this past year, how many are from each of the following gender, age and ethnic categories?

		% seen in last year
Gender:	Female	
	Male	
Age:	5 or younger	
	6-17	
	18-30	
	31-50	
	51-64	
	65 or older	
Ethnicity:	Asian	
	Pacific Islander	
	Black/ African American	
	Caucasian/White	
	Hispanic	
	Native American	
	Indian	
	Other e.g. Marui, Aboriginals Please specify:	

Work environment

12. Which description best characterises your role in the office where you work (Tick (√) appropriate box)?

	Individual practitioner/only one chiropractor in office
	One of two chiropractors in office
	Junior associate or examining doctor
	Practitioner in a multi-disciplinary office

13. Please place a tick (√) in the appropriate box:

Do you practice in more than one office location?	YES	NO
Do you primarily delegate administration of adjunctive therapies to a non-chiropractic member of your office staff?		
Do you ever deliver chiropractic care outside an office setting, such as a patient's home?		
Do you have staff privileges at a hospital?		

14. When radiographs are indicated for your patients, where are they done? (Tick (√) appropriate box)

	Nearly all are taken at my practice

	At an imaging centre or hospital
	Some are taken at my practice and others are referred to another facility

15. Who interprets the diagnostic images of your patients? (Tick (√) appropriate box)

	I generally interpret all of the images on my patients, even if I have a radiologist's report
	I only interpret the images that I take in my practice and rely on the report for images taken elsewhere
	I do not interpret any of the images on my patients, relying solely on a radiologists' report
	The interpretation is generally done by a radiologist, but I always draw my own conclusions in addition to the radiologist's report

16. Please answer the following question by placing a tick (√) in the appropriate box:

	YES	NO
Do you primarily delegate taking x-rays to a chiropractic assistant?		
Do you primarily delegate developing x-rays to a chiropractic assistant?		

17. How frequently have the following health professionals made referrals to you during the past year?

	Never	Rarely (<1/mo)	Sometimes (1-3/mo)	Often (1-2)/wk	Routinely (>2/wk)
Acupuncturist					
Dentist					
Family practitioner					
Internist					
Massage therapist					
Nutritionist					
OB/GYN					
Orthopedic surgeon					
Neurologist					
Neurosurgeon					
Other Chiropractor					
Paediatrician					
Physical therapist					
Physiatrist					
Orthopedic technician					
Podiatrist					
Psychologist/Psychiatrist					
Surgeon					
Other: Specify					

18. How frequently have you made referrals to the following health professionals during the past year?

	Never	Rarely (<1/mo)	Sometimes (1-3/mo)	Often (1-	Routinely (>2/wk)

				2)/wk	
Acupuncturist					
Dentist					
Family practitioner					
Internist					
Massage therapist					
Nutritionist					
OB/GYN					
Orthopedic surgeon					
Neurologist					
Neurosurgeon					
Other Chiropractor					
Paediatrician					
Physical therapist					
Physiatrist					
Orthopedic technician					
Podiatrist					
Psychologist/Psychiatrist					
Surgeon					
Other: Specify					

Treatment procedures

19. Please indicate the primary technique approach that you use in your practice: (mark only one)

	Never 0%	Rarely 1-25%	Sometimes 26-50%	Frequently 51-75%	Routinely 76-100%
Activator methods					
Adjustive instrument					
Applied Kinesiology					
Cox/flexion distraction					
Cranial					
Diversified					
Extremity adjusting					
Gonstead					
Logan Basic					
Meric					
NIMMO/receptor tonus					
Plamer upper cervical/HIO					
Pierce-Stilwagon					
SOT					
Thompson					
Other: Specify					

20. For what percentage of patients during the last year did you utilise the following adjunctive procedures? (You may have utilised more than one procedure on a given patient)

	Never 0%	Rarely 1-25%	Sometimes 26-50%	Frequently 51-75%	Routinely 76-100%
Changing risky/unhealthy behaviours					
Disease prevention/early screening advice					
Ergonomic/postural advice					
Nutritional /dietary recommendations					
Physical fitness/exercise promotion					
Relaxation/stress reduction recommendations					
Self-care strategies					

21. For what percentage of patients during the past year did you utilise the following health promotion and wellness procedures? (You may have utilised more than one procedure on a given patient)

ACTIVE procedures	Never 0%	Rarely 1-25%	Sometimes 26-50%	Frequently 51-75%	Routinely 76-100%
Activities of daily living					
Back school (formal program)					
Corrective or therapeautic exercise					
Foot orthotics					
Rehabilitation/Spinal or extremity joint stabilisation					
Work hardening					

22. For what percentage of patients, during the past year, did you utilise the following adjunctive procedures? (You may have utilised more than one procedure on a given patient)

PASSIVE procedures	Never 0%	Rarely 1-25%	Sometimes 26-50%	Frequently 51-75%	Routinely 76-100%
Acupressure or meridian therapy					
Acupunture with needles					
Biofeedback					
Bed rest					
Bracing with lumbar support, cervical collar etc.					
Casting					
Diathermy – shortwave or microwave					
Direct current, electrodiagnosis or iontophoresis					
Electrical stimulation					
Heel lifts					
Homoeopathic remedies					
Hot pack/moist heat					

Ice pack/cryotherapy					
Infrared-baker, heat lamp or hot pad					
Massage therapy					
Mobilization therapy					
Nutritional counselling, therapy or supplementation					
Paraffin bath					
Taping/strapping					
Traction					
Trigger point therapy					
Ultrasound					
Vibration therapy					
Whirlpool or hydrotherapy					
Other: Specify					

Chief Complaint and etiology

Instruction: This section lists areas of chief complaint and possible etiologies. Please indicate the approximate percentage of patients in your practice during the past year who presented with each chief complaint and the percentage of patients represented by each primary etiology.

23. What percentage of your patients in the past year presented with the following chief complaints? (Total should be approximately 100%)

%	None	1-10	11-20	21-30	31-40	41-50	51-60	70-80	81-90
Headache or facial pain without neck pain									
Headache with neck pain									
Neck pain/injury without arm pain or headache									
Neck pain/injury with arm pain									
Midback pain/injury									
Low back, pelvis pain/injury without leg pain									
Low back, pelvis pain/injury with leg pain									
Upper extremity pain/injury									
Lower extremity pain/injury									
Chest pain/injury									
Abdominal pain/injury									
Wellness/preventative care									
Other nonmusculoskeletal condition. Specify									

24. What percentage of your patients in the past year presented with the following primary etiologies for their chief complaints? (Total should be approximately 100%)

%	None	1-10	11-20	21-30	31-40	41-50	51-60	70-80	81-90
Activities of daily living (eg. In and around home)									
Motor vehicle accident									
Overuse/repetitive stress									
Sports/exercise/recreation									
Work (not repetitive stress)									
Acute illness pathology (eg. Colds, ear infections)									
Chronic illness pathology (eg. Cardiovascular, diabetes)									
Emotional stressors									
Environmental stressors, including dietary									
Other. Specify:									

Section B

Agree or disagree with the following statements:		Agree	Disagree
1	Grounded theory is a quantitative method of research design	1	2
2	Key terms are necessary in a publication	1	2
3	Randomized control trials are qualitative methods of research design	1	2
4	Case reports are considered a good source of evidence	1	2
5	Coding and themes are used in qualitative research	1	2
6	A value of p=0.34 is better than a value of p=0.87	1	2
7	Systematic reviews are seen as the highest form of credible evidence	1	2
8	Statistics arenot always necessary in quantitative research	1	2
9	Intervention studies on small sample sizes (e.g. n=8)are generalizable	1	2
10	A peer reviewed research article means my colleagues in practice commented on the research article	1	2

	Answer the following questions in relation to Chiropractic research: **Please indicate your chosen answer with a tick (√)**	Strongly Agree				Strongly Disagree
1	Improves patient care	1	2	3	4	5
2	Promotes acceptance of the chiropractic profession among patients	1	2	3	4	5
3	Research is fundamental to practicing	1	2	3	4	5
4	I feel that I don't have time due to my busy schedule to keep up to date with research findings	1	2	3	4	5
5	Aids to improve the clinical knowledge of practitioners	1	2	3	4	5
6	Assists in evaluating existing treatments and their efficacy	1	2	3	4	5
7	My practice changes due to evidence found	1	2	3	4	5
8	Increases collaboration and integration of chiropractic	1	2	3	4	5
9	Influences legislation	1	2	3	4	5
10	Should be a mandatory component of clinical training in					

	chiropractic schools	1	2	3	4	5
11	Aids to improve the clinical skills of practitioners	1	2	3	4	5
12	Promotes acceptance of chiropractic by third party payers e.g. Workers compensation	1	2	3	4	5
13	Is of benefit to chiropractic as a profession	1	2	3	4	5
14	Stimulates critical thinking	1	2	3	4	5
15	It is important to use ICD-10 coding correctly as this information directly affects reimbursement from health insurance	1	2	3	4	5
16	Informs teaching curricula					
17	Adds credibility to the chiropractic profession	1	2	3	4	5
18	Influences scope of practice	1	2	3	4	5
19	Promotes acceptance of chiropractic among other health care disciplines	1	2	3	4	5
20	EBP is a waste of time	1	2	3	4	5
21	I stick to tried and trusted methods rather than changing new methods according to the latest evidence	1	2	3	4	5
22	Helps to establish practice parameters/guidelines	1	2	3	4	5
23	Promotes acceptance of chiropractic by health insurance e.g. NHS	1	2	3	4	5
24	I feel that research is essential to the progression of the chiropractic profession	1	2	3	4	5
25	Health Management organisations use research to determine reimbursement schemes	1	2	3	4	5

Research Utilization
Please indicate your chosen answer with a tick (√)

Personal use of research		Always	Sometimes	Rarely	Never
1.1	I read research articles: to assist with patient education	1	2	3	4
1.2	:for my own knowledge	1	2	3	4
1.3	: to look up specific patient conditions	1	2	3	4
1.4	: on areas of special interest	1	2	3	4
2	I apply research findings in my practice	1	2	3	4
3	I don't like reading research articles	1	2	3	4
4	I use research findings to enhance clinical practice	1	2	3	4
5	I use research to change my approach to conditions, policies or practices in my area of chiropractic	1	2	3	4
6	I use research for self-development	1	2	3	4
7	I discuss research findings with my colleagues	1	2	3	4
How often do you use the following research resources?		At least once/wk	1-3 times per month	less than once/month	Never
1	Clinical practice guidelines	1	2	3	4
2	Cochrane Database of Reviews	1	2	3	4
3	Colleagues	1	2	3	4
4	Google	1	2	3	4
5	Peer-reviewed journals	1	2	3	4
6	PubMed / Medline / other databases	1	2	3	4
7	Textbooks / Handbooks	1	2	3	4
8	Scientific Journal Web sites	1	2	3	4
9	Other, specify:	1	2	3	4

		1	2	3	4
		1	2	3	4
		1	2	3	4

The future of Chiropractic research: In your opinion what are the important areas to focus research on for the next 5 years are: **Please indicate your chosen answer with a tick (√)**		Strongly agree	agree	disagree	Strongly disagree
1	Chiropractic education	1	2	3	4
2	The effectiveness of chiropractic care for various musculoskeletal conditions	1	2	3	4
3	Evaluating the validity and reliability of chiropractic techniques, procedures and equipment	1	2	3	4
4	The nature of the subluxation complex, and /or the physiological effects of adjustments.	1	2	3	4
5	Evaluating the efficacy of chiropractic care for various "visceral" conditions	1	2	3	4
6	Research on chiropractic in the health industry (e.g. cost-effectiveness)	1	2	3	4
7	Other, please specify below:	1	2	3	4
		1	2	3	4
		1	2	3	4
		1	2	3	4

In what direction would you like the Chiropractic profession to progress (you may tick (√) more than one):		√
1	Focus on the art of Chiropractic	
2	Focus on the science of Chiropractic	
3	Focus on the philosophy of Chiropractic	
4	Chiropractic should integrate as an independent profession e.g. General Practitioner	
5	Chiropractic should look for limited integration e.g. specialist	
6	Chiropractic should remain as a Complimentary alternative profession	
7	The scope should increase to include injectable and drugs e.g. anti-inflammatory medicine	
8	The scope should remain as conservative management of musculoskeletal conditions	
9	Other, please specify:	

Thank you for your participation, time and patience in completing this questionnaire.

Appendix H: IREC approval for amendment of study

APPLICATION FOR APPROVAL OF AMENDMENT

To be completed by the principles investigator/researcher in accordance with the Standard Operating Procedure for the IREC.

Title of the study:	
Institution: DUT	Date: 25 April 2013
Name and qualification of principal investigator/researcher: Mr Jason d'Hotman De Villiers Miss L. Bezuidenhout	Name and qualification of supervisor(s): Dr L. O'Connor M.Tech. Chiropractic
Name of qualification: M.Tech. Chiropractic	Student Number: Mr Jason d'Hotman De Villiers – student no. 20707518 Miss L. Bezuidenhout - student no. 20809738
Ethical approval number: Mr Jason d'Hotman De Villiers – REC 26/13 Miss L. Bezuidenhout – REC 25/13	Research site: The ICC during the World Federation of Chiropractic congress

Nature of amendment:
The above two studies were conducted at the World Federation of Chiropractic (WFC) Congress in April 2013; there was a response rate of approximately 20%. We would like try and improve the response rate by changing the methodology of data collection to include an email to all delegates requesting their participation in the research. The questionnaire would be available online through SurveyMonkey.com. From the email they will be able to access the link to take them to the questionnaire. The email will contain the letter of information and consent (Appendix F). Once the participant clicks on the link to the questionnaire they will be taken to a screen where they will be asked to check a box to accept the terms and conditions and give consent to proceed with answering the questionnaire (Appendix G). The researchers will be able to monitor the response by viewing their account with SurveyMonkey.com; the respondents will be anonyms as there is no way to link the completed questionnaire with the respondent. The secretary of the WFC has agreed to assist in distributing the emails to the WFC delegates (Appendix A) as she has all the email addresses of the delegates.

Please see attached:

1. Approved proposals – Lauren (Appendix B) and Jason (Appendix C)
2. New proposals – Lauren (Appendix D) and Jason (Appendix E): the changes will be underlined.

Effect on risk benefit profile of participants: No risk to participants

Please submit the following documentation:

1. Approved proposal
2. Changes to letter of information and consent
3. Any other relevant documentation

Signature:	**Date:**
Researcher:	
Supervisor:	
Head of Department:	

TO BE COMPLETED BY THE CHAIR OF THE IREC.

Date received:	Review required:	
	Expedited	Full committee

To be completed by the chairperson of the IREC

The amendment is:	Yes	No	N/A
Approved – there are no evident grounds for concern or further investigation.			
Approved subject to minor changes			
Needs to be re-submitted after recommendations are met			
Approved however a site inspection is recommended.			

Denied (please see attached)			
Signature:	**Date:**		
Chairperson of IREC			

DURBAN UNIVERSITY of TECHNOLOGY

INSTITUTIONAL RESEARCH ETHICS COMMITTEE (IREC)

29 May 2013

IREC Reference Number: REC 25/13

Ms L L Bezuidenhout
P O Box 39437
Queensburgh
4070

Dear Ms Bezuidenhout

Practice characteristics of Chiropractic delegates attending the World Federation of Chiropractic's 12th Biennial Congress 2013

I am pleased to inform you that your application for amendment to your research proposal has been approved.

Yours Sincerely

[redacted]

Dr D. F. Naude
Chairperson: IREC

Appendix I: Consent from the secretary of the WFC to assist in emailing the questionnaire.

Thank you Dr Wilson, I would be glad to help. Please forward the survey in pdf document and covering letter or email with instructions to delegates and I will forward to due course.
Kind Regards,

Christina Davis
Executive Secretary, World Federation of Chiropractic
1246 Yonge Street, Suite 203
Toronto ON M4T 1W5 Canada
Tel: 416-484-9978
Fax: 416-484-9665
E: cdavis@wfc.org
Web: www.wfc.org

From: Laura Wilson [mailto:lauraw@dut.ac.za]
Sent: Thursday, April 18, 2013 8:40 AM
To: Christina Davis
Cc: Lollen; Jason d' Hotman de Villiers (jdhotman@gmail.com)
Subject: WFC questionnaire

Dear Christina
Thank you for a wonderful congress I meant to introduce myself to you however each time I saw you, you were busy, so I do apologise. With regards to the questionnaire that was handed out at the congress there was quite a poor response rate about 20%. I was wondering if it would be possible for the questionnaire to be emailed to the delegates excluding those who responded to try and improve the response rate.
If the WFC is in agreement it would mean that we would need access to the delegates email addresses or alternatively it could be emailed from your data base if possible?
Your assistance would be greatly appreciated.
Regards
Laura

Appendix J: Survey Monkey®: Letter of information and consent: Questionnaire

Dear Chiropractor

Your assistance in completing this questionnaire would be appreciated. The questionnaire is being used to generate data for two research projects that are being conducted by students registered for their Masters in Technology: Chiropractic at the Durban University of Technology, South Africa.

The titles are:

- *The perception of Chiropractors attending the World Federation of Chiropractic 12th Biennial congress 2013 on research and its role in the Chiropractic profession*.
  Principal researcher: Jason d'Hotman de Villiers, B. Tech: Chiropractic
  Supervisor: Dr L. Wilson, M. Tech: Chiropractic
  The aim of this study is to determine the perceptions of Chiropractic delegates attending the World Federation of Chiropractic (WFC) congress 2013 towards research and its role in the profession, and to determine in which area future research should concentrate (Ethical clearance REC 26/13).

- *Practice Characteristics of Chiropractic Delegates attending the World Federation of Chiropractic 12th Biennial congress 2013*
  Principal researcher: Lauren Bezuidenhout, B. Tech: Chiropractic
  Supervisor: Dr L. Wilson, M. Tech Chiropractic
  Co-Supervision: Dr J. Shaik, M. Tech Chiropractic, M. Med. Sci. (SM)
  This study aims to determine the practice characteristics of the Chiropractic delegates as well as their demographic profiles, and the association between the two (Ethical clearance REC 25/13).

Brief Introduction and Purpose of the Study: Since the beginning of Chiropractic there have been many changes that have occurred in the profession and in health care. There has been a shift in medicine towards evidence based practice and chiropractic has not been

exempt from this shift. Many chiropractic colleagues are incorporating evidence based practice into their curricula with many encouraging master and doctoral qualifications. Although many professionals may agree that research is valuable, do they use it in practice?
As Chiropractic has grown and spread over the globe there are different factors that have influenced the way it is practiced. Studies investigating practice characteristics of chiropractors have found some similarities and some differences. The WFC biennial congress presents an ideal opportunity to survey chiropractors from several different countries to discover how these chiropractors are practicing.

Study procedure: The study is designed as a descriptive questionnaire study. Should you wish to participate, please click on the link below. The questionnaire should take between 15 to 20 minutes to complete.

LINK

Benefits: The information generated by this research will give an indication of how chiropractors feel about research and the practice characteristics of chiropractors globally; this information can be used by associations and educational bodies to facilitate workshops or seminars if necessary on evidence based practice, using research and curriculum development.

Remuneration: There will be no financial compensation partaking in the study.

Costs of the Study: There are no costs to you in partaking in the study.

Confidentiality: All information you supply is anonymous, your name will not appear in any report or publication of the research. All research data will be kept confidential and in a safe place in the Chiropractic program for a period of 15 years thereafter they will be shredded.

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

Researcher: Jason d'Hotman de Villiers and Lauren Bezuidenhout (+27 31 3732205)

Supervisor/s: Dr Laura Wilson (+27 31 373 2923/lauraw@dut.ac.za) and Dr Junaid Shaik (+27 31 373 2094)

Institutional Research Ethics administrator: Ms L. Deonarian (+27 31 373 2900). Complaints can be reported to the DVC: TIP, Prof F. Otieno (+27 31 373 2382) or dvctip@dut.ac.za.

Thank you for participating in this research.

Yours sincerely,

Jason d'Hotman de Villiers Researcher	Lauren Bezuidenhout Researcher
Dr L. Wilson M.Tech: Chiropractic	Dr Junaid Shaik M. Tech Chiropractic, M. Med. Sci. (SM)

Appendix K: Survey Monkey® Private Policy

Privacy Policy

Last updated: February 5, 2013

This privacy policy explains how SurveyMonkey handles your personal information and data. We value your trust, so we've strived to present this policy in clear, plain language instead of legalese. The policy is structured so you can quickly find answers to the questions which interest you the most.

This privacy policy applies to all the products, services and websites offered by SurveyMonkey.com, LLC, SurveyMonkey Europe Sarl, and their affiliates, except where otherwise noted. We refer to those products, services and websites collectively as the "services" in this policy. Some services have supplementary privacy statements that explain in more detail our specific privacy practices in relation to them. Unless otherwise noted, our services are provided by SurveyMonkey.com, LLC inside of the United States and by SurveyMonkey Europe Sarl outside of the United States.

TRUSTe. SurveyMonkey.com, LLC has been awarded TRUSTe's Privacy Seal signifying that this privacy policy and our privacy practices have been reviewed TRUSTe, an independent third party, for compliance with TRUSTe's program requirements, which include transparency, accountability and choice regarding the collection and use of your personal information.

European Safe Harbors. SurveyMonkey.com, LLC complies with the US-EU and US-Swiss Safe Harbor Frameworks developed by the U.S. Department of Commerce regarding the collection, use and retention of personal information from EU member countries and Switzerland. We have certified, and TRUSTe has verified, that we adhere to the Safe Harbor Privacy Principles of notice, choice, onward transfer, security, data integrity, access and enforcement. View our certification on the U.S. Department of Commerce's Safe Harbor website.

Questions? For questions regarding our privacy policy or practices, contact SurveyMonkey by mail at 285 Hamilton Avenue, Suite 500, Palo Alto, CA 94301, USA, or electronically

through this form. You may contact TRUSTe if feel your question has not been satisfactorily addressed.

1. Key Privacy Points: The Stuff You Really Care About

IF YOU CREATE SURVEYS:

2. **Your survey data is owned by you.** Not only that, but SurveyMonkey treats your surveys as if they were private. We don't sell them to anyone and we don't use the survey responses you collect for our own purposes, except in a limited set of circumstances (e.g. if we are compelled by a subpoena, or if you've made your survey responses public).

3. **We safeguard respondents' email addresses.** To make it easier for you to invite people to take your surveys via email, you mayupload lists of email addresses, in which case SurveyMonkey acts as a mere custodian of that data. We don't sell these email addresses and we use them only as directed by you and in accordance with this policy. The same goes for any email addresses collected by your surveys.

4. **We keep your data securely.** Read our Security Statement for more information.

5. **Survey data is stored on servers located in the United States.** More information about this is available if you are located in Canada orEurope. SurveyMonkey will process your survey data on your behalf and under your instructions (including the ones agreed to in this privacy policy).

IF YOU ANSWER SURVEYS:

6. **Surveys are administered by survey creators.** Survey creators conduct thousands of surveys each day using our services. We host the surveys on our websites and collect the responses that you submit to the survey creator. If you have any questions about a survey you are taking, please contact the survey creator directly as SurveyMonkey is not responsible for the content of that survey or your responses to it. The survey creator is usually the same person that invited you to take the survey and sometimes they have their own privacy policy.

7. **Are your responses anonymous?** This depends on how the survey creator has configured the survey. Contact them to find out, or click here to read more about respondent anonymity.

8. **We don't sell your responses to third parties.** SurveyMonkey doesn't sell or share your survey responses with third party advertisers or marketers (although the survey creator might, so check with them). SurveyMonkey merely acts as a custodian on behalf of the survey creator who controls your data.

9. If you think a survey violates our Terms of Use or may be engaging in illegal activity, click here to report it.

10. Survey Creators & Survey Respondents

SurveyMonkey is used by **survey creators** (people who create and conduct surveys online) and **survey respondents** (people who answer those surveys). The information we receive from survey creators and survey respondents and how we handle it differs, so we have split this privacy policy into two parts. Click on the one that applies to you:

Privacy for Survey Creators
Privacy for Survey Respondents

PRIVACY FOR SURVEY CREATORS

11. What information does SurveyMonkey collect?

When you use SurveyMonkey, we collect information relating to you and your use of our services from a variety of sources. These are listed below. The sections afterward describe what we do with this information.

Information we collect directly from you

1. **Registration information.** You need a SurveyMonkey account before you can create surveys on SurveyMonkey. When you register for an account, we collect your username, password and email address. If you choose to register by using a third party account (such as your Google or Facebook account), please see "Information from third parties" below.

2. **Billing information.** If you make a payment to SurveyMonkey, we require you to provide your billing details, such as a name, address, email address and financial information corresponding to your selected method of payment (e.g. a credit card number and expiration date or a bank account number). If you provide a billing address, we will regard that as the location of the account holder.

3. **Account settings.** You can set various preferences and personal details on pages like your account settings page. For example, your default language, timezone and communication preferences (e.g. opting in or out of receiving marketing emails from SurveyMonkey).

4. **Address book information.** We allow you to import email addresses into an Address Book and associate email addresses withemail invitation collectors so you can easily

invite people to take your surveys via email. We don't use these email addresses for our own purposes or email them except at your direction.

5. **Survey data.** We store your survey data (questions and responses) for you.

6. **Other data you intentionally share.** We may collect your personal information or data if you submit it to us in other contexts. For example, if you provide us with a testimonial, or participate in a SurveyMonkey contest.

We safeguard your respondents' email addresses. Rest assured, SurveyMonkey will not email your survey respondents or people in your Address Book except at your direction. We definitely don't sell those email addresses to any third parties.

Information we collect about you from other sources

7. **Usage data.** We collect usage data about you whenever you interact with our services. This may include which webpages you visit, what you click on, when you performed those actions, and so on. Additionally, like most websites today, our web servers keep log files that record data each time a device accesses those servers. The log files contain data about the nature of each access, including originating IP addresses.

8. **Device data.** We collect data from the device and application you use to access our services, such as your IP address and browser type. We may also infer your geographic location based on your IP address.

9. **Referral data.** If you arrive at a SurveyMonkey website from an external source (such as a link on another website or in an email), we record information about the source that referred you to us.

10. **Information from third parties.** We may collect your personal information or data from third parties if you give permission to those third parties to share your information with us. For example, you have the option of registering and signing into SurveyMonkey with your Facebook account details. If you do this, the authentication of your logon details is handled by Facebook and we only collect information about your Facebook account that you expressly agree to share with us at the time you give permission for your SurveyMonkey account to be linked to your Facebook account.

11. **Information from page tags.** We use third party tracking services that employ cookies and page tags (also known as web beacons) to collect aggregated and anonymized data about visitors to our websites. This data includes usage and user statistics.

12. How does SurveyMonkey use the information we collect?

We treat your survey questions and responses as information that is private to you. We know that, in many cases, you want to keep your survey questions and responses (which we collectively refer to as "survey data") private. Unless you decide toshare your survey questions and/or responses with the public, we do not use your survey data for our own purposes, except in the limited circumstances described in this privacy policy or unless we have your express consent. We do not sell your survey data to third parties.

Generally, we use the information we collect from you in connection with providing our services to you and, on your behalf, to your survey respondents. For example, specific ways we use this information are listed below. (See the next section of this privacy policy to see who we share your information with.)

1. **To provide you with our services.**

    1. This includes providing you with customer support, which requires us to access your information to assist you (such as with survey design and creation or technical troubleshooting).

    2. Certain features of our services use the content of your survey questions and responses and your account information in additional ways. Feature descriptions will clearly identify where this is the case. You can avoid the use of your survey data in this way by simply choosing not to use such features. For example, by using our Question Bank feature, to add questions to your surveys, you also permit us to aggregate the responses you receive to those questions with responses received by other Question Bank users who have used the same questions. We may then report statistics about the aggregated (and anonymized) data sent to you and other survey creators.

    3. If you choose to link your SurveyMonkey account to a third party account (such as your Google or Facebook account), we may use the information you allow us to collect from those third parties to provide you with additional features, services, and personalized content.

2. **To manage our services.** We internally use your information, including certain survey data, for the following limited purposes:

    1. **To monitor and improve our services and features.** We internally perform statistical and other analysis on information we collect (including usage

data, device data, referral data, and information from page tags) to analyze and measure user behavior and trends, to understand how people use our services, and to monitor, troubleshoot and improve our services. However, we do not use the non-public content of surveys (i.e. the content of questions and responses that you have not publicly shared) for these purposes.

2. **To assist the enforcement of our Terms of Use.**

3. **To prevent potentially illegal activities.**

4. **To screen for undesirable or abusive activity.** For example, we have automated systems that screen content for phishing activities, spam, and fraud.

3. **To create new services, features or content (public data and metadata only).** We may use public survey data and anonymized survey metadata (that is, data about the characteristics of a survey but not its non-public content), to create and provide new services, features or content. For example, we may look at statistics like response rates, question and answer word counts, and the average number of questions in a survey and publish interesting observations about these for informational or marketing purposes. When we do this, neither individual survey creators nor survey respondents will be identified or identifiable unless we have obtained their permission.

4. **To facilitate account creation and the logon process.** If you choose to link your SurveyMonkey account to a third party account (such as your Google or Facebook account), we use the information you allowed us to collect from those third parties to facilitate the account creation and login process. For more information, click here.

5. **To contact you about your service or account.** We occasionally send you communications of a transactional nature (e.g. service-related announcements, billing-related matters, changes to our services or policies, a welcome email when you first register). You can't opt out of these communications since they are required to provide our services to you.

6. **To contact you for marketing purposes (if you opt in).** We will only do this if you have given us your express permission to contact you for this purpose. For example, during the account registration process we will ask for your permission to use your information to contact you for promotional purposes. You may opt out of these communications at any time by clicking on the "unsubscribe" link in them, or changing the relevant setting on your My Account page.

7. **To respond to legal requests and prevent harm.** If we receive a subpoena or other legal request, we may need to inspect the data we hold to determine how to respond.

13. With whom do we share or disclose your information?

We don't sell your survey data!

When might we disclose your survey data to third parties? Only for a limited number of reasons. Mostly commonly, we share your information with our service providers who help us to provide our services to you. We contractually bind these service providers to keep your information confidential and to use it only for the purpose of providing their services to us. For example, we use payment processors who help us to process credit card transactions. By using our services, you authorize SurveyMonkey to sub-contract in this manner on your behalf.

Rare circumstances include when we need to share information if required by law, or in a corporate restructuring or acquisition context (see below for more details).

Sharing your surveys with the public. By default, your surveys are private. You are able to control who can take your survey bychanging your collector settings. For example, surveys can be made completely public (and indexable by search engines),password protected, or distributed to a restricted list of people. You can also choose to share your survey responses instantlyor at a public location.

We recognize that you have entrusted us with safeguarding the privacy of your information. Because that trust is very important to us, the only time we will disclose or share your personal information or survey data with a third party is when we have done one of three things, in accordance with applicable law: (a) given you notice, such as in this privacy policy; (b) obtained your express consent, such as through an opt-in checkbox; or (c) anonymized the information so that individuals cannot be identified by it. Where required by law, we will obtain your express consent prior to disclosing or sharing any personal information.

We may disclose:

1. **Your information to our service providers.** We use service providers who help us to provide you with our services. We give relevant persons working for some of these providers access to your information, but only to the extent necessary for them to perform their services for us. We also implement reasonable contractual and technical protections to ensure the confidentiality of your personal information and data is maintained, used only for the provision of their services to us, and handled in

accordance with this privacy policy. Examples of service providers include payment processors, email service providers, and web traffic analytics tools.

2. **Your account details to your billing contact.** If your details (as the account holder) are different to the billing contact listed for your account, we may disclose your identity and account details to the billing contact upon their request (we also will usually attempt to notify you of such requests). By using our services and agreeing to this privacy policy, you consent to this disclosure.

3. **Aggregated information to third parties to improve or promote our services.** No individuals can be identified or linked to any part of the information we share with third parties to improve or promote our services.

4. **The presence of a cookie to advertise our services.** We may ask advertisers to display ads promoting our services on other websites. We may ask them to deliver those ads based on the presence of a cookie but in doing so will not share any other information with the advertiser. Our advertising network partners may use cookies and page tags or web beacons to collect certain non-personal information about your activities on this and other websites to provide you with targeted advertising based upon your interests. If you do not wish to have this information used for the purpose of serving you such targeted ads, you may opt-out athttp://preferences-mgr.truste.com/. You will continue to receive generic ads.

5. **Your information if required or permitted by law.** We may disclose your information as required or permitted by law, or when we believe that disclosure is necessary to protect our rights, and/or to comply with a judicial proceeding, court order, subpoena, or other legal process served on us.

6. **Your information if there's a change in business ownership or structure.** If ownership of all or substantially all of our business changes, or we undertake a corporate reorganization (including a merger or consolidation) or any other action or transfer between SurveyMonkey entities, you expressly consent to SurveyMonkey transferring your information to the new owner or successor entity so that we can continue providing our services. If required, SurveyMonkey will notify the applicable data protection agency in each jurisdiction of such a transfer in accordance with the notification procedures under applicable data protection laws.

7. **Information you expressly consent to be shared.** For example, we may expressly request your permission to provide your contact details to third parties for various purposes, including to allow those third parties to contact you for marketing purposes. (You may later revoke your permission, but if you wish to stop receiving

communications from a third party to which we provided your information with your permission, you will need to contact that third party directly.)

14. What are your rights to your information?

You can:

1. **Update your account details.** You can update your registration and other account information on your My Account page. Information is updated immediately.

2. **Download/backup your survey data.** We provide you with the ability to export, share and publish your survey data in a variety of formats. This allows you to create your own backups or conduct offline data analysis. See here for downloading instructions.

3. **Delete your survey data.** Deleting survey data in the ways described on this page will not permanently delete survey data immediately. As long as you maintain an account with us, we retain your deleted data in case you delete something by accident and need to restore it (which you can request by contacting customer support). To the extent permitted by law, we will permanently delete your data if you request to cancel your account.

4. **Cancel your account.** To cancel and delete your account, please contact customer support. Deleting your account will cause all the survey data in the account to be permanently deleted, as permitted by law, and will disable your access to any other services that require a SurveyMonkey account. We will respond to any such request, and any appropriate request to access, correct, update or delete your personal information within the time period specified by law (if applicable) or without excessive delay. We will promptly fulfill requests to delete personal data unless the request is not technically feasible or such data is required to be retained by law (in which case we will block access to such data, if required by law).

For how long do we retain your data? We generally retain your data for as long as you have an account with us, or to comply with our legal obligations, resolve disputes, or enforce our agreements. Data that is deleted from our servers may remain as residual copies on offsite backup media for up to approximately 12 months afterward. We describe our retention practices in more detail in this FAQ

15. Security, cookies and other important information

Changes to this privacy policy. We may modify this privacy policy at any time, but if we do so, we will notify you by publishing the changes on this website. If we determine

the changes are material, we will provide you with additional, prominent notice as is appropriate under the circumstances, such as via email.

For any changes to this privacy policy for which you are required to provide prior consent, we will provide you with reasonable notice of such changes before they become effective and provide you with the opportunity to consent to those changes. If you do not cancel your subscription and continue to use our services beyond the advance-notice period, you will be considered as having expressly consented to the changes in our privacy policy. If you disagree with the terms of this privacy policy or any updated privacy policy, you may close your account at any time.

1. **Security.** Details about SurveyMonkey's security practices are available in our Security Statement. We are committed to handling your personal information and data with integrity and care. However, regardless of the security protections and precautions we undertake, there is always a risk that your personal data may be viewed and used by unauthorized third parties as a result of collecting and transmitting your data through the internet.

2. **Cookies.** We use cookies on our websites. Cookies are small bits of data we store on the device you use to access our services so we can recognize repeat users. Each cookie expires after a certain period of time, depending on what we use it for. We use cookies for several reasons:

    1. **To make our site easier to use.** If you use the "Remember me" feature when you sign into your account, we may store your username in a cookie to make it quicker for you to sign in whenever you return to SurveyMonkey.

    2. **For security reasons.** We use cookies to authenticate your identity, such as confirming whether you are currently logged into SurveyMonkey.

    3. **To provide you with personalized content.** We may store user preferences, such as your default language, in cookies to personalize the content you see. We also use cookies to ensure that users can't retake certain surveys that they have already completed.

    4. **To improve our services.** We use cookies to measure your usage of our websites and track referral data, as well as to occasionally display different versions of content to you. This information helps us to develop and improve our services and optimize the content we display to users.

Click here for more details about our cookies. We don't believe cookies are sinister, but you can still choose to remove or disable cookies via your browser. Refer to your web browser's configuration documentation to learn how to do this. Please note that doing this may adversely impact your ability to use our services. Enabling cookies ensures a smoother experience when using our websites. By using our websites and agreeing to this privacy policy, you expressly consent to the use of cookies as described in this policy.

3. **Blogs and Forums.** Our website offers publicly accessible blogs and community forums. You should be aware that any information you provide in these areas may be read, collected, and used by others who access them. We're not responsible for any personal information you choose to submit in these areas of our site. To request removal of your personal information from our blog or community forum, contact us at support@surveymonkey.com. In some cases, we may not be able to fulfill your request and we will let you know why.

4. **Safety of Minors and COPPA.** Our services are not intended for and may not be used by minors. "Minors" are individuals under the age of majority in their place of residence (or under 13 in the United States). SurveyMonkey does not knowingly collect personal data from minors or allow them to register. If it comes to our attention that we have collected personal data from a minor, we may delete this information without notice. If you have reason to believe that this has occurred, please contact us atsupport@surveymonkey.com.

5. **English version controls.** Non-English translations of this privacy policy are provided for convenience. In the event of any ambiguity or conflict between translations, the English version is authoritative.

16. Additional information for European Union users

SurveyMonkey provides some of its services to users in the EU through SurveyMonkey Europe Sarl, located at 1, Allée Scheffer, L-2520 Luxembourg.

1. **"Personal data".** For users located in the EU, references to "personal information" in this policy are equivalent to what is commonly referred to as "personal data" in the EU.

2. **About IP addresses.** Our servers record the incoming IP addresses of visitors to our websites (whether or not the visitor has a SurveyMonkey account) and store the IP addresses in log files. We use these log files for purposes such as system administration and maintenance, record keeping, tracking referring web sites, inferring

your location, and security purposes (e.g. controlling abuse, spam and DDOS attacks). We also store IP addresses along with certain actions you take on our system. IP addresses are only linked to survey responses if a survey creator has configured a survey to collect IP addresses. By agreeing to this privacy policy, you expressly consent to SurveyMonkey using your IP address for the foregoing purposes. If you wish to opt out from the foregoing consent to use your IP address, you must cancel your account (if you have one) or not respond to a survey if requested to do so.

3. **Data controller.** SurveyMonkey Europe Sarl, whose contact information is listed above, is the data controller for registration, billing and other account information that we collect from users in the EU. However, the data controller for survey data is the survey creator. The survey creator determines how their survey questions and responses are used and disclosed. SurveyMonkey only processes such survey data in accordance with the instructions and permissions (including those given under this privacy policy) selected by the survey creator when they create and administer their survey.

4. **Accessing and correcting your personal data.** You have the right to access and correct the personal information that SurveyMonkey holds about you. This right may be exercised through by visiting your account's My Account page or by emailingsupport@surveymonkey.com.

5. **Your responsibilities.** By using our services, you agree to comply with applicable data protection requirements when collecting and using your survey data, such as requirements to inform respondents about the specific uses and disclosures of their data.

Consents

By clicking "I Agree" or any other button indicating your acceptance of this privacy policy, you expressly consent to the following:

6. You consent to the collection, use, disclosure and processing of your personal data in the manner described in this privacy policy, including our procedures relating to **cookies, IP addresses and log files**.

7. Our servers are based in the United States, so your personal data will be primarily processed by us in the United States. You consent to the transfer and processing of your personal data in the United States by SurveyMonkey.com, LLC, in

Luxembourg by SurveyMonkey Europe Sarl and in Portugal by SurveyMonkey Spain, Sucursal em Portugal.

8. You consent and agree that we may transfer your data to data processors located in countries, including the United States, which do not have data protection laws that provide the same level of protection that exists in countries in the European Economic Area. Your consent is voluntary, and you may revoke your consent by opting out at any time. Please note that if you opt-out, we may no longer be able to provide you our services.

9. You consent to us sharing your personal data with relevant persons working for service providers who assist us to provide our services.

10. If you have enabled cookies on your web browser, you consent to our use of cookies as described in this privacy policy.

17. Additional information for Canadian users

1. Please read this article for information about the U.S. Patriot Act and how it affects the personal information of Canadian users.

18. Additional information for Japanese users

1. You agree that you are responsible for notifying the respondents of surveys that you create using our services about how SurveyMonkey may use the respondents' survey responses and personal data as described in this privacy policy and obtaining prior consent from respondents to disclose their personal data to SurveyMonkey.

PRIVACY FOR SURVEY RESPONDENTS

19. What information does SurveyMonkey collect?

When you respond to surveys hosted by SurveyMonkey, we collect, on behalf and upon instructions (including the ones provided in this privacy policy) of survey creators, information relating to you and your use of our services from a variety of sources. These are listed below. The sections afterward describe what we do with this information.

Information we collect directly from you

1. **Survey responses.** We collect and store the survey responses that you submit. The survey creator is responsible for this data and manages it. A survey may ask you to provide personal information or data. If you have any questions about a survey you are taking, please contact the survey creator directly as SurveyMonkey is not

responsible for the content of that survey. The survey creator is usually the same person that invited you to take the survey and sometimes they have their own privacy policy.

Are your survey responses anonymous? You will need to ask the survey creator this as it depends on how they have chosen to configure their survey. We provide instructions on how a survey creator can ensure they collect responses anonymously. However, even if a survey creator has followed those steps, specific questions in the survey may still ask you for your personal information or data that could be used to identify you.

Information we collect about you from other sources

2. **Usage data.** We collect usage data about you whenever you interact with our services. This may include which webpages you visit, what you click on, when you performed those actions, and so on. Additionally, as with most websites today, our web servers keep log files that record data each time a device accesses those servers. The log files contain data about the nature of each access, including originating IP addresses. Note that we do not link this usage data to your survey responses.

3. **Device data.** We collect data from the device and application you use to access our services, such as your IP address and browser type. We may also infer your geographic location based on your IP address. Your IP address will be linked to your survey responses unless a survey creator has disabled IP address collection for the survey you respond to.

4. **Referral data.** We record information about the source that referred you to a survey (e.g. a link on a website or in an email).

5. **Information from page tags.** We use third party tracking services that employ cookies and page tags (also known as web beacons) to collect aggregated and anonymized data about visitors to our websites. This data includes usage and user statistics.

6. **Your email address.** If a survey creator uses an email invitation collector to send you a survey invitation email, we collect your email address when the survey creator provides it to us. We don't use this to send you email except at the direction of a survey creator. The emails we send on behalf of a survey creator appear to come from that survey creator's email address.

Providing survey responses is voluntary. Remember, you can always choose not to provide an answer to any given survey question (especially those requesting your personal information or data). However, sometimes this will prevent you from completing a survey if the survey creator has marked that question as requiring an answer.

20. How does SurveyMonkey use the information we collect?

Your survey responses are owned and managed by the survey creator, and we treat that information as private to the survey creator. Please contact the survey creator directly to understand how they will use your survey responses. Some survey creators may provide you with a privacy policy or notice at the time you take their survey and we encourage you to review that to understand how the survey creator will handle your responses.

Please see the Survey Creator version of this privacy policy to understand how SurveyMonkey handles survey responses. SurveyMonkey does not sell survey responses to third parties and we do not use any contact details collected in our customers' surveys to contact survey respondents.

We also use the information we collect from you (including usage data, device data, referral data and information from page tags) to manage and improve our services.

21. With whom do we share or disclose your information?

SurveyMonkey does not sell your survey responses!

We disclose:

1. **Your survey responses to survey creators.** We host surveys for survey creators, but they are really the primary curator of survey data. Anything you expressly disclose in your survey responses will, naturally, be provided to them. Please contact the survey creator directly to understand how they might share your survey responses. Please see the Survey Creator version of this privacy policy to understand what SurveyMonkey tells survey creators about how we handle survey responses.

22. What are your rights to your information?

1. **Contact the survey creator to access and correct your responses and personal information.** Because we collect survey responses on behalf of survey creators, you will need to contact the survey creator if you have any questions about the survey, or if you want to access, update, or delete anything in your responses. We provide survey creators with tools to maintain the responses they collect through their

surveys. SurveyMonkey cannot provide you with this access since survey responses are the survey creator's private information.

2. **Opt out of receiving surveys.** You may opt out of receiving email invitations to take surveys which are sent by survey creators via SurveyMonkey.

23. Security, cookies and other important information

Changes to this privacy policy. We may modify this privacy policy at any time, but if we do so, we will notify you by publishing the changes on this website. If we determine the changes are material, we will provide you with additional, prominent notice as is appropriate under the circumstances, such as via email.

For any changes to this privacy policy for which you are required to provide prior consent, we will provide you with reasonable notice of such changes before they become effective and provide you with the opportunity to consent to those changes. If you do not cancel your subscription and continue to use our services beyond the advance-notice period, you will be considered as having expressly consented to the changes in our privacy policy. If you disagree with the terms of this privacy policy or any updated privacy policy, you may close your account (if you have one) at any time or not respond to a survey.

1. **Security.** Details about SurveyMonkey's security practices are available in our Security Statement. We are committed to handling your personal information and data with integrity and care. However, regardless of the security protections and precautions we undertake, there is always a risk that your personal data may be viewed and used by unauthorized third parties as a result of collecting and transmitting your data through the internet.

2. **Cookies.** We use cookies on our websites. Cookies are small bits of data we store on the device you use to access our services so we can recognize repeat users. Each cookie expires after a certain period of time, depending on what we use it for. We use cookies for several reasons:

    1. **To make our site easier to use.** If you use the "Remember me" feature when you sign into your account, we may store your username in a cookie to make it quicker for you to sign in whenever you return to SurveyMonkey.

    2. **For security reasons.** We use cookies to authenticate your identity, such as confirming whether you are currently logged into SurveyMonkey.

3. **To provide you with personalized content.** We may store user preferences, such as your default language, in cookies to personalize the content you see. We also use cookies to ensure that users can't retake certain surveys that they have already completed.

4. **To improve our services.** We use cookies to measure your usage of our websites and track referral data, as well as to occasionally display different versions of content to you. This information helps us to develop and improve our services and optimize the content we display to users.

Click here for more details about our cookies. We don't believe cookies are sinister, but you can still choose to remove or disable cookies via your browser. Refer to your web browser's configuration documentation to learn how to do this. Please note that doing this may adversely impact your ability to use our services. Enabling cookies ensures a smoother experience when using our websites. By using our websites and agreeing to this privacy policy, you expressly consent to the use of cookies as described in this policy.

3. **Blogs and Forums.** Our website offers publicly accessible blogs and community forums. You should be aware that any information you provide in these areas may be read, collected, and used by others who access them. We're not responsible for any personal information you choose to submit in these areas of our site. To request removal of your personal information from our blog or community forum, contact us at support@surveymonkey.com. In some cases, we may not be able to fulfill your request and we will let you know why.

4. **Social Media Features.** Our websites may include social media features or widgets, such as the Facebook Like button. Use of these features may allow them to collect your IP address, detect which page you are visiting on our site, and set a cookie to enable the feature to function properly. Your interactions with these features are governed by the privacy policy of the third party providing it.

5. **Safety of Minors and COPPA.** Our services are not intended for and may not be used by minors. "Minors" are individuals under the age of majority in their place of residence (or under 13 in the United States). SurveyMonkey does not knowingly collect personal data from minors or allow them to register. If it comes to our attention that we have collected personal data from a minor, we may delete this information without notice. If you have reason to believe that this has occurred, please contact us atsupport@surveymonkey.com.

6. **English version controls.** Non-English translations of this privacy policy are provided for convenience. In the event of any ambiguity or conflict between translations, the English version is authoritative.

24. Additional information for European Union users

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1. **"Personal data".** For users located in the EU, references to "personal information" in this policy are equivalent to what is commonly referred to as "personal data" in the EU.

2. **About IP addresses.** Our servers record the incoming IP addresses of visitors to our websites (whether or not the visitor has a SurveyMonkey account) and store the IP addresses in log files. We use these log files for purposes such as system administration and maintenance, record keeping, tracking referring web sites, inferring your location, and security purposes (e.g. controlling abuse, spam and DDOS attacks). We also store IP addresses along with certain actions you take on our system. IP addresses are only linked to survey responses if a survey creator has configured a survey to collect IP addresses. By agreeing to this privacy policy, you expressly consent to SurveyMonkey using your IP address for the foregoing purposes. If you wish to opt out from the foregoing consent to use your IP address, you must cancel your account (if you have one) or not respond to a survey if requested to do so.

3. **Data controller.** SurveyMonkey Europe Sarl, whose contact information is listed above, is the data controller for registration, billing and other account information that we collect from users in the EU. However, the data controller for survey data is the survey creator. The survey creator determines how their survey questions and responses are used and disclosed. SurveyMonkey only processes such survey data in accordance with the instructions and permissions (including those given under this privacy policy) selected by the survey creator when they create and administer their survey.

4. **Accessing and correcting your personal data.** You have the right to access and correct the personal information that SurveyMonkey holds about you. This right may be exercised through by visiting your account's My Account page or by emailingsupport@surveymonkey.com.

Consents

By clicking "I Agree" or any other button indicating your acceptance of this privacy policy, you expressly consent to the following:

5. You consent to the collection, use, disclosure and processing of your personal data in the manner described in this privacy policy, including our procedures relating to **cookies, IP addresses and log files**.

6. Our servers are based in the United States, so your personal data will be primarily processed by us in the United States. You consent to the transfer and processing of your personal data in the United States by SurveyMonkey.com, LLC, in Luxembourg by SurveyMonkey Europe Sarl and in Portugal by SurveyMonkey Spain, Sucursal em Portugal.

7. You consent and agree that we may transfer your data to data processors located in countries, including the United States, which do not have data protection laws that provide the same level of protection that exists in countries in the European Economic Area. Your consent is voluntary, and you may revoke your consent by opting out at any time. Please note that if you opt-out, we may no longer be able to provide you our services.

8. You consent to us sharing your personal data with relevant persons working for service providers who assist us to provide our services.

9. If you have enabled cookies on your web browser, you consent to our use of cookies as described in this privacy policy.

25. Additional information for Canadian users

1. Please read this article for information about the U.S. Patriot Act and how it affects the personal information of Canadian users.

26. Additional information for Japanese users

1. You agree that you are responsible for notifying the respondents of surveys that you create using our services about how SurveyMonkey may use the respondents' survey responses and personal data as described in this privacy policy and obtaining prior consent from respondents to disclose their personal data to SurveyMonkey.

27. Security Statement

SurveyMonkey takes our users' security and privacy concerns seriously. We strive to ensure that user data is kept secure, and that we collect only as much personal data as is required to make our users' experience with SurveyMonkey as efficient and satisfying as possible. We also aim to collect data in the most unobtrusive manner possible. This Security Statement is aimed at being transparent about our security infrastructure and practices, to help reassure you that your data is sufficiently protected.

User Security

SurveyMonkey utilizes some of the most advanced technology for Internet security commercially available today.

28. SurveyMonkey requires users to create a unique user name and password that must be entered each time a user logs on. SurveyMonkey issues a session "cookie" only to record encrypted authentication information for the duration of a specific session. The session cookie does not include either the username or password of the user.

29. When a user accesses secured areas of our site, Secure Sockets Layer (SSL) technology protects user information using both server authentication and data encryption, ensuring that user data is safe, secure, and available only to authorized persons

30. Passwords and credit card information are always sent over secure, encrypted SSL connections.

31. Accounts which are SSL enabled ensure that the responses of survey respondents are transmitted over a secure, encrypted connection

32. We are PCI-DSS compliant

Physical Security

33. Our data center is located in a SOC 2, Type II audited facility

34. Data center staffed and surveilled 24/7

35. Data center secured by security guards, visitor logs, and entry requirements (passcards/biometric recognition)

36. Servers are kept in a locked cage

37. Digital surveillance equipment monitors the data center

38. Environmental controls for temperature, humidity and smoke/fire detection

39. All customer data is stored on servers located in the United States

Availability

40. Fully redundant IP connections

41. Multiple independent connections to Tier 1 Internet access providers

42. Uptime monitored constantly, with escalation to SurveyMonkey staff for any downtime

43. Database is log-shipped to standby servers and can failover in less than an hour

44. Servers have redundant internal and external power supplies

Network Security

45. Firewall restricts access to all ports except 80 (http) and 443 (https)

46. Intrusion detection systems and other systems detect and prevent interference or access from outside intruders

47. QualysGuard network security audits are performed weekly

48. McAfee SECURE scans performed daily

Storage Security

49. All data is stored on servers located in the United States

50. Backups occur hourly internally, and daily to a centralized backup system for offsite storage

51. Backups are encrypted

52. Data stored on a RAID 10 array

53. O/S stored on a RAID 1 array

Organizational Security

54. Access controls to sensitive data in our databases and systems are set on a need-to-know basis

55. We maintain and monitor audit logs on our services and systems (we generate gigabytes of log files each day)

56. We maintain internal information security policies, including incident response plans, and regularly review and update them

Software

57. Code in ASP.NET 2.0, running on SQL Server 2008, Ubuntu Linux, and Windows 2008 Server

58. Our engineers use best practices and industry-standard secure coding guidelines to ensure secure coding

59. Latest patches applied to all operating system and application files

60. Billing data is encrypted

Handling of Security Breaches

Despite best efforts, no method of transmission over the Internet, or method of electronic storage, is perfectly secure. Therefore, we cannot guarantee absolute security. If SurveyMonkey learns of a security breach or potential security breach, we will attempt to notify affected users electronically so that they can take appropriate protective steps. SurveyMonkey may also post a notice on our website if a security breach occurs.

Your Responsibilities

Keeping your data secure also depends on you ensuring that you maintain the security of your account by using sufficiently complicated passwords and storing them safely. You should also ensure that you have sufficient security on your system, to keep any survey data you download to your own computer away from prying eyes. We offer SSL to secure the transmission of survey responses, but it is your responsibility to ensure that that feature is enabled on your account.

Questions?

If you have any questions about security on the SurveyMonkey website, please email us at support@surveymonkey.com.

1 Are my survey responses anonymous and secure?

2 Anonymity

It is up to each survey creator to decide if they want to collect responses anonymously, or to capture respondents' personal information. Respondents' personal information can be captured by the survey creator in two ways: by expressly asking you for your personal details

(name, address, etc.), and by configuring the survey to automatically capture your IP address and/or email address.

SurveyMonkey provides survey distribution methods that range from emailing a survey link, embedding a survey on a personal or business website, using social networks to post survey links, and so on. All of these options allow the survey creator to collect responses anonymously. All collection methods permit the tracking of respondent IP addresses. Anyone using the Email Invitation collector could potentially track an email address on the response.

We allow survey authors to disable the storage of email addresses and disable IP address collection for all collection methods so that they can collect anonymous survey responses.

Survey creators may have their own privacy policies which apply to surveys that they create using our services and that detail how they handle your personally identifiable information. We encourage you to read any such policy, or to contact the survey creator directly to ask them any questions about their privacy practices. If the survey creator has not disclosed the collection method in the introduction of the survey, please contact him or her to verify if the response is anonymous.

Note that although survey creators may choose to collect responses anonymously, creators may still from include specific survey questions that ask you for personally identifiable information. To review SurveyMonkey's privacy policy and how we handle respondents' personal information, click on the **Privacy Policy** link in the footer of our main SurveyMonkey site (www.surveymonkey.com).

3 Security

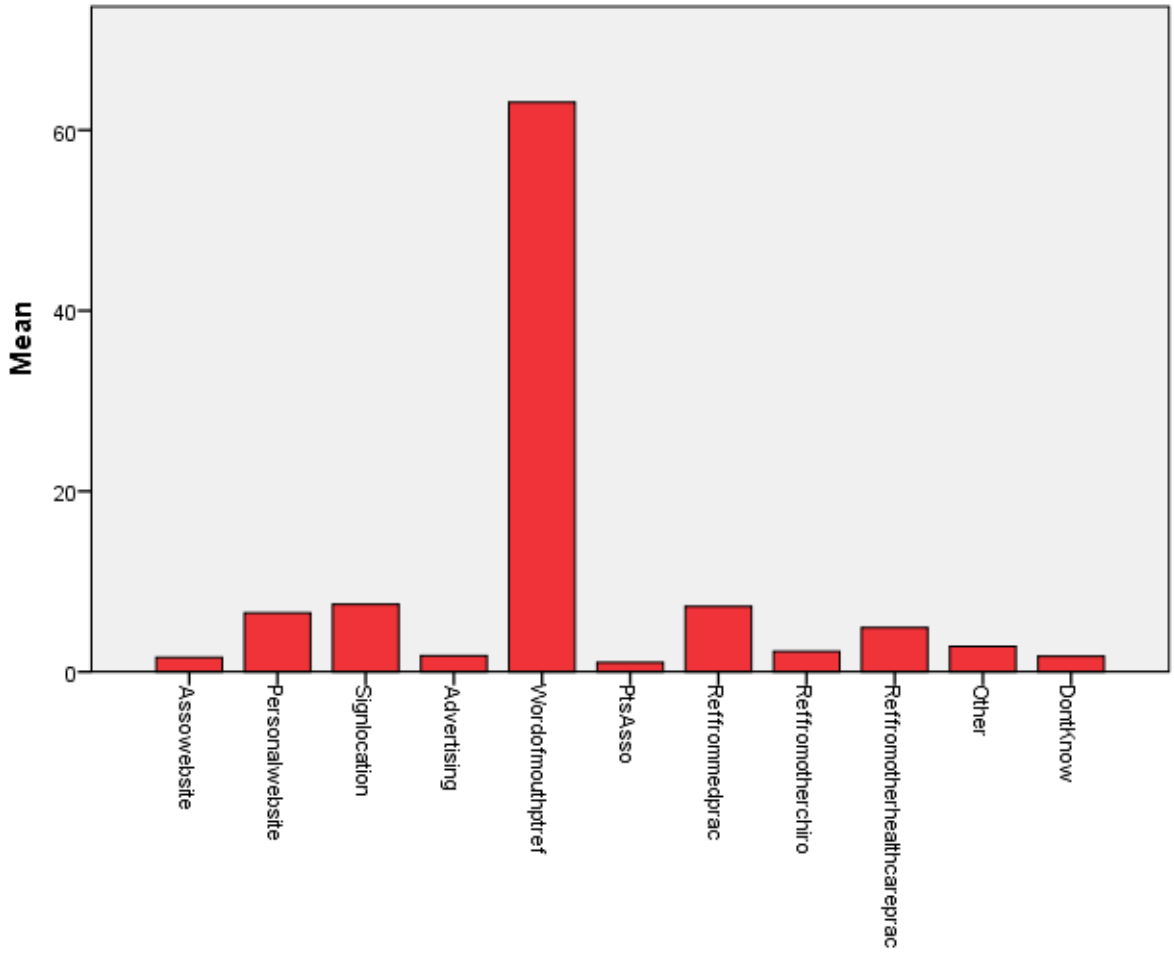
SurveyMonkey takes our users' security and privacy concerns seriously. We strive to ensure that user data is kept secure, and that we collect only as much personal data as is required to make our users' experience with SurveyMonkey as efficient and satisfying as possible. We also aim to collect data in the most unobtrusive manner possible. We aim to be transparent about our security infrastructure and practices to help reassure you that your data is sufficiently protected. For more details, see ourSecurity Statement.

If the URL of your survey contains "https://" at the start, your survey responses are sent to us over a secure, encrypted connection. Whether a survey offers this depends on whether the survey creator has enabled this feature on their account. See here for more details.

Appendix L: Provinces in South Africa

Province	*n*	%
Eastern Cape	3	4.5
Free State	1	1.5
Gauteng	19	28.8
Kwa-Zulu Natal	28	42.5
Limpopo	2	3.0
Mpumalanga	4	6.1
Northern Cape	1	1.5
Western Cape	8	12.1
Total	**66**	**100**

Appendix M: Source of new patients



Appendix N: Reassessments of new patients

Reassessment Interval	*n*	%
1	20	17.5
2-3	36	31.6
4-5	34	29.8
6-7	9	7.9
8-9	2	1.8
≥10	10	8.8
I do not reassess	3	2.6
Total	**114**	**100**

Appendix O: Diagnostic imaging

Who intreprets images	***n***	**%**
I do	53	46.9
I intrepret ones taken at my practice and rely on reports of images taken elsewhere	5	4.4
Rely solely on radiologists reports	3	2.7
Interpretation by radiologist but I draw my own conclusions in addition to reports	52	46.0
Total	**113**	**100**

Appendix P: Inter-professional relationships and referrals

Referrals FROM	Never		Rarely		Sometimes		Often		Routinely	
	n	Row N %	*n*	Row N %	*n*	Row N %	*n*	Row N %	*n*	Row N %
Acupuncturist	63	61.8	25	24.5	14	13.7	0	0.0	0	0.0
Dentist	58	55.2	38	36.2	8	7.6	0	0.0	1	1.0
Family Practitioner	11	10.2	30	27.8	42	38.9	15	13.9	10	9.3
Internist	72	69.9	19	18.4	8	7.8	2	1.9	2	1.9
Massage Therapist	14	13.0	30	27.8	34	31.5	23	21.3	7	6.5
Nutritionist	73	71.6	18	17.6	5	4.9	6	5.9	0	0.0
OB/GYN	73	72.3	17	16.8	9	8.9	2	2.0	0	0.0
Orthosurgeon	50	49.0	31	30.4	17	16.7	3	2.9	1	1.0
Neurologist	67	65.0	26	25.2	6	5.8	3	2.9	1	1.0
Neurosurgeon	69	67.0	25	24.3	6	5.8	2	1.9	1	1.0
Other Chiropractor	18	16.8	49	45.8	27	25.2	11	10.3	2	1.9
Paediatrician	69	66.3	22	21.2	9	8.7	2	1.9	2	1.9
Physical Therapist	35	33.7	34	32.7	28	26.9	6	5.8	1	1.0
Physiatrist	87	87.0	9	9.0	4	4.0	0	0.0	0	0.0
Ortho Technician	93	91.2	6	5.9	3	2.9	0	0.0	0	0.0
Podiatrist	63	61.2	22	21.4	14	13.6	3	2.9	1	1.0
Psychologist/ Psychiatrist	75	73.5	16	15.7	10	9.8	1	1.0	0	0.0
Surgeon	77	75.5	19	18.6	5	4.9	1	1.0	0	0.0
Other	0	0.0	5	27.8	7	38.9	3	16.7	3	16.7

Referrals TO	Never		Rarely		Sometimes		Often		Routinely	
	n	Row N %	*n*	Row N %	*n*	Row N %	*n*	Row N %	*n*	Row N %
Acupuncturist	39	36.8	42	39.6	23	21.7	1	0.9	1	0.9
Dentist	44	41.9	43	41.0	17	16.2	1	1.0	0	0.0
Family Practitioner	6	5.7	16	15.1	55	51.9	22	20.8	7	6.6
Internist	70	68.0	16	15.5	12	11.7	4	3.9	1	1.0
Massage Therapist	17	15.7	19	17.6	34	31.5	29	26.9	9	8.3
Nutritionist	49	46.2	20	18.9	29	27.4	8	7.5	0	0.0
OB/GYN	53	51.0	32	30.8	18	17.3	1	1.0	0	0.0
Orthosurgeon	15	14.0	33	30.8	49	45.8	7	6.5	3	2.8
Neurologist	23	22.1	44	42.3	29	27.9	6	5.8	2	1.9
Neurosurgeon	21	20.0	46	43.8	28	26.7	9	8.6	1	1.0
Other Chiropractor	18	17.0	53	50.0	32	30.2	2	1.9	1	0.9
Paediatrician	46	44.7	37	35.9	17	16.5	2	1.9	1	1.0
Physical Therapist	26	24.5	33	31.1	33	31.1	11	10.4	3	2.8
Physiatrist	80	77.7	17	16.5	5	4.9	0	0.0	1	1.0
Ortho Technician	89	86.4	11	10.7	2	1.9	0	0.0	1	1.0
Podiatrist	36	34.6	38	36.5	24	23.1	2	1.9	4	3.8
Psychologist /Psychiatrist	43	41.3	43	41.3	14	13.5	3	2.9	1	1.0
Surgeon	42	41.2	48	47.1	11	10.8	0	0.0	1	1.0
Other	0	0.0	6	42.9	6	42.9	1	7.1	1	7.1

OB/GYN – Obstetrics and gynecology

Appendix Q: Technique approaches utilised in patient management

		n	%
Activator methods	never	51	49.5
	rarely	33	32.0
	sometimes	11	10.7
	often	3	2.9
	routinely	5	4.9
Adjustive instrument	never	67	70.5
	rarely	15	15.8
	sometimes	8	8.4
	often	1	1.1
	routinely	4	4.2
Applied Kinesiology	never	69	68.3
	rarely	23	22.8
	sometimes	5	5.0
	often	2	2.0
	routinely	2	2.0
Coxflexion distraction	never	50	49.0
	rarely	24	23.6
	sometimes	15	14.7
	often	9	8.8
	routinely	4	3.9
Cranial	never	68	66.0
	rarely	24	23.3
	sometimes	8	7.8
	often	1	1.0
	routinely	2	1.9
Diversified	never	4	3.6
	rarely	1	0.9
	sometimes	6	5.5
	often	17	15.5
	routinely	82	74.5
Extremity adjusting	never	5	4.6
	rarely	8	7.3
	sometimes	21	19.3
	often	39	35.8
	routinely	36	33.0
Gonstead	never	60	59.4
	rarely	14	13.9
	sometimes	9	8.9
	often	3	3.0
	routinely	15	14.9

Logan Basic	never	84	83.2
	rarely	12	11.9
	sometimes	3	3.0
	routinely	2	2.0
Meric	never	97	99.0
	sometimes	1	1.0
NIMMO receptor tonus	never	82	82.0
	rarely	3	3.0
	sometimes	5	5.0
	often	3	3.0
	routinely	7	7.0
Plamer upper cervical HIO	never	89	89.0
	rarely	7	7.0
	sometimes	2	2.0
	often	1	1.0
	routinely	1	1.0
Pierce Stilwagon	never	96	98.0
	rarely	2	2.0
SOT	never	70	68.0
	rarely	12	11.7
	sometimes	13	12.6
	often	5	4.9
	routinely	3	2.9
Thompson	never	57	54.3
	rarely	20	19.0
	sometimes	15	14.3
	often	8	7.6
	routinely	5	4.8
Other	rarely	4	23.5
	sometimes	8	47.1
	often	2	11.8
	routinely	3	17.6

Appendix R: Adjunctive auxiliary procedures

	Never		Rarely		Sometimes		Often		Routinely	
	n	Row N %	*n*	Row N %	*n*	Row N %	*n*	Row N %	*n*	Row N %
Changing risky unhealthy behaviour	1	0.9	12	10.8	38	34.2	35	31.5	25	22.5
Disease prevention/early screening	6	5.4	20	18.0	38	34.2	36	32.4	11	9.9
Ergonomic/postural advice	0	0.0	4	3.6	21	18.9	29	26.1	57	51.4
Nutritional dietary recommendations	1	0.9	13	11.6	32	28.6	48	42.9	18	16.1
Physical fitness exercise promotion	0	0.0	2	1.8	13	11.7	36	32.4	60	54.1
Relaxation/stress reduction	0	0.0	17	15.2	31	27.7	38	33.9	26	23.2
Selfcare strategies	1	0.9	7	6.3	22	19.6	34	30.4	48	42.9

Appendix S: Active adjunctive auxiliary procedures

	Never		Rarely		Sometimes		Often		Routinely	
	n	Row N %	*n*	Row N %	*n*	Row N %	*n*	Row N %	*n*	Row N %
Activities of daily living	4	3.6	10	9.1	20	18.2	40	36.4	36	32.7
Back school	61	56.0	25	22.9	13	11.9	5	4.6	5	4.6
Corrective therapeutic exercise	3	2.7	3	2.7	24	21.8	37	33.6	43	39.1
Foot orthotics	33	30.0	43	39.1	26	23.6	3	2.7	5	4.5
Rehab spinal or extremity stabilisation	8	7.3	18	16.4	27	24.5	37	33.6	20	18.2
Work hardening	53	52.0	23	22.5	17	16.7	6	5.9	3	2.9

Appendix T: Passive adjunctive auxiliary procedures

		n	Column N %
Acupressure meridian therapy	never	66	60.6
	rarely	19	17.4
	sometimes	12	11.0
	often	9	8.3
	routinely	3	2.8
Acupuncture with needles	never	69	64.5
	rarely	9	8.4
	sometimes	6	5.6
	often	15	14.0
	routinely	8	7.5
Biofeedback	never	90	83.3
	rarely	10	9.3
	sometimes	3	2.8
	often	4	3.7
	routinely	1	0.9
Bed rest	never	59	54.6
	rarely	36	33.3
	sometimes	13	12.0
Bracing with lumbar support cervical collar	never	47	43.1
	rarely	52	47.7
	sometimes	9	8.3
	routinely	1	0.9
Casting	never	99	91.7
	rarely	8	7.4
	sometimes	1	0.9
Diathermy	never	102	93.6
	rarely	5	4.6
	often	1	0.9
	routinely	1	0.9
Direct current electrodiagnosis	never	91	84.3
	rarely	11	10.2
	sometimes	2	1.9
	often	4	3.7
Electrical stimulation	never	56	51.4
	rarely	20	18.3
	sometimes	14	12.8
	often	13	11.9
	routinely	6	5.5
Heellifts	never	51	46.8
	rarely	39	35.8
	sometimes	16	14.7
	often	1	0.9

	routinely	2	1.8
Homeopathic remedies	never	56	50.9
	rarely	30	27.3
	sometimes	14	12.7
	often	8	7.3
	routinely	2	1.8
Hotpack/moist heat	never	32	29.1
	rarely	21	19.1
	sometimes	24	21.8
	often	24	21.8
	routinely	9	8.2
Icepack/cryotherapy	never	9	8.3
	rarely	22	20.2
	sometimes	30	27.5
	often	34	31.2
	routinely	14	12.8
Infraredbaker/heatlamp orhotpad	never	91	84.3
	rarely	11	10.2
	sometimes	2	1.8
	often	2	1.8
	routinely	2	1.8
Massage therapy	never	18	16.4
	rarely	13	11.8
	sometimes	26	23.6
	often	26	23.6
	routinely	27	24.5
Mobilisation therapy	never	11	10.1
	rarely	14	12.8
	sometimes	30	27.5
	often	29	26.6
	routinely	25	22.9
Nutritional counseling therapy or supplementation	never	14	12.6
	rarely	27	24.3
	sometimes	33	29.7
	often	26	23.4
	routinely	11	9.9
Paraffin bath	never	105	97.2
	rarely	3	2.8
Taping/strapping	never	20	18.2
	rarely	33	30.0
	sometimes	34	30.9
	often	16	14.5
	routinely	7	6.4
Traction	never	31	28.4
	rarely	27	24.8

	sometimes	34	31.2
	often	15	13.8
	routinely	2	1.8
Trigger point therapy	never	5	4.5
	rarely	7	6.4
	sometimes	18	16.4
	often	36	32.7
	routinely	44	40.0
Ultrasound	never	66	60.6
	rarely	18	16.5
	sometimes	15	13.8
	often	5	4.6
	routinely	5	4.6
Vibration therapy	never	82	75.2
	rarely	9	8.3
	sometimes	7	6.4
	often	6	5.5
	routinely	5	4.6
Whirlpool or hydrotherapy	never	103	95.4
	rarely	3	2.8
	sometimes	2	1.9
Other	sometimes	4	28.6
	often	7	50.0
	routinely	3	21.4

Appendix U: Symptom duration (5 – 12 weeks)

		n	Column N %
Symptom Free	None	33	34.0
	1-25%	59	60.8
	26-50%	3	3.1
	51-75%	1	1.0
	76-100%	1	1.0
4-8 weeks	None	2	2.0
	1-25%	56	56.6
	26-50%	34	34.2
	51-75%	6	6.1
	76-100%	1	1.0
8-12 weeks	None	3	3.3
	1-25%	64	70.3
	26-50%	16	17.6
	51-75%	7	7.7
	76-100%	1	1.1