An investigation into the congruency between research perceived to be of relevance to Chiropractors practicing in KwaZulu-Natal and the student research completed at the Durban University of Technology.

By:

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I, Nicolette van der Hulst, 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

This dissertation is dedicated to Dr. Raymond Rethman. The great care and dedication you showed to your patients and life purpose has been one of my greatest inspirations.

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To Paul, thank you for your unconditional love and, in everything, holding the fort.

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Abstract

Background:

The recent increase in the implementation of evidence-based practice (EBP) in the Chiropractic profession and the call within the profession for validation of its claims has seen a growing interest in good quality research. It is advocated that the future of Chiropractic research and thus the success of the profession is dependent on future practitioner and student research endeavours. It was the aim of this study to evaluate the student research agendas at the Durban University of Technology (DUT). Secondly, local Chiropractors were asked what they perceived to be clinically relevant Chiropractic research agendas. The agendas that were under-studied by the students, but perceived as important by the practitioners, were recommended as suggestions for more clinically relevant future student research. The intention of this was that future student research would become more congruent with local and international Chiropractic research trends.

Methodology:

The study was a prospective exploratory study, which utilised a mixed method approach. Documented evidence giving an overview of student research completed at the DUT was combined with a qualitative questionnaire that was circulated to all Chiropractors practicing in KwaZulu-Natal. The questionnaire aimed to give insight into the research agendas perceived to be most relevant for future research by Chiropractic professionals. Incongruence between the research completed at the DUT and the research that is perceived to be of highest professional relevance by Chiropractors in KwaZulu-Natal was determined.

All the Chiropractors practicing in KwaZulu-Natal as per the AHPCSA list received the questionnaire. A neutral third party at DUT collected the returned questionnaires and data analysis followed.

The student research completed at the DUT between 1994 and 2013 was obtained from the Institutional Repository (IR) and library archives. These studies were descriptively analysed and compared with the respondents' perceptions of clinically important Chiropractic research.

Data analysis highlighted the overlap of agendas and gaps in the research. Following this was a statistical analysis of the questionnaire responses using Pearson's chi square tests for two independent samples. A p value of ≤ 0.05 was considered as statistically significant. The results were interpreted using frequency tables and bar charts for categorical variables, while summary statistics such as mean,

standard deviation and range were used for continuous variables. A descriptive comparison was performed to determine the congruency between the student research agendas and the research perceived to be of relevance by Chiropractors practicing in KwaZulu-Natal.

Results:

The response rate of 66.3 % was regarded as representative of the entire Chiropractic population. The overall practitioner perception of research was positive with 64.4% of the respondents perceiving improved Chiropractic abilities due to previous research experience. The prevailing practitioner reason for research conducted was that it increased recognition as an EBP, increased development within the profession and validated its claims and theories.

An investigation into the student studies found that the majority of the research agendas recommended by the respondents had been undertaken at DUT. Future research into the following areas is encouraged:

- Neurological testing.
- Orthopaedic testing.
- Reduction of posture related disorders.
- Gross anatomical changes as a result of the Chiropractic manipulation.
- Range of Motion (ROM) assessment.
- Muscular testing, motion and/ or static palpation.
- Gait and posture assessment.

The respondents were asked to give recommendations for future Chiropractic research; the majority was willing to contribute a database of shared research ideas. It was anticipated that the sharing of the practitioner ideas with the students would result in more clinically relevant student research being produced.

Conclusion:

A comparison of the DUT student research agendas and those of Chiropractors in KwaZulu-Natal highlighted an incongruence of purpose between the two. The research agendas recommended by the Chiropractic respondents were recommended for future student uptake. A shared database of student

and practitioner research ideas aimed to encourage future student research that is more clinically relevant and in line with local and international research trends.

Key words: Chiropractor, Research agendas, Perceptions

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Definitions

Adjustment: A technique that is used by Chiropractors to change the functioning of the body's joints, neurology and physiology. It makes use of direction, amplitude, force and velocity directed at a specific site on the body (Leach 2004).

Allopathic: The term refers to the system of medicine that treats disease with the prescription of medicines that produces effects that are in opposition to the disease symptoms. It was first coined by the founder of Homoeopathy and is often contrasted to it (Oxforddictionaries.com 2015).

Attitude: A way of feeling or thinking about something that influences an individual's actions (Milton 1981).

Chiropractic profession: A health care profession that encourages the prevention of illness and treatment of neuromuscular and skeletal disorders with the use of non-invasive techniques (Chapman-Smith, 2000). The Chiropractic practitioner makes use of manual techniques to encourage the return to health without the use of medicine (Leach 2004).

Content Validity: The ability of the contents of a test or tool (for example, a questionnaire) to effectively answer the research question (Mouton 1996).

Face Validity: The degree to which a test or tool is valid and on the face of it is able to meet its aims and objectives (Mouton 1996).

Perception: "The ability to see, hear or become aware of something through the senses" (Oxforddictionaries.com 2015).

Vertebral Subluxation Complex (VSC): A description of the sequelae of a spinal articular dysfunction. This includes all the negative effects on the tissues, organs, body systems and overall health (Leach, 2004).

Chapter One: Introduction

1.1 Introduction

Leach (2004) argued that a profession's research agenda is guided by its hypotheses, which are as a result of the profession's philosophies. He maintained that "The quality of a health profession's philosophies, hypotheses, and research in turn affect the quality of care delivered by that profession" (Leach 2004).

When considering the value of Chiropractic research to the Chiropractic profession, it should be borne in mind that Chiropractic research should improve and guarantee the efficacy of health care. It should define, develop and make the profession more acceptable to the public. Research aims to improve the quality of professional education, expand evidence-based care and meaningfully contribute to scientific knowledge (Haldeman 2005; Brink 2006). As such, Brink (2006) highlighted that research should defend professional status and provide scientifically grounded interventions and motivations. It should also contribute to better evidence-based practice (EBP) by examining functional patient outcomes and provide evidence for best decision-making. It should improve practice methods, contribute to public policies concerning the profession and contribute to improved medical aid reimbursement (Portney and Watkins 2009). Furthermore, it should increase the cost effectiveness of treatment, and demonstrate weaknesses and strengths within the profession's health care system (Brink 2006). Ogre (2012) also indicated that research should establish the function of the Chiropractic profession within the Chiropractic health care environment and the role of the individual clinician.

A thorough review of the related literature, studies regarding South African student perceptions of research (Rieder 2010) and South African Chiropractors' perceptions of research (Gordon 2012) have been conducted. No-one has evaluated the Durban University of Technology (DUT) student research agendas or areas of focus and compared these with local and international research trends. The most important suggested areas of focus for Chiropractic research as perceived by professional Chiropractors have also not been investigated. The recommended research agendas of Chiropractors practicing in KwaZulu-Natal, which would prove beneficial to Chiropractic clinical practice, remains unknown. This study investigated the incongruence between the areas of focus of DUT student research and those perceived to be important by Chiropractors in KwaZulu-Natal. The most important areas that should be the focus of Chiropractic research, as recommended in the study

questionnaire, aimed to open doors to new opportunities for further exploration by future Chiropractic students. In respect of the Chiropractic profession, two important questions can therefore be asked:

- What research agendas are perceived as relevant by Chiropractors in KwaZulu-Natal?
- Is the research that all Chiropractic students have to undertake at the DUT congruent with these agendas?

It is a pre-requisite of qualification as a Chiropractor from the DUT that Chiropractic graduates complete a Master's research dissertation (Chiropractic Association of South Africa 2012; Allied Health Professions Council of South Africa – Act 63 of 1982, as amended). Without a Master's degree, a student is unable to qualify as a Chiropractor and is therefore unable to practice Chiropractic in South Africa (Allied Health Professions Council of South Africa – Act 63 of 1982). It was hypothesized that the information from the research questionnaire would provide suggested research agendas for clinically relevant student research in line with international Chiropractic research trends.

When considering the contribution of Chiropractic research to the growth and success of the Chiropractic profession, the need for the uptake of evidence-based medicine (EBM) and research is further highlighted (Haldeman 2005; McCoy 2006). Notwithstanding the above progress, much resistance still exists regarding research into the validity of the profession's subluxation mediators, or detection methods, and very little research has been conducted. Chiropractic research has resulted in better EBM, has increased the quality of available evidence for clinical use, helped with clearer decision-making and improved clinical and patient outcomes (Dagenais *et al*. 2015). Accordingly, the Allopathic medical system is now more inclined to accept Chiropractic as a credible profession (Meeker and Haldeman 2002). Research also meets the demands placed on the system for evidence and nullifies myths and misinterpretations (Nieswiadomy 1993). To this end, EBM is described as "the integration of best research evidence with clinical expertise and patient values" (Sackett *et al.* 1996).

The above aside, Leach (2004) argued that in a maturing profession there is still no consensus on definitive definitions of Chiropractic terms, such as a segmental dysfunction or vertebral subluxation complex (VSC). The VSC, as the model underlying the foundation for Chiropractic theories, should be developed fully. The effects of manipulation on a VSC are unfortunately still not fully measurable, because we lack a clear definition of the VSC and are limited by current research models. To date, notwithstanding our basic biomechanical

understanding of the VSC, there is no evidence of the exact effects of manipulation and its implications. The philosophy and ideology of the Chiropractic profession is suggested as the guide for the fledgling profession (Leach 2004).

Future Chiropractic research into a better understanding of the Chiropractic foundations and theories and establishment of a valid VSC definition is vital. Additionally, continued research efforts into the most promising spinal mediators or subluxation detection methods will result in more effective Chiropractic treatment, better strategies for preventative and maintenance care and validation of Chiropractic techniques (Gottlieb 1997; Lantz 1988; Rupert 2000; Schafer and Faye 1990; Leach 2004).

The question "Where will research lead us?" posed by Leach (2004), remains relevant. Redwood and Cleveland (2003) suggested that congruency of purpose will determine the Chiropractic research agenda, which, while still in its infancy, might be the greatest defining factor of the success or failure of the profession.

1.2 Research Aims and Objectives

The aim of this study was to determine the research agendas perceived to be most relevant by Chiropractors in KwaZulu-Natal and to compare these with the most frequently researched DUT student agendas. Identification of the incongruence between the practitioner perceptions and recommendations, and the student research agendas, aims to open doors for more clinically relevant future student research.

Primary Objectives

The first objective was to determine the research agendas perceived to be most relevant by Chiropractors in KwaZulu-Natal. A descriptive questionnaire (Appendix C) was sent to Chiropractic practitioners who were currently in practice in KwaZulu-Natal as per the AHPCSA list (Terry 2002; Ford 2013). The information was statistically analysed with the help of a statistician. An investigation followed into the practitioners' responses of the foremost research agendas that should be investigated. The relationships between the factors that influenced the practitioners' perception to research, such as demographics and practice profiles, were also investigated. The practitioners were asked to give recommendations for future Chiropractic research. This information was anticipated to provide opportunities for clinically relevant future student research.

The second objective was to determine the main areas of focus of the Chiropractic student research conducted at the DUT between 1994 and 2013. Information was extracted from the Internal Repository and library archives to conduct a descriptive analysis of the student research agendas between 1994 and 2013 (Appendix H).

Secondary Objectives

The third objective was to determine the congruency between the focus of Chiropractic student research completed at the DUT and the research which is perceived to be of the highest professional relevance by Chiropractors in KwaZulu-Natal. The data was statistically analysed and a descriptive analysis followed. The information was discussed in terms of current national and international Chiropractic research trends.

1.3 Study Rationale

The premise of this research was that an overview of the Chiropractic research agendas deemed to be important by Chiropractic professionals who are in practice would give insight into local research trends. An overview of the research completed by Chiropractic students would determine the student research agendas. A comparison of the practitioner and the student research agendas would establish whether or not the DUT Chiropractic students were producing clinically relevant research as determined by Chiropractic practitioners in practice.

A brief look into medical history describes hypotheses that are constantly questioned and tested and rejected through research, and as a result patient care, morbidity and mortality, and the general practice of medicine improve (Leach 2004). Keating and Mootz (1989) maintained that the survival of the Chiropractic profession is dependent on its scientific development and integration. The integration of EBM into Chiropractic practice has resulted in a better quality of available evidence, decision-making and improved clinical and patient outcomes (Dagenais *et al*. 2015).

This study investigated the congruency between the practitioner agenda and that of the students' research agenda, along with international research trends. It was postulated that significant congruency of purpose of research agendas would be highlighted, as suggested by Redwood and Cleveland (2003). This is important, as according to Drennan (2008) there is a paucity of knowledge surrounding the Chiropractic Master's degree coursework. This knowledge was intended to promote a greater insight into the relevance and contribution of the student research projects. The study would determine if student research was in line with South African and international Chiropractic research trends. Future research should be

founded on the research requirements of present day practitioners (Gordon 2012). The research agenda recommended by the Chiropractic professionals was intended **t**o open doors to future student research in South Africa.

1.4 Study Benefits

The study benefits were to give recommendations for more clinically relevant DUT student research. This would result in better use of personal and institutional resources, such as funds, time and professional expertise. More clinically relevant research was anticipated to result in more student research being published. This would more beneficial to the DUT, the researcher and the Chiropractic profession.

1.5 Study Limitations

The questionnaire was assumed to be answered honestly by all respondents. Skewed results may have unfortunately resulted from practitioners answering the questions to please the researcher (Dyer 1997).

The sample size of the population may have been too small to make generalisations of the entire population. The results would therefore not have been an accurate representation of local and international research agendas.

1.6 Conclusion

Chapter One served as an Introduction of the aims, objectives, rationale and limitations of the study. Chapter Two provides a discussion of the Literature Review, giving an overview of pertinent research relating to the research topic. Chapter Three discusses the Research Methodology in which the research design, sampling, inclusion and exclusion criteria, procedures, questionnaire development, data collection and statistical methodology are explained. Chapter Four combines the Results and Discussion sections, and therefore discusses the outcomes of this research. Chapter Five concludes this research and gives recommendations.

Chapter Two: Literature Review

2.1 Introduction to Research

Research is the process of asking a question of interest and discovering the answer. This is achieved by analysing how similar questions have been answered by others (Leach 2004). The question of interest must be explicitly stated and couched in previous research into the same or similar questions. The result is that the question is answered (Leach 2004). In the context of the doctor/patient relationship, this process is as equally evident in the research process as it is in clinical practice (Murphy *et al*. 2008).

The relevant clinical question asked in the research process is the first step in evidence-based practice (EBP). It directs decision-making and thereby impacts on the final clinical outcomes. The use of tradition, common understanding or paradigm within the profession are all factors which influence the decision-making process. Further impacts on the decision-making process are made by trial-and-error approaches, as well as through deductive and inductive reasoning methods (Portney and Watkins 2009). The clinical question that is posed after history taking may be answered by making an assumption or a hypothesis. Ultimately, a theory regarding what may be wrong with the patient can be developed through a physical examination that is composed of measuring and testing. This methodical and stepwise process is known as the Scientific Method (Leach 2004) and is defined as a "systematic, empirical, controlled and critical examination of hypothetical propositions about the associations among natural phenomenon". As stated by Portney and Watkins (2009), this method is "considered the highest form of acquiring knowledge". The testing of the hypothesis requires accurate, reliable and valid measurements of clinical phenomena according to a sound clinical protocol (Leach 2004). The data obtained needs to be described in both a clinical and research-related language. Leach (2004) argued that "Only by understanding the principles of the scientific method and basic statistics can we increase medical validity of the field of Chiropractic". This will ultimately increase the clinical outcomes for the patient.

2.2 Types of Clinical Research

As described by Portney and Watkins (2009), research types can broadly be classified into three groups, according to the purpose and objectives of the research. As per Figure 2.1, these are as follows:

1. Quantitative and qualitative.
2. Basic, applied and translational.
3. Experimental and non-Experimental, which includes exploratory and descriptive research.

(Portney and Watkins 2009).

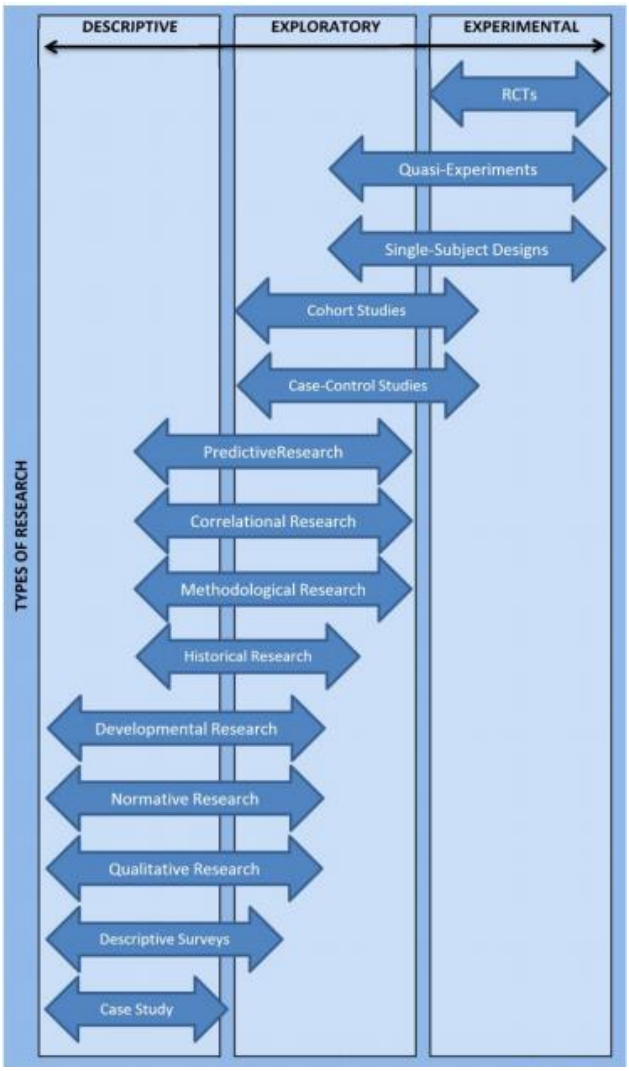

Figure 2.1. Research Types

Diagram adapted from Portney and Watkins (2009).

2.2.1 Quantitative and Qualitative Research

Quantitative research makes use of numerical measurement. Due to this, data can undergo objective statistical analysis and scales can be measured. Conversely, qualitative research makes use of observation, interviews and open-ended questions to gain a better understanding of a state, association, theory or phenomenon (Portney and Watkins 2009). Qualitative research also fits within the descriptive research methodological framework.

2.2.2 Basic, Applied and Translational Research

The role of basic research, also known as bench research, is to obtain new knowledge to test a theory. This can lead to both a practical and functional application of the gained knowledge. In contrast to

basic research, applied research makes use of clinical and practical testing to discover practical application of the theory (Portney and Watkins 2009).

Translational research describes applying basic research findings to a clinical application. In other words, one takes knowledge from "bedside to bench and back to bedside" (Portney and Watkins 2009). This ensures that what is discovered in the laboratories can benefit Chiropractic patients most effectively and timeously in the clinical setting.

2.2.3 Experimental and Non-Experimental Research

Research types can be described as experimental or non-experimental. Non-Experimental research incorporates both exploratory and descriptive research. In real terms there is much overlap between these classifications. Experimental research involves the manipulation of a variable within the research design to gain changes within other variables. In contrast, non-experimental or observational research describes, explores and observes a phenomenon without much manipulation of the design or environment; it simply collects information as it exists naturally. Exploratory research explores relationships between variables and descriptive research describes populations (Portney and Watkins 2009).

2.2.3.1 Experimental Research

Experimental research allows comparisons between results or subjects and recognises the limitations of the experiment. These include randomised controlled trials (RCT's), single-subject designs and quasi-experimental designs. Typically, RCT's make use of a placebo as the control compared with an experimental intervention. It is regarded as the gold standard of designs. Single-subject designs make use of repeated measurements or a response to an intervention over time so that trends, patterns and variability of responses can easily be observed. A baseline measurement is first taken and a subsequent measurement is then taken during the intervention phase, so that cause-and-effect comparisons can be made. Quasi-experimental designs are non-randomised studies where participants are not randomly allocated a group. These studies have less control within the design, but still yield measurable results (Portney and Watkins 2009). Four groups of quasi-experimental designs are employed based on control group and pre-test utilisation. These designs are appropriate for the evaluation of a specific medical intervention or causality. They are often used when subject or location randomisation is not feasible, or where there are either ethical considerations or a small sample group (Harris 2006).

2.2.3.1.1 Design Validity

Experimental research is often limited by the threats to the four different design validities which provide the framework for the evaluation of the experiment. These are as follows:

1. **Statistical Conclusion Validity:** Statistical conclusion validity is the use of statistical procedures for analysing data. When examining the relationship between dependent and independent variables, the validity of the research may come under threat. Factors which may threaten the statistical conclusion validity include inadequate sample size, un-met assumptions and repeated testing with errors. Additional threats include unreliable measurements, environmental influences and un-standardised research protocols. This will limit the study and consequently result in invalid conclusions.
2. **Internal Validity:** The internal validity focuses on the cause and effect relationship between independent and dependent variables that have a statistical relationship. The internal validity is limited by certain factors which may interfere with this relationship. These are as follows:
    a. Single Group Threats: These threats include the influence of events unrelated to the experiment that occur during the history of the experiment. Subject maturation, subject dropout, the effect of repeated testing and the reliability of measurement tools are included in this group.
    b. Multiple Group Threats: These are factors outside of the experiment that influence the post-test results between groups. Differing group maturation speeds and inconsistent testing across the groups need to be considered.
    c. Social Threats: These include the influence of interaction between subjects, investigators and the control groups when blinding is impossible. This results in imitation of the treatment on the part of the control group. Subsequently, equalisation of the treatment by the investigators and demoralisation of the respondents occurs.
3. **Construct Validity:** Construct validity examines how well the experimental results can be generalised into theoretical conceptualisations. Threats to construct validity relate to biases introduced into the research study. These include the testing of one treatment form or measurement in a multi-dimensional situation, as well as making generalisations. In addition, testing over unrelated time frames, experimental bias and multiple-treatment interactions can introduce bias into the study.
4. **External Validity:** The extent to which the study results can be generalised to other settings, times and people that fall outside of the experiment sample, can be threatened. Additionally, the interaction of the treatment and study subject as well as the experiment setting may negatively influence the validity of the research. Furthermore, the interaction of the treatment and time in history when the experiment was carried out pose threats to the study validity.

(Portney and Watkins 2009)

Quasi-experimental research and single-subject research are included within both experimental and non-experimental types of research. Quasi-experimental research is less generalisable than experimental research. It has limited control over extraneous factors which leads to an increased

threat to the internal validity. The value of the research should not be dismissed, however, as it is often more applicable to the clinical situation and individual patient than any experimental research that is performed (Portney and Watkins 2009).

Single-subject research allows for the evaluation of an intervention within the clinical context. Observation of the patient's behaviour and responses to the intervention as they occur in real time add value to this research. The research can be clinically replicated by the Chiropractor in an evidence-based practice setting. Furthermore, these studies promote discovery into new clinical application and empirical hypothesis. The limitations of the research include lengthy documentation of the outcomes and unstable patient responses. Inconsistency of the findings due to data analysis discrepancies can also occur. In addition, inappropriate lengths of time are often required for the measurement of the baseline values in acute situations. All of the above compound to make this research less clinically viable (Portney and Watkins 2009).

2.2.3.2 Non-Experimental, Exploratory Research

Exploratory research includes the research types listed below:

a) **Cohort studies:** These studies monitor a population to establish incidence and outcome following exposure to a factor. They can be prospective or retrospective studies.
b) **Case-control studies:** Epidemiological in nature, these studies analyse exposure to factors within a population and control group. They thereby establish risk factors.
c) **Correlational studies:** In these studies relationships are explored and predictions are made.
d) **Predictive studies:** As their name suggests, these studies recognise relationships and associations. These studies are very valuable in healthcare research.
e) **Methodological studies:** This study type demonstrates validity and reliability. It improves research methodologies so as to answer research questions more accurately.
f) **Historical studies:** Studies that analyse events that occurred in the past.

(Portney and Watkins 2009)

Exploratory research gives insight onto the relationship of variables in nature. Unfortunately, cause-and-effect cannot be demonstrated due to bias in the data. Measurements are uncontrolled and many influencing factors, not under the control of the researcher, influence the research outcomes. Correlational analysis of relationships is often difficult to establish. The psychological, physical, social, environmental and behavioural interactions make the correlations of the variables complex. Conversely, these studies are of value in their clinical application. Clinical phenomena are afforded explanations that would not be possible in experimental studies (Portney and Watkins 2009).

2.2.3.3 Non-experimental, Descriptive Research

Descriptive research, in contrast to experimental research, describes the fundamental existence of a phenomenon and behaviour of the natural world. This invaluable formative information is used for test purposes in the experimental design.

The listed types of research below are included within descriptive research.

a) **Developmental studies:** A map is made of the natural progression or changes within a phenomenon, circumstance or population.
b) **Normative studies:** Normal values which act as baseline comparatives are provided.
c) **Qualitative and Descriptive studies:** Human behaviour, attitudes and perceptions are examined. The result is a better understanding of a population or experience.
d) **Case studies:** The full experience of an individual or population when exposed to an experiment or intervention is examined.

(Portney and Watkins 2009)

Descriptive research proves limiting in its inability to describe cause-and-effect relationships. This is due to a lack of randomisation of the variables. These studies do, however, prove invaluable in explaining and characterising variables. The differing responses between subjects are better understood. This invariably contributes to a better understanding of the clinical trial benefits.

2.3 Perceptions and Research

2.3.1 The Concept of Perception

Chaffee (1997) described the concept of perception as the way the way the world is viewed. This is the active and automatic selection of which sensations to focus on. This complex selection is mostly based on one's needs, emotions, interests, and that which has caught our attention (Chaffee 1997; Milton 1981). Our sensitivity to stimuli selectively filters that to which we respond. Sensations are then organised into familiar patterns and the meaning therein is subsequently interpreted (Chaffee 1997; Robbins 1996; Milton 1981). This is the determinant of favourable or unfavourable behaviour (Milton 1981). Our perceptions are influenced, distorted and biased by a combination of past experiences, personalities and emotional complexities (Chaffee 1997; Robbins 1996; Milton 1981). In light of the above statements, it becomes clear that in order to understand South African Chiropractors' perception of research then we need to understand those factors that influence perception.

2.3.2 Factors that affect Perception

Robbins (1996), Milton (1981) and Bergh and Theron (1999) described three main areas of perception that influence the way in which one perceives the world. Our perceptions are fundamentally shaped by:

1. The attributes of the perceiver (e.g. the Chiropractor).
2. The object or target being perceived (e.g. Chiropractic research agendas).
3. The context of the situation or environment in which the object of perception is viewed.

(Robbins 1996; Milton 1981; Bergh and Theron 1999).

2.3.2.1 Factors in the Perceiver

The perceptions of the Chiropractic sample population in this study were subject to the influence of a host of factors specific to the South African context. Rieder (2010) found that age, gender and ethnicity were influential in the South African Chiropractors' perceptions of research. Additionally, the level of education and the socio-economic and cultural upbringing of the Chiropractor contributed to their perceptions of research.

Student studies conducted at the DUT have expanded on the locally relevant influential factors in the perceiver (i.e. the Chiropractor). These include the items below and highlight some of the factors which have contributed to the perceptions of South African Chiropractors.

1. The investigation into the perception, knowledge and utilisation and role of Chiropractic (Ford 2013; Ralekwa 2010; Wise 2010; Maharajh 2010; Keeter 2010 Maharaj 2009; Labuschagne 2009; Meyer 2009; Bar-Gil 2009l; Botha 2009; Deonaran 2009) .
2. The referral of patients between Chiropractors (Slabbert 2013).
3. Studies on the perceptions of Chiropractic research (Gordon 2012; Rieder 2010; Snow 2013; Bosman 2012; Taverner 2011).

The Chiropractors' personal attitudes towards research, their motives and personal interests influence the focus of their attention and ultimately their perception (Robbins 1996; Milton 1981; Hayes 1994). Motives or needs are two of the most influential motivations in the selective perception of reality, as are the influences of past experiences of an object or event (Robbins 1996; Milton 1981; Hayes 1994). They either intensify the perception should there be no past experience of the event, or diminish its interest. Added to past experiences are personal expectations, which dramatically shape our perception of the perceived object, often attributing characteristics to an object which do not in reality exist (Robbins 1996; Milton 1981; Hayes 1994). Hayes (1994) described the 'top down' approach to perception formation, which includes all the factors that influence the perceiver in the shaping of their perceptions.

Inanimate objects are perceived differently from how people are judged by the perceiver. Essentially, people are automatically judged by the perceiver according to their behaviour (Robbins 1996). The Attribution Theory explains how peoples' behaviour is attributed to internal or external conditions and how their actions are subsequently judged. Oftentimes, internal factors are weighed more than external factors, resulting in a fundamental attribution error (Robbins 1996; Milton 1981). Behaviour is often perceived based on non-observable, single attributes rather than through viewing the situation in its multi-factorial context (Milton 1981).

The observable traits, gender and status of a person are often incorrectly used to judge the person's behaviour (Milton 1981). The perceiver may also suffer self-serving bias towards their own successes and failures, subsequently projecting their own attributes onto others. This serves to further distort perceptions (Robbins 1996; Milton 1981). The assumptions about a person, object or situation heavily influence the expectations of it. Consequently, what is expected often results in an untrue perception (Milton 1981). Added to this, the perceiver can implement the halo effect in a non-random fashion. This effect results in inappropriate positive judgements of others' behaviour based upon the observers' cognitive bias. Akin to stereotyping, a single factor is then generalised into overall assumptions about the person (Robbins 1996, Milton 1981).

2.3.2.1 Factors in the Perceiver:

a) Age, Gender and Ethnicity

Increased age has been identified with a greater awareness of the need for research and confidence in conducting Chiropractic research (Zhang 1996; Ditcher and Tetley 1999; Martin 2001; *et al.* 2001). The literature to date is conflicting in relation to attitudes towards Chiropractic research based on gender. Some studies reveal a more positive attitude towards research in females and a greater female participation in research (Martin, Machlachlin and Karmel 2001; Bills 2003; Woodfeild, Jessop and MacMillan 2006; Krupat *et al.* 1999; Haldeman 2005; Brown *et al.* 2007). Others, however, show that females have a more negative perception of research and are less confident in the conduction thereof (Newell and Cunliffe 2003; Meelissen and Drent 2008; Wright and Cochrane 2000). Both Black (2008) and Rieder (2010) have hypothesised that in the future the Chiropractic professional population would be mainly female.

2.3.2.1 Factors in the Perceiver:

b) Socio-Economic Status

The perception of Chiropractic research is largely influenced by ethnicity and socio-economic status. This is particularly clear within the South African context (Rieder 2010). Due to a lack of research exposure and negative attitudes towards education and financial difficulties, the previously disadvantaged populations have shown a negative attitude toward research (Ellis 2001; Rattan 2006; Spours 1996; Pretorious and Le Roux 1998; De Beer 2005; Creighton 2007; Mazloomdoost *et al.* 2007, Nora 2001, Tinto 1999; Wright and Cochrane 2000). In contrast to the above, some studies have revealed that the desire to improve upon socio-economic standing has a positive influence on perceptions to research (Makuakane-Drechsel and Hagedorn 2000)

2.3.2.1 Factors in the Perceiver:

c) Level of Education

The higher the level of education of the perceiver, the more positive the perception of research due to factors such as better time management, coping mechanisms and academic literacy skills (Grant 2006; Lazarus and Folkman 1984; Mouton 2001). Chiropractors who had obtained a qualification before entering the Chiropractic course demonstrated these attributes and were better equipped to conduct research (Gordon 2012). Newell and Cunliffe (2003) attributed increased exposure to research from subsequent qualifications with a more positive attitude towards research. Gordon (2010) and Rodgers (2000) found a correlation between a higher level of education and higher research utilisation.

2.3.2.2 Factors in the Perceived Object

Targets or objects of observation are rarely observed in isolation (Robbins 1996). We organise and interpret the object in relation to its background and proximity to other objects due to physical similarity or a relation in time. This heavily influences how we view the object (Robbins 1996). We often group unrelated events, people and inanimate objects which are, in reality, unrelated (Robbins 1996; Milton 1981).

The perceptions of Chiropractic research are under the influence of factors in the perceived object. These factors include history; self-imposed barriers; proximity; barriers to accessibility; novelty; background; research education; motion and size (Robbins 1996; Berg and Theron 1999; Hayes 1994). The difficult and stunted history of both the Chiropractic profession (Coulter 1992; Wardwell 1994) and the slow integration of EBM into the profession has negatively influenced perceptions of research.

2.3.2.2 Factors in the Perceived Object:

a) History and Self-Imposed Barriers

The negative historical Chiropractic professional outlook of separation and superiority to allopathic medicine and the lack of integration of EBM built self-imposed barriers to research locally and internationally, greatly hindering the professions' validation, acceptance and integration (Haldeman 2005; Chapman-Smith 2000; Villanueva-Russell 2005; Keating 1992).

2.3.2.2 Factors in the Perceived Object:

b) Proximity and Novelty

Rieder (2010) found that a lack of proximity or exposure to Chiropractic research has negatively affected perceptions of research in South African Chiropractic graduates (Rieder 2010). Conversely, Gordon (2012) established that South African Chiropractic graduates had more positive attitudes towards research and higher levels of research utilisation following extensive research training. Newell and Cunliffe (2003) found more positive attitudes in undergraduates with previous research experience. The novelty, or 'newness' of Chiropractic research is assumed to positively influence perceptions to Chiropractic research and inspire expansion of the Chiropractic research agenda (Rieder 2010).

2.3.2.2 Factors in the Perceived Object:

c) Background

The backgrounds of the Chiropractors participating in the study will have an influence on the perceptions and recommendation outcomes. Chiropractors who have qualified from the DUT Chiropractic Master's programme have met both the Allied Health Professions guidelines and the stipulations of the World Health Organization (WHO) regarding extensive research training towards a partial Master's dissertation, as a pre-requisite of qualification. Nonetheless, Rieder (2010) found that the DUT Chiropractic students lacked confidence to perform research and lacked research skills. The students also had negative perceptions towards research and would choose not to perform research again in the future. From this it can be asserted that recent South African graduates place less importance on research than Chiropractors from previous generations who heavily relied on research to validate the profession. This is a direct result of the late integration and acceptance of the Chiropractic profession by the medical fraternity (Brantingham and Snyder 1999; Chapman-Smith 2000) and the late opening of the first South African Chiropractic training institution in 1989.

The above assertion is in opposition to the findings of Gordon (2012), who discovered a very positive perception of Chiropractic research held by South African Chiropractors when compared with graduates from other countries. This is a direct result of their increased research education and

research experience (Newell and Cunliffe 2003; Rodgers 2000). Gordon (2012), along with Schwarz and Honduras (2007), hypothesised that modern-day Chiropractors would place increasing value on research as a source of professional substantiation, validation and personal empowerment. This was based on the increased international acceptance of Chiropractic and changing medical and public perceptions of the Chiropractic profession (Chapman-Smith 2000). Improved educational standards for Chiropractic training institutions, a greater focus on evidence-based research within the Chiropractic profession and contributions toward greater professional acceptance and understanding from researchers, such as Coulter and Kelner, have further substantiated these hypotheses (Haldeman 2005). The outcomes of this study are in accordance with these findings, as it is clearly evident that the bulk of the respondents perceived improved Chiropractic abilities due to their research experience.

2.3.2.2 Factors in the Perceived Object:

d) Motion

Motion refers to the movement in support of Chiropractic research. This increased support is largely because Complementary and Alternative Medicine (CAM) professions have been highly influenced by EBM. The increased production of high quality, relevant research within the Chiropractic profession over the last 20 years has highly influenced the movement toward better research perceptions (Newell and Cunliffe 2003). The recently pioneered national and international Chiropractic research trends investigated in this study succinctly highlight the overall expansion of the research agenda.

2.3.2.2 Factors in the Perceived Object:

e) Size

The increased size, or demand, for Chiropractic research is anticipated to increase exposure and perceptions of Chiropractic research. Internationally, inadequate research training has resulted in negative perceptions of research (Zhang 1996; Aslam *et al.* 2004). In contrast, increased research training has resulted in more positive perceptions of research (Harrison, Lowery and Bailey 1991; Hakansson *et al.* 2005; Marusic and Marusic 2003; Newell and Cunliff 2003). Zhang (1996) emphatically places the responsibility for continuing both the growth and the demand for clinically relevant research in the hands of future Chiropractic graduates and practitioners.

2.3.2.3 Factors in the Environment:

a) Chiropractic Specific Historical Influences

Hayes (1994) described the external environmental or situational factors that contribute to the formation of perceptions as the ‘bottom up’ approach to perception formation. The EBM movement and the resultant effect on CAM progress and credibility have positively influenced perceptions of

research (Rieder 2010). Conversely, the conflict between the medical and Chiropractic fraternities around research implementation and the dogmatic protection of the philosophy of Chiropractic by the founders of the Chiropractic profession have historically had a negative influence on the perception of research within the profession (Rieder 2010).

The work setting, social setting and time at which the object is observed can shape our perception of the object even if all factors of both object and perceiver remained unchanged (Robbins 1996). The situational context relating to the observation of, and attention given to, an object changes our perception of the object entirely (Robbins 1996). In this respect, the situational positioning of the study respondents combined with their needs have shaped their perception of the environment (Milton 1981).

Gordon (2012) and Rieder (2010) described South African environmental factors that specifically influence perceptions to Chiropractic research. These included the cumulative effects of the following:

- Development of EBM and its effects on the CAM professions.
- The historical conflict between the Chiropractic and allopathic profession.
- The philosophy of the Chiropractic profession.
- The influence of the doctor patient experience.
- The influence of research training.

Also of consideration are environmental factors within a South African context, such as community, family, culture and socio-economic status. All of these combine to highly influence individual perceptions (Rattan 2007).

2.3.2.3 Factors in the Environment:

b) The Influence of the Development of EBM and the Chiropractic and Allopathic Conflict

Research agendas have been the topic of debate since the early days of Chiropractic (Leach 2004). Researchers such as Watkins (1994) and Haldeman (2005) advocated the implementation of the scientific method as the authoritative source for Chiropractic knowledge, education, philosophy and practice. The National College of Chiropractic launched the Journal of Manipulative and Physiological Therapeutics (JMPT) as early as 1978, which was quickly followed by other peer-reviewed Chiropractic periodicals and special interest journals (Haldeman 2005). Evidence of the growth of Chiropractic as a science is expanding (Leach 2004). Increased contributions to Chiropractic journals and the development of the Centre for Chiropractic Research in 1998 have further expanded awareness of the profession (Leach 2004). Leach (2004) also anticipated that the

mounting evidence of the efficacy and cost-effectiveness of Chiropractic care would lead to increased research funding.

Haldeman (2005) and McCoy (2008) also advocated the need for the uptake of EBM and research, based on the considerable contribution research has made to the Chiropractic professions' continued growth and success. The above progress aside, there is still resistance to research into the validity of Chiropractic subluxation detection methods. Very little Chiropractic research is conducted overall and Chiropractic research contributions still fall far short in comparison to those of the allopathic profession.

There is a clear indication that increased Chiropractic research will be required in the future (Meeker and Haldeman 2002). This is important, as the development of EBM to date has resulted in better patient outcomes. This is largely based on increased research and sound clinical experience (Nelson *et al.* 2005). These two factors have motivated the Chiropractic profession to provide validation of its claims to the allopathic profession, medical aids and the wider public (Villanueva-Russell 2005; Haynes 1999; Eisenberg *et al.* 1993; Eisenberg *et al.* 1998). Added to this, the ostracism of Chiropractic by the American Medical Association (AMA) has forced the Chiropractic profession to formalise its education, practice and research and engage more readily in EBM (Kaptchuck and Eisenberg 1998; Wilk 1987; Chapman-Smith 2000). It can be said, however, that the isolation caused by this exclusion has hindered both the integration of research into the Chiropractic profession and the wider perceptions of research within the profession (Keating 1992; Eisenberg *et al.* 1998; Meeker and Haldeman 2002).

2.3.2.3 Factors in the Environment:

c) The Influence of the Chiropractic Philosophical Outlook

The self-isolation and negative historical attitudes toward research within the profession were based largely on the philosophical outlook that the profession was separate and superior to allopathic medicine, and that positive patient experience, case studies and testimonials were validation enough for the professions' acceptance and integration (Haldeman 2005; Chapman-Smith 2000; Villanueva-Russell 2005; Keating 1992). The validation of Chiropractic subluxation theories in a philosophically divided Chiropractic profession has played a major role in stunting scientific growth within the profession (Leach 2004; Villaneuva-Russell 2005). Watkins (1994) is cited as saying: "recognised sciences base their methods not upon philosophy or theory but upon specific facts demonstrated in practice through clinical research" (Keating 1995). Leach (2004) suggested this to be vital for improving patient health and safe practice procedures. Anderson (1999) also suggested that the validation of the Chiropractic professions' theories are critically important in ensuring that the profession is seen as an alternative to orthodox medicine, and not just another alternative therapy.

The failed attempt at the reconciliation of practice guidelines within the Chiropractic profession is ongoing (Leach 2004). The two schools of thought that remain divided are as follows:

1. The school where Chiropractic clinical practice has a broad-based approach as its foundation.
2. The school of thought that bases Chiropractic clinical practice on research founded on scientific evidence only.

The Mercy Centre Consensus Conference gathered in 1992 to reach a consensus on a set of practice guidelines for Chiropractic which would outline the implementation of scientific research for the validation of the use of a test or procedure to be used in practice. This group allowed for clinical opinion to support the use of Chiropractic methods used in practice in the absence of scientific research. This broad-based approach is reflected in practice by the utilisation of wellness strategies, nutritional considerations and physiotherapeutic utilisation. In 1995 this was challenged by an alternative set of guidelines by the Council on Chiropractic Practice (CCP). This new set of guidelines only supported the practice of Chiropractic which could be based on the findings from randomised controlled trials (RCT's). In this group, the focus of the profession was on the philosophy and practice of subluxation-based practice based on scientific results only. It can be anticipated that the use of any single approach to research presents with its own pro's and con's. In reality, each and every individual doctor/patient encounter is influenced by a number of factors that cannot be accounted for by the influence of the philosophical stance of the practitioner. These factors include the patients' perceptions and medical and psychological history, the practitioners' past experiences, the environment and the pathogenic stage of the disease.

Murphy (2008) therefore suggested that EBP should be a cumulative gathering of information. Qualitative findings as reported in the patients' history, the quantitative physical examination assessment of the patient by the practitioner, as well as a contextualisation of what is actually known within the published research, should all contribute to Chiropractic practice guidelines. Is it after all possible that research is not focusing enough on clinical outcomes and therefore not providing the context for clinical practice? It can be argued that the lack of ability to agree on practice guidelines is a direct result of the vastly differing clinical practice and research outcomes.

In contrast to Chiropractic, allopathic medicine appears to be philosophically united. Despite the natural differences in opinion about what constitutes sound EBP, it is never questioned whether the practice should be evidence-based (Leach 2004). Portney and Watkins (2009) suggested that within the Allopathic medical profession there is a responsibility for the practitioner to explore the implications of the profession, practice a more organised EBP, and make use of a scientific support framework. In stark contrast, EBP and a scientific attitude does not seem to be encouraged within the Chiropractic community (Rosner 1997; Richardson 2007). Ultimately, the community should be

promoting research based on current and reliable literature, clinical competency and patient requirements in order to promote the best patient care (Johnson 2005). Within the Chiropractic community there are arguments that the use of the RCT does not adequately capture the clinical encounter and its healing properties. It can thus be argued that scientific evidence based on RCT's is not the most appropriate for the Chiropractic profession (Rosner 1997; Richardson 2007). In opposition to this, Murphy (2008) suggested EBP in a clinical setting to be a combination of clinical experience, patient contributions and research findings as applied to the clinical encounter. In concordance, Strauss *et al.* (2005) described EBP as "the integration of best research evidence with our clinical expertise and our patient's unique values and circumstances."

2.3.2.3 Factors in the Environment:

d) The Influence of the Doctor-Patient Experience

It was previously believed that positive patient experience was all the proof needed to support the use of the Chiropractic method (Villaneuva-Russell 2005). Evidence-based treatment backed by scientific methods was not encouraged. The dissociation of the profession from medicine due to fear of incarceration and superior perception of the profession (Chapman-Smith 2000; Haldeman 2005) led to the profession developing separately from medicine (Keating 1992). Following the slow integration of research into the Chiropractic profession, the current need for research as a major contributing factor in the profession's growth is clear (Haldeman 2005; Rieder 2010).

More recently, it has been appreciated that the influence of the practice setting on patient outcomes and the doctor/patient interaction warrants consideration when reviewing the outcomes of Chiropractic research (Rosner 1997; Richardson 2007; Vernon 1991; Jamison 1997, 1998 and 2004). The environment in which the research is performed and all other non-specific therapeutic effects of Chiropractic treatment are also factors that influence the research results. Untestable hypotheses due to the constraints of modern medicine and the limitations of the previously discussed research types are also of consideration. These include the immeasurability of somatoautonomic reflexes in vivo, as we cannot connect the subluxation to the dysfunction and, therefore, cannot measure the subsequent changes within the patient. Compromised organic function and overall health without obvious symptoms, as a sequelae of the VSC, occurs in the so called 'silent subluxations', also warrants investigation (Leach 2004).

In contrast to decision-making based on the patient doctor experience, Sawyer *et al.* (1997) advocated the use of RCT's above all other measurement tools to evaluate the efficacy of Chiropractic treatment techniques, specifically in comparison to para-medical and allopathic treatment. The RCT was also recommended to test the outcomes of patient management. This resulted in a worldwide spinoff effect to other countries where EBP was not readily utilised within the Chiropractic profession. There

was evidently a need for trials that are specific to conditions, diagnostic and analytical procedures and therapy use. Over and above this, the lack of consensus on the definition of the subluxation with regard to the validation of Chiropractic theories is recognised as an ongoing challenge (Sawyer *et al.* 1997).

The National Workshop to Develop the Chiropractic Research Agenda (NWCRA) held in the United States of America (USA) in 1996 targeted research outcomes; educational, clinical and health services; and basic sciences. According to Leach (2004) this was only the initial step toward developing consensus on research priorities; there is a need to follow a developmental process that includes more varied clinical scenarios. A research agenda that adopts minimum processes and procedures for the validation of its theories and outcomes is essential. He argued that the validation of Chiropractic research will greatly improve patient care, acceptance of the profession and financial remuneration. Further, he viewed better Chiropractic patient care as the primary reason for doing research. Also of consideration is our obligation as a profession to avoid funding and resource wastefulness, unnecessary trials to justify false theories, and the prevention of patient exposure to unnecessary risks (Leach 2004).

Improvements to practice methods and functional outcomes are the result of sound clinical research and are viewed as the hallmark of a mature and responsible healthcare profession (Portney and Watkins 2009). Patient care is proposed to become more standardised and the Chiropractic profession more unified (Leach 2004). Portney and Watkins (2009) argued that the quality of patient care depends on choices and decisions made that are based on scientific knowledge and the best scientific evidence available at the time. They stated that "The ultimate purpose of a profession is to develop a knowledge base that will maximize the effectiveness of practice". Over and above this, the unification within the Chiropractic profession necessitates the inclusion of practice priorities that are often excluded from research, such as patient preference, subjective input, the clinical experience of the practitioner, and the context of the patient doctor interaction (Murphy 2007). In contrast to the purely scientific allopathic approach, clinical competency and patient requirements (Hawk 2004) are widely regarded by the Chiropractic community as the foremost contributors to best patient management and best outcomes (Johnson 2005).

2.3.2.3 Factors in the Environment:

e) The Influence of Research Training

As previously stated, prior research training, confidence and exposure to research in South Africa and world-wide have highly influenced local perceptions of research (Rieder 2010). Gordon (2012) established that South African Chiropractors had an overall positive perception of research. Positive attitudes to research are found to encourage participation in future research (Cull *et al.* 2003). The

respondents in this study viewed their personal research experiences as positively contributing to their patient outcomes.

2.4 The Need for Research

It is suggested that research into familiar predictors of the quality of Chiropractic care, such as patient satisfaction, is much more readily investigated than the unfamiliar and un-validated VSC mediators, such as surface electromyography (EMG) or radiographic correlations to spinal dysfunction. Studies into the most widely used mediators and not the most promising are more abundant and do not positively serve the validity testing of our professions mediating variables and theories. Research is also largely based on tests that are easier to conduct. Unfortunately the historical or traditional value placed on a spinal mediator has also influenced further research into its validity (Leach 2004). There exists a genuine need by the individual Chiropractor, society, government and insurance stakeholders to conduct further research into spinal mediators to maintain an EBP and profession (Leach 2004; Walker and Buchbinder 1997).

As previously mentioned, future Chiropractic research that promotes a better understanding of the Chiropractic professions' fundamental foundations and theories will therefore positively contribute to the professions growth and development. The same can be said for the establishment of a valid VSC definition. Furthermore, Chiropractic research focusing on Chiropractic subluxation detection methods is anticipated to provide better strategies for preventative and maintenance care. This will further validate the Chiropractic treatment techniques and increase the effectiveness of Chiropractic treatment (Gottlieb 1997; Lantz 1988; Rupert 2000; Schafer and Faye 1990; Leach 2004).

The practice of better EBM has resulted from an increased uptake of Chiropractic research efforts. This has also resulted in clearer clinical decision-making within a clinical setting and increased the quality of available evidence for clinical use. Improved clinical and patient outcomes have also been attributed to recently increased Chiropractic research efforts (Dagenais and Haldeman 2008 and 2012). Sacket (1997) described EBP as patient care based on the best evidence. The translation of published Chiropractic evidence into clinical practice is paramount for best clinical outcomes. The practitioner's utilisation of the best available evidence, the practitioner's level of clinical experience and the amount of information that the patient imparts into the system so that the context of the clinical encounter is also considered, needs to be considered within the Chiropractic context (Murphy *et al*. 2008; Johnson 2005). The integration of research and EBM into the profession has been suggested to determine the future of Chiropractic as a scientific model and its acceptance by the allopathic medical system (Meeker and Haldeman 2002). This is accomplished by standardising patient care and unification within the profession (Leach 2004).

Chiropractic research is anticipated to improve and guarantee the quality of Chiropractic health care and to define, develop and make the profession more publically acceptable. Both Haldeman (2005) and Brink (2006) suggested that future Chiropractic research should improve upon the quality of the professions' education, expand evidence-based care and meaningfully contribute to scientific knowledge (Haldeman 2005; Brink 2006). Accordingly, Brink (2006) advocated that research increases the cost effectiveness of Chiropractic treatment, defends the professions' status and provides the best EBP interventions and motivations. It should also demonstrate the weaknesses and strengths within the Chiropractic health care system (Brink 2006). Leboeuf-Yde (2004) also suggested that better public relations are encouraged with increased research efforts. Portney and Watkins (2009) further clarified that research contributes to improved EBP, improved practice methods, contributes to public policies concerning the profession and contributes to improved reimbursement. Furthermore, Ogre (2012) suggests that increased Chiropractic research efforts will better promote the responsibility of the Chiropractic profession within the health care environment and the individual role of the Chiropractic practitioner in clinical practice.

2.4.1 Future Chiropractic Research

Leach (2004) argued that as the foundation for Chiropractic theory, it is vital that the VSC model be defined and developed fully. He also stated that the barriers to evidence-based research acceptance be abolished. To date we still lack a clear definition of the VSC, are limited by current research models, and have no evidence of the exact effects and implications of manipulation. In order to improve this situation, it is proposed that the philosophy and ideology of the Chiropractic profession is utilised as the guide for research agendas within the profession.

The Association for Chiropractic Colleges (ACC) (1997) philosophy, mission statements and definitions of Chiropractic focuses on the improvement of health, with particular emphasis on the subluxation. The ACC position papers that were born of consensus (1997) stated that,

> Chiropractic is a healthcare discipline that emphasizes the inherent recuperative power of the body to heal itself without drugs or surgery (Leach 2004). The practice of Chiropractic focuses on the relationship between structure (primarily the spine) and function (as co-ordinated by the nervous system), and how that relationship affects the preservation and restoration of health. In addition, Doctors of Chiropractic recognise the value and responsibility of working in co-operation with other health care practitioners when in the best interest of the patient (ACC 1997).

This alone offers a host of questions that provide further Chiropractic research opportunities. We are encouraged to ask how the inherent healing happens, how the spine and nervous system are involved and how health is restored. Focus group research between Chiropractors and their medical counterparts is inherently opened for exploration by this ideology and, very importantly, subluxation based research is encouraged (Leach 2004).

Research into the Chiropractic basic science of the VSC mechanisms and response to Chiropractic manipulative techniques is crucial (Brennan *et al*. 1997; Leach 2004). Animal studies on afferent nerve modulation due to vertebral subluxation (Bolton 2000); immune deficit due to posterior joint dysfunction (Brennan 1997); and association of muscular pain to headaches (Hu, Vernon and Tatourian 1995), directs us to good animal model evidence of biological mechanism linking VSC to system dysfunction. Brennan (2000) suggested a great need for human subject studies that are replicable, published and peer-reviewed. Investigation into the role of the VSC in myopathology, immune dysfunction, neural facilitation and organ functionality is advocated (Leach 2004). The research of Cramer, Tucj and Knudsen (2000) into Zygopophyseal joint changes following Chiropractic side-posture manipulation encourages further study into the same technique for low back pain (LBP) conditions (Cramer, Tucj and Knudsen 2000; Leach 2004). Further areas of investigation proposed by Leach (2004) included the effect of functional inflammatory and structural articular changes on neuropathology and the subsequent effects on system function and overall wellness.

In a review of the prioritisation of Chiropractic research agendas by the USA Public Health Service (PHS), six recommendations were made (Leach 2004):

1. Investigation into the financial, social, psychological and professional barriers to Chiropractic usage.
2. The development of explanatory models on the use of Chiropractic.
3. Research into Chiropractic overall treatment and individual procedural cost-effectiveness is recommended as an important professional goal.
4. The need for the development of predictors of the quality of Chiropractic treatment
5. Testing of valid measurement tools, such as algometry, range of motion (ROM) testing and surface EMG testing.
6. Investigation into patient, provider and purchaser service satisfaction.

In a clinical context biased medical opinion, the medical boycott of Chiropractic treatment, and the lack of quality Chiropractic research necessitates the need for further clinical investigations and defence of research findings by the Chiropractic profession. Further studies into the efficacy of Chiropractic treatment for acute and chronic LBP; migraine; attention deficit hyperactivity (ADH); colic; dysmenorrhea; sciatica; disc syndromes; pregnancy-related back pain; cervicogenic headache; fibromyalgia; duodenal ulcers; and essential hypertension, are necessary (Leach 2004).

Future research needs to address the lack of evidence and research on the validity of VSC-mediating variables or subluxation detection methods used in Chiropractic care and predictors of quality of patient care (Leach 2004). Research of the most promising spinal mediators of VSC is important for the advancement of the profession and for improving patient outcomes. These should be high on the research agenda (Leach 2004). Haldeman (2005) described unanswered questions pertaining to

intensity, duration, relative cost-effectiveness, associated modalities and the best form of spinal manipulation as fields of further research. He also described a treatment algorithm for non-musculoskeletal disorders that warrants further investigation (Haldeman 2005). Additionally, numerous studies on detection strategies of subluxation, such as leg length tests and orthopaedic and neurological tests, show poor inter- and intra-examiner reliability and warrant RCT investigation (Hawk, Phongohua and Bleeker 1999; Keating, Bergman and Jacobs 1990; Schleifer, Keifer and Hagen 1995; French, Green and Forbes 2000).

Previous promising studies on fixations using intersegmental ROM changes; paraspinal stiffness; pain and devices such as CROM (cervical range of motion), BROM (back range of motion), CA-6000 Spine Motion Analyser and PulStar devices, open doors for further investigation into fixations as an important clinical outcome predictor (Nyiendo and Haldeman 1987; Hickey, Rondeau and Corrente 2000; Jordan 2000; Breum, Wiberg and Bolton 1995; Christensen and Nilsson 1998; Leach, Parker and Veal 2003; Fjellner, Bexander and Faleij 1999; Haas *et al.* 1995; Nansel *et al.* 1989). Future RCT's investigating pressure pain thresholds (PPTs), or paraspinal muscle tenderness, and paraspinal muscle spasm and rigidity as measurements of spinal dysfunction within the VSC is highly recommended (Leach 2004).

Boline, Haas and Meyer (1993) and Christensen, Vach and Vach (2002) found that palpatory techniques for pain and tenderness were the most reliable measure of spinal dysfunction. Further palpatory skill training has been shown to greatly improve this measurement tool (Hubka and Phelan 1994; Nilsson 1995). Studies into the use of algometry to measure myopathy and PTT's and the correlation of radiographic findings to PTT's warrant further investigation (Fischer 1986 and 1987; Vernon, Aker and Burns 1990; Leach, Owens and Giesen 1993; Harrison *et al.* 2002; Harrison, Jackson and Troyanovich 1994; Wallace *et al.* 1994). Trials of surface EMG and dermothermograph scanning show correlation to back pain, myopathy and spinal dysfunction, and indicate a need for further RCT's (Plaugher *et al.* 1991; Meyer 1994; Triano and Schultz 1987; Owens and Hosek 1994; McGorry *et al.* 2001).

The reliability and widespread use of radiography as a subluxation detection measure of clinical outcomes warrants further RCT's (Leach 2004; Harrison 2002; Seemann 1999; Owens 1992; Plaugher, Hendricks and Doble 1993; Peterson *et al.* 1999; Troyanovich, Harrison and Harrison 1999; Sigler and Howe 1988; Rochester 1994). Leach (2004) suggested that RCT's examining the use of Chiropractic in the treatment of cervicogenic headache could be measured with correlating findings from radiological cervical hyperlordosis measurement, PPT algometry readings and a headache diary. Other recommendations include RCT's into the correlation of cervical hypolordosis and chronic osteoarthritis, as well as of whiplash-induced radiographic instability and chronic neck pain (Leach 2004).

The aforementioned ACC mission statement emphasised the restoration and preservation of health, wellness and prevention of disease as key goals. Despite numerous previous studies into Chiropractic health and wellness contributions (Leboeuf-Yde 2004; Gatterman 2006), there is a plethora of questions that are still open to investigation. The role of Chiropractic relating to injury and disability prevention and the effect of Chiropractic treatment on the overall physical and mental health of patients provide great opportunities for further research (Leach 2004).

2.5 Current Research Trends: Chiropractic Context

2.5.1 Current International Research Trends: Chiropractic Context

Recently pioneered international research agendas include a neuro-physiological focus on Chiropractic care (Haavik Taylor 2010; Reed and Pickar 2015; Hawk 1999; Keating, Bergman and Jacobs 1990; Schleifer 1995; French 2000; Nicholson 2000; Triano 2013; Kawchuk and Perle, 2006; Kawchuk and Stewart-Smith 2002), and the clinical investigation into sports Chiropractic (Hoskins and Pollard 2011; Greenstein 2010; Brantingham 2001; Nook 2009). There is currently an increased focus within the profession on public health and disease prevention (Leboeuf-Yde 2004; Gatterman 2006; Mootz *et al*. 2006) and an increased focus on public health as part of Chiropractic educational curricula (Blum *et al*. 2008). Hawk, Phongohua and Bleeker (1999) suggested that Chiropractors should increase the utilisation of diagnostic screenings, which should be based on the best available literature (Dagenais and Haldeman 2012) to support health promotion and disease prevention (Hawk 2004). Public credibility and patient management would greatly benefit from the increased utilisation of diagnostic screening techniques within the profession. Byfield (2012) proposed that Chiropractors are better equipped to provide more successful overall healthcare to their patients by participation in public healthcare initiatives; RCT's negate this.

Current exploration of full kinematic chain adjusting (Redwood 2007; Brantingham 2013; de Luca 2011; Dwyer and Boysen 2011; McGill, Bereznik and Ross 2001;) and spinal research (Nicholson 2000; Vernon *et al*. 2013; Triano *et al*. 2013; Kawchuk and Perle 2006; Kawchuk and Stewart-Smith 2002) are greatly improving the evidence-based research available. The validation of orthopaedic tests (Blum 2015; Kleinfield, Daniel and Ndetan 2011; Walsh 1998; Walker and Buchbinder 1997) and reduction of posture-related disorders (Liebenson 1998; Sahrmann 2011: Kendall 2015) are current international agendas that warrant further investigation.

Chiropractic research into LBP, research regarding neck pain, as well as recent research into biomechanics (Triano 2015; Kawchuk 2015; Herzog 2010) are further examples of expansion of the research agenda (Haldeman 2005). The physiological effects of the Chiropractic manipulation of a spinal dysfunction have been researched by the likes of Sato (1992) and Budgell(2000). These areas are therefore part of the focus for conferences such as the Association of Chiropractic Colleges and

Research Agenda Conference (ACC-RAC) (Johnson and Green 2012); the World Federation of Chiropractic (WFC) (Haldeman 2005; Chapman-Smith 2012); and the European Chiropractic Union (ECU) (Brown 2012), that are specific to Chiropractic.

2.5.2 Current Student Research Trends: Chiropractic Context

Recent student research completed to date at the DUT has not been reviewed or analysed, and as such was an objective of this study. A thorough evaluation following statistical analysis is discussed in Chapter Four. On the surface there has been much focus in previous years on comparative studies of different Chiropractic treatment modalities in various clinical conditions or performance measurements (Botha 2013; Coetzee 2013; Abdul-Rasheed 2013; Dwyer 2013; Meyer 2013; de Beer, 2013; Jagarnath 2012; Deonarain 2012, Brett 2012; van der Westhuizen 2012; Flanders 2012; Lubbe 2011; Marquis 2011; Harper 2010; Trollope 2010; Turnbull 2010; Legoete 2010; Henry 2010; Hicklin 2010; Roodt 2009; Forbes 2009; Cuningham 2009; Smit 2009; Murray 2009; Marshall 2009; Jordan 2009; Clark 2009; Deutchmann 2011). Studies on the physiological effects of Chiropractic treatment in symptomatic or in asymptomatic patients were also popular (Camitsis 2013; Wiseman 213; Nelson 2011; Govender 2011; Pastilledes 2009; Blakene, 2009; Varatharajullu 2009).

The RCT's that specifically investigate Chiropractic manipulative techniques have been a major focus of student research. The biomechanical effects of Chiropractic manipulation have also gained much attention and myofascial assessment and treatment has been a popular topic of study for students to date (Appendix H). Studies investigating the relationship between symptomology and clinical conditions (Frandsen-Smith 2012; Seagreen 2009); headaches (Duani 2010; Prangley 2010); and investigations into professional performance-related disorders (Coetzee 2013; Hohls 2010; Murgatroyd 2009; Tychsen 2009), have highlighted correlations useful for clinical assessment within an EBP paradigm.

Inter-examiner reliability studies of motion palpation (Williams 2010; Manley 2010; Moodley 2011 Farrimond,2010); radiographic studies (Naicker 2012; McPhail 2011; Roopnarian 2011; Marais 2011; Gajeerajee 2010); and exploration of post-manipulation diagnostic tools (Belling 2011) have greatly contributed to the assessment of Chiropractic VSC-mediating variables.

The research agenda has been further expanded by prevalence studies on low back pain (Raad 2012; Seethal 2010; Perreira 2009; Palmer 2009) and others centred on specific symptomology (Kinsman 2013; Tuck 2010), as well as epidemiological (Dyers 2012; Muchna 2011; Slabbert 2010; Singh 2009; Albert 2009; Tuck 2010) and demographic studies (McDonald 2013; Higgs 2009).

Investigations into the perception of Chiropractic (Ford 2013; Ralekwa 2010; Wise 2010; Maharajh 2010; Keeter 2010 Maharaj 2009; Labuschagne 2009; Meyer 2009; Bar-Gil 2009l; Botha 2009; Deonaran 2009) and patient referrals between Chiropractors (Slabbert 2013) have been popular. Studies on the perceptions of Chiropractic research (Gordon 2012; Rieder 2010) and perception studies of animal Chiropractic (Snow 2013; Bosman 2012; Taverner 2011) have also added to the current qualitative research exploring Chiropractic's professional status.

2.5.3 Questions arising from Research Development

In determining where research will lead us, we need to determine the perceptions that different stakeholders have of research. To this end, perceptions of research need to be addressed. Does student research produced in South Africa have the same vision and agenda as that of the South African professional Chiropractor, and are we on track with current international Chiropractic trends? Congruency of future Chiropractic research purpose is suggested as the greatest determinant in the success or failure of the profession (Redwood and Cleveland 2003).

South African Chiropractors' perceptions to research have been influenced by the EBM movement and its effects, despite the negative influence of the conflict around medical and Chiropractic research implementation and the extreme protection of the Chiropractic philosophy by its profession (Rieder 2010). Previous perceptions were that positive patient experience was the only proof needed to support Chiropractic use and validity (Villaneuva-Russell 2005). In South Africa factors such as exposure to research, previous research training and research confidence has further contributed to perceptions of research (Rieder 2010). Chiropractic research is perceived as a major contributing factor in professional growth, especially following its slow integration into the profession (Haldeman 2005; Rieder 2010).

2.6 Conclusion

Our view of the world is largely shaped by ourselves, our environment and the object of our attention. It has previously been established that the perceptions of South African Chiropractors regarding Chiropractic research has largely been influenced by the conflict between the Chiropractic and allopathic professions; the duality within the Chiropractic professional philosophy; the development of EBM; and the effects of EBM on the CAM professions. Age, level of education, research training internationally and nationally, socio-economic and cultural upbringing, gender, ethnicity, and the current status of Chiropractic research have contributed to the perceptions Chiropractors have of research locally.

The history of Chiropractic research both nationally and internationally, and the current Chiropractic research movement, are highly influential considerations when examining perceptions of research. Self-imposed personal and professional barriers to research, as well as previous research

exposure/education affect the way we view our world. Research training and the research background of Chiropractor are factors to address when investigating current perceptions of Chiropractic research. Also of consideration are barriers of accessibility to research, the 'newness' or novelty of Chiropractic research and the demand for further research.

It is evident that there exists a genuine need for further Chiropractic research into spinal mediators; Chiropractic foundations and theories; the establishment of segmental dysfunction or VSC; more effective Chiropractic treatment; and better strategies for preventative and maintenance care and validation of Chiropractic techniques. A plethora of future research opportunities exist in answer to our most important research questions.

To date the perceptions of South African Chiropractors regarding what is important as the focus of Chiropractic research has not been addressed and compared with current international Chiropractic trends. A common research agenda or vision can be said to be the determining factor in the success or failure of the future of the Chiropractic profession.

The aim of this study was firstly to determine the research agendas perceived to be of most relevance by Chiropractors in KwaZulu-Natal. Secondly, the study was performed to provide an overview of the student Chiropractic research completed at the DUT. Congruency of purpose between the research agendas of the DUT Chiropractic students and those of professional Chiropractors in practice were explored. The study further investigated whether the aforementioned research agendas reflected current international Chiropractic research trends. Identifying the fields of research recommended by the Chiropractors in practice in KwaZulu-Natal is aimed at opening doors to future student research.

Chapter Three: Methodology

3.1 Introduction

The aim of this chapter is to describe the research design, sampling procedures, methodology used, measurement tools, data collection and statistical analysis.

3.2 The Research Design

The study was a perception survey (Wisker 2001). There were two phases to the research design: phase one was a descriptive survey design (Wisker 2001; Dyer 1997) with data collection in the form of a structured questionnaire (Appendix C) that had been developed with the help of an expert group (Hawk 2004) and pilot study (Thabane *et al.* 2010). Phase two was a retrospective descriptive design evaluating Chiropractic student research completed at the DUT) between 1994 and 2013. The approach combined documented evidence as available from the DUT, as well as a questionnaire that was circulated to all practicing Chiropractors in KwaZulu-Natal. Booysen (2003) regards questionnaires as appropriate methods of obtaining perceptions, attitudes and opinions. The study was approved by the DUT Institutional Research and Ethics Committee (IREC) (Appendix E) on 25th November 2014, thereby fulfilling the requirements of the 1975 Declaration of Helsinki (Leach 2004).

3.3 Advertising

No advertising was used. All the Chiropractors registered with the Allied Health Professions Council of South Africa who were currently practicing in KwaZulu-Natal (N=95), and who did not fall into the phase one exclusion group (research, expert and pilot study participants), were contacted telephonically and informed of the research study. The participants received the questionnaire (Appendix C), a Letter of Information and Informed Consent (Appendix A) and a Confidentiality Statement (Appendix B) introducing the study and its aims and objectives through e-mails, regular mail or hand-delivery. This assured the respondents of confidentiality and anonymity. Participation was voluntary. Those questionnaires sent via regular mail included the addition of a stamped and pre-addressed envelope for ease of return.

3.4 Sampling Procedure

3.4.1 Methodology

The first phase of the study made use of a questionnaire that was sent via e-mail, regular mail or hand delivered to all the Chiropractors registered with the Allied Health Professions Council of South Africa, who were currently practicing in KwaZulu-Natal (N=95). The study thus served as a census of this total population. All the Chiropractors who fell into the phase one exclusion group were excluded. The recipients received the questionnaire (Appendix C), a Letter of Information and Informed Consent (Appendix A) and Confidentiality Statement (Appendix B) introducing the study

and its aims and objectives, thereby assuring the respondents of confidentiality and anonymity. Participation was voluntary (Dyer 1997; Mouton 1996). Those questionnaires sent via regular mail included the addition of a stamped and pre-addressed envelope for ease of return. A response rate of 40% was considered large enough to adequately represent the entire population of Chiropractors practicing in KwaZulu-Natal (Lindstrom 2007).

The second phase of the study made use of a list of all the Chiropractic student research completed at the DUT between 1994 and 2013 (Appendix H2). This information was accessed from the Institutional Repository (IR) and library archives. A census of all the completed student research (N = 381) formed the second population that was analysed.

3.4.2 Size

The phase one sample group included Chiropractors registered with the Allied Health Professions Council of South Africa (AHPCSA) who were currently practicing in KwaZulu-Natal (N=95) (Terry 2002; Ford 2013), but excluded the members of the expert and pilot groups. A minimum response rate of 40% was considered adequate, although Esterhuizen (2015) suggested a response rate of at least 70% to be representative of the population studied.

The phase two sample group included all the student research completed at the DUT between 1994 and 2013 (N=381).

3.4.3 Allocation

All participants from phase one were allocated into one group. Sub-group analysis was formed at the data analysis stage. The DUT Chiropractic student research that had been completed was descriptively compared with the research which was considered important by practicing professionals, as established by the questionnaire.

3.4.4 Characteristics

3.4.4.1 Sample Characteristics: Main Study

A prerequisite for participation in the main study was that the following inclusion and exclusion criteria were applied.

Inclusion Criteria:

Phase one:

a) Only Chiropractic practitioners registered with the AHPCSA and practicing in KwaZulu-Natal were considered for the study.
b) Informed consent was given by the respondents.

c) All questionnaires (Appendix C) that were properly completed and returned were statistically analysed.

Phase two:

a) Only Chiropractic student research completed at the DUT between 1994 (date of the first Chiropractic dissertation completed at the DUT) and 2013 was considered for the study.

Exclusion criteria:

Phase one:

a) All persons participating in this research process, the development of the research proposal, the expert group and the pilot study were excluded from the main study, so as to limit bias based on previous exposure or knowledge of the research.
b) Non-resident Chiropractors of KwaZulu-Natal who were registered with the AHPCSA were excluded from the study.
c) Non-practicing Chiropractors of KwaZulu-Natal who were registered with the AHPCSA were excluded from the study.
d) Chiropractors who did not meet the Phase One inclusion criteria were excluded from the study.

Phase two:

a) Chiropractic student research completed at the DUT after 2013 was not considered for the study.
b) Chiropractic student research not completed at the DUT was not considered for the study.

3.4.4.2 Sample Characteristics: Expert Group

A prerequisite for participation in the Expert group was that the following inclusion and exclusion criteria were applied.

Inclusion Criteria:

a) The researcher.
b) The research supervisor.
c) Two lecturers from the DUT who were knowledgeable and experienced in the student research process.
d) One lecturer from the DUT who was knowledgeable, experienced and up to date with current Chiropractic research nationally and internationally.

e) One Chiropractor, currently in practice in KwaZulu-Natal, with many years of clinical experience.
f) Two Chiropractors, currently in practice in KwaZulu-Natal, with limited years of clinical experience.

Exclusion criteria:

a) All participants in the expert group who were not familiar with the student research process were excluded.
b) All practicing Chiropractors in the expert group who were not practicing in KwaZulu-Natal were excluded.

3.4.4.3 Sample Characteristics: Pilot Study

The pilot study sample was chosen as a representation of the entire population participating in phase one of the study, and as such necessarily mirrored the phase one population group. All the inclusion and exclusion criteria of phase one of the main study were applied to the pilot study members.

3.5 Research Procedure

The researcher designed the questionnaire (Appendix C1). It was then subject to rigorous refinement by an expert group and thereafter a pilot study, before the final questionnaire (Appendix C) was sent to the Chiropractic sample group. This process ensured both face validity and content validity.

Each participant of the Expert group received a Letter of Information and informed consent (Appendix D1), Confidentiality and Code of Conduct Statement (Appendix D2), as well as a copy of the Pre-expert group Questionnaire (Appendix C1). The Pre-pilot group Questionnaire (Appendix C2) was then developed.

The pilot study members were chosen according to the pilot study inclusion criteria and were e-mailed the questionnaire. The pilot study was conducted to ascertain the time it took to complete the questionnaire and to see if the questionnaire answered the research question sufficiently (Thabane *et al.* 2010). Modification of the questionnaire took place according to the suggestions from the pilot study members. The final questionnaire was then developed (Appendix C).

Once fully developed, the questionnaire was sent via e-mail to all Chiropractors practicing in KwaZulu-Natal as per the AHPCSA list (Terry 2002; Ford 2010). The questionnaire was also hand-delivered should the recipient have requested it, or sent via regular mail should the Chiropractor not have had an e-mail address. Participation was voluntary. The e-mail included the questionnaire (Appendix C), a Letter of Information and Informed Consent (Appendix A) and Confidentiality Statement (Appendix B) introducing the study and its aims and objectives. This assured the

respondents of confidentiality and anonymity. Those questionnaires sent via regular mail included the same, with the addition of a stamped and pre-addressed envelope for ease of return.

Once completed, respondents were required to fax, post or e-mail the questionnaire (Appendix C) back to a neutral third party at the DUT. The questionnaires were re-e-mailed to those subjects who had not responded within four weeks.

The Departmental Research Officer (DRO) marked off the returned responses from the list of Chiropractors who were sent the questionnaire to determine the response rate. The DRO deleted the names of the respondents from returned questionnaires, and returned the questionnaires to the researcher. This information was correlated and the outcome variables statistically analysed with the help of a statistician (Esterhuizen 2015).

Data analysis of the questionnaire responses entailed frequency tables and bar charts for categorical variables, while summary statistics such as mean, standard deviation and range were used for continuous variables. A p value of ≤ 0.05 was considered as statistically significant (Esterhuzen 2015).

The student research completed at the DUT between 1994 and 2013 was obtained from the IR and library archives. This information was categorised into research agendas as per the questionnaire.

Descriptive analysis followed, highlighting any overlap of research agendas and gaps in the student research.

3.6 Measurement Tool

3.6.1 Questionnaire

The design of the study was simple and made for efficient data collection (Booysen 2003). The expert groups expertise of current research literature (Schwarz and Hondras 2007; Suter *et al.* 2007), knowledge of the latest Chiropractic research agendas and both Chiropractic practice and research experience (Heslop 2008; Rieder 2010) contributed to the design of the final questionnaire (Appendix C). Furthermore, investigation into the history of Chiropractic research and the context of the KwaZulu-Natal environment was borne in mind when developing the questionnaire (Hawk *et al.* 2004).

3.6.2 Expert Group

An expert group (Hawk *et al.* 2004) was called upon to ensure face and content validity (Kelley *et al.* 2003; Bernard 2000). The questionnaire could therefore be analysed, corrected, opinions exchanged and feedback given to the researcher with regard to the context and viability of the questionnaire as a valid measurement tool. Massey (2010) suggested that this increases insight and understanding into

the aim of the questionnaire. Construct validity (Bernard 2000) was achieved by choosing expert group members with expert experience and knowledge of Chiropractic research.

3.6.2.1 Size

The expert group consisted of eight participants, which met the recommendations made by Huston and Hobson (2008) of between five and ten participants as the optimal number of participants. All expert group members were selected because of their expert experience and knowledge of Chiropractic research (Ruff, Alexander and Mckie 2005).

3.6.2.2 Allocation

The expert group was allocated into one group that met the inclusion criteria and numbered eight participants.

3.6.2.3 Method

The researcher telephonically invited the members, who had been purposively sampled because of their experience in the research topic (Ruff, Alexander and Mckie 2005), to participate in the study. The expert group was selected to provide a better understanding and insight into the study topic (Massey 2010; Hawk *et al.* 2004) and add face and content validity (Kelley *et al.* 2003; Bernard 2000). The expert group members were e-mailed the Pre-expert Group Questionnaire (Appendix C1) before the meeting and were expected to bring changes and suggestions for the questionnaire to the meeting.

At the meeting the expert group participants each received an expert group Letter of Information and Informed Consent (Appendix D1), an expert group Confidentiality Statement (Appendix D2) introducing the study and assuring the participants of confidentiality and anonymity, and the Pre-expert Group Questionnaire (Appendix C1). The participants were required to read and sign the relevant forms. The researcher then proceeded to read each question on the Pre-expert Group Questionnaire out aloud in sequential order (Morgan 1998), with time allowed for feedback from the expert group to each question. Following the recommendations of the expert group, the changes were made to the questionnaire and the Pre-pilot Group Questionnaire was developed (Appendix C2).

3.6.2.4 Expert Group changes to the Questionnaire

- An introduction to the questionnaire was added. This read: ‘Dear Chiropractor, thank you for your participation in this study. Herewith follows the study questionnaire’.
- Questions 1-11, applicable to demographic profiling, were ordered alphabetically.
- Question 7 was deleted as it was not relevant, as the population group had changed to Kwa-Zulu Natal only.
- Question 9 read ‘type of practice’ and was replaced with ‘current type of practice’; ‘solo’ was replaced by ‘individual’ and ‘multi-disciplinary’ was added as a category.

- Question 11 read ‘Number of hours practiced per week’ and was replaced by ‘Average number of hours per week’
- Question 15 read ‘Was the research published?’ This was to be followed by the question ‘If yes, where was it published?’ and the options of ‘Journal’, ‘Peer reviewed journal’, ‘If other, please specify’ given.
- Question 18 read ‘Would you contribute to a central repository for research topics?’ and was replaced by ‘Would you contribute to a data base of research ideas that students can access’ and moved to the end of the questionnaire.
- The question ‘Are you accessing DUT research?’ was added.
- All headings from Question 20 wording to be changed to read: ‘Please mark with an X in the spaces provided whether you think research in the Chiropractic discipline, on the following is Relevant/Irrelevant’ with the subcategories of ‘Very important’, ‘Important’ and ‘Not important’ listed under ‘Relevant’.
- All leading questions categorising a particular research agenda e.g. Question 19 which read ‘Do you think chiropractic research should focus on health promotion and disease prevention?’ were omitted. Therefor Questions 19, 49, 62, 87, 88, 89, 90 – 107 were omitted.
- Questions 20-133 were replaced with less specific options and broader categories such as ‘Lifestyle factors’ instead of ‘Alcohol abuse risks and cessation’, ‘Exercise for disease prevention’, ‘Social drug risks and cessation’, Tobacco risks and prevention’.
- Questions 135-174 were omitted.
- The question ‘What are your top 2 reasons for doing research?’ was added.
- Question 175 read ‘If there is a research focus/field which you feel has been omitted from the above, please provide details in the space provided below’ and was replaced by ‘If there is a research focus/field which you feel is important and has been omitted from the above, or have suggestions for future Chiropractic research, please provide details in the space provided below’.
- Question 176 read ‘Please provide, in the space below, your recommendations for future Chiropractic research’ and was omitted as the question was incorporated into the previous question.

3.6.3 Pilot Study

The pilot questionnaire was developed and pilot study conducted to ascertain the time it took to complete the questionnaire, and to see if the questionnaire answered the research question sufficiently (Thabane *et al.* 2010; Hicks 2004; Fink and Kosecoff 1985). The pilot study population met the inclusion criteria of the main study.

3.6.3.1 Size

The pilot group numbered five participants who also met the inclusion criteria of the main study. The number of participants was based on recruitment practically as suggested by Leon, Davies and Kramer (2010).

3.6.3.2 Allocation

There was no allocation of the pilot study members as only one group of members, all of whom met the inclusion criteria of the main study, participated in the pilot study.

3.6.3.3 Method

The researcher purposively sampled the pilot study members because of their main study sample representation and recruitment practicality (Leon, Davies and Kramer 2010). The researcher telephonically invited the pilot study members to participate in the study. Upon agreement to participate, the members were each emailed a Pre-pilot Group Letter of Information and Informed Consent (Appendix A2), a Pre-pilot Group Confidentiality Statement (Appendix B2) and the Pre-pilot Group Questionnaire (Appendix C2). The participants were required to make changes, corrections, recommendations and suggestions to all three appendixes within two weeks. Following the recommendations of the pilot group, the changes were made to the questionnaire and the Final Questionnaire was developed (Appendix C).

3.6.3.4 Pilot Study changes to the Questionnaire

- Q 18: Wording changed from 'Research sources' to 'Other sources through which you are accessing research?'.
- The following heading preceding Questions 19-102 which read 'Please mark with an X in the spaces provided whether you think research in the Chiropractic discipline, on the following, is Relevant/Irrelevant' was changed to 'Please mark with an X in the spaces provided whether you think the following research areas in the Chiropractic discipline, are Relevant/Irrelevant to clinical practice'.
- Q 38: Wording changed from 'Motion palpation' to 'Motion and/ or Static palpation'.
- Q 44: Wording changed from 'Postural risk reduction' to 'Reduction of posture related disorders'.
- Q103: Wording changed from 'What are your top 2 reasons for doing research?' to 'What, in your opinion, are the top 2 reasons for doing research?'

3.6.4 Final Questionnaire

The final questionnaire (Appendix C) consisted of nine tables and 105 questions:

- Table One: Questions (1-10) examined the participants' demographic details.
- Table Two: Questions (11-18) examined the participants' research profile.

- Table Three: Questions (19-54) examined Chiropractic interest into the foremost possible areas of Chiropractic research focus. These areas included health promotion and disease prevention; examination procedures; diagnostic screening techniques; sports medicine; epidemiological studies; and successful clinical practice management.
- Table Four: Questions (55-92) examined Chiropractic research interest in the most common South African medical conditions.
- Table Five: Questions (93-97) examined Chiropractic interest in reactions to Chiropractic manipulation.
- Table Six: Questions (98-102) examined Chiropractic interest in treatment techniques.
- Table Seven: Question (103) examined Chiropractic Motivation behind research conduction.
- Table Eight: Question (104) explored any area of Chiropractic research focus that has been omitted from the questionnaire that the Chiropractor felt is important and would open doors for future research suggestions.
- Table Nine: Question (105) examined the Chiropractor's interest in contributing to a student research data base. This aimed to provide new suggestions and recommendations for future Chiropractic student research.

3.7 Statistical Analysis

Data analysis of the final questionnaire (Appendix C) highlighted the research perceived to be most relevant by practicing Chiropractors in KwaZulu-Natal. The latest SPSS version was used (SPSS Inc. Chicago, Illinois, 2012). A p value of ≤ 0.05 was considered as statistically significant. Pearson's chi square tests were used for correlations and associations (Appendix G1-G6).

Research agendas that had been perceived as 'very important' by the practitioners, but had not been studied by the students, were examined and recommendations were made for future Chiropractic student research. Descriptive analysis of the phase one questionnaire responses entailed frequency tables and bar charts for categorical variables. Summary statistics such as mean, standard deviation and range were used for continuous variables. A descriptive comparison was performed to determine the congruency between the student research agendas and the research perceived to be of most clinical relevance by Chiropractors practicing in KwaZulu-Natal.

Chapter Four: Results and Discussion

4.1 Introduction

This chapter represents the results of the data collection following statistical analysis. It also includes a discussion of these results. Although it is not the standard dissertation format to include the discussions of the results in the same chapter, this allows for a better overview of the results and discussion in a study with a large volume of statistical data.

4.2 Review of Objectives

- The first objective of the study was to determine the research agendas perceived to be of the highest professional relevance by Chiropractors in practice in KwaZulu-Natal.
- The second objective of the study was to determine the main areas of focus of the Chiropractic student research conducted at the DUT between 1994 and 2013.
- The third objective of the study was to determine the congruency between the focus of Chiropractic student research completed at the DUT and the research which is perceived to be of highest professional relevance by Chiropractors in KwaZulu-Natal.

4.3 Data

4.3.1 Primary Data

The primary data for the first phase of the study was collected in the form of a questionnaire (Appendix C). The data for the second phase of the study was collected from the IR and library archives.

4.3.2 Secondary Data

The data, as cited in the reference list, was accessed from research dissertations, internet sources, textbooks and journal articles. Information from personal communications in 2015 with the supervisor, Dr. van der Meulen and statistician, Mrs. Esterhuizen, as well as Chiropractic research expert in the field, Dr. Korporaal, was also utilized.

4.4 Abbreviations pertinent to this Chapter

% = percentage.

< = "less than" the figure that follows.

AECC = Anglo European College of Chiropractic.

CASA = Chiropractic Association of South Africa.

DC = Doctor of Chiropractic.

DUT – Durban University of Technology.

N = population sample size.

n = subgroup sample size.

NCC = National College of Chiropractic.

p value = probability value.

Q = question.

SD = standard deviation.

UJ – University of Johannesburg.

4.5 Response Rates

The total number of Chiropractors registered with the AHPCSA in KwaZulu-Natal was 132. Of these, seven formed part of the expert group, five participated in the pilot study and five were involved with research at the DUT. These were excluded from the study. Furthermore, four had emigrated or moved provinces and sixteen were no longer actively practicing. All the Chiropractors were contacted regarding the study and 32 responded by declining participation as they were too busy. The total number of Chiropractors who were sent the questionnaire was therefore 95. The total number of Chiropractors who completed the questionnaire was 63. The response rate was therefore 66.3%.

4.5.1 Advantages and disadvantages of the Response Rate

A response rate of 66.3% was regarded as an accurate representation of the entire population (Lindström 2007). The response rate fell below Esterhuizens' (2015) suggestions that a response rate of at least 70% is required for analysis of the population and extrapolation of significant results. A predictable consideration for a response rate close to 70% (as suggested by Esterhuizen 2015) was that the questionnaire was relatively short and the pilot study was completed in fifteen to twenty minutes. The questionnaire was 881 words in length, which was well below the recommendations of Jepson *et al.* (2005) of 1000 words for comparatively higher response rates. The respondents were contacted telephonically and participation in the study was requested. As per the recommendations of Lapane, Quilliam and Hughes (2007) and Edwards *et al.* (2002), the questionnaire was repeatedly e-mailed. Some respondents requested that the questionnaire be posted and these contained a stamped, pre-addressed envelope for ease of return. The majority of questionnaires were personally delivered and then collected once completed, should the practitioner have requested this option of data collection. Lapane *et al.* (2007) suggested hand delivery for a better response rate, decreased bias and improved viability.

Although the response rate was considered adequate, the data collection took much more time than anticipated as the database was not current. The researcher spent many months investigating correct contact details of the respondents. The out-of-date member database had a further negative impact on the response rate (Terry 2011) as potential participants may not have been on the database. As recommended by popular publications, no incentives which would have increased response rates were permitted. As per Figure 4.1, the factors that positively affected the response rate were:

1) The length of the questionnaire was less than 1000 words.
2) The questionnaire was completed in a short period of time.
3) The respondents were contacted telephonically and requested to participate in the study.
4) The questionnaire was mailed/e-mailed multiple times to each Chiropractor.
5) Posted questionnaires were easy to return as each contained a stamped, pre-addressed envelope.
6) Questionnaires were delivered and collected as requested by the respondents.

Additionally and as per Figure 4.1, the factors that negatively affected the response rate were:

1) The database was not current and excluded potential participants.
2) No incentives were permitted.

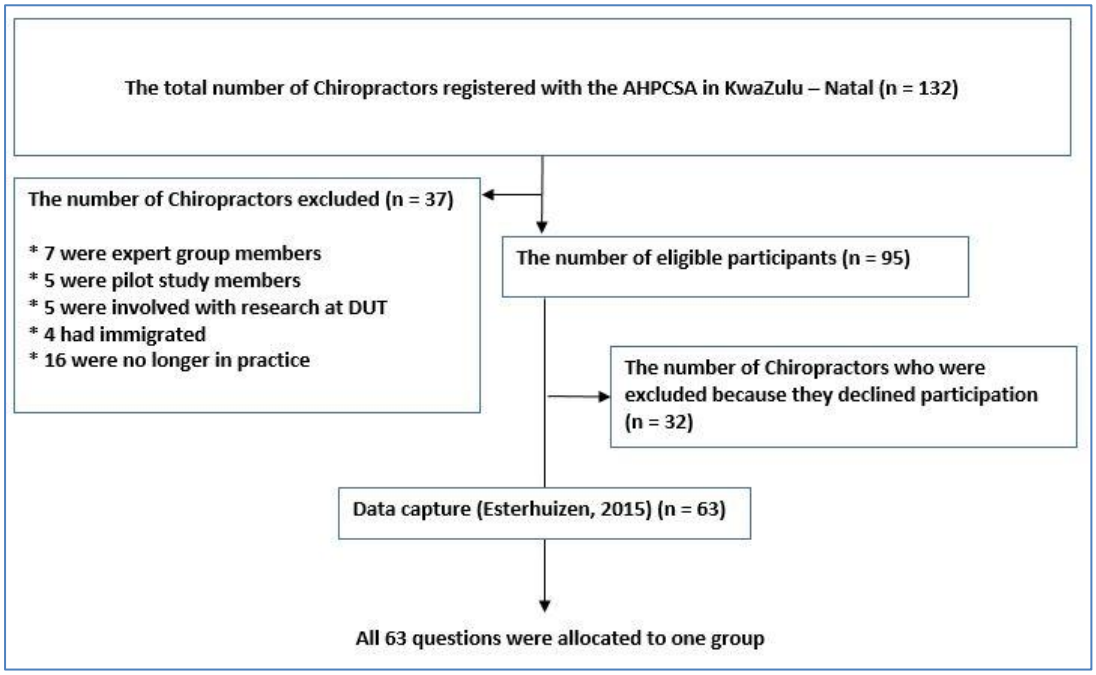

Figure 4.1. Diagram of the Factors influencing the Response Rate.

4.6 Results

4.6.1 Respondents Demographics

4.6.1.1 Age and Number of Hours practiced per week

Table: 4.1 Age and Number of Hours practiced per week

		Age	Hours practiced per week
N	Valid	63	59
	Missing	0	4
Mean		37.889	33.27
Median		36.000	35.00
Std. Deviation		10.2045	13.278
Minimum		24.0	4
Maximum		71.0	60
Percentiles	25	30.000	20.00
	50	36.000	35.00
	75	41.000	42.00

4.6.1.2 Gender, Language and Ethnicity

Table: 4.2 Gender, Language and Ethnicity

		Count	Column N %			Count	Column N %
Gender	Female	39	61.9%	Ethnicity	African	0	0.0%
	Male	24	38.1%		Asian	0	0.0%
Language	Afrikaans	0	0.0%		Coloured	1	1.6%
	English	60	96.7%		Indian	10	15.9%
	IsiXhosa	0	0%		white	52	82.5%
	Hebrew	1	1.6%		other	0	0.0%
	German	1	1.6%				

4.6.1.3 Discussion of Respondents Demographics

a) **Age:** As per Table 4.1, the mean age of the respondents was 38 years with a standard deviation (SD) of ten years. The range was from 24 to 71 years. The majority of respondents were categorised between the ages of 35 to 55 years of age, which was classed as the mature adulthood category (Hayes 1994; Berg and Theron 1999). Based on current literature, more positive perceptions of research in this age group relates to the individuals' increased confidence in their profession (Schwarz and Hondras 2007; Black 2008; Suter *et al.* 2007). Zhang (1996), Ditcher and Tetley (1999) and Martin (2001) all corroborate the increased confidence in, and increased conduction of, Chiropractic research with increased age.

b) **Number of hours practiced per week:** As illustrated in Table 4.1, an average number of 33 hours were practiced per week, with a range from four to 60 hours. This was in accordance with previous Chiropractic studies (Gordon 2012; Schwarz and Hondras 2007).

c) **Gender:** As Table 4.2 illustrates, more females responded to the study, with 61.9% of the respondents being female. Martin, Maclachlan and Karmel (2001) and Bills (2003) found that the completion of research education studies and more positive perceptions of research were found among females. Black (2008) consequently surmised that the gender demographics of the Chiropractic profession would shift to a predominantly female profession in the future. This was substantiated by the findings of Rieder (2010) and Newell and Cunliffe (2003), who

purported that the majority of Chiropractic students are female. Of the 32 Chiropractors who declined participation in the study because they were too busy, fifteen were female. The majority of these gave family obligations as their primary reasons for declining. Of the sixteen Chiropractors who were no longer actively practicing, eleven were female (Dieden 2004). The number of females excluded from the study was therefore 26. Black (2008) also found that the majority of Chiropractors were married with dependents. The average age of respondents in this study was 38 years of age. This is in accordance with the findings of Chan and Willet (2004) who established that females, particularly in their thirties, take time out from their careers for family obligations.

d) **Language:** As per Table 4.2, the majority (96.7%) of the respondents' first language was English, 1.6% Hebrew, 1.6% German and 0% IsiXhosa. This finding was not unusual, as the majority of the respondents had graduated from the DUT where all classes are taught in English.

e) **Ethnicity:** As Table 4.2 illustrates, most (82.5%) of the respondents were White, 15.9% Indian, 1.6% Coloured and 0% African or Asian. This is in accordance with the demographics described by Black (2008), but in opposition to Rieder's (2010) Chiropractic student perception studies which describes a population of 66.2 % White, 19.1% Indian and 9.6% African students. He proposed a better African contribution to future research studies. Rieder (2010) also found that ethnicity and socio-economic status largely influence research perceptions in South Africa. Many other studies show that a previously disadvantaged background, financial constraints and a lack of education has a negative impact on perceptions of research (Ellis 2001; Rattan 2006; Spours 1996; Pretorious and Le Roux 1998; De Beer 2005; Creighton 2007; Mazloomdoost *et al.* 2007, Nora 2001, Tinto 1999; Wright and Cochrane 2000). This correlated to the South African context of this study. In a country where higher education was previously only available to a White population, a more positive perception of research was therefore expected from this ethnic group. This mirrored the findings of this study. Increased literacy skills, better coping mechanisms and management of time (Grant 2006; Lazarus and Folkman, 1984; Mouton 2001) were also associated with positive research endeavours.

4.6.2 Research Profile and Practice Demographics

Table: 4.3 Research profile and Practice Demographics

Graduating Chiropractic Institute	DUT	56	91.8%	Type of Practice	Group	9	14.5%
	AECC	1	1.6%		Individual	18	29.0%
	Palmer	2	3.3%		Multidisciplinary	29	46.8%
	National CC	2	3.3%		Partnership	6	9.7%
Qualification	M Tech Chiropractic	56	93.4%	Years in Practice	<5	18	28.6%
	DC	4	6.7%		5-10	15	23.8%
					11-20	25	39.7%
					21-30	1	0.1%
					31-40	3	4.8%
					40+	1	0.1%
Previous Research Conducted	yes	54	85.7%	Where Research was Published	Journal	4	6.9%
	no	9	14.3%		Peer reviewed journal	6	10.3%
Improved Chiropractic abilities due to Research	yes	38	64.4%		Other	0	0.0%
	N/A	3	5.1%		N/A	41	82.7%
Was Research Published	yes	11	18.6%				
	no	47	79.7%				
	N/A	1	1.7%				

4.6.2.1 Discussion of Research Profile and Practice Demographics

a) **Graduating Chiropractic Institute:** As per Table 4.3, the majority (91.8%) of the respondents graduated from the DUT, 3.3% from Palmer College, 3.3% from the National College of Chiropractic (NCC) and 1.6% from the Anglo European College of Chiropractic (AECC). This was understandable when one considers that the DUT is the only Chiropractic training institution in KwaZulu-Natal. It is one of only two, the other being the University of

Johannesburg, in South Africa. These two South African institutions are the only institutions worldwide that require the completion of a Master's degree in Chiropractic for graduation as a Chiropractor. This is also a prerequisite for registration with the AHPCSA (Allied Health Professions Act 63 of 1982). Rieder (2010) argued that research perceptions are positively influenced by the motivation of acquiring the Chiropractic qualification in South Africa. This was also reiterated by one of the respondents in this study. In opposition to this, Bergh and Theron (1999) suggested that the negative environment created by the research process could negatively affect research perceptions. The other Chiropractic institutions attended were abroad, and represented a sample of Chiropractors who necessarily had to study as Chiropractors elsewhere before the establishment of the South African institutions (Chapman-Smith 2000).

b) **Highest Academic Qualification:** Grant (2006), Lazarus and Folkman (1984) and Mouton (2001) suggested that more positive perceptions of research were associated with a higher level of education. The highest qualification achieved by the respondents was a Master's in Chiropractic, and a Doctor of Chiropractic should the respondent have qualified abroad. Many of the respondents had qualifications in other fields. Previous exposure to research was associated with a better perception of research (Newell and Cunliffe 2003) and improved ability for the conduction of research (Gordon 2012). Both Gordon (2010) and Rodgers (2000) suggested that there was a higher utilisation of research by individuals with a higher academic qualification.

c) **Type of Practice:** As Table 4.3 illustrates, the majority of respondents (46.8%) worked in a multi-disciplinary practice and only 29% were in individual solo practices. Black's (2008) study corroborated this and found that 53.2% of Chiropractors practiced in multi-disciplinary practices and 33.9% worked in solo practices. Gordon (2012) suggested that the popularity of group practices increase in relation to the number of years in practice. Increased age and years in practice also encouraged continued practitioner education. As a result, more positive perceptions of research were anticipated. This corresponded well to the findings of this study, which indicated that the majority of respondents had been in practice for between eleven and 20 years. The majority of respondents also fell within the mature adulthood age group (Hayes 1994; Berg and Theron 1999). As previously cited, this suggested a better perception of research in general (Schwarz and Hondras 2007; Black 2008; Suter *et al*. 2007; Zhang 1996; Ditcher and Tetley 1999; Martin 2001).

d) **Number of Years in Practice**: As per Table 4.3, the majority of the respondents (39.7%) had been in practice for between eleven and 20 years. The results indicated that 23.8 % had been practicing for five to ten years, 28.6% for less than five years, and 4.8% for 31-40 years. The average mature age of the respondents corresponded to these findings and suggested better research perceptions. Furthermore, current literature suggests that an increased number of

years in practice related to increased previous research conducted and increased established referral networks with other professionals (Ramsey *et al.* 2004).

e) **Previous research Conduction**: As illustrated in Table 4.3, many (85.7%) of the respondents had previously participated in research. This was understandable when one considers that the majority of the respondents graduated from the DUT and had conducted research as a prerequisite of the qualification of a Masters in Chiropractic. Gordon (2012) suggested that the extensive research training gained at the South African Chiropractic institutions encouraged better perceptions of research and utilisation of research by its graduates. The findings of Newell and Cunliffe (2003), Rodgers (2000) and Zhang (1996) indicated that previous research conducted was associated with more positive perceptions of research.

f) **Improved Chiropractic Abilities due to Research**: As per Table 4.3, a total of 64.4% of the practitioners responded as having had improved Chiropractic abilities due to previous research experience. The improvement of clinical practice was in line with the respondents' foremost reasons for conducting research (Appendix F1). Furthermore, studies suggest that increased research efforts have been associated with improved EBP, increased practitioner confidence and better patient outcomes (Dagenais and Haldeman 2008 and 2012; Triano 2010).

g) **Published Research**: As illustrated in Table 4.3, a large number of the respondents (79.7%) had not published any research. This was incongruent with the general move towards the practice of EBM within the profession (Newell and Cunliffe 2003; Haldeman 2005). Conversely, 18.6% of the respondents had previously published their research. The respondents' aforementioned previous research conduction and anticipated positive perceptions to research (Newell and Cunliffe 2003; Rodgers 2000; Zhang 1996) therefore improved their capabilities as a Chiropractor (Dagenais and Haldeman 2008; Triano 2010) and stand in opposition to these findings. Subsequently, further exploration of the respondents' ability to identify appropriate research questions is recommended for further studies of this nature.

h) **Where the Research was published**: As per Table 4.3, only 10.3% of the respondents had published research in peer reviewed journals. This opened up questions for investigation in future studies as to whether the practitioners have themselves been producing clinically relevant research. This was in agreement with other studies which had determined that positive perceptions to research did not necessarily equate with the uptake of research in the clinical setting (Schwarz and Hondras 2007). Something for consideration in future studies is whether or not the place of publication of the respondents' research had a congruent research agenda with that of the respondents' perceptions of clinically relevant research.

4.7 Discussion of Q103-105

The results for questions 103, 104 and 105 are in Appendix F1 (Table 4.4), F2 (Table 4.5) and F3 (Table 4.6) respectively. A discussion of the responses follows.

4.7.1 Discussion of Q103: The Respondents main Reasons for doing Research.

The respondents' greatest motivation for further research endeavours was by far (29%) the need for recognition of the Chiropractic profession as an EBP. This was understandable when one considers the Chiropractic struggle for professional recognition and turbulent history with the medical profession (Haldeman 2005; Chapman-Smith 2000; Villanueva-Russell 2005; Keating 1992). Research was also considered by the respondents to provide empirical evidence and encourage the practice of EBM. This was in line with the suggestions of Portney and Watkins (2009) and Brink (2006). Furthermore education of the general public and medical profession was cited as a notable reason for conducting research. This correlates to the need for recognition of the profession as an EBP (Meeker and Haldeman 2002).

Professional progression and advancement was also a highly regarded motivation for continued research efforts. It was proposed that research further develops a profession and keeps it current and up to date. Both Haldeman (2005) and Brink (2006) argued that research was fundamental to a professions' development and progression. Maintaining an academic reputation was also thought to be of importance.

The respondents felt that research necessarily guides, enhances and supports treatment protocols. Knowledge of treatment protocols was increased. Furthermore, it was suggested that research validates and proves the benefit of Chiropractic treatment. This was previously cited as a valuable tool in increasing recognition by the public, medical profession and medical aids (Villanueva-Russell 2005; Haynes 1999; Eisenberg *et al.* 1993; Eisenberg *et al.* 1998). Respondents felt that research determined the efficacy of different treatment protocols and verified treatment alternatives.

Clinically, research was suggested to strengthen the clinical outlook, increase clinical proficiency and competency and correlate findings from private practice. This was important as the quality of Chiropractic service was believed to be improved. Similarly, the overall number of conditions that were able to be treated by Chiropractors was expanded by continued research within the profession. New research development was also provided as a motivation for expanding the Chiropractic research agenda. Research was highly regarded as a tool for increasing knowledge, both professionally and personally. This mirrored the hypothesis made by Schwarz and Hondras (2007). Respondents perceived knowledge of the benefit of Chiropractic treatment, knowledge of the Chiropractic literature and knowledge of dissertation construction to be increased with increased research efforts. An increased body of knowledge was thought to precede improved professional recognition and

improved treatment of patients. Personally, research was regarded as 'broadening the mind', encouraging scientific thinking, analysis and conceptualisation. Further personal motivation for continued research was that it initiated progress and answered questions. It was also suggested to be responsible for the delineation of good research from bad research.

Chiropractic research that focused on proving the efficacy of Chiropractic treatment has increased over the years, with a dramatic increase in the number of RTC's performed (Sawyer *et. al*. 1997). Within a South African context, this has been seen with both increased practitioner (Brantingham 2012) and student (Coetzee 2013) implementation. Research was believed by the respondents to provide a database of reliable clinical trials and data for the extrapolation of results and basis of good clinical practice. Improved patient outcomes and minimising unnecessary diagnostic screening and ineffectual treatment were further motivation for increased RTC's. They were also thought to improve the confidence for the treatment of a specific condition and diversify the Chiropractic scope of practice.

Proving the efficacy of Chiropractic treatment on the nervous system was believed to be of importance, as was the relationship between the Chiropractic manipulation and body function. Improving the understanding of role of the Chiropractic manipulation in a multi-disciplinary approach was regarded as important. This was suggested as encouraging interdisciplinary co-operation and understanding. It was also perceived that patient outcomes were improved and validation of the Chiropractic theories were anticipated with increased research efforts. An increased holistic understanding of the patient and approach to treatment were given as important reasons for doing research.

Research was recommended to validate Chiropractic as a Primary Health Care system, as is encouraged by the likes of Leboeuf-Yde (2004), Gatterman (2006), Mootz (2006) and Hawk (2004). Similarly, medical aid reimbursement was also motivation for increased evidence of the benefit of Chiropractic treatment.

One respondent noted that qualification with a Chiropractic degree in South Africa was motivation for student research. This was because qualification from the DUT with a Master's Degree in Chiropractic necessarily requires completion of a research dissertation (Chiropractic Association of South Africa 2012; Allied health professions Council of South Africa – Act 63 of 1982, as amended).

4.7.2 Discussion of Q104: The Respondents Recommendations for Future Chiropractic Research.

Recommendations for future Chiropractic research included perception studies focusing on public and medical professional views of Chiropractic, notably the Chiropractors' scope of practice and role in the healthcare system. Research into patient, public sector and governmental education on

Chiropractic treatment was advised. A need for more qualitative research was proposed that collaborated Chiropractic and medical care. Multi-disciplinary correlations and synergies in treatment within Chiropractic and physiotherapeutic fraternities, as well as analgesic and non-steroidal anti-inflammatory drugs (NSAID), were also advised. Similarly, comparative studies on Chiropractors and General Practitioners (GP's) as primary care providers for musculoskeletal complaints was recommended. Comparative diagnostic screening studies of musculoskeletal complaints by the GP, physiotherapist and Chiropractor were also recommended for future research endeavours. Recommendations were also made that Chiropractic research focus on the cause and the prevention of disease, rather than simply treatment.

Specifically for student recommendation was Chiropractic Practice Management feasibility studies.

The need for increased RCT's was voiced and increased condition-specific research was recommended, most notably into Gastroesophageal Reflux Disease (GERD); Dynamic Neuromuscular Stabilization (DNS); Carpal Tunnel Syndrome (CTS); Lateral Epicondilitis; Adhesive Capsulitis; rib conditions; Osteoarthritis (OA); Rheumatoid arthritis (RA) and Tietze syndrome. Studies into pain as a consequence of spinal dysfunction as well as cervicogenic headache were also suggested. The referral of systemic conditions such as musculoskeletal pain and spinal postural consequences on the extremities were considered an important focus for future research. More focus was called for on conditions affecting the feet and ankles. More studies on the positive contributions of Chiropractic treatment and conditions that respond well to Chiropractic adjustments were recommended.

Many respondents made recommendations for increased obstetric and paediatric Chiropractic studies. Pregnancy-related disorders, as well as research studies into spinal dysfunction in new-borns following caesarean section and vaginal birth, were recommended. The Chiropractic treatment of infants, notably for colic and sleep disorders, was suggested. The Chiropractic treatment of children, mostly with regard to learning abnormalities, postural disorders and enuresis, were suggested as important research agendas.

Studies exploring different treatment techniques were deemed important. The exploration of positional release techniques and treatment modalities other than the Chiropractic manipulation, specifically Transeva in combination with Chiropractic manipulation techniques, were advised. Comparative studies on the use of Chiropractic manipulations and various soft tissue techniques (STT) were also recommended. Further suggestions included the diagnostic identification of the manipulable lesion and investigation into the role of Chiropractic in sports and professional performance. The long term sequelae of Chiropractic treatment was also proposed as an important focus of Chiropractic treatment. A recommendation was made by one of the respondents that future studies involve no animal testing.

4.7.3 Discussion of Q105: The Respondents Willingness to contribute to a Research Database.

As illustrated in Figure 4.2, only 4 respondents did not answer this question. Of the 59 respondents who answered the question, ten respondents answered that they would not contribute to a database of research ideas that students could access. This was 15.87 % of the total population of practitioners who participated. The majority (n=49) of the respondents, equating to 77.77% of the total practitioner population, were willing to contribute to a data base of research ideas that students can access. This was a promising response, and of great value, as recommendations based on clinical experience are believed to make Chiropractic research more clinically relevant (Zhang 1996).

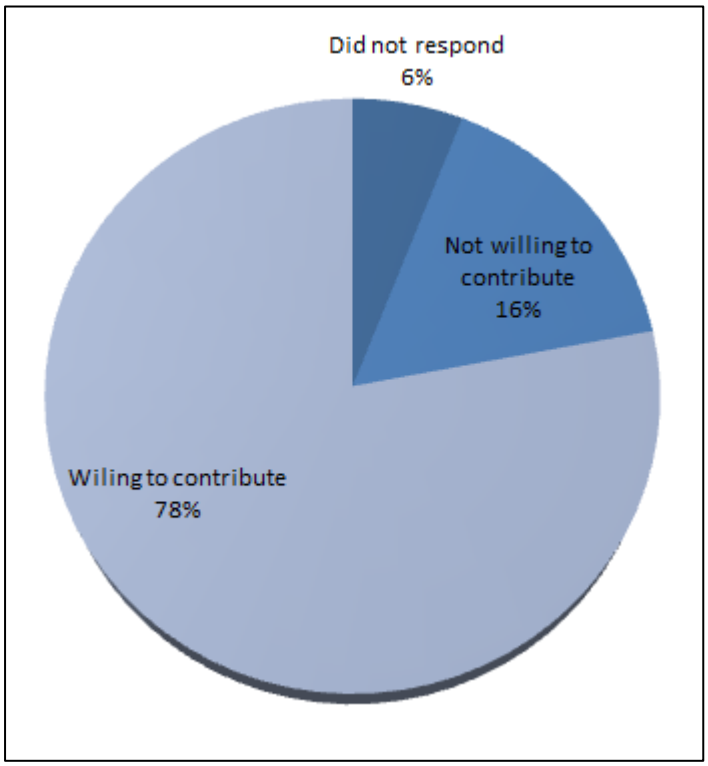

Figure 4.2. The Respondents Willingness to contribute to a Research Database.

4.8 The First Objective of this study was to determine the Research Agendas perceived to be of the Highest Professional Relevance by Chiropractors in KwaZulu-Natal.

4.8.1 Practitioner Perceptions of Research

Table 4.7: Practitioner Perceptions of Research

		very important	important	not important	irrelevant
Q19. Allergy testing	Count	3	19	28	12
	Column N %	4.8%	30.6%	45.2%	19.4%

Q20. Blood screening e.g. for Anaemia's, Sugar levels	Count	10	30	18	5
	Column N %	15.90%	47.60%	28.60%	7.90%
Q21. Body Mass Index and Cardiovascular fitness testing	Count	12	35	13	2
	Column N %	19.40%	56.50%	21.00%	3.20%
Q22. Bone testing e.g. for Density, Hot and Cold spots	Count	26	28	6	3
	Column N %	41.30%	44.40%	9.50%	4.80%
Q23. Cancer prevention screening e.g. Mammogram, Pap smear, PSA testing	Count	12	27	16	7
	Column N %	19.40%	43.50%	25.80%	11.30%
Q24. Chronic disease prevention e.g. Cancer, DM, Obesity, TB and Opportunistic infection prevention	Count	16	30	11	5
	Column N %	25.80%	48.40%	17.70%	8.10%
Q25. Complementary medication for health promotion eg. Chinese herbal, Ayurvedic, Naturapathic and Homeopathic medication	Count	8	36	17	2
	Column N %	12.70%	57.10%	27.00%	3.20%
Q26. Culture screening e.g. of Stool and Bloods	Count	5	20	29	9
	Column N %	7.90%	31.70%	46.00%	14.30%
Q27. Dietary advice	Count	24	35	3	1
	Column N %	38.10%	55.60%	4.80%	1.60%
Q28. Dietary supplementation	Count	20	35	4	2
	Column N %	32.80%	57.40%	6.60%	3.30%
Q29. Epidemiological studies	Count	6	36	17	4
	Column N %	9.50%	57.10%	27.00%	6.30%
Q30. Ergonomic risk prevention	Count	41	19	2	0
	Column N %	66.10%	30.60%	3.20%	0.0%

Q31. Gait analysis and Postural assessment	Count	44	18	0	0
	Column N %	71.00%	29.00%	0.0%	0.0%
Q32. Gastrointestinal scopes	Count	1	18	27	14
	Column N %	1.70%	30.00%	45.00%	23.30%
Q33. General medical examination for common conditions such as Jaundice, Anemia, Clubbing, Cyanosis, Oedema….	Count	10	31	18	3
	Column N %	16.10%	50.00%	29.00%	4.80%
Q34. Injury prevention	Count	37	24	1	0
	Column N %	59.70%	38.70%	1.60%	0.0%
Q35. Imaging studies e.g. Angiography, Doppler Ultrasound, CT scan, MRI, Ultrasound, X-rays	Count	38	25	0	0
	Column N %	60.30%	39.70%	0.0%	0.0%
Q36. Lifestyle factors e.g. Alcohol abuse risks and cessation, Exercise for disease prevention, Social drug risks and cessation, Tobacco risks and cessation,	Count	26	29	6	2
	Column N %	41.30%	46.00%	9.50%	3.20%
Q37. Mental illness and psychological intervention for health promotion e.g. Pain avoidance reduction and Stress management techniques	Count	18	38	7	0
	Column N %	28.60%	60.30%	11.10%	0.0%
Q38. Motion and / or Static palpation	Count	45	17	1	0
	Column N %	71.40%	27.00%	1.60%	0.0%
Q39. Muscular testing	Count	46	16	1	0
	Column N %	73.00%	25.40%	1.60%	0.0%
Q40. Myofascial trigger	Count	46	16	1	0

point assessment	Column N %	73.00%	25.40%	1.60%	0.0%
Q41. Neurological testing	Count	53	10	0	0
	Column N %	84.10%	15.90%	0.0%	0.0%
Q42. Orthopaedic testing	Count	49	12	1	0.0%
	Column N %	79.00%	19.40%	1.60%	0.0%
Q43. Over-The-Counter medication for disease prevention	Count	8	33	18	4
	Column N %	12.70%	52.40%	28.60%	6.30%
Q44. Prescription medication	Count	11	31	16	4
	Column N %	17.70%	50.00%	25.80%	6.50%
Q45. Range of Motion assessment	Count	46	16	1	0
	Column N %	73.00%	25.40%	1.60%	0.0%
Q46. Reduction of posture related disorders	Count	49	11	3	0
	Column N %	77.80%	17.50%	4.80%	0.0%
Q47. Safe sex practices	Count	6	14	28	15
	Column N %	9.50%	22.20%	44.40%	23.80%
Q48. Salivary cortisol testing to assess stress levels	Count	7	28	19	7
	Column N %	11.50%	45.90%	31.10%	11.50%
Q49. Sexually transmitted disease prevention e.g. Contraception use, HIV prevention	Count	7	14	25	16
	Column N %	11.30%	22.60%	40.30%	25.80%
Q50. Sports medicine	Count	39	21	2	0
	Column N %	62.90%	33.90%	3.20%	0.0%
Q51. Successful practice management	Count	39	20	4	0
	Column N %	61.90%	31.70%	6.30%	0.0%
Q52. Supplementation e.g. Dietary or Sports supplementation	Count	24	34	5	0
	Column N %	38.10%	54.00%	7.90%	0.0%

Q53. Urinalysis	Count	10	32	16	4
	Column N %	16.10%	51.60%	25.80%	6.50%
Q54. Vital signs examination	Count	25	24	13	1
	Column N %	39.70%	38.10%	20.60%	1.60%
Q55. Alzheimer's	Count	1	19	28	14
	Column N %	1.60%	30.60%	45.20%	22.60%
Q56. Anaemias	Count	4	27	24	7
	Column N %	6.50%	43.50%	38.70%	11.30%
Q57. Angina	Count	5	24	27	6
	Column N %	8.10%	38.70%	43.50%	9.70%
Q58. Asthma	Count	5	38	15	4
	Column N %	8.10%	61.30%	24.20%	6.50%
Q59. Breast Cancers	Count	6	22	22	11
	Column N %	9.80%	36.10%	36.10%	18.00%
Q60. Cervical cancer	Count	2	24	24	10
	Column N %	3.30%	40.00%	40.00%	16.70%
Q61. Colorectal Cancers	Count	5	22	23	11
	Column N %	8.20%	36.10%	37.70%	18.00%
Q62. Coronary heart disease	Count	5	25	22	10
	Column N %	8.10%	40.30%	35.50%	16.10%
Q63. Chronic Obstructive Pulmonary Disease	Count	3	26	23	10
	Column N %	4.80%	41.90%	37.10%	16.10%
Q64. Diarrhoeal diseases	Count	2	17	29	13
	Column N %	3.30%	27.90%	47.50%	21.30%
Q65. Cholera	Count	2	7	33	20
	Column N %	3.20%	11.30%	53.20%	32.30%

Q66. Colon cancer	Count	5	21	24	11
	Column N %	8.20%	34.40%	39.30%	18.00%
Q67. Diabetis Mellitis	Count	11	25	19	7
	Column N %	17.70%	40.30%	30.60%	11.30%
Q68. Ebstein-Barr Virus	Count	8	18	21	15
	Column N %	12.90%	29.00%	33.90%	24.20%
Q69. Epilepsy	Count	7	26	20	9
	Column N %	11.30%	41.90%	32.30%	14.50%
Q70. Hepatitis	Count	5	15	28	14
	Column N %	8.10%	24.20%	45.20%	22.60%
Q71. HIV/AIDS	Count	5	19	25	12
	Column N %	8.20%	31.10%	41.00%	19.70%
Q72. Hypertension	Count	13	31	14	4
	Column N %	21.00%	50.00%	22.60%	6.50%
Q73. Hypothyroidism	Count	5	30	21	6
	Column N %	8.10%	48.40%	33.90%	9.70%
Q74. Ischaemic heart disease	Count	5	22	24	10
	Column N %	8.20%	36.10%	39.30%	16.40%
Q75. Influenza and Pneumonia	Count	1	20	28	13
	Column N %	1.60%	32.30%	45.20%	21.00%
Q76. Leukaemia's	Count	5	14	28	13
	Column N %	8.30%	23.30%	46.70%	21.70%
Q77. Liver cancer	Count	4	17	26	13
	Column N %	6.70%	28.30%	43.30%	21.70%
Q78. Low birth weight	Count	6	18	27	11
	Column N %	9.70%	29.00%	43.50%	17.70%

Q79. Lung disease and Cancer	Count	6	19	25	11
	Column N %	9.80%	31.10%	41.00%	18.00%
Q80. Lymphoma	Count	7	16	28	11
	Column N %	11.30%	25.80%	45.20%	17.70%
Q81. Malaria	Count	3	9	33	17
	Column N %	4.80%	14.50%	53.20%	27.40%
Q82. Measles	Count	2	12	30	17
	Column N %	3.30%	19.70%	49.20%	27.90%
Q83. Meningitis	Count	15	19	19	9
	Column N %	24.20%	30.60%	30.60%	14.50%
Q84. Oesophageal Cancer	Count	5	13	30	13
	Column N %	8.20%	21.30%	49.20%	21.30%
Q85. Peptic ulcers	Count	5	24	22	10
	Column N %	8.20%	39.30%	36.10%	16.40%
Q86. Polycystic ovarian syndrome	Count	5	19	28	10
	Column N %	8.10%	30.60%	45.20%	16.10%
Q87. Polycystic kidneys	Count	5	17	27	13
	Column N %	8.10%	27.40%	43.50%	21.00%
Q88. Rabies	Count	3	9	28	22
	Column N %	4.80%	14.50%	45.20%	35.50%
Q89. Schistosomiasis	Count	1	10	30	21
	Column N %	1.60%	16.10%	48.40%	33.90%
Q90. Strokes	Count	22	22	13	5
	Column N %	35.50%	35.50%	21.00%	8.10%
Q91. Syphilis	Count	4	8	25	23
	Column N %	6.70%	13.30%	41.70%	38.30%

Q92. Tuberculosis	Count	10	15	22	15
	Column N %	16.10%	24.20%	35.50%	24.20%
Q93. Biochemical changes as a result of chiropractic manipulation e.g. Changes in metabolism and enzymes	Count	34	27	2	0
	Column N %	54.00%	42.90%	3.20%	0.0%
Q94. Biomechanical changes as a result of chiropractic manipulation e.g. Altered movement patterns in kinematic chains	Count	51	12	0	0
	Column N %	81.00%	19.00%	0.0%	0.0%
Q95. Gross anatomical changes as a result of chiropractic manipulation e.g. Change in orientation of joint surfaces	Count	48	48	14	1
	Column N %	76.20%	76.20%	22.20%	1.60%
Q96. Histological changes as a result of chiropractic manipulation e.g. Microscopic changes in cell characteristics	Count	34	25	3	0
	Column N %	54.80%	40.30%	4.80%	0.0%
Q97. Physiological changes as a result of chiropractic manipulation e.g. Changes in hormone production, secretion, absorption and use	Count	39	24	0	0
	Column N %	61.90%	38.10%	0.0%	0.0%
Q98. Chiropractic adjustment techniques e.g. Diversified, Gonstead	Count	46	17	0	0
	Column N %	73.00%	27.00%	0.0%	0.0%
Q99. Electrotherapy treatment e.g. Interferential current, TENS	Count	22	28	9	3
	Column N %	35.50%	45.20%	14.50%	4.80%
Q100. Multidisciplinary	Count	27	29	7	0

treatments e.g. Biopuncture, Medication, Applied kinesiology	Column N %	42.90%	46.00%	11.10%	0.0%
Q101. Myofascial treatment techniques e.g. Dry needling, Ischemic compression	Count	36	24	2	0
	Column N %	58.10%	38.70%	3.20%	0.0%
Q102. Rehabilitation programmes e.g. Orthotics, PNF, Strapping	Count	38	25	0	0
	Column N %	60.30%	39.70%	0.0%	0.0%

Please note that for certain questions, the responses do not add up to 63. This is because certain respondents did not answer all questions.

4.8.1.1 Discussion of the Practitioner Perceptions of the most Relevant Chiropractic Research Agendas

In summary and as per Table 4.7 and Figure 4.3, practicing Chiropractors in KwaZulu-Natal perceived the following Chiropractic research agendas as the most relevant:

- 84% perceived Neurological testing as a 'very important' Chiropractic research agenda.
- 81% perceived Biomechanical changes as a result of the Chiropractic manipulation as a 'very important' Chiropractic research agenda.
- 78% perceived Orthopaedic testing as a 'very important' Chiropractic research agenda.
- 78% perceived Reduction of Posture related disorders as a 'very important' Chiropractic research agenda.
- 76% perceived Gross Anatomical changes as a result of the Chiropractic manipulation as a 'very important' Chiropractic research agenda.
- 73% perceived Chiropractic Adjustment techniques as a 'very important' Chiropractic research agenda.
- 73% perceived Myofascial Trigger Point (MFTP) assessment as a 'very important' Chiropractic research agenda.
- 73% perceived Muscular testing as a 'very important' Chiropractic research Agenda.
- 73% perceived Range of Motion (ROM) assessment as a 'very important' Chiropractic research agenda.
- 71% perceived Motion and / or Static Palpation as a 'very important' Chiropractic research agenda.

- 71% perceived Gait and posture assessment as a ‘very important’ Chiropractic research agenda.
- 65% perceived Ergonomic Risk Prevention as a ‘very important’ Chiropractic research agenda.
- 62% perceived Physiological changes as a result of the Chiropractic manipulation as a ‘very important’ chiropractic agenda.
- 62% perceived Successful Practice Management as a ‘very important’ Chiropractic research agenda.
- 62% perceived Sports Medicine as a ‘very important’ Chiropractic research agenda.
- 60% perceived Imaging studies as a ‘very important’ Chiropractic research agenda.
- 60% perceived Rehabilitation Programmes as a ‘very important’ Chiropractic research agenda.
- 59% perceived Injury Prevention as a ‘very important’ Chiropractic research agenda.
- 54% perceived Histological changes as a result of the Chiropractic manipulation as a ‘very important’ Chiropractic research agenda.
- 54% perceived Biochemical changes as a result of the Chiropractic manipulation as a ‘very important’ Chiropractic research agenda and 42% perceived it as ‘important’. No-one perceived it to be ‘not important’ or ‘irrelevant’.
- 42% perceived Multidisciplinary techniques as a ‘very important’ Chiropractic research agenda and 46% perceived it to be ‘important’. No-one perceived it to be ‘not important’ or ‘irrelevant’.

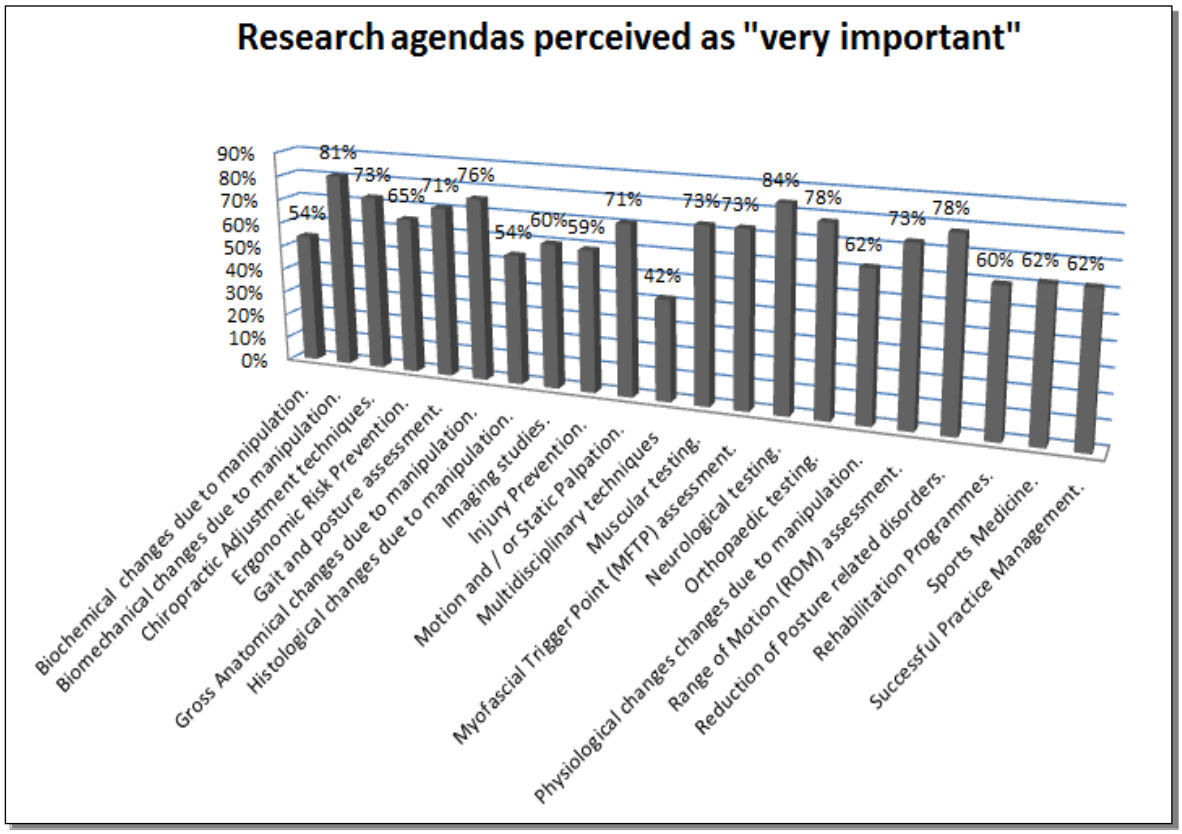

Fig 4.3 Research agendas perceived as 'very important'.

The majority (84.1%) of the Chiropractic respondents perceived Neurological testing as a 'very important' Chiropractic research agenda. This mirrored the agendas of Haavik-Taylor and Murphy (2010) which focused on the effects of the manipulation on central integration and the subsequent sensorimotor sequalae. Additionally, the popular focus of current international Chiropractic studies includes research into nerve variants (Battaglia, Scalia and Enix 2012) and the effects of the Chiropractic manipulation on sensorimotor function (Goertz *et al.* 2015). Similarly, studies on the effects on non-muscular conditions and whole system function (Hawk 2004), and neurological responses to spinal manipulation have been popularly researched (Reed and Pickar 2015; Hawk 1999; Keating. Bergman and Jacobs 1990; Schleifer 1995; French 2000; Nicholson,2000; Triano 2013; Kawchuk and Perle 2006; Kawchuk and Stewart-Smith 2002).

Biomechanical changes as a result of the Chiropractic manipulation was perceived as 'very important' by 81% of the respondents. This was in line with the work of Triano (2015) and Kawchuk (2015) whose investigations into the biomechanical and neurological responses to manipulation and real-time visualisations of the effects of the Chiropractic manipulation have vastly improved the understanding of the effects of the professions' treatment techniques. Herzog's (2010) studies on the biomechanics of spinal manipulation and, most notably, the effects on the internal carotid arteries, are also areas of

interest. Similarly, Wuest's (2010) investigations into the biomechanics of the vertebral arteries during manipulation are agendas for further investigation. The biomechanical analysis of patients with pain (Wong *et al.* 2015) and analysis of biomechanical and proteomic changes in the intervertebral discs with degenerative joint disease (Erwin *et al.* 2015) are also current biomechanical focal areas.

Orthopaedic testing was regarded by 79% of respondents as being a 'very important' subject for further investigation. Walsh (1998) did extensive orthopaedic testing in patients with lower back pain and further investigations into the postural effects of the manipulation. Both Blum (2015) and Kleinfield, Daniel and Ndetan (2011) focused on the clinical assessment of orthopaedic techniques and tests. Walker and Buchbinder's (1997) analysis of spinal subluxation detection methods, combination testing in orthopaedic assessment (Miller *et al.* 2007) and investigation into outcome measures (Hinton *et al.* 2010) provided further expansion of the research agenda.

The Reduction of Posture related disorders was considered by 77.8% of the respondents as 'very important' research. As previously mentioned, Walsh's (1998) studies have largely contributed to increased knowledge in this field. Both Liebenson (1998) and Sahrmann (2011) are two of the key contributors to studies on the reduction of posture related disorders with a focus on rehabilitative techniques and movement impairment syndromes, respectively. Also of note was Key's (2008) classification of movement dysfunction for improved diagnostic assessment and Chiropractic outcomes. Kendall's (2015) investigations into the effects of the manipulation in elderly patients have greatly improved the knowledge and treatment of geriatric conditions.

Gross Anatomical changes as a result of the Chiropractic manipulation was perceived by 76.2% of the respondents as 'very important'. Triano (2015) and Kawchuk's (2015) previously cited visuals of the joint cavitation process that occurs during the manipulation have contributed to a greater understanding of the anatomical changes that result from the Chiropractic treatment. Numerous studies have investigated the anatomical responses following varied manipulation techniques (Colloca 2012) and most notably aimed to quantify the zygapophyseal joint changes following manipulation (Cramer *et al.* 2013).

Both Colloca and Keller (2007) and Reed and Pickar (2015) have investigated the anatomical changes of the intervertebral foramen and reduction of neural inflammation following manipulation of the lumber spine. Their studies have also focused on the muscular and anatomical consequences of the Chiropractic manipulation.

Manipulation techniques, regarded by 73% of the respondents as a 'very important' research agenda, is one of the foremost subjects of Byfield (2012) and Byfield and Barbers' (2005) studies. Langenfeld *et al.* (2015) have also contributed to further studies on the effects of different manipulation

techniques, specifically on neck pain. Descarreaux (2015) has a slightly different focus, which is mainly on the education of manipulation technique training.

Maggee (2012), Macedo and Maggee (2009) and Rieder (2003) have focused mainly on Range of Motion (ROM) and proprioception studies following Chiropractic treatment. Range Of Motion assessment was also perceived by 73% of the respondents as 'very important'. Additionally, Muir's (2014) studies on Range Of Motion evaluation in the assessment of postural stability and Meiritz's (2014) evaluations of measurement devices that test motion parameters in low back pain patients have further increased knowledge in this field.

Of equal importance (73%) to Manipulation techniques and ROM assessment was Myofascial Trigger Point (MFTP) assessment and Muscular Testing. Experts in Myofascial Trigger Point (MFTP) assessment research are Triano *et al.* (2013), Travell and Simons (1983), Chaitow (2015) and Sahrmann (2015). The study of Myofascial origins and assessment and treatment (Travell and Simon, 1983) has contributed greatly to improved clinical practice. Methodologies used in detecting spinal subluxation and Myofascial dysfunction (Triano *et al.* 2013) are regarded as important contributions to preventative health care and validation of the Chiropractic theories as treatment techniques (Rupert 2000; Leach 2004). Furthermore, the study of Myofascial pain syndromes (Chaitow 2015), movement and Myofascial impairment studies (Sahrmann 2015) continue to contribute towards improved treatment outcomes.

Muscular testing studies mostly validate the Myopathic Chiropractic theories. The study by Demers *et al.* (2014) that tested hearing acuity in response to stimulation of the paraspinal muscles tested one of the fundamental Chiropractic theories in an attempt to validate the profession's theoretic philosophy (Gottlieb 1997; Lantz 1988; Rupert 2000; Schafer and Faye 1990; Leach 2004). Research into the somatosensory influences on muscle testing (Leisman, Shambaugh and Ferentz 1989) further increased knowledge and validation of the Chiropractic theories. Reliability studies that focus upon manual muscle testing (Hsieh and Philips 1990) and on modified sphygmomanometer dynamometer testing (Vernon *et al.* 1992) provided for better evidence-based patient management.

Studies which have focused on the muscular System and muscular testing of specific muscles or groups of muscles have provided for a better understanding of myopathies. This has ultimately resulted in better patient outcomes. Investigations into specific muscular conditions, such as spasmodic dysphonia (Waddell 2005), have also provided for improved management of these conditions. The extraocular muscles and cranial nerve relationships (Zhang and He 2010), the response of muscles to various load bearing forces (Jansen and Cooperstein 1998) and studies that investigate the responses of muscles to changing dietary intakes (Anderson and Pitsinger 2014), are but a few of the important contributions to increased evidence-based practice within the profession. Furthermore, muscular testing techniques such as the investigations of Cuthbert and Rosner (2010)

into applied Kinesiology techniques have further improved knowledge of spinal mediators. This is necessary in maintaining an evidence-based profession (Leach 2004; Walker and Buchbinder 1997).

Motion and/or static palpation was considered by 71.4% of the respondents as 'very important'. Gillet (1996) and Lewit (1999) are important contributors to this field. Schneider's (2008) reliability studies of palpatory techniques and Pringle's (2004) focus on palpatory skills learning were also of great importance, particularly to student Chiropractors.

Many respondents (71%) perceived gait and posture assessment as 'very important'. Steele *et al.* (2014), Newell *et al.* (2012) and Herzog (1987) are forerunners in this field of research. The investigations by Kendall *et al*. (2015) into foot postural assessment and geriatric postural dysfunction have also made great contributions to the increased knowledge and treatment of postural anomalies. Furthermore, Smith, Walsh and Smith's (2009) studies into running postural changes following manipulation have provided outcome measurement tools for improved clinical practice. Increased management studies of diseases such as Parkinson's disease (Bova and Sergent 2014) have provided increased knowledge for improved management of common clinical conditions.

Other agendas perceived to be 'very important' by the respondents include ergonomic risk prevention (65% of respondents), physiological changes as a result of the Chiropractic manipulation, successful practice management and sports medicine (all 62%). Many (60%) of the respondents perceived imaging studies and rehabilitation programmes as the most important Chiropractic research agenda. Injury prevention was regarded by 59% of the respondents as a 'very important' agenda and 54% of the respondents deemed histological changes as a result of the Chiropractic manipulation as a 'very important' research topic. Unfortunately it is not within the scope of this study to explore every research agenda. Future Chiropractic research, based on these findings, is therefore recommended.

Two research agendas that were considered as highly significant were studies that investigated the biochemical changes as a result of the Chiropractic manipulation and multi-disciplinary techniques. None of the respondents thought these to be 'not important' or 'irrelevant'. All of the respondents perceived these two research agendas as 'important' or 'very important'.

Biochemical changes as a result of the Chiropractic manipulation were considered by 54% of the respondents as 'very important' and by 42% of the respondents as 'important'. Herzog, Tang and Leonard's (2012) studies into internal carotid artery changes following manipulation were important biochemical studies for further exploration. Similarly Leach's (2004) studies warrant further investigation.

Hawk (2004) is a popular contributor to complementary and alternative treatment studies for disease prevention and health promotion. Similarly, Haldemann (2005) focused on multidisciplinary

techniques. Evans *et al.* (2011) are also responsible for many collaborations on studies into health promotion. These were of importance as multidisciplinary techniques were perceived by 42.9% of the respondents as 'very important' and by 46% of the respondents as 'important'.

4.8.2.1 Results of associations between Practitioner Demographics and Practitioner Perceptions

The results of the associations between the practitioner demographics and practitioner perceptions can be found in Appendices G1-G6 (Tables 4.8-4.13) respectively.

4.8.2.1.1 Discussion of the Associations between the Practitioner Demographics and Perceptions of Research

The results for the associations between the practitioner demographics and their perceptions of research drew no statistically significant valid associations, as too many categories were compared with too few cell counts (Esterhuizen 2015). The associations between the practitioners' age (Appendix G1), gender (Appendix G2), type of practice (Appendix G3), years in practice (Appendix G4), previous research conduction (Appendix G5) and improvement of Chiropractic abilities due to research conduction (Appendix G6), were analysed with no significant outcomes. In instances where significant p values were found, the chi square test was invalid due to small sample sizes and 0 values (Esterhuizen 2015).

4.9 The second objective of this study was to determine the main Focus of the Chiropractic Student Research conducted at the Durban University of Technology between 1994 and 2013.

4.9.1 The DUT Chiropractic student research agendas between 1994 and 2013

Table: 4.14 The DUT Chiropractic student research agendas between 1994 and 2013.

Q	CATEGORY	COUNT
19	Allergy testing	0
20	Blood screening e.g. for anaemia's, sugar levels	0
21	Body mass index and cardiovascular fitness testing	0
22	Bone testing e.g. for density, hot and cold spots	0
23	Cancer prevention screening e.g. mammogram, pap smear, psa testing	0
24	Chronic disease prevention e.g. cancer, DM, obesity, TB and opportunistic infection prevention	0
25	Complementary medication for health promotion eg. Chinese herbal, ayurvedic, naturapathic and	5

	homeopathic medication	
8	Culture screening e.g. of stool and bloods	0
9	Dietary advice	0
10	Dietary supplementation	2
11	Epidemiological studies	11
12	Ergonomic risk prevention	2
13	Gait analysis and postural assessment	3
14	Gastrointestinal scopes	0
15	General medical examination for common conditions such as jaundice, anemia, clubbing, cyanosis, oedema….	0
16	Injury prevention	5
17	Imaging studies e.g. angiography, doppler ultrasound, ct scan, mri, ultrasound, x-rays	11
18	Lifestyle factors e.g. alcohol abuse risks and cessation, exercise for disease prevention, social drug risks and cessation, tobacco risks and cessation,	12
19	Mental illness and psychological intervention for health promotion e.g. pain avoidance reduction and stress management techniques	0
20	Motion and / or static palpation	10
21	Muscular testing	0
22	Myofascial trigger point assessment	51
23	Neurological testing	3
24	Orthopaedic testing	1
25	Over-the-counter medication for disease prevention	5
26	Prescription medication	5
27	Range of motion assessment	3
28	Reduction of posture related disorders	2
29	Safe sex practices	0
30	Salivary cortisol testing to assess stress levels	0
31	Sexually transmitted disease prevention e.g. contraception use, HIV prevention	0

32	Sports medicine	4
33	Successful practice management	0
34	Supplementation e.g. dietary or sports supplementation	2
35	Urinalysis	0
36	Vital signs examination	0
37	Alzheimer's	0
38	Anemias	0
39	Angina	0
40	Asthma	2
41	Breast cancers	0
42	Cervical cancer	0
43	Colorectal cancers	0
44	Coronary heart disease	0
45	Chronic obstructive pulmonary disease	0
46	Diarrheal diseases	0
47	Cholera	0
48	Colon cancer	0
49	Diabetes mellitus	1
50	Ebstein-barr virus	0
51	Epilepsy	0
52	Hepatitis	0
53	Hiv/aids	0
54	Hypertension	0
55	Hypothyroidism	0
56	Ischeamic heart disease	0
57	Influenza and pneumonia	1

58	Leukemias	0
59	Liver cancer	0
60	Low birth weight	0
61	Lung disease and cancer	0
62	Lymphoma	0
63	Malaria	0
64	Measles	0
65	Meningitis	0
66	Oesophageal cancer	0
67	Peptic ulcers	0
68	Polycystic ovarian syndrome	0
69	Polycystic kidneys	0
70	Rabies	0
71	Schistosomiasis	0
72	Strokes	0
73	Syphilis	0
74	Tuberculosis	0
75	Biochemical changes as a result of chiropractic manipulation e.g. changes in metabolism and enzymes	0
76	Biomechanical changes as a result of chiropractic manipulation e.g. altered movement patterns in kinematic chains	124
77	Gross anatomical changes as a result of chiropractic manipulation e.g. change in orientation of joint surfaces	
78	Histological changes as a result of chiropractic manipulation e.g. microscopic changes in cell characteristics	0
79	Physiological changes as a result of chiropractic manipulation e.g. changes in hormone production, secretion, absorption and use	0
80	Chiropractic adjustment techniques e.g. diversified, gonstead	128
81	Electrotherapy treatment e.g. interferential current, TENS	4

82	Multidisciplinary treatments e.g. biopuncture, medication, applied kinesiology	10
83	Myofascial treatment techniques e.g. dry needling, ischemic compression	51
84	Rehabilitation programmes e.g. orthotics, PNF, strapping	18

4.9.2 Discussion of the DUT Student Research Agendas between 1994 and 2013

Student research completed at the DUT between 1994 and 2013 was analysed according to their main research agendas. In summary and as per Table 4.14, the most popular DUT Chiropractic student research agendas between 1994 and 2013 were as follows:

- 33% of the completed student studies had focused on Chiropractic adjustment techniques.
- 32% of the completed student studies had focused on biomechanical changes as a result of the Chiropractic manipulation.
- 11% of the completed student studies had focused on myofascial assessment and myofascial treatment techniques.
- 3% of the completed student studies had focused on lifestyle factors.
- 2% of the completed student studies had focused on imaging and epidemiology.
- 2% of the completed student studies had focused on motion and/or static palpation techniques and multi-disciplinary treatment techniques.
- 1% of the completed student studies had focused on complementary medicines, over-the-counter (OTC) medication, prescription medicine and injury prevention.
- 1% of the completed student studies had focused on sports Chiropractic and electrotherapy.

The majority of the students' research has been Randomized Controlled Trials (RCT's). One hundred and twenty-eight of the 381 completed student studies (33%) have focused on Chiropractic adjustment techniques (Appendix H1). These findings were not surprising, considering the number of years spent on adjustment techniques and skills training at the DUT (Chiropractic and Somatology Handbook 2014). The DUT Chiropractic students spent three years, as per the curriculum, learning and perfecting the skill of Chiropractic adjustment techniques in preparation for clinical practice (Chiropractic and Somatology Handbook 2014). These student agendas were congruent with the practitioner research agendas of Byfield (2012), Byfield and Barber (2005), Langenfeld *et al.* (2015) and Descarreaux (2015).

One hundred and twenty-four of the 381 total student studies (32%) had investigated biomechanical changes as a result of the Chiropractic manipulation (Appendix H1). Biomechanics is a Bachelor's Degree subject in the DUT Chiropractic course (Chiropractic and Somatology Handbook 2014). It

complements the clinical experience gained at the DUT through the learning of the aforementioned manipulation skills (Chiropractic and Somatology Handbook 2014). Triano (2015), Kawchuk (2015) and Herzog (2010) are international forerunners in this field. Research into the biomechanic consequences of full kinematic chain manipulation are currently improving the Chiropractic evidence-based research applicable to clinical practice (Redwood 2010; Brantingham 2010, 2012 and 2013; de Luca 2011 and 2014; Dwyer and Boysen 2011; Bereznick 2008; McGill 2006; Lehman 2001).

Forty-four (11%) of the total student studies had researched myofascial assessment and myofascial treatment techniques (Appendix H1). Myofascial assessment and treatment techniques are also a major subject of study within the student curriculum. The recommended works of Travell and Simons (1983) formed the backbone of the myofascial component of the DUT students' Chiropractic training. Furthermore, the student studies were in line with the research agendas of Triano *et al.* (2013), Chaitow (2015) and Sahrmann (2015).

Other topics that had proved to be popularly researched at the DUT, in order of significance, were:

- **Lifestyle factors:** Public health and disease prevention is the foremost research agenda of Leboeuf-Yde (2004), Hawk (2004), Gatterman (2006) and Mootz (2006). The integration of public health training into Chiropractic educational institutions is Blum's (2008) mandate and may warrant further investigation with reference to DUT student education.
- **Imaging studies:** Radiography is studied throughout the Chiropractic course at the DUT and is a large component of the curriculum (Chiropractic and Somatology Handbook 2014). The campus has an on-site Radiography Department where practical skills are learnt and the Chiropractic clinic also has facilities for examination and reporting of x-rays. Referrals for imaging studies other than x-rays are encouraged if necessary. An understanding of the principles of the MRI, CT and bone scan imaging are also taught (Chiropractic and Somatology Handbook 2014). Considering the length of time spent studying imaging, the student interest in imaging studies was to be expected. Similarly, it is widely agreed upon that imaging studies as an aid in the detection of the subluxation warrants further investigation (Leach 2004; Harrison 2002; Seemann 1999: Peterson 1999; Troyanovich 1999; Rochester 1994; Owens 1992; Plaugher 1993; Sigler and Howe 1988).
- **Epidemiology studies:** Epidemiology is studied in the first years of the DUT Chiropractic course (Chiropractic and Somatology Handbook 2014) and offers experience in aforementioned case-control study techniques (Portney and Watkins 2009). Many international contributors in this line of research have expanded the epidemiological knowledge gained from these studies (Williams and Zipp 2014; Walker, 2014; Langenfeld *et al.* 2015; Marchand 2012; Dagenais 2015).
- **Motion and/or Static Palpation techniques:** The Chiropractic student at DUT spends three years learning palpation techniques before advancing to the study of the Chiropractic

manipulation techniques (Chiropractic and Somatology Handbook 2014). This student agenda was congruent with that of Gillet (1996), Lewit (1999) and Schneider (2008).

- **Multi-disciplinary treatment techniques:** Not many international Chiropractic studies focused on multi-disciplinary techniques (Korporaal 2015). Nonetheless, the research contributions of Hawk (2012), Haldemann (2005) and Ndetan (2012) were recognised as important treatment studies for the promotion of health and prevention of disease.
- **Complementary medicines:** The student interest in complementary medicine studies was not unusual given that the Chiropractic student's formative years at the DUT run parallel with the DUT Homoeopathic students training (Chiropractic and Somatology Handbook 2014). The course curriculum also exposed the student to adjunctive complementary therapies, such as meridian therapies and hydrotherapies, to name a few (Chiropractic and Somatology Handbook 2014). Furthermore, the Chiropractic student, once graduated, is required to become a member of the AHPCSA, the governing body of twelve Allied Health Professions in South Africa, of which Chiropractic is one. International investigation into this agenda has been explored by Woodbury *et al.* (2015), Kligler *et al*. (2015), Galicia-Connolly *et al.* (2014), Rodriquez-van Lier *et al.* (2013), Huang *et al.* (2011) and Lauche *et al*. (2015), to name a few.
- **Over-the-counter (OTC) medication:** The slow integration of Chiropractic as a mainstream medical treatment (Leach 2004) and the self-imposed isolation from mainstream medicine had negatively affected the integration of research into the Chiropractic profession (Keating *et al.* 1992; Eisenberg *et al.* 1998; Meeker and Haldeman 2002). Conversely, the increased move within the profession to a more EBP has encouraged the Chiropractic profession to validate its treatments and claims to the public, medical aids and Allopathic profession (Villanueva-Russell 2005; Haynes 1999; Eisenberg *et al.* 1993; Eisenberg *et al.* 1998). Byfield (2010), Leboeuf-Yde, (2004) and Hawk (2004) suggested further promotion of the Chiropractic profession in public and primary healthcare initiatives.
- **Prescription medicine:** Pharmacology study is part of the DUT Chiropractic curriculum in the first years of study, which aimed to give the student a good pharmacological grounding (Chiropractic and Somatology Handbook 2014). As previously cited, the conflicting history of the Chiropractic and Allopathic professions had largely affected Chiropractic research to date (Leach 2004; Keating 1992; Meeker and Haldeman 2002). Comparative trials weighing up the benefits of Chiropractic treatment versus Allopathic medicine were therefore expected to be an agenda of student interest. The RCT's comparing prescription medicine to Chiropractic treatment are the agendas of Catalá-Lopez *et al*. (2015), Kaeser *et al.* (2015) and Jamison (1999).
- **Injury prevention:** The subject of injury prevention was focused on at the DUT in various subjects over the course of the students' education. Skills such as rehabilitation, strapping techniques, ergonomic education and nutritional advice were but a few of the subjects the students learn that improved their knowledge of injury prevention (Chiropractic and Somatology

Handbook 2014). Furthermore, the student was required by the AHPCSA to participate in sports events that further educated the student in injury prevention. Leach (2004) suggested that the role of Chiropractic in injury prevention was an agenda that warrants further investigation.

- **Sports Chiropractic:** Sports Chiropractic is a popular national and international research agenda (Macquarie University 2010; Hoskins, 2011; Pollard, 2007; McHardy and Pollard, 2005; Greenstein, 2010; Lakhani, 2009; Brantingham 2001; Moreau and Nook 1991; Nook 1985). As previously cited, the Chiropractic student at the DUT gained much experience in sports Chiropractic via their participation in mandatory sports events, as stipulated by the AHPCSA internship requirements (Allied Health Professional Council of South Africa Internship guidelines 2015).
- **Electrotherapy:** Students at the DUT study the skills of auxiliary therapeutics as an adjunct to the manipulation technique training (Chiropractic and Somatology Handbook 2014). The students were required, as per the curriculum, to complete a work integrated learning (WIL) programme (Chiropractic and Somatology Handbook 2014). The DUT Chiropractic Day Clinic offered the students this opportunity and was well equipped with electrotherapy modalities for improved clinical skills training. The DUT student studies focusing on this agenda were congruent with the popular agendas of Reed, Lang and Pickar (2013), Chapman and Bakkum (2012), and Gemmell and Hilland (2011).

4.10 The Third objective of this study was to the congruency between the focus of the Chiropractic Student Research completed at the DUT and the Research Agendas which were perceived to be of highest professional relevance by Chiropractors in KwaZulu-Natal.

4.10.1 Comparison between the focus of the Chiropractic Student Research completed at DUT between 1994 and 2013 and the Research Agendas which were perceived to be of highest professional relevance by Chiropractors in KwaZulu-Natal.

Table: 4.15 Comparison between Chiropractic student research and the practitioner's perceptions of research.

Q	CATEGORIES FROM QUESTIONNAIRE n=84	STUDENT COUNT n=381	%	PRACTITIONER RATED IMPORTANCE FROM SURVEY, n=63	%
Q19	Allergy testing	0	0	3	5
Q20	Blood screening e.g. for anemias, sugar	0	0	10	16

	levels				
Q21	Body mass index and cardiovascular fitness testing	0	0	12	19
Q22	Bone testing e.g. for density, hot and cold spots	0	0	26	41
Q23	Cancer prevention screening e.g. mammogram, pap smear, psa testing	0	0	12	19
Q24	Chronic disease prevention e.g. cancer, DM, obesity, TB and opportunistic infection prevention	0	0	16	25
Q25	Complementary medication for health promotion eg. Chinese herbal, ayurvedic, naturapathic and homeopathic medication	5	1	8	13
Q26	Culture screening e.g. of stool and bloods	0	0	5	8
Q27	Dietary advice	0	0	24	38
Q28	Dietary supplementation	2	0	20	32
Q29	Epidemiological studies	11	2	6	10
Q30	Ergonomic risk prevention	2	0	41	65
Q31	Gait analysis and postural assessment	3	1	44	70
Q32	Gastrointestinal scopes	0	0	1	2
Q33	General medical examination for common conditions such as jaundice, anemia, clubbing, cyanosis, oedema….	0	0	10	16
Q34	Injury prevention	5	1	37	59
Q35	Imaging studies e.g. angiography, doppler ultrasound, CT scan, MRI, ultrasound, x-rays	11	2	38	60
Q36	Lifestyle factors e.g. alcohol abuse risks and cessation, exercise for disease prevention, social drug risks and cessation,	12	3	26	41

	tobacco risks and cessation,				
Q37	Mental illness and psychological intervention for health promotion e.g. pain avoidance reduction and stress management techniques	0	0	18	29
Q38	Motion and / or static palpation	10	2	45	71
Q39	Muscular testing	0	0	46	73
Q40	Myofascial trigger point assessment	51	11	46	73
Q41	Neurological testing	3	0	53	84
Q42	Orthopaedic testing	1	0	49	78
Q43	Over-the-counter medication for disease prevention	5	1	8	13
Q44	Prescription medication	5	1	11	17
Q45	Range of motion assessment	3	1	46	73
Q46	Reduction of posture related disorders	2	0	49	78
47	Safe sex practices	0	0	6	10
Q48	Salivary cortisol testing to assess stress levels	0	0	7	11
Q49	Sexually transmitted disease prevention e.g. contraception use, hiv prevention	0	0	7	11
Q50	Sports medicine	4	1	39	62
Q51	Successful practice management	0	0	39	62
Q52	Supplementation e.g. dietary or sports supplementation	2	0	24	38
Q53	Urinalysis	0	0	10	16
Q54	Vital signs examination	0	0	25	40
Q55	Alzheimers	0	0	1	2

Q56	Anemias	0	0	4	6
Q57	Angina	0	0	5	8
Q58	Asthma	2	0	5	8
Q59	Breast cancers	0	0	6	10
Q60	Cervical cancer	0	0	2	3
Q61	Colorectal cancers	0	0	5	8
Q62	Coronary heart disease	0	0	5	8
Q63	Chronic obstructive pulmonary disease	0	0	3	5
Q64	Diarrhoeal diseases	0	0	2	3
Q65	Cholera	0	0	2	3
Q66	Colon cancer	0	0	5	8
Q67	Diabetis mellitis	1	0	11	17
Q68	Ebstein-barr virus	0	0	8	13
Q69	Epilepsy	0	0	7	11
Q70	Hepatitis	0	0	5	8
Q71	HIV/aids	0	0	5	8
Q72	Hypertension	0	0	13	21
Q73	Hypothyroidism	0	0	5	8
Q74	Ischeamic heart disease	0	0	5	8
Q75	Influenza and pneumonia	1	0	1	2
Q76	Leukemias	0	0	5	8
Q77	Liver cancer	0	0	4	6
Q78	Low birth weight	0	0	6	10
Q79	Lung disease and cancer	0	0	6	10
Q80	Lymphoma	0	0	7	11
Q81	Malaria	0	0	3	5

Q82	Measles	0	0	2	3
Q83	Meningitis	0	0	15	24
Q84	Oesophageal cancer	0	0	5	8
Q85	Peptic ulcers	0	0	5	8
Q86	Polycystic ovarian syndrome	0	0	5	8
Q87	Polycystic kidneys	0	0	5	8
Q88	Rabies	0	0	3	5
Q89	Schistosomiasis	0	0	1	2
Q90	Strokes	0	0	22	35
Q91	Syphilis	0	0	4	6
Q92	Tuberculosis	0	0	10	16
Q93	Biochemical changes as a result of chiropractic manipulation e.g. changes in metabolism and enzymes	0	0	34	54
Q94	Biomechanical changes as a result of chiropractic manipulation e.g. altered movement patterns in kinematic chains	124	26	51	81
Q95	Gross anatomical changes as a result of chiropractic manipulation e.g. change in orientation of joint surfaces		0	48	76
Q96	Histological changes as a result of chiropractic manipulation e.g. microscopic changes in cell characteristics	0	0	34	54
Q97	Physiological changes as a result of chiropractic manipulation e.g. changes in hormone production, secretion, absorption and use	0	0	39	62
Q98	Chiropractic adjustment techniques e.g. diversified, gonstead	128	27	46	73
Q99	Electrotherapy treatment e.g. interferential current, TENS	4	1	22	35

Q100	Multidisciplinary treatments e.g. biopuncture, medication, applied kinesiology	10	2	27	43
Q101	Myofascial treatment techniques e.g. dry needling, ischemic compression	51	11	36	57
Q102	Rehabilitation programmes e.g. orthotics, PNF, strapping	18	4	38	60

4.10.1.1 Discussion of the Comparison of the focus of the Chiropractic Student Research completed at DUT between 1994 and 2012 and the Research Agendas which were perceived to be of highest professional relevance by Chiropractors in KwaZulu-Natal.

Binomial one sample tests were used to compare, firstly, the sample proportion of Chiropractic practitioners who perceived the research agenda as 'most important' in the questionnaire (Appendix C), and secondly, the proportion of the number of times that the research agenda had been investigated at the DUT. The majority of the questionnaire research agendas had not been studied by the students, except for a few areas of overlap (Esterhuizen 2015).

In summary and as per Table 4.15, the results of the comparison of the research agendas perceived to be as 'very important' by the practitioners in practice in KwaZulu-Natal and the completed student research at the DUT between 1994 and 2013 were as follows:

- 84% of the practitioners perceived neurological testing as 'very important'; 0% of the student research was focused on this agenda.
- 81% of the practitioners perceived biomechanical changes as a result of the Chiropractic manipulation as 'very important'; 26% of the student research was focused on this agenda.
- 78% of the practitioners perceived reduction of posture related disorders as 'very important'; 0% of the student research was focused on this agenda.
- 78% of the practitioners perceived orthopaedic testing as 'very important'; 0% of the student research was focused on this agenda.
- 76% of the practitioners perceived gross anatomical changes as a result of the Chiropractic manipulation as 'very important; 0% of the student research was focused on this agenda.
- 73% of the practitioner's perceived Chiropractic adjustment techniques as 'very important'; 33% (majority) of the student research was focused on this agenda.
- 73% of the practitioners perceived myofascial assessment as 'very important'; 11% of the student research was focused on this agenda.

- 73% of the practitioners perceived range of motion (ROM) as ‘very important’; 1 % of the student research was focused on this agenda.
- 73% of the practitioners perceived muscular testing as ‘very important’; 0% of the student research was focused on this agenda.
- 71% of the practitioners perceived motion and/or static palpation as ‘very important’; 2% of the student research was focused on this agenda.
- 71% of the practitioners perceived gait and posture as ‘very important’; 1% of the student research was focused on this agenda.
- 65% of the practitioners perceived ergonomic risk prevention as ‘very important’; 0% of the student research was focused on this agenda.
- 62% of the practitioners perceived sports medicine as ‘very important’; 1% of the student research was focused on this agenda.
- 62% of the practitioners perceived physiological changes as a result of the Chiropractic manipulation as ‘very important’; 0% of the student research was focused on this agenda.
- 62% of the practitioners perceived successful practice management as ‘very important’; 0% of the student research was focused on this agenda.
- 60% of the practitioners perceived rehabilitation programmes as ‘very important’; 4% of the student research was focused on this agenda.
- 60% of the practitioners perceived imaging studies as ‘very important’; 2% of the student research was focused on this agenda.
- 59% of the practitioners perceived injury prevention as ‘very important’; 1% of the student research was focused on this agenda.
- 57% of the practitioners perceived myofascial treatment techniques as ‘very important’; 11% of the student research was focused on this agenda.
- 54% of the practitioners perceived biochemical changes as a result of the Chiropractic manipulation as ‘very important’; 0% of the student research was focused on this agenda.
- 54% of the practitioners perceived histological changes as a result of the Chiropractic manipulation as ‘very important’; 0% of the student research was focused on this agenda.
- 43% of the practitioners perceived multi-disciplinary treatment techniques as ‘very important’; 2% of the student research was focused on this agenda.
- 41% of the practitioner’s perceived lifestyle factors as ‘very important’; 3% of the student research was focused on this agenda.

The practitioner research agenda of neurological testing was perceived to be ‘very important’. This was congruent with the neurological agendas of Haavik-Taylor and Murphy (2010), Hawk *et al.* (2004) and Reed and Pickar (2015), to name but a few. None of the Chiropractic students at the DUT had completed research in this field. The incongruences between the practitioner agendas (84%

perceived this agenda as the most important) and those of the students (0% of the student research was focused on this agenda) warrants further investigation. Redwood and Cleveland (2003) suggested that the Chiropractic profession's future success is reliant on congruency of purpose of research agendas. It is therefore recommended that future student research, in keeping with the practitioners' recommendations and international research trends, shifts to a more neurophysiological focus.

Biomechanical changes as a result of the Chiropractic manipulation was considered by 81% of the respondents to be 'very important'. Many (26%) of the student studies had focused on the same. This particular research agenda was the most congruent between the practitioner perceptions and the completed DUT research. Both student and practitioner research agendas were congruent with those of Triano (2015), Kawchuk (2015) and Herzog (2010). Also of interest were the studies of Wong *et al.* (2015) and Erwin *et al.* (2015). The biomechanical effects on the arterial system following manipulation (Herzog 2010; Wuest 2010), although a current popular international Chiropractic research agenda, had not been researched by the DUT students. Future student studies into this agenda may be of important clinical relevance.

Both the reduction of posture related disorders and orthopaedic testing were highly regarded (78% of respondents) as 'very important' Chiropractic research agendas. There was a great incongruence of purpose between the practitioner agendas and those of the students, as no students had investigated these agendas. This calls for future student investigation into these fields if the student research aims to be clinically current and in line with international Chiropractic trends.

Walsh (1998), Liebenson (1998), Sahrmann (2011), Key (2008) and Kendall (2015) are international forerunners in the field of postural disorder reduction studies. Future student investigation into their line of research would prove beneficial. International orthopaedic studies into the postural sequelae of the Chiropractic manipulation (Walsh 1998) and validation of both orthopaedic tests and orthopaedic VSC mediating variables (Blum 2015; Kleinfield, Daniel and Ndetan 2011; Walker and Buchbinder 1997) were recommended for investigation in future student research. As previously cited, combination orthopaedic testing (Miller *et al.* 2007) and the testing of orthopaedic outcome measures (Hinton *et al.* 2010) were also areas of interest that warrant further investigation. This was in line with the Chiropractic professions' ongoing endeavours for better prevention and treatment techniques, as well as improved patient outcomes (Gottlieb 1997; Rupert 2000; Leach 2004).

Gross anatomical changes as a result of the Chiropractic manipulation were highly regarded (76%) by the practitioners as a 'very important' research agenda, yet 0% of the student studies had focused on this agenda. There is still little evidence of the results of the Chiropractic manipulation (Korporaal 2014) which made it a foremost agenda for investigation. Cramer (2000), Leach (2004), Colloca (2012), Triano (2015) and Kawchuk's (2015) contributions have greatly added to increased knowledge in this area and were recommended for future student investigation.

The practitioners' research agenda and students' research agenda that proved most congruent were those of the Chiropractic adjustment technique. This was perceived by many (73%) of the practitioner respondents as 'very important' and the majority (33%) of the students' research was focused on it. The effects of the Chiropractic adjustment were popularly investigated internationally (Budgell 2000; Sato 1992; Byfield 2012; Byfield and Barber 2005; Langenfeld *et al.* 2015; Reed and Pickar 2013; Cao *et al.* 2013). So too was the education and training of the Chiropractic adjustment technique (Descarreaux 2015).

Muscular testing, ROM and myofascial assessment studies were also perceived as 'very important' research agendas by many (73%) of the practitioner respondents. Muscular testing was the foremost agenda of Hsieh and Philips (1990), Zhang and He (2010), Jansen and Cooperstein (1998), Anderson and Pitsinger (2014) and Cuthbert and Rosner (2010), to name but a few. There existed a great incongruence between the focus of the Chiropractic practitioners' research agenda and that of the students, as 0% of the student studies had focused on muscular testing. This agenda therefore warrants future investigation. Similarly, only 1% of the students had studied ROM. Although these studies were congruent with the agendas of Macedo and Maggee (2009), Reider *et al.* (2003), Muir (2014) and Meiritz (2014), this agenda called for further student evaluation in order for future student research to be in line with international research trends. Myofascial trigger point (MFTP) assessment was a more popular (11%) student research topic. This agenda was therefore more congruent with that of the practitioners. In concordance, the student research agenda was congruent internationally with the notable contributions of Travell and Simons (1983), Chaitow (2015), Sahrmann (2015) and Triano (2013).

Motion and/or static palpation was perceived to be a 'very important' research agenda by 71% of the respondents. This mirrored the international focus of Gillet (1996), Lewit (1999), Schneider (2008) and Pringle (2004). Only 2% of the student research had investigated this agenda and therefore future student research in this area is encouraged.

Gait and posture assessment had been investigated by only 1 % of the students. This was incongruent with the perceptions of the practitioner respondents, 71% of whom perceived it to be a 'very important' research agenda. Increased student research in this area is therefore suggested. This is in keeping with the clinically important studies of Herzog (1987), Newell, (2012), Kendall *et al.* (2015) and Steele *et al.* (2014).

None of the student studies had evaluated ergonomic risk prevention, physiological changes as a result of the Chiropractic manipulation, or successful practice management. This was incongruent with the agendas of the respondents (65%, 62% and 62% respectively) whom perceived these agendas to be a 'very important' topic for investigation. Conversely, the student research (1%) into sports medicine was more congruent with the perceptions of the practitioners (62%) and national and

international sports medicine research agendas (Greenstein 2010; Nook 1991). Comparatively there was increased congruency between the conduction of student imaging studies (2%) and the respondents' agenda. Sixty percent of the respondents regarded imaging studies as a 'very important' research agenda. This mirrored the growing interest in imaging studies internationally (Leach 2004; Harrison 2002; Seemann 1999; Peterson 1999; Troyanovich 1999; Rochester 1994; Owens 1992; Plaugher 1993; Sigler and Howe 1988).

Of the total responses, 60% of the respondents perceived rehabilitation programmes as a 'very important' research agenda and 4% of the student research has focused on this topic. This is congruent with the studies of Liebenson (1996), Kendall *et al*. (2014), Janda (1976), Jull (2014), Sahrmann (2015) and Lewit (1999). Injury prevention was perceived by 59% of the respondents as 'very important'; by comparison only 1% of the student research had evaluated this agenda. It is Leachs' (2004) recommendation for increased future investigation into this agenda.

Myofascial treatment techniques were regarded by 57% of the respondents as a 'very important' research agenda. This agenda was highly congruent with that of the students. Eleven percent of the conducted student studies had focused on myofascial treatment techniques and were congruent with the aforementioned studies of Sahrmann (2015), Triano *et al*. (2013) Travell and Simons (1983) and Chaitow (2015).

Neither biochemical changes, nor histological changes as a result of the Chiropractic manipulation had been investigated by the students. Fifty-four percent of the respondents perceived these agendas as 'very important'. Further student investigation into both of these agendas is recommended in keeping with the international agendas of Sato (1992), Reed and Pickar (2015), Cao *et al*. (2013).

The student interest (2% of the studies) in multi-disciplinary techniques was congruent with that of the practitioners, as 43% of the respondents perceived it to be a 'very important' research agenda. Similarly, the agendas were congruent with those of Haldeman (2005), Hawk (2015) and Evans *et al*. (2011). There was even more congruency between the practitioner and the student research into lifestyle factors. Future research into lifestyle factors and disease prevention was encouraged by the likes of Leboeuf-Yde (2004), Hawk (2015), Gatterman (2006) and Mootz *et al*. (2006), who had made important contributions in this field. Blum's (2008) suggestions of incorporating public health training into Chiropractic educational institutions was worth further consideration.

Many of the student research agendas were incongruent with those of the respondents. These areas of incongruence offer DUT students opportunities for future clinically relevant student research. Research into the subject matter that was perceived to be 'very important' by the practitioner respondents, but was not focused on by the student research, is highly recommended. It is suggested that research which is congruent with both national and international trends is the greatest

contributing factor in the future success of the Chiropractic profession (Redwood and Cleveland 2003).

4.11 Summary

A comparison of the Chiropractic student research completed at DUT between 1994 and 2013 and the most clinically relevant research agendas, as perceived by Chiropractic practitioners in practice in KwaZulu-Natal, produced many incongruencies. The outcomes aimed to provide the DUT student with increased opportunities for the exploration of more clinically relevant research. Similarly, the practitioners' recommendations for future student Chiropractic research aimed to provide the DUT Chiropractic student with research agendas that are congruent with local and international research trends. This is important, as congruency of purpose is suggested as the most important contributor to the future success of the Chiropractic profession.

Chapter Five: Discussion, Conclusions and Recommendations

5.1 Conclusion

The study respondents were mostly White, English speaking females with an average age of 38 years. The majority of the respondents had been in practice for eleven to twenty years, had graduated from the DUT, and had previous research experience that was perceived to improve their capabilities as a Chiropractor. Conversely, very few had previously published research. Many of the respondents held a Master's in Chiropractic as well as a further qualification in a different field. The average number of hours practiced per week was 33 hours, mostly in multi-disciplinary practices. The respondents perceived the increased recognition and practice of EBM as the primary motivation for conducting research. Included in this was the drive for increased education of the general public, medical fraternity and medical aid companies on Chiropractic as a PHC profession.

The advancement and continued development of the Chiropractic profession were cited as very important reasons for further research uptake. The validation and knowledge of treatment protocols and improved patient outcomes were perceived as important outcomes of the research process. Furthermore, the increase in personal and professional knowledge obtained from increased research endeavours was highly regarded as an important motivating factor for more research efforts. Improved treatment outcomes, discrimination of effectual from ineffectual testing techniques and expansion of the Chiropractic scope of practice were also perceived as important reasons for conducting future research. Other reasons for conducting research were investigations into the relationships between the Chiropractic treatment techniques and outcomes in terms of patient health. Similarly, inter-disciplinary relationship exploration was also deemed important for future investigation.

The research study aimed to provide new ideas for student research, thereby keeping student research congruent with local and international research agendas. The results from this study were sent to the Chiropractic research co-ordinator at DUT so that the recommendations were made available to Chiropractic Masters' degree students embarking on research. The majority of the respondents were open to participation in a database of clinically relevant research recommendations that could be accessed by the Chiropractic students. The Chairperson of the Chiropractic Association of South Africa (CASA) agreed to administrate this database following the positive outcome of this study.

The student research agendas that were congruent with local perceptions of clinically relevant and important research were those of Chiropractic adjustment techniques, biomechanical changes as a result of the Chiropractic manipulation and MFTP assessment. Chiropractic research into neurological testing; biomechanical changes as a result of the Chiropractic manipulation; orthopaedic testing; reduction of posture related disorders; and gross anatomical changes as a result of the

Chiropractic manipulation, in this order, were the foremost agendas of the respondents. All, bar the biomechanical changes as a result of the Chiropractic manipulation, had not been the focus of student research. These incongruences highlighted opportunities for future student research. Similarly, the perceived clinically important ROM assessment, muscular testing, motion and/or static palpation, and gait and posture assessment agendas had been under-studied at the DUT.

5.2 Study Limitations

The relatively small sample size used in both phase one and phase two of the study may not have been representative of the entire population of practitioner and student Chiropractors in South Africa. Research trends and current agendas would be easier to ascertain with a larger population group that included the other provinces in South Africa and the other Chiropractic institution. Similarly, comparisons and correlations with international trends would be easier and more relevant.

The small sample size in phase one and data collection sheet (the questionnaire) with too many categories resulted in no valid associations between the practitioner demographics and practitioner perceptions (Esterhuizen 2015). The resulting chi square tests were therefore invalid. Future studies with larger sample sizes are anticipated to provide better information on these associations.

The second phase of the study determined the research agendas of the student research completed at the DUT for a comparative study. It was not within the scope of this research to make an in-depth investigation into the use of personal and institutional resources that contribute to the conduction of student research at the DUT. This is anticipated, however, to provide valuable information for both the institution and the researcher. This is recommended for further investigation.

5.3 Discussion of Review of Objectives

The first objective of the study was to determine the most relevant research agendas of the Chiropractic practitioners in KwaZulu-Natal. Neurological testing was perceived as a ‘very important’ Chiropractic research agenda. This was followed, in order, by biomechanical changes as a result of the Chiropractic manipulation; orthopaedic testing; reduction of posture related disorders; and gross anatomical changes as a result of the Chiropractic manipulation. Thereafter, Chiropractic adjustment techniques, ROM assessment and MFTP assessment were perceived as having equal relevance for future research investigation. Motion and/or static palpation, and gait and posture assessment, were also regarded as ‘very important’ Chiropractic research agendas. Of interest was that both biochemical changes as a result of the Chiropractic manipulation and multi-disciplinary techniques were perceived as significant fields of study, as each of these agendas were perceived as ‘very important’ or ‘important’. Neither of these agendas were perceived as ‘not important’ or ‘irrelevant’.

The second objective was to determine the main research focus of the Chiropractic student research completed at the DUT between 1994 and 2013. The number of student-conducted RCT's that focused on Chiropractic adjustment techniques and the biomechanical changes as a result of the Chiropractic manipulation far outnumbered any other research agenda that had been investigated at the DUT between 1994 and 2013. The RCT's that focused on myofascial assessment and myofascial treatment techniques followed in popularity. A much smaller percentage of the completed DUT studies had investigated lifestyle factors; imaging studies; epidemiology studies; motion and/or static palpation techniques; and multi-disciplinary treatment techniques. Complementary medicines; OTC medication; prescription medicine; injury prevention; sports Chiropractic and electrotherapy had also been areas of interest for student research conducted between 1994 and 2013.

The third objective was to determine the congruency between the research agendas perceived to be most relevant by the Chiropractic practitioners in KwaZulu-Natal and student research completed at the DUT between 1994 and 2013. There existed many incongruencies between the student research agendas and those of the practitioner respondents. The aforementioned most highly regarded agendas of neurological testing, orthopaedic testing, a reduction of posture related disorders and gross anatomical changes as a result of the Chiropractic manipulation, had not been investigated by the DUT Chiropractic students. Thereafter, ROM assessment, muscular testing, motion and/or static palpation, and gait and posture assessment, which were perceived as 'very important' research agendas by the practitioners, had been poorly investigated by the students. Conversely, many of the practitioners had perceived Chiropractic adjustment techniques, biomechanical changes as a result of the Chiropractic manipulation and MFTP assessment as 'very important' research agendas, which had been the main focus areas of the DUT Chiropractic student research between 1994 and 2013.

5.4 Recommendations

The use of the most current and correct database is recommended, as the database provided for this study was out of date. This may have contributed to a lower response rate. A higher response rate would have contributed to more valid associations between the practitioner demographics and practitioner perceptions at data analysis. Furthermore, the out-of-date database contributed to an unnecessarily prolonged time for data collection.

The questionnaire aimed to investigate recommendations from the practitioners for future clinically relevant Chiropractic student research. In summary, as previously cited, the following subjects were recommended as necessary topics for future exploration:

- Perception studies exploring the public, patient and medical fraternity's opinions and knowledge of the Chiropractic profession.

- Studies investigating inter- and-multi-disciplinary relationships, including comparative RCT's.
- Studies focused on preventative Chiropractic care.
- Successful practice management.
- RCT's into the Chiropractic treatment of specific conditions, referral of systemic pathologies and positive outcomes of treatment.
- Obstetric and paediatric studies investigating pregnancy-specific conditions, the effects of birth on the spine, and the treatment of infants and children.
- Treatment techniques and VSC diagnostic detection methods.
- Sports Chiropractic.
- Chiropractic treatment technique effects after a prolonged period of time.

One of the study's objectives was to establish the incongruences between student research conducted at the DUT and the research agendas regarded as 'very important' by Chiropractors in practice. The under-studied practitioner agendas were recommended as areas of future student focus. These agendas, as stated previously, were disseminated to the DUT Chiropractic students as topics for consideration. This was important, as it would encourage student research that was more congruent with national and international research agendas.

In summary, the following agendas were under-studied at the DUT and warrant future exploration:

- Neurological and orthopaedic testing.
- Reduction of posture related disorders and gait and posture assessment.
- Gross anatomical changes as a result of the Chiropractic manipulation.
- Motion and/or static palpation and ROM assessment.
- Muscular testing.

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Appendix A: Letter of information and Informed Consent.

Dear Chiropractor,

Thank you for your participation in my study. This letter serves as an introduction to and explanation of my study and its aims and objectives.

Dissertation title: An investigation into the congruency between research perceived to be of relevance to Chiropractors practicing in KwaZulu-Natal and the student research completed at the Durban University of Technology.

Researcher: Nicolette van der Hulst (Tel: 0825729873), Supervisor: Dr. Anthony van der Meulen (M.Tech.Chiro) (Tel: 083-233 2924 / 031 262 0776)

Purpose of the study:

The aim of this study is to evaluate the congruency between the research perceived to be of relevance to Chiropractors and the research completed by students to date in KwaZulu-Natal.

The first phase objective is to determine the research agendas perceived to be most relevant for future research by Chiropractors practicing in KwaZulu-Natal. The questionnaire aims to answer the question "Where should Chiropractic research be focused?" *This is in the form of the questionnaire (Appendix C) to be completed by yourself, the Chiropractor.*

The second phase objective is to determine the focus of the student research conducted at Durban University of Technology between 1994 and 2013. During the third phase of the research the researcher will determine the congruency between the two.

The research agenda recommended by yourself aims to open doors to future student research in South Africa.

Outline of the procedure:

Inclusion Criteria

Phase 1: All Chiropractic practitioners registered with the Allied Health Professions Council who are practicing Chiropractic in KwaZulu-Natal.

Phase 2: All student research completed at Durban University of Technology from 1994-2013.

Exclusion criteria:

Phase 1: All persons participating in this research process, the development of the research proposal, expert groups, focus groups and pilot study.

Phase 2: None

Once completed, please will you post or email the questionnaire back. Your response will go to a neutral third party. The Department Research Officer will delete the names of the respondents from returned questionnaires and return the questionnaires to the researcher.

The student research completed in KwaZulu-Natal between 1994 and 2013 will be obtained from the Institutional Repository (IR) and library archives. This information will be correlated and the outcome variables statistically analysed with the help of a statistician. Data analysis will follow, highlighting overlap of agendas and gaps in the research. A statistical comparison will be performed to determine the congruency between the student research agendas and the research perceived to be of relevance by Chiropractors practicing in KwaZulu-Natal.

There will be **no risks, benefits, remuneration or expense** to participants.

Your **participation** in the study is **voluntary**.

Withdrawal from the study and refusal to participate in the study will have **no adverse consequences**.

All personal information will be kept **confidential**.

Contact persons:

Researcher: Nicolette van der Hulst (Tel: 0825729873)

Supervisor: Anthony van der Meulen (M.Tech.Chiro) (Tel: 083-233 2924 / 031 262 0776)

Should you voluntarily agree to participate in this study, please sign below.

Statement of agreement to participate in the research study:

I, ……..

(Participants full name)

with ID number……..,

have read and understood this letter. All queries have been answered satisfactorily and I fully understand that I am in no way obligated to continue with the study should I wish to withdraw at any stage. I understand that there are no risks to my person and all information will be kept confidential. I

voluntarily agree to participate in the study and understand that data collected from the study will be published in the form of a dissertation. I understand that new developments that may impact me will be made known to me by the researcher.

Participant's name (print) …….

Participant's signature ……Date…….

Researcher's name (print) …….

Researcher's signature ……Date…….

Witness name (print) …….

Witness signature ……...Date…….

Appendix A1: Pre- Expert Letter of information and Informed Consent.

Dear Chiropractor,

Thank you for your participation in my study. This letter serves as an introduction to and explanation of my study and its aims and objectives.

Dissertation title: An investigation into the congruency between research perceived to be of relevance to South African Chiropractors and the student research completed in South Africa.

Researcher: Nicolette van der Hulst (Tel: 0825729873)

Supervisor: Anthony van der Meulen (M.Tech.Chiro) (Tel: 083-233 2924 / 031 262 0776)

Purpose of the study:

The aim of this study is to evaluate the congruency between the research perceived to be of relevance to Chiropractors and the research completed by students to date in South Africa.

The first phase objective is to determine the research agendas perceived to be most relevant for future research by South African Chiropractors. The questionnaire aims to answer the question "Where should Chiropractic research be focused?" *This is in the form of the questionnaire (Appendix C) to be completed by yourself, the Chiropractor.*

The second phase objective is to determine the focus of the research conducted at South African Chiropractic educational institutions. During the third phase of the research the researcher will determine the congruency between the two.

The research agenda recommended by yourself aims to open doors to future student research in South Africa.

Outline of the procedure:

Inclusion Criteria

Phase 1: All Chiropractic practitioners registered with the Allied Health Professions Council who are practicing Chiropractic in South Africa.

Phase 2: All student research completed at South African Chiropractic Institutions from 1994-2012

Exclusion criteria:

Phase 1: All persons participating in this research process, the development of the research proposal, expert groups, focus groups and pilot study.

Phase 2: None

Once completed, please will you post or email the questionnaire back. Your response will go to a neutral third party.The Department Research Officer will delete the names of the respondents from returned questionnaires and return the questionnaires to the researcher.

The student research completed in South Africa between 1994 -2012 will be obtained from DUT and UJ Institutional Repositories (IR) and library archives. This information will be correlated and the outcome variables statistically analysed with the help of a statistician. Data analysis will follow, highlighting overlap of agendas and gaps in the research. A statistical comparison will be performed to determine the congruency between the student research agendas and the research perceived to be of relevance by South African Chiropractors.

There will be **no risks, benefits, remuneration or expense** to expert participant.

Your **participation** in the study is **voluntary**.

Withdrawal from the study and refusal to participate in the study will have **no adverse consequences**.

All personal information will be kept **confidential**.

Contact persons:

Researcher: Nicolette van der Hulst (Tel: 0825729873)

Supervisor: Anthony van der Meulen (M.Tech.Chiro) (Tel: 083-233 2924 / 031 262 0776)

Should you voluntarily agree to participate in this study, please sign below.

Statement of agreement to participate in the research study:

I, ……..
(Participants full name)

with ID number……..,
have read and understood this letter. All queries have been answered satisfactorily and I fully understand that I am in no way obligated to continue with the study should I wish to withdraw at any stage. I understand that there are no risks to my person and all information will be kept confidential. I voluntarily agree to participate in the study and understand that data collected from the study will be published in the form of a dissertation. I understand that new developments that may impact me will be made known to me by the researcher.

Participant's name (print) …….
Participant's signature……Date…….

Researcher's name (print) …….
Researcher's signature……Date…….

Witness name (print) …….
Witness signature……...Date…….

Appendix A2: Pre-Pilot Letter of information and Informed Consent.

Dear Chiropractor,

Thank you for your participation in my study. This letter serves as an introduction to and explanation of my study and its aims and objectives.

Dissertation title: An investigation into the congruency between research perceived to be of relevance to Chiropractors practicing in KwaZulu-Natal and the student research completed at the Durban University of Technology.

Researcher: Nicolette van der Hulst (Tel: 0825729873), Supervisor: Dr. Anthony van der Meulen (M.Tech.Chiro) (Tel: 083-233 2924 / 031 262 0776)

Purpose of the study:

The aim of this study is to evaluate the congruency between the research perceived to be of relevance to Chiropractors and the research completed by students to date in KwaZulu-Natal.

The first phase objective is to determine the research agendas perceived to be most relevant for future research by Chiropractors practicing in KwaZulu-Natal. The questionnaire aims to answer the question "Where should Chiropractic research be focused?" *This is in the form of the questionnaire (Appendix C) to be completed by yourself, the Chiropractor.*

The second phase objective is to determine the focus of the student research conducted at Durban University of Technology between 1994 and 2013. During the third phase of the research the researcher will determine the congruency between the two.

The research agenda recommended by yourself aims to open doors to future student research in South Africa.

Outline of the procedure:

Inclusion Criteria

Phase 1: All Chiropractic practitioners registered with the Allied Health Professions Council who are practicing Chiropractic in KwaZulu-Natal.

Phase 2: All student research completed at Durban University of Technology from 1994-2013.

Exclusion criteria:

Phase 1: All persons participating in this research process, the development of the research proposal, expert groups, focus groups and pilot study.

Phase 2: None

Once completed, please will you post or email the questionnaire back. Your response will go to a neutral third party. The Department Research Officer will delete the names of the respondents from returned questionnaires and return the questionnaires to the researcher.

The student research completed in KwaZulu-Natal between 1994 and 2013 will be obtained from the Institutional Repository (IR) and library archives. This information will be correlated and the outcome variables statistically analysed with the help of a statistician. Data analysis will follow, highlighting overlap of agendas and gaps in the research. A statistical comparison will be performed to determine the congruency between the student research agendas and the research perceived to be of relevance by Chiropractors practicing in KwaZulu-Natal.

There will be **no risks, benefits, remuneration or expense** to participants.

Your **participation** in the study is **voluntary**.

Withdrawal from the study and refusal to participate in the study will have **no adverse consequences**.

All personal information will be kept **confidential**.

Contact persons:

Researcher: Nicolette van der Hulst (Tel: 0825729873)

Supervisor: Anthony van der Meulen (M.Tech.Chiro) (Tel: 083-233 2924 / 031 262 0776)

Should you voluntarily agree to participate in this study, please sign below.

Statement of agreement to participate in the research study:

I, …….
(Participants full name)

with ID number……,
have read and understood this letter. All queries have been answered satisfactorily and I fully understand that I am in no way obligated to continue with the study should I wish to withdraw at any stage. I understand that there are no risks to my person and all information will be kept confidential. I

voluntarily agree to participate in the study and understand that data collected from the study will be published in the form of a dissertation. I understand that new developments that may impact me will be made known to me by the researcher.

Participant's name (print) …….
Participant's signature ……Date…….

Researcher's name (print) …….
Researcher's signature ……Date…….

Witness name (print) …….
Witness signature ……...Date…….

Appendix B: Confidentiality Statement.

Dear Chiropractor,

Please read and sign the declaration below before commencing the questionnaire.

Declaration

1. All information pertaining to the research study will be kept confidential. The identity of the participants in the research study will be kept confidential.
2. The returned questionnaires will be collected by a neutral third party at DUT. The Department Research Officer will mark off returned responses from the list of Chiropractors who were sent the questionnaire. The Officer will delete the names of the respondents from returned questionnaires and return the questionnaires to the researcher. This will ensure confidentiality.
3. The recommendations and decisions of the respondents will not be communicated to any individual or organization.
4. The publication of the information obtained from this questionnaire will ensure the respondents identities are kept confidential and all subjects participating in the study will remain anonymous.

If you have read and agreed to the above declaration, please print your name (in block letters) and sign below. This signature serves to acknowledge agreement of the confidentiality statement.

Chiropractor name: ……..
Signature ……

Witness name: ……
Signature……..

Researchers name: ……...
Signature……..

Thank you.

Appendix B1. Pre-Expert Confidentiality Statement.

Dear Chiropractor,

Please read and sign the declaration below before commencing the questionnaire.

Declaration

1. All information pertaining to the research study will be kept confidential. The identity of the participants in the research study will be kept confidential.
2. The returned questionnaires will be collected by a neutral third party at DUT. The Department Research Officer will mark off returned responses from the list of Chiropractors who were sent the questionnaire. The Officer will delete the names of the respondents from returned questionnaires and return the questionnaires to the researcher. This will ensure confidentiality.
3. The recommendations and decisions of the respondents will not be communicated to any individual or organization.
4. The publication of the information obtained from this questionnaire will ensure the respondents identities are kept confidential and all subjects participating in the study will remain anonymous.

If you have read and agreed to the above declaration, please print your name (in block letters) and sign below. This signature serves to acknowledge agreement of the confidentiality statement.

Expert group member: ……..
Signature ……

Witness name: ……
Signature……..

Researchers name: ……...
Signature……..

Thank you.

Appendix B2: Pre-Pilot Confidentiality Statement.

Dear Chiropractor,

Please read and sign the declaration below before commencing the questionnaire.

Declaration

1. All information pertaining to the research study will be kept confidential. The identity of the participants in the research study will be kept confidential.
2. The returned questionnaires will be collected by a neutral third party at DUT. The Department Research Officer will mark off returned responses from the list of Chiropractors who were sent the questionnaire. The Officer will delete the names of the respondents from returned questionnaires and return the questionnaires to the researcher. This will ensure confidentiality.
3. The recommendations and decisions of the respondents will not be communicated to any individual or organization.
4. The publication of the information obtained from this questionnaire will ensure the respondents identities are kept confidential and all subjects participating in the study will remain anonymous.

If you have read and agreed to the above declaration, please print your name (in block letters) and sign below. This signature serves to acknowledge agreement of the confidentiality statement.

Chiropractor name: ……..
Signature ……

Witness name: ……
Signature……..

Researchers name: ……...
Signature……..

Thank you.

Appendix C: Questionnaire

Dear Chiropractor,

Thank you for your participation in this study. Herewith follows the study questionnaire.

DEMOGRAPHIC PROFILE : Where applicable, please indicate with an X in the spaces provided below							
1)	Age						
2)	Average hours practiced/week						
3)	Current practice location		Rural		Suburban		Urban
4)	Current type of practice		Group practice	Individual	Multidisciplinary		Partnership
5)	Ethnicity	African	Asian	Coloured			
		Indian	White	If other, please specify			
6)	First language	Afrikaans	English	IsiNdebele			
		IsiSwati	IsiXhosa	IsiZulu			
		Sepedi	Sesotho	Setswana			
		Tshivenda	Xitsonga	If other, please specify			
7)	Gender	Female	Male				
8)	Graduating Chiropractic institution						
9)	Highest academic qualification						
10)	Years actively practicing	< 5	5 – 10	11 – 20	21 – 30	31– 40	> 40
RESEARCH PROFILE: Where applicable, please indicate with an X in the spaces provided below.							
11)	Have you ever conducted research?					Yes	No
12)	If yes, have your abilities as a Chiropractor improved by conducting the research?					Yes	No
13)	Was the research published?					Yes	No
14)	If yes, where was it published?	Journal	Peer reviewed journal			If other, please specify	
15)	When was the research completed?						
16)	Where was the research conducted?						
17)	Are you accessing DUT research?					Yes	No
18)	Other sources through which you are accessing research?	Online	Library	Interviews	If other, please specify		

Please mark with an X in the spaces provided whether you think the following research areas in the Chiropractic discipline, are Relevant/Irrelevant to clinical practice:

		Relevant			Irrelevant
		Very important	Important	Not important	
19)	Allergy testing				
20)	Blood screening e.g. for Anemias, Sugar levels				
21)	Body Mass Index and Cardiovascular fitness testing				
22)	Bone testing e.g. for Density, Hot and Cold spots				
23)	Cancer prevention screening e.g. Mammogram, Pap smear, PSA testing				
24)	Chronic disease prevention e.g. Cancer, DM, Obesity, TB and Opportunistic infection prevention				

		Relevant			Irrelevant
		Very important	Important	Not important	
25)	Complementary medication for health promotion eg. Chinese herbal, Ayurvedic, Naturapathic and Homeopathic medication				
26)	Culture screening e.g. of Stool and Bloods				
27)	Dietary advice				
28)	Dietary supplementation				
29)	Epidemiological studies				
30)	Ergonomic risk prevention				
31)	Gait analysis and Postural assessment				
32)	Gastrointestinal scopes				
33)	General medical examination for common conditions such as Jaundice, Anemia, Clubbing, Cyanosis, Oedema….				
34)	Injury prevention				
35)	Imaging studies e.g. Angiography, Doppler Ultrasound, CT scan, MRI, Ultrasound, X-rays				
36)	Lifestyle factors e.g. Alcohol abuse risks and cessation, Exercise for disease prevention, Social drug risks and cessation, Tobacco risks and cessation,				
37)	Mental illness and psychological intervention for health promotion e.g. Pain avoidance reduction and Stress management techniques				
38)	Motion and / or Static palpation				
39)	Muscular testing				
40)	Myofascial trigger point assessment				
41)	Neurological testing				
42)	Orthopaedic testing				
43)	Over-The-Counter medication for disease prevention				
44)	Prescription medication				
45)	Range of Motion assessment				
46)	Reduction of posture related disorders				
47)	Safe sex practices				
48)	Salivary cortisol testing to assess stress levels				
49)	Sexually transmitted disease prevention e.g. Contraception use, HIV prevention				
50)	Sports medicine				
51)	Successful practice management				
52)	Supplementation e.g. Dietary or Sports supplementation				
53)	Urinalysis				
54)	Vital signs examination				

Please mark with an X in the spaces provided whether you think the following research areas in the Chiropractic discipline, are Relevant/Irrelevant to clinical practice:

		Relevant			Irrelevant
		Very important	Important	Not important	
55)	Alzheimers				
56)	Anemias				
57)	Angina				
58)	Asthma				
59)	Breast Cancers				
60)	Cervical cancer				
61)	Colorectal Cancers				

62)	Coronary heart disease				
63)	Chronic Obstructive Pulmonary Disease				
64)	Diarrhoeal diseases				
65)	Cholera				
66)	Colon cancer				
67)	Diabetis Mellitis				
68)	Ebstein-Barr Virus				
69)	Epilepsy				
70)	Hepatitis				
71)	HIV/AIDS				
72)	Hypertension				
73)	Hypothyroidism				
74)	Ischeamic heart disease				
75)	Influenza and Pneumonia				
76)	Leukemias				
77)	Liver cancer				
78)	Low birth weight				
79)	Lung disease and Cancer				
80)	Lymphoma				
81)	Malaria				
82)	Measles				
83)	Meningitis				
84)	Oesophageal Cancer				
85)	Peptic ulcers				
86)	Polycystic ovarian syndrome				
87)	Polycystic kidneys				
88)	Rabies				
89)	Schistosomiasis				
90)	Strokes				
91)	Syphilis				
92)	Tuberculosis				

Please mark with an X in the spaces provided whether you think the following research areas in the Chiropractic discipline, are Relevant/Irrelevant to clinical practice:

		Relevant			Irrelevant
		Very important	Important	Not important	
93)	Biochemical changes as a result of chiropractic manipulation e.g. Changes in metabolism and enzymes				
94)	Biomechanical changes				

	as a result of chiropractic manipulation e.g. Altered movement patterns in kinematic chains				
95)	Gross anatomical changes as a result of chiropractic manipulation e.g. Change in orientation of joint surfaces				
96)	Histological changes as a result of chiropractic manipulation e.g. Microscopic changes in cell characteristics				
97)	Physiological changes as a result of chiropractic manipulation e.g. Changes in hormone production, secretion, absorption and use				

Please mark with an X in the spaces provided whether you think the following research areas in the Chiropractic discipline, are Relevant/Irrelevant to clinical practice:

		Relevant			Irrelevant
		Very important	Important	Not important	
98)	Chiropractic adjustment techniques e.g. Diversified, Gonstead				
99)	Electrotherapy treatment e.g. Interferential current, TENS				
100)	Multidisciplinary treatments e.g. Biopuncture, Medication, Applied kinesiology				
101)	Myofascial treatment techniques e.g. Dry needling, Ischemic compression				
102)	Rehabilitation programmes e.g. Orthotics, PNF, Strapping				
103)	What, in your opinion, are the top two reasons for doing research?				
	1.				
	2.				

104) If there is a research focus/field which you feel is important and has been omitted from the above, or have suggestions for future Chiropractic research, please provide details in the space provided below.

105) Would you contribute to a data base of research ideas that students can access? YES/NO

Thank you.

Appendix C1: Pre Expert Questionnaire

Appendix C1: TBC								
DEMOGRAPHIC PROFILE: Where applicable, please indicate with an X in the spaces provided below.								
1)	Age							
2)	Gender	Male	Female					
3)	Ethnicity	African	Coloured	Indian				
		White	Asian	If other, please specify.				
4)	First language	English	Afrikaans	IsiZulu				
		IsiNdebele	IsiXhosa	IsiSwati				
		Setswana	Sesotho	Sepedi				
		Tshivenda	Xitsonga	If other, please specify.				
5)	Graduating Chiropractic institution							
6)	Highest academic qualification							
7)	Province practiced in	Gauteng		Mpumalanga		Limpopo		
		North West Province		Free State		Eastern Cape		
		Northern Cape		Western Cape		Kwa Zulu Natal		
8)	Practice location	Urban		Suburban		Rural		
9)	Type of practice	Group practice		Partnership		Solo		
10)	Years actively practicing	< 5	5 – 10	11 – 20	21 – 30	31 – 40	> 40	
11)	Number of hours practiced per week							
RESEARCH PROFILE: Where applicable, please indicate with an X in the spaces provided below.								
12)	Have you ever conducted research?	Yes	No					
13)	Where was the research conducted?							
14)	When was the research completed?							
15)	Was the research published?	Yes	No					
16)	Research sources	Online	Library	Interviews	If other, please specify			
17)	Have your abilities as a Chiropractor improved by conducting the research?	Yes	No					
18)	Would you contribute to a central repository for research topics?	Yes	No					
19) Do you think chiropractic research should focus on **health promotion and disease prevention? YES / NO**								
If yes, please mark with an X in the spaces provided whether you think chiropractic research on the following aspects of health promotion and disease prevention is very important/not important:								
If no, please ignore and skip to the next questions.								
		Very important	Important	Neutral	Not important			
20)	Alcohol abuse risks and cessation							
21)	Ayurvedic medication							
22)	Cancer prevention							
23)	Chinese herbal medication							
24)	Contraception use							
25)	Dietary advice							
26)	Dietary supplementation							
27)	DM prevention							
28)	Ergonomic risk prevention							
29)	Excercise							
30)	HIV prevention							
31)	Homeopathic medication							
32)	Injury prevention							
33)	Mental illness and psychological intervention							
34)	Naturopathic medication							

35)	Obesity prevention				
36)	Opportunistic infection prevention				
37)	OTC medication				
38)	OTC medication risks and cessation				
39)	Pain avoidance reduction				
40)	Postural risk reduction				
41)	Safe sex practices				
42)	Social drug risks and cessation				
43)	Sports supplementation				
44)	Stress management techniques				
45)	TB prevention				
46)	Thyroid disease prevention				
47)	Tobacco risks and cessation				
48)	Other, please specify:				
	1.				
	2.				
	3.				

49) Do you think chiropractic research should focus on **examination procedures? YES / NO**

If yes, please mark with an X in the spaces provided below, indicating whether you think chiropractic research on the following **examination procedures** is very important, important, neutral or not important:

If no, please ignore and skip to the next questions.

		Very important	Important	Neutral	Not important
50)	Gait analysis				
51)	General medical examination for conditions such as jaundice, anemia, clubbing, cyanosis, oedema….				
52)	Motion palpation				
53)	Muscular testing				
54)	Myofascial trigger point assessment				
55)	Neurological testing				
56)	Orthopaedic testing				
57)	Other systems examination				
58)	Postural assessment				
59)	Range of Motion assessment				
60)	Vital signs examination				
61)	Other, please specify				
	1.				
	2.				
	3.				

62) Do you think chiropractic research should focus on **diagnostic screening techniques? YES / NO**

If yes, please mark with an X in the spaces provided below, indicating whether you think chiropractic research on the following **examination procedures** is very important, important, neutral or not important:

If no, please ignore and skip to the next questions.

		Very important	Important	Neutral	Not important
63)	Allergy testing				
64)	Angiogram				
65)	Blood culture				
66)	Blood sugar testing				
67)	BMI testing				
68)	Bone density testing				
69)	Bone scanning for ‘hot/cold spots’				
70)	Cardiovascular fitness testing				
71)	CT				
72)	Doppler Ultrasound				
73)	Full blood count				
74)	Gastrointestinal scopes				

75)	HIV testing				
76)	Lumber punctures				
77)	Mammogram				
78)	MRI				
79)	Pap smear				
80)	PSA				
81)	Serology tests for arthritis				
82)	Serum cholesterol tests				
83)	Stool culture				
84)	Ultrasound				
85)	X-rays				
86)	Other, please specify:				
	1.				
	2.				
	3.				

For the following questions, if the answer is "yes" , please specify your top 3 and mark with an X in the spaces provided whether you think chiropractic research on the following is very important/not important:

If no, please ignore and skip to the next questions.

87) Do you think chiropractic research should focus on **cardiorespiratory medicine? YES / NO**

		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				

88) Do you think chiropractic research should focus on **endocrinology? YES / NO**

		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				

89) Do you think chiropractic research should focus on **gastroenterology? YES / NO**

		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				

90) Do you think chiropractic research should focus on **haematology? YES / NO**

		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				

91) Do you think chiropractic research should focus on **infectious diseases? YES / NO**

		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				

92) Do you think chiropractic research should focus on **neurological medicine? YES / NO**

		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				

93) Do you think chiropractic research should focus on **oncology and immunology? YES / NO**

		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				

94) Do you think chiropractic research should focus on **renal medicine? YES / NO**

		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				

95) Do you think chiropractic research should focus on **rheumatology, CT, joints and bones? YES / NO**					
		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				
96) Do you think chiropractic research should focus on **skin diseases? YES / NO**					
		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				
Do you think chiropractic research should focus on the following **reactions to chiropractic manipulation:**					
97**) Physiological reactions to chiropractic manipulation? YES / NO**					
		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				
98) **Biochemical reactions to chiropractic manipulation? YES / NO**					
		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				
99) **Gross anatomical changes as a result of chiropractic manipulation? YES / NO**					
		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				
100) **Biomechanical changes as a result of chiropractic manipulation? YES / NO**					
		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				
101) **Histological reactions to chiropractic manipulation? YES / NO**					
		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				
102) Do you think chiropractic research should focus on **radiological studies? YES / NO**					
		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				
103) Do you think chiropractic research should focus on **sports medicine? YES / NO**					
		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				
104) Do you think chiropractic research should focus on **combination treatments? YES / NO**					
		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				
105) Do you think chiropractic research should focus on **epidemiology studies? YES / NO**					
		Very important	Important	Neutral	Not important
	1.				
	2.				
	3.				
106) Do you think chiropractic research should focus on **successful practice management? YES / NO**					
		Very important	Important	Neutral	Not important

	1.				
	2.				
	3.				

107) Do you think chiropractic research should focus on **treatment techniques? YES/NO**

If yes, please mark with an X in the spaces provided whether you think chiropractic research on the following **treatment techniques** is very important/not important:

If no, please ignore and skip to the next questions.

		Very important	Important	Neutral	Not important
108)	Acupuncture				
109)	Applied Kinesiology				
110)	Biopuncture				
111)	Chiropractic adjustment techniques				
112)	Craniosacral therapy				
113)	Cryotherapy				
114)	Diversified				
115)	Drop piece adjustments				
116)	Gonstead				
117)	Graston Technique				
118)	Instrament adjustment				
119)	Interferential current				
120)	Massage				
121)	Medication prescription				
122)	Mobilisation				
123)	Myofascial trigger point treatment				
124)	Orthopaedic surgery				
125)	Orthotics				
126)	PNF				
127)	Rehabilitation				
128)	Strapping				
129)	Stretching				
130)	TENS				
131)	Thompson				
132)	Traction				
133)	Ultrasound				
134)	Other, please specify:				
	1.				
	2.				

135) Do you think chiropractic research should focus on **validating chiropractic theories? YES/NO**

If yes, please mark with an X in the spaces provided whether you think chiropractic research on the **validation of the** following **chiropractic theories** is very important/not important:

If no, please ignore and skip to the next questions.

		Very important	Important	Neutral	Not important
136)	Biochemical hypotheses				
137)	Cord compression hypotheses				
138)	Kinesiopathological / Biomechanical hypotheses: 1. adhesions				
139)	Kinesiopathological / Biomechanical hypotheses: 2. disc deformity				
140)	Kinesiopathological / Biomechanical hypotheses: 3. hypermobility				
141)	Kinesiopathological / Biomechanical hypotheses: 4. mechanical joint locking				
142)	Kinesiopathological / Biomechanical hypotheses: 5. vertebral malposition				
143)	Motor system degeneration hypotheses				
144)	Myopathic hypotheses eg Simons and Hong				

145)	Nerve compression hypotheses				
146)	Neurodystrophic/ immune reaction hypotheses				
147)	Neurological hypotheses: 1. Dvorak				
148)	Neurological hypotheses: 2. Korr				
149)	Neurological hypotheses: 3. Patterson-Steinmetz				
150)	Neurological hypotheses: 4. Sandoz et al.				
151)	Neurovisceral reflexes: 1. Somatosomatic				
152)	Neurovisceral reflexes: 2. Somatoviscera				
153)	Neurovisceral reflexes: 3. Viscerosomatic				
154)	Neurovisceral reflexes: 4. Viscerovisceral				
155)	Psychosocial hypotheses				
156)	Trophic hypotheses: 1. Axoplasmic abberation				
157)	Trophic hypotheses: 2. CSF fluid flow				
158)	Trophic hypotheses: 3. Macrocirculation ischaemia				
159)	Trophic hypotheses: 4. Microcirculation ischaemia				

160) Do you think chiropractic research should focus on **chiropractic research? YES/NO**

If yes, please mark with an X in the spaces provided whether you think chiropractic research on the following aspects of **chiropractic research** is very important/not important:

If no, please ignore and skip to the next questions.

		Very important	Important	Neutral	Not important
161)	Implication of research on integration of the profession				
162)	Implications of research on acceptance of the profession				
163)	Implications of research on clinical proficiency				
164)	Implications of research on patient care				
165)	Link between research and professional reimbursement				
166)	Motivation for doing research				
167)	Perceptions of/attitudes towards research				
168)	Recent treatment modalities/ trends				
169)	Type of research resources utilized				
170)	Utilization of research for business development and growth				
171)	Utilization of research for personal improvement				
172)	Implication of research on integration of the profession				
173)	Implications of research on acceptance of the profession				
174)	Other, please specify:				
	1.				
	2.				
	3.				

175) If there is a research focus/field which you feel has been omitted from the above, please provide details in the space provided below.

Appendix C2: Pre-Pilot Questionnaire

Dear Chiropractor,

Thank you for your participation in this study. Herewith follows the study questionnaire.

DEMOGRAPHIC PROFILE : Where applicable, please indicate with an X in the spaces provided below							
1)	Age						
2)	Average hours practiced/week						
3)	Current practice location		Rural		Suburban		Urban
4)	Current type of practice		Group practice	Individual		Multidisciplinary	Partnership
5)	Ethnicity	African	Asian	Coloured			
		Indian	White	If other, please specify			
6)	First language	Afrikaans	English	IsiNdebele			
		IsiSwati	IsiXhosa	IsiZulu			
		Sepedi	Sesotho	Setswana			
		Tshivenda	Xitsonga	If other, please specify			
7)	Gender	Female	Male				
8)	Graduating Chiropractic institution						
9)	Highest academic qualification						
10)	Years actively practicing		< 5	5 – 10	11 – 20	21 – 30	31– 40	> 40

RESEARCH PROFILE : Where applicable, please indicate with an X in the spaces provided below.					
11)	Have you ever conducted research?			Yes	No
12)	If yes, have your abilities as a Chiropractor improved by conducting the research?			Yes	No
13)	Was the research published?			Yes	No
14)	If yes, where was it published?	Journal	Peer reviewed journal	If other, please specify	
15)	When was the research completed?				
16)	Where was the research conducted?				
17)	Are you accessing DUT research?			Yes	No
18)	Research sources	Online	Library	Interviews	If other, please specify

Please mark with an X in the spaces provided whether you think research in the Chiropractic discipline, on the following, is Relevant/Irrelevant:					
		Relevant			Irrelevant
		Very important	Important	Not important	
19)	Allergy testing				
20)	Blood screening e.g. for Anemias, Sugar levels				
21)	Body Mass Index and Cardiovascular fitness testing				
22)	Bone testing e.g. for Density, Hot and Cold spots				
23)	Cancer prevention screening e.g.Mammogram, Pap smear, PSA testing				
24)	Chronic disease prevention e.g. Cancer, DM, Obesity, TB and Opportunistic infection prevention				
25)	Complementary medication for health promotion eg. Chinese herbal, Ayurvedic, Naturapathic and Homeopathic medication				
26)	Culture screening e.g. of Stool and Bloods				
27)	Dietary advice				

28)	Dietary supplementation				
29)	Epidemiological studies				
		Relevant			Irrelevant
		Very important	Important	Not important	
30)	Ergonomic risk prevention				
31)	Gait analysis and Postural assessment				
32)	Gastrointestinal scopes				
33)	General medical examination for common conditions such as Jaundice, Anemia, Clubbing, Cyanosis, Oedema….				
34)	Injury prevention				
35)	Imaging studies e.g. Angiography, Doppler Ultrasound, CT scan, MRI, Ultrasound, X-rays				
36)	Lifestyle factors e.g. Alcohol abuse risks and cessation, Exercise for disease prevention, Social drug risks and cessation, Tobacco risks and cessation,				
37)	Mental illness and psychological intervention for health promotion e.g. Pain avoidance reduction and Stress management techniques				
38)	Motion palpation				
39)	Muscular testing				
40)	Myofascial trigger point assessment				
41)	Neurological testing				
42)	Orthopaedic testing				
43)	Over-The-Counter medication for disease prevention				
44)	Postural risk reduction				
45)	Prescription medication				
46)	Range of Motion assessment				
47)	Safe sex practices				
48)	Salivary cortisol testing to assess stress levels				
49)	Sexually transmitted disease prevention e.g. Contraception use, HIV prevention				
50)	Sports medicine				
51)	Successful practice management				
52)	Supplementation e.g. Dietary or Sports supplementation				
53)	Urinalysis				
54)	Vital signs examination				

Please mark with an X in the spaces provided whether you think research in the Chiropractic discipline, on the following, is Relevant/Irrelevant:

		Relevant			Irrelevant
		Very important	Important	Not important	
55)	Alzheimers				
56)	Anemias				
57)	Angina				
58)	Asthma				
59)	Breast Cancers				
60)	Cervical cancer				
61)	Colorectal Cancers				
62)	Coronary heart disease				
63)	Chronic Obstructive Pulmonary Disease				
64)	Diarrhoeal diseases				
65)	Cholera				
66)	Colon cancer				

		Relevant			Irrelevant
		Very important	Important	Not important	
67)	Diabetis Mellitis				
68)	Ebstein-Barr Virus				
69)	Epilepsy				
70)	Hepatitis				
71)	HIV/AIDS				
72)	Hypertension				
73)	Hypothyroidism				
74)	Ischeamic heart disease				
75)	Influenza and Pneumonia				
76)	Leukemias				
77)	Liver cancer				
78)	Low birth weight				
79)	Lung disease and Cancer				
80)	Lymphoma				
81)	Malaria				
82)	Measles				
83)	Meningitis				
84)	Oesophageal Cancer				
85)	Peptic ulcers				
86)	Polycystic ovarian syndrome				
87)	Polycystic kidneys				
88)	Rabies				
89)	Schistosomiasis				
90)	Stokes				
91)	Syphilis				
92)	Tuberculosis				

Please mark with an X in the spaces provided whether you think research in the Chiropractic discipline, on the following, is Relevant/Irrelevant:

		Relevant			Irrelevant
		Very important	Important	Not important	
93)	Biochemical changes as a result of chiropractic manipulation e.g. Changes in metabolism and enzymes				
94)	Biomechanical changes as a result of chiropractic manipulation e.g. Altered movement patterns in kinematic chains				
95)	Gross anatomical changes as a result of chiropractic manipulation e.g. Change in orientation of joint surfaces				
96)	Histological changes as a result of chiropractic manipulation e.g. Microscopic changes in cell characteristics				
97)	Physiological changes as a result of chiropractic manipulation e.g. Changes in hormone production, secretion, absorption and use				

Please mark with an X in the spaces provided whether you think research in the Chiropractic discipline, on the following, is Relevant/Irrelevant:

		Relevant			Irrelevant
		Very important	Important	Not important	
98)	Chiropractic adjustment techniques e.g.				

	Diversified, Gonstead				
99)	Electrotherapy treatment e.g. Interferential current, TENS				
100)	Multidisciplinary treatments e.g. Biopuncture, Medication, Applied kinesiology				
101)	Myofascial treatment techniques e.g. Dry needling, Ischemic compression				
102)	Rehabilitation programmes e.g. Orthotics, PNF, Strapping				

103)	What are your top 2 reasons for doing research?
	1.
	2.

104) If there is a research focus/field which you feel is important and has been omitted from the above, or have suggestions for future Chiropractic research, please provide details in the space provided below.

105) Would you contribute to a data base of research ideas that students can access? YES/NO

Thank you.

Appendix D1: Letter of information and informed consent. Expert group

Dear expert participant,

Thank you for your participation in my study. This letter serves as an introduction to and explanation of my study and its aims and objectives. Furthermore, your role as expert member will be explained.

Dissertation title: An investigation into the congruency between completed South African Chiropractic student research and research perceived to be of relevance to South African Chiropractors.

Researcher: Nicolette van der Hulst (Tel: 0825729873)

Supervisor: Anthony van der Meulen (M.Tech.Chiro) (Tel: 083-233 2924 / 031 262 0776)

Purpose of the study:

The aim of this study is to provide an overview of the research completed at South African Chiropractic educational institutions and to evaluate the congruency between the aforementioned research and that which is perceived to be of relevance to South African Chiropractors.

The first phase objective is to determine the research agendas perceived to be most relevant for future research by South African Chiropractors. *This is in the form of the questionnaire (Appendix E) to be discussed by yourselves, the expert group*.

The second phase objective is to determine the focus of the research conducted at South African Chiropractic educational institutions.

During the third phase of the research the researcher will determine the congruency between the research completed at South African educational institutions and the research which is perceived to be of highest professional relevance by South African Chiropractors.

The expert group is called to discuss the questionnaire in its entirety before finalizing the questionnaire. The researcher will read out each question which then needs to be discussed with feedback from yourselves. Please be aware that the expert group does not answer the questionnaire, but rather scrutinizes the question, evaluating if the question fulfills the aims and objectives. Each question should add value to the questionnaire, makes sense, and answer the question "Where should chiropractic research be focused?"

Inclusion Criteria for the expert group:

- The researcher.
- At least one person with questionnaire research experience.

- At least one person with knowledge of research agendas and trends.
- At least two practicing chiropractors.
- At least one practicing chiropractor who has completed a questionnaire study.

Exclusion criteria for the expert group:

- Participants who are invited to the group meeting, but have declined participation.
- Participants who do not voluntarily sign this Letter of information and informed consent (Appendix A1).

Purpose of the study: An overview of the research completed by South African Chiropractic students will give insight into the institutional and personal use of valuable research resources. Once the perceived research agenda of South African Chiropractic practitioners is established by the questionnaire (Appendix E), incongruence between this agenda and that of the student's research agenda can be investigated along with international research trends. The research agenda recommended by Chiropractic professionals aims to open doors to future student research in South Africa.

There will be no risks, benefits, remuneration or expense to expert participant.

Your participation in the study is voluntary. Withdrawal from the study and refusal to participate in the study will have no adverse consequences. All personal information will be kept confidential.

Should you voluntarily agree to participate in this study, please sign below.

Statement of agreement to participate in the research study:

I, ……..
(Participants full name)

with ID number……..,
have read and understood this letter. All queries have been answered satisfactorily and I fully understand that I am in no way obligated to continue with the study should I wish to withdraw at any stage. I understand that there are no risks to my person and all information will be kept confidential. I voluntarily agree to participate in the study.

Participant's name (print) ……
Participant's signature ……Date…….

Researcher's name (print) ……
Researcher's signature ……Date…….

Witness name (print) ……
Witness signature ……...Date…….

Appendix D2. Confidentiality Statement. Expert group

All participants are to please read and sign the declaration below before commencing the Expert group meeting.

Declaration

1. All information pertaining to the research study and anything discussed during the expert group meeting will be kept confidential. The identity of the participants in the research study will be kept confidential.
2. The returned questionnaires will be collected by a neutral third party at DUT. The Department Research Officer will mark off returned responses from the list of Chiropractors who were sent the questionnaire to determine a response rate. The Officer will delete the names of the respondents from returned questionnaires and return the questionnaires to the researcher. This will ensure confidentiality.
3. The discussions and decisions of this expert group will not be communicated to any individual or organization outside of this expert group meeting.
4. The publication of the information obtained at this expert group meeting will ensure the participants' identities are kept confidential and subjects participating in the study remain anonymous.

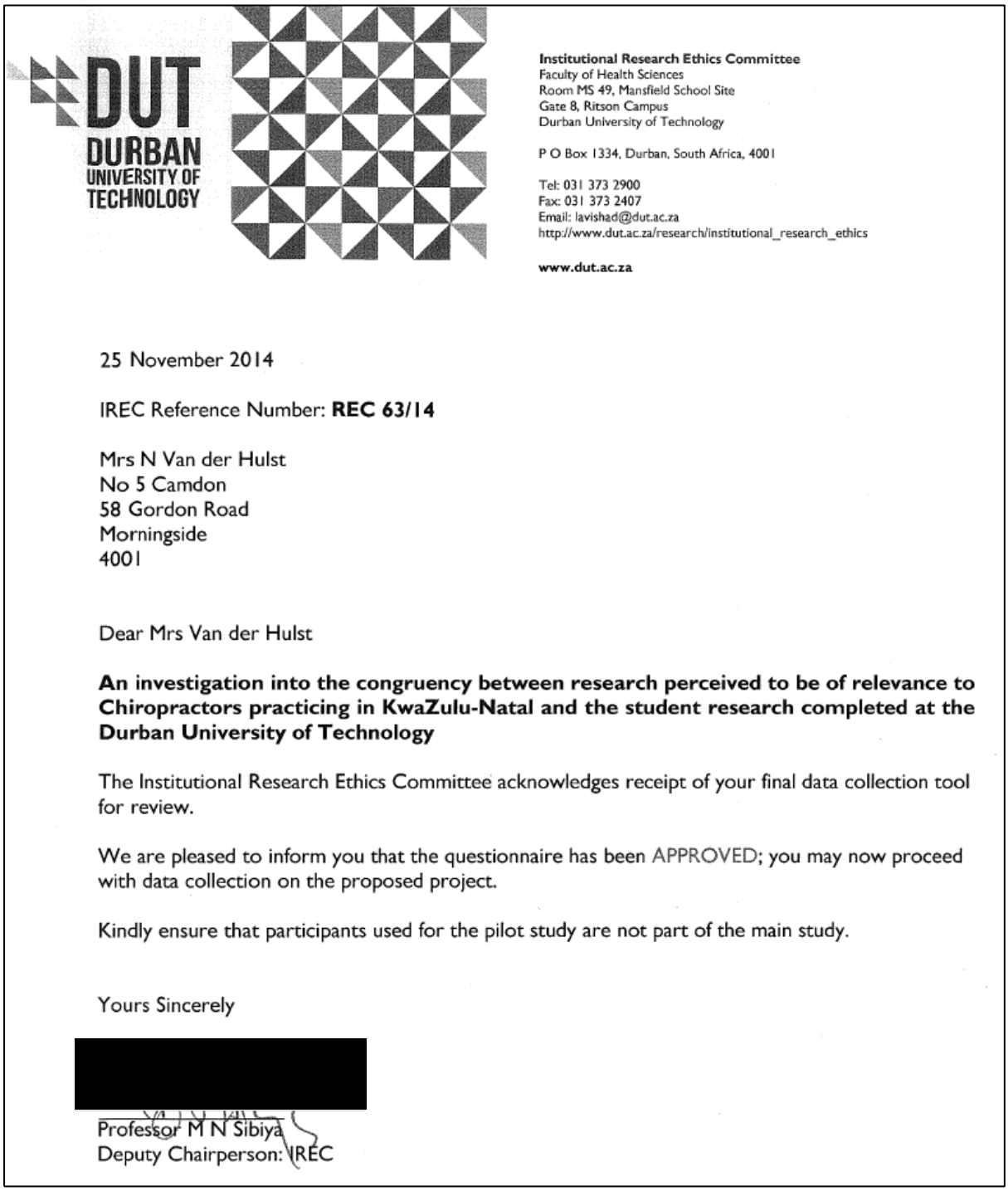
If you have read and agreed to the above declaration, please print your name (in block letters) and sign below. This signature serves to acknowledge agreement of the confidentiality statement.

Expert group member: ……..
Signature ……

Witness name: ……
Signature……..

Researchers name: ……...
Signature……...

Appendix E: IREC Approval



DUT
DURBAN UNIVERSITY OF TECHNOLOGY

Institutional Research Ethics Committee
Faculty of Health Sciences
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Gate 8, Ritson Campus
Durban University of Technology

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www.dut.ac.za

25 November 2014

IREC Reference Number: **REC 63/14**

Mrs N Van der Hulst
No 5 Camdon
58 Gordon Road
Morningside
4001

Dear Mrs Van der Hulst

An investigation into the congruency between research perceived to be of relevance to Chiropractors practicing in KwaZulu-Natal and the student research completed at the Durban University of Technology

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

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

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

Yours Sincerely

[redacted]

Professor M N Sibiya
Deputy Chairperson: IREC

Appendix F1: Table 4.4 – The respondents main reasons for doing research

	Reason 1	**Reason 2**
Res 1	Professional progression	Recognition as an EBP
Res 2	Provides empirical evidence	Guides treatment protocols
Res 3	Increase proficiency and clinical competency	Improves quality of service and aids treatment of more conditions

Res 4	Improves knowledge of the literature	Professional growth and new research development
Res 5	Increases knowledge of benefit of treatment	Proves efficacy of treatment
Res 6	Increases knowledge	Interdisciplinary co-operation and understanding
Res 7	Proves correlation between manipulation and body function	Broadens the mind
Res 8	Answer questions and initiates progress	Maintains an academic reputation
Res 9	Supports treatment methods	Proves benefit of treatment
Res 10	Improves practice	Recognition as an EBP
Res 11	Develops profession	Strengthens clinical outlook
Res 12	Increases body of knowledge	Recognition as an EBP
Res 13	Increases knowledge	Proves efficacy of treatment for medical aid reimbursement
Res 14	Advances profession	Recognition as an EBP
Res 15	Proves efficacy of treatment on the Nervous System	
Res 16	Validates Chiropractic as a Primary Health Care	Patient education
Res 17	Qualification with Chiropractic degree	Professional progression
Res 18	Recognition as an EBP	Increases body of knowledge for better treatment of patients
Res 19	Continued education	Increases body of knowledge for improved professional recognition
Res 20	Proves efficacy of treatment	Determines most effective treatment method for specific condition
Res 21	Qualification with Chiropractic degree	Proves efficacy of treatment
Res 22	Teaches analysis and conceptualization	Qualification with Chiropractic degree
Res 23	Improves patient outcomes	Improves confidence for treatment of a specific condition
Res 24	Validates procedures and protocols in EBM	Recognition as an EBP
Res 25	Increases knowledge of benefit of treatment	Recognition as an EBP
Res 26	Recognition as an EBP	Continued education
Res 27	Increases knowledge	Improves patient outcomes
Res 28	Validates procedures and protocols in EBM	Increases scope of practice
Res 29	Proves efficacy of treatment	Improves confidence for treatment of a specific condition
Res 30	Professional progression	Professional recognition
Res 31	Advances profession	Keeps profession current and up to date
Res 32	Recognition as an EBP	Increases/diversifies scope of practice
Res 33	Recognition as an EBP	Improves patient management protocols
Res 34	Determines most effective treatment method for specific condition	Minimizes ineffectual treatments/tests

Res 35	Teaches analysis and conceptualization, scientific thinking	Increases knowledge of dissertation construction
Res 36	Proves efficacy of treatment	Determines most effective treatment method for specific condition
Res 37	Qualification with Chiropractic degree	Academic
Res 38	Recognition as an EBP	Enhances treatment and protocols in EBM. Increases knowledge
Res 39	Validates the 'Innate'/ theories	Increase holistic approach to treatment
Res 40	Validates treatment protocols	Improve holistic understanding of patient, not only musculoskeletal system
Res 41	Increases knowledge for improved treatment	Professional recognition
Res 42	Keeps profession current and up to date	Guides treatment protocols
Res 43	Proves efficacy of treatment	Provides empirical evidence
Res 44	Increases knowledge of treatment protocols	Education of population and medical profession
Res 45	Verification of treatment alternatives	Discrimination of good research from bad research
Res 46	Recognition as an EBP	Validates treatment protocols
Res 47	Improves patient outcomes	Provides empirical evidence
Res 48	Correlates findings from private practice	Increases knowledge
Res 49	Promotes better outcomes in EBP	Recognition as an EBP
Res 50	Proves efficacy of treatment	Motivates medical aid reimbursement
Res 51	Proves efficacy of treatment for specific conditions	Guides treatment protocols
Res 52	Gain reliable data for basis of clinical practice	Recognition as an EBP
Res 53	Recognition as an EBP	Recognition as a mainstream profession
Res 54	Professional progression	Education of population and medical profession
Res 55	Increases knowledge of treatment protocols	Provides database of clinical trials for extrapolation of results
Res 56	Proves efficacy of treatment	Professional progression
Res 57	Increases knowledge	Practice of evidence-based techniques
Res 58	Proves efficacy of treatment	Determines efficacy of different treatment protocols
Res 59	Improves understanding of role of manipulation in a multidisciplinary approach	Increases/diversifies scope of practice
Res 60	Increases efficacy of treatment	Guides treatment protocols
Res 61	Validates procedures and protocols in EBM	Increases efficacy of treatment and improves patient outcomes
Res 62	Increases knowledge	Guides treatment protocols

Appendix F2: Table 4.5 – The respondent's recommendations for future research

Respondents	Recommendations for future Chiropractic research
1	I would like to know how the medical society and general public view Chiropractic and to what extent we are still considered quacks
2	Financial feasibility of being a Chiropractor → incomes, salaries, taxes etc.
3	NO RESPONSE SUPPLIED
4	NO RESPONSE SUPPLIED
5	NO RESPONSE SUPPLIED
6	NO RESPONSE SUPPLIED
7	NO RESPONSE SUPPLIED
8	NO RESPONSE SUPPLIED
9	Chiropractic treatment of infants → Colic and sleep disorders. Chiropractic treatment of children, learning abnormalities and posture.
10	No animal testing
11	NO RESPONSE SUPPLIED
12	NO RESPONSE SUPPLIED
13	NO RESPONSE SUPPLIED
14	Qualitative research in collaboration with medical doctors
15	CHIROPRACTIC should take a leading role in the cause and particularly the prevention of disease that may lead to disease: not just crisis management and quick fixes.
16	How organic pain refers as musculoskeletal pain in certain conditions. Is it as literature states? Research on Chiropractic education in patients / SA government.
17	NO RESPONSE SUPPLIED
18	NO RESPONSE SUPPLIED
19	NO RESPONSE SUPPLIED
20	The effect of spinal posture on extremity conditions. For example, anterior head posture and shoulder impingement / instability
21	Long term effects of Chiropractic care. The effects of Chiropractic adjustments on health. The effect of poor posture on extremity conditions.
22	NO RESPONSE SUPPLIED
23	Identifying the manipulable lesion.
24	Correlation between CHIROPRACTIC / Physio treatment and analgesic / NSAID medication. Are there improved outcomes / synergistic effects.
25	NO RESPONSE SUPPLIED
26	NO RESPONSE SUPPLIED
27	NO RESPONSE SUPPLIED
28	GERD, positional release techniques, DNS.
29	NO RESPONSE SUPPLIED
30	NO RESPONSE SUPPLIED
31	Activator gun : effectiveness, safety, special precautions etc.
32	Provide documented research on exactly what we do, to educate both the medical profession as well as the general public better.
33	Increased randomised clinical trials and systematic reviews.
34	NO RESPONSE SUPPLIED
35	NO RESPONSE SUPPLIED
36	Very little on management of various conditions such as CTS, Lateran Epicondilitis, Adhesive Capsulitis, rib conditions, Tietzes syndrome…feet and ankle.

37	NO RESPONSE SUPPLIED
38	We need further info on how we are perceived by other medical professions and by the general public. Perhaps a study on what the general public thinks a Chiropractor does and what the qualification entitles one to do.
39	There needs to be more effort in CHIROPRACTIC public education of non-white groups. Almost all white people know of CHIROPRACTIC. But it still remains unknown in other race groups.
40	NO RESPONSE SUPPLIED
41	NO RESPONSE SUPPLIED
42	The use of CHIROPRACTIC in performance and specific sports.
43	Pediatric CHIROPRACTIC
44	NO RESPONSE SUPPLIED
45	NO RESPONSE SUPPLIED
46	CHIROPRACTIC of pregnancy related pain / bio mechanical dysfunction.
47	Spinal dysfunction in new born babies, trends comparing c section s with natural births. Enuresis
48	NO RESPONSE SUPPLIED
49	NO RESPONSE SUPPLIED
50	NO RESPONSE SUPPLIED
51	NO RESPONSE SUPPLIED
52	NO RESPONSE SUPPLIED
53	NO RESPONSE SUPPLIED
54	NO RESPONSE SUPPLIED
55	OA / RA
56	Lower back pain, neck pain, cervicogenic headache, radiculopathies etc. The world out there is still largely ignorant of the positive contributions CHIROPRACTIC can make. We need to focus on conditions that respond well to CHIROPRACTIC adjustments as those conditions become more prevalent than ever. However it is a concern to me that research in CHIROPRACTIC adjustments at college whereby students do not have the required skills at adjusting makes no sense. My own research tells me that having chatted to lots of graduates the average term of 5 years is what it takes to become proficient at adjusting. Is an appy brick-layer as good as a journeyman brick-layer?
57	NO RESPONSE SUPPLIED
58	Compare adjustment alone to various STT.
59	Understanding the uses of other modalities. I.e., transeva in conjunction with CHIROPRACTIC manipulation, in particular their benefits.
60	NO RESPONSE SUPPLIED
61	CHIROPRACTIC vs. general medicine as primary provider of care for muscoskeletal complaints. Diagnosis of musculoskeletal injuries by Chiropractors vs. physios vs. GP's.
62	NO RESPONSE SUPPLIED
63	NO RESPONSE SUPPLIED

Appendix F3: Table 4.6 – Willingness to contribute to a research database

Respondents	Contribution to a research database	Yes/No/Exclude	Count	Percentage
Res 1	Y	EXCLUSION	4	6.349206349
Res 2	Y	NO	10	15.87301587
Res 3	N	YES	49	77.77777778
Res 4	N			

Res 5	E			
Res 6	E			
Res 7	E			
Res 8	Y			
Res 9	Y			
Res 10	Y			
Res 11	N			
Res 12	Y			
Res 13	Y			
Res 14	Y			
Res 15	Y			
Res 16	Y			
Res 17	Y			
Res 18	Y			
Res 19	Y			
Res 20	Y			
Res 21	Y			
Res 22	Y			
Res 23	Y			
Res 24	Y			
Res 25	N			
Res 26	N			
Res 27	Y			
Res 28	Y			
Res 29	Y			
Res 30	Y			
Res 31	N			
Res 32	N			
Res 33	Y			
Res 34	Y			
Res 35	Y			
Res 36	Y			
Res 37	Y			
Res 38	Y			
Res 39	Y			
Res 40	Y			
Res 41	Y			
Res 42	Y			
Res 43	Y			
Res 44	Y			
Res 45	N			
Res 46	Y			
Res 47	Y			
Res 48	Y			

Res 49	N			
Res 50	Y			
Res 51	Y			
Res 52	E			
Res 53	N			
Res 54	Y			
Res 55	Y			
Res 56	Y			
Res 57	Y			
Res 58	Y			
Res 59	Y			
Res 60	Y			
Res 61	Y			
Res 62	Y			
Res 63	Y			

Appendix G1: Table 4.8– Association between practitioner demographics and perception: Age

		age	P value (ANOVA)
		Mean	
Q19. Allergy testing	very important	39.7	0.811
	important	38.9	
	not important	36.6	
	irrelevant	39.6	
Q20. Blood screening e.g. for Anemias, Sugar levels	very important	33.8	0.567
	important	39.1	
	not important	38.4	
	irrelevant	38.8	
Q21. Body Mass Index and Cardiovascular fitness testing	very important	40.3	0.698
	important	37.5	
	not important	38.3	
	irrelevant	31.5	
Q22. Bone testing e.g. for Density, Hot and Cold spots	very important	37	0.871
	important	38.8	
	not important	37	
	irrelevant	41	
Q23. Cancer prevention screening e.g. Mammogram, Pap smear, PSA testing	very important	38.4	0.963
	important	37.2	

	not important	38.4	
	irrelevant	39.1	
Q24. Chronic disease prevention e.g. Cancer, DM, Obesity, TB and Opportunistic infection prevention	very important	40.3	0.7
	important	37.4	
	not important	35.6	
	irrelevant	39	
Q25. Complementary medication for health promotion eg. Chinese herbal, Ayurvedic, Naturapathic and Homeopathic medication	very important	39	0.303
	important	38.9	
	not important	34.4	
	irrelevant	46.5	
Q26. Culture screening e.g. of Stool and Bloods	very important	41.6	0.74
	important	38	
	not important	36.8	
	irrelevant	39.9	
Q27. Dietary advice	very important	39.2	0.048
	important	37.5	
	not important	28.3	
	irrelevant	60	
Q28. Dietary supplementation	very important	36.2	0.012
	important	36.2	
	not important	47	
	irrelevant	53	
Q29. Epidemiological studies	very important	42.3	0.766
	important	37.6	
	not important	37.6	
	irrelevant	37.3	
Q30. Ergonomic risk prevention	very important	37.1	0.241
	important	40.4	
	not important	29	
Q31. Gait analysis and Postural assessment	very important	38	0.979
	important	38.1	
Q32. Gastrointestinal scopes	very important	39	0.914
	important	39	
	not important	36.9	
	irrelevant	38.6	
Q33. General medical examination for common conditions such as Jaundice, Anemia, Clubbing, Cyanosis, Oedema	very important	37.1	0.758
	important	37.1	
	not important	39.1	

	irrelevant	43	
Q34. Injury prevention	very important	36.8	0.002
	important	37.4	
	not important	71	
Q35. Imaging studies e.g. Angiography, Doppler Ultrasound, CT scan, MRI, Ultrasound, X-rays	very important	37.7	0.791
	important	38.4	
Q36. Lifestyle factors e.g. Alcohol abuse risks and cessation, Exercise for disease prevention, Social drug risks and cessation, Tobacco risks and cessation	very important	40.1	0.372
	important	36.3	
	not important	35	
	irrelevant	44.5	
Q37. Mental illness and psychological intervention for health promotion e.g. Pain avoidance reduction and Stress management techniques	very important	36.4	0.254
	important	39.6	
	not important	33.4	
Q38. Motion and / or Static palpation	very important	38.8	0.599
	important	36.4	
	not important	32	
Q39. Muscular testing	very important	38.2	0.841
	important	37.9	
	not important	32	
Q40. Myofascial trigger point assessment	very important	38.2	0.842
	important	38	
	not important	32	
Q41. Neurological testing	very important	38.6	0.346
	important	35.2	
Q42. Orthopaedic testing	very important	38.4	0.025
	important	34.7	
	not important	63	
Q43. Over-The-Counter medication for disease prevention	very important	34.3	0.74
	important	38.6	
	not important	38.2	
	irrelevant	39.5	
Q44. Prescription medication	very important	38.1	0.232
	important	38.5	
	not important	35.1	
	irrelevant	47	
Q45. Range of Motion assessment	very important	39.1	0.427
	important	35.2	
	not important	36	

Q46. Reduction of posture related disorders	very important	38.9	0.434
	important	35.3	
	not important	33.7	
Q47. Safe sex practices	very important	47.7	0.063
	important	34.4	
	not important	38	
	irrelevant	37.7	
Q48. Salivary cortisol testing to assess stress levels	very important	37.4	0.592
	important	38.8	
	not important	35.1	
	irrelevant	39.5	
Q49. Sexually transmitted disease prevention e.g. Contraception use, HIV prevention	very important	44.6	0.29
	important	36.4	
	not important	36.5	
	irrelevant	38.8	
Q50. Sports medicine	very important	37.8	0.974
	important	38.3	
	not important	39	
Q51. Successful practice management	very important	38.4	0.544
	important	38.3	
	not important	32.5	
Q52. Supplementation e.g. Dietary or Sports supplementation	very important	35	0.201
	important	39.9	
	not important	38.8	
Q53. Urinalysis	very important	36.2	0.54
	important	39.7	
	not important	35.4	
	irrelevant	39	
Q54. Vital signs examination	very important	37.6	0.032
	important	40.2	
	not important	33.2	
	irrelevant	60	
Q55. Alzheimers	very important	38	0.385
	important	39.3	
	not important	35.6	
	irrelevant	41.1	
Q56. Anemias	very important	38.3	0.794
	important	39.3	

	not important	36.3	
	irrelevant	38.6	
Q57. Angina	very important	37	0.671
	important	39.7	
	not important	36.2	
	irrelevant	39.7	
Q58. Asthma	very important	32.6	0.155
	important	39.9	
	not important	33.9	
	irrelevant	40.8	
Q59. Breast Cancers	very important	37.7	0.313
	important	41.4	
	not important	35.5	
	irrelevant	37.3	
Q60. Cervical cancer	very important	39	0.954
	important	38.3	
	not important	36.9	
	irrelevant	37.2	
Q61. Colorectal Cancers	very important	42	0.579
	important	39.7	
	not important	36.3	
	irrelevant	37.3	
Q62. Coronary heart disease	very important	37.4	0.552
	important	40.1	
	not important	35.6	
	irrelevant	38	
Q63. Chronic Obstructive Pulmonary Disease	very important	44	0.325
	important	39.8	
	not important	35.1	
	irrelevant	37.7	
Q64. Diarrhoeal diseases	very important	64.5	0.002
	important	36.8	
	not important	37.5	
	irrelevant	36.8	
Q65. Cholera	very important	48	0.518
	important	35.6	
	not important	37.7	
	irrelevant	38.3	

Q66. Colon cancer	very important	47.2	0.244
	important	37.3	
	not important	37.4	
	irrelevant	37.3	
Q67. Diabetis Mellitis	very important	44.9	0.065
	important	35.5	
	not important	36.4	
	irrelevant	40	
Q68. Ebstein-Barr Virus	very important	47.4	0.035
	important	34.9	
	not important	37.2	
	irrelevant	37.7	
Q69. Epilepsy	very important	45.2	0.217
	important	38.4	
	not important	35.2	
	irrelevant	38.2	
Q70. Hepatitis	very important	38	0.747
	important	40.5	
	not important	36.9	
	irrelevant	37.3	
Q71. HIV/AIDS	very important	31.5	0.532
	important	38.3	
	not important	39.5	
	irrelevant	36.8	
Q72. Hypertension	very important	38.5	0.868
	important	38.1	
	not important	36.2	
	irrelevant	41	
Q73. Hypothyroidism	very important	41.2	0.408
	important	39.1	
	not important	34.9	
	irrelevant	40.2	
Q74. Ischeamic heart disease	very important	38.8	0.645
	important	40.1	
	not important	36.1	
	irrelevant	38	
Q75. Influenza and Pneumonia	very important	33	0.877
	important	37.2	

	not important	39.1	
	irrelevant	37.4	
Q76. Leukemias	very important	38.6	0.712
	important	36.5	
	not important	39.7	
	irrelevant	36.3	
Q77. Liver cancer	very important	36	0.746
	important	37.3	
	not important	39.8	
	irrelevant	36.5	
Q78. Low birth weight	very important	40.5	0.897
	important	38.5	
	not important	37.6	
	irrelevant	36.6	
Q79. Lung disease and Cancer	very important	38.5	0.455
	important	41.3	
	not important	36.6	
	irrelevant	36.3	
Q80. Lymphoma	very important	39	0.577
	important	41	
	not important	36.8	
	irrelevant	36.3	
Q81. Malaria	very important	40	0.857
	important	40	
	not important	38	
	irrelevant	36.5	
Q82. Measles	very important	48	0.532
	important	38.3	
	not important	38.3	
	irrelevant	36.5	
Q83. Meningitis	very important	41.5	0.313
	important	34.8	
	not important	37.9	
	irrelevant	39.3	
Q84. Oesophageal Cancer	very important	41.4	0.528
	important	35.3	
	not important	39.5	
	irrelevant	36.5	

Q85. Peptic ulcers	very important	45.8	0.219
	important	38.9	
	not important	35.3	
	irrelevant	37.4	
Q86. Polycystic ovarian syndrome	very important	38.4	0.883
	important	39.5	
	not important	37.1	
	irrelevant	37.1	
Q87. Polycystic kidneys	very important	40	0.545
	important	40.6	
	not important	36.2	
	irrelevant	37.4	
Q88. Rabies	very important	55.7	0.021
	important	36.1	
	not important	37.3	
	irrelevant	37.2	
Q89. Schistosomiasis	very important	63	0.107
	important	38.3	
	not important	37.4	
	irrelevant	37.5	
Q90. Strokes	very important	41.2	0.218
	important	36.4	
	not important	34.5	
	irrelevant	40.8	
Q91. Syphilis	very important	41.3	0.215
	important	36.5	
	not important	34.7	
	irrelevant	40.3	
Q92. Tuberculosis	very important	39	0.133
	important	35.9	
	not important	35.4	
	irrelevant	43	
Q93. Biochemical changes as a result of chiropractic manipulation e.g. Changes in metabolism and enzymes	very important	37.6	0.89
	important	38.7	
	not important	36	
Q94. Biomechanical changes as a result of chiropractic manipulation e.g. Altered movement patterns in kinematic chains	very important	38	0.955
	important	38.2	
Q95. Gross anatomical changes as a result of chiropractic	very important	37.5	0.745

manipulation e.g. Change in orientation of joint surfaces	important	39.9	
	not important	36	
Q96. Histological changes as a result of chiropractic manipulation e.g. Microscopic changes in cell characteristics	very important	35.8	0.107
	important	41.3	
	not important	34.7	
Q97. Physiological changes as a result of chiropractic manipulation e.g. Changes in hormone production, secretion, absorption and use	very important	36.1	0.064
	important	41	
Q98. Chiropractic adjustment techniques e.g. Diversified, Gonstead	very important	38.8	0.345
	important	36	
Q99. Electrotherapy treatment e.g. Interferential current, TENS	very important	34.2	0.026
	important	38.6	
	not important	46.1	
	irrelevant	34.7	
Q100. Multidisciplinary treatments e.g. Biopuncture, Medication, Applied kinesiology	very important	35.7	0.281
	important	40	
	not important	39	
Q101. Myofascial treatment techniques e.g. Dry needling, Ischemic compression	very important	35.9	0.034
	important	40.5	
	not important	52	
Q102. Rehabilitation programmes e.g. Orthotics, PNF, Strapping	very important	36.7	0.209
	important	40.1	

Appendix G2: Table 4.9 – Association between practitioner demographics and perception: Gender

		Gender			
		Female		Male	
		Count	Column N %	Count	Column N %
Q19	very important	3	7.7%	0	0.0%
	important	13	33.3%	6	26.1%
	not important	17	43.6%	11	47.8%
	irrelevant	6	15.4%	6	26.1%
Q20	very important	8	20.5%	2	8.3%
	important	18	46.2%	12	50.0%
	not important	10	25.6%	8	33.3%
	irrelevant	3	7.7%	2	8.3%
Q21	very important	9	23.7%	3	12.5%
	important	20	52.6%	15	62.5%
	not important	8	21.1%	5	20.8%
	irrelevant	1	2.6%	1	4.2%
Q22	very important	18	46.2%	8	33.3%
	important	15	38.5%	13	54.2%
	not important	5	12.8%	1	4.2%
	irrelevant	1	2.6%	2	8.3%

Q23	very important	10	26.3%	2	8.3%
	important	14	36.8%	13	54.2%
	not important	12	31.6%	4	16.7%
	irrelevant	2	5.3%	5	20.8%
Q24	very important	12	31.6%	4	16.7%
	important	16	42.1%	14	58.3%
	not important	8	21.1%	3	12.5%
	irrelevant	2	5.3%	3	12.5%
Q25	very important	5	12.8%	3	12.5%
	important	22	56.4%	14	58.3%
	not important	12	30.8%	5	20.8%
	irrelevant	0	0.0%	2	8.3%
Q26	very important	4	10.3%	1	4.2%
	important	11	28.2%	9	37.5%
	not important	19	48.7%	10	41.7%
	irrelevant	5	12.8%	4	16.7%
Q27	very important	14	35.9%	10	41.7%
	important	23	59.0%	12	50.0%
	not important	2	5.1%	1	4.2%
	irrelevant	0	0.0%	1	4.2%
Q28	very important	14	36.8%	6	26.1%
	important	23	60.5%	12	52.2%
	not important	1	2.6%	3	13.0%
	irrelevant	0	0.0%	2	8.7%
Q29	very important	5	12.8%	1	4.2%
	important	19	48.7%	17	70.8%
	not important	13	33.3%	4	16.7%
	irrelevant	2	5.1%	2	8.3%
Q30	very important	26	66.7%	15	65.2%
	important	11	28.2%	8	34.8%
	not important	2	5.1%	0	0.0%
Q31	very important	28	73.7%	16	66.7%
	important	10	26.3%	8	33.3%
Q32	very important	1	2.7%	0	0.0%
	important	11	29.7%	7	30.4%
	not important	17	45.9%	10	43.5%
	irrelevant	8	21.6%	6	26.1%
Q33	very important	8	21.1%	2	8.3%
	important	20	52.6%	11	45.8%
	not important	8	21.1%	10	41.7%
	irrelevant	2	5.3%	1	4.2%
Q34	very important	26	66.7%	11	47.8%
	important	13	33.3%	11	47.8%
	not important	0	0.0%	1	4.3%
Q35	very important	24	61.5%	14	58.3%
	important	15	38.5%	10	41.7%
Q36	very important	18	46.2%	8	33.3%
	important	17	43.6%	12	50.0%
	not important	4	10.3%	2	8.3%
	irrelevant	0	0.0%	2	8.3%
Q37	very important	17	43.6%	1	4.2%
	important	18	46.2%	20	83.3%
	not important	4	10.3%	3	12.5%
Q38	very important	29	74.4%	16	66.7%
	important	10	25.6%	7	29.2%
	not important	0	0.0%	1	4.2%
Q39	very important	30	76.9%	16	66.7%
	important	9	23.1%	7	29.2%
	not important	0	0.0%	1	4.2%

Q40	very important	31	79.5%	15	62.5%
	important	8	20.5%	8	33.3%
	not important	0	0.0%	1	4.2%
Q41	very important	33	84.6%	20	83.3%
	important	6	15.4%	4	16.7%
Q42	very important	31	81.6%	18	75.0%
	important	7	18.4%	5	20.8%
	not important	0	0.0%	1	4.2%
Q43	very important	6	15.4%	2	8.3%
	important	20	51.3%	13	54.2%
	not important	12	30.8%	6	25.0%
	irrelevant	1	2.6%	3	12.5%
Q44	very important	8	21.1%	3	12.5%
	important	18	47.4%	13	54.2%
	not important	12	31.6%	4	16.7%
	irrelevant	0	0.0%	4	16.7%
Q45	very important	31	79.5%	15	62.5%
	important	7	17.9%	9	37.5%
	not important	1	2.6%	0	0.0%
Q46	very important	29	74.4%	20	83.3%
	important	7	17.9%	4	16.7%
	not important	3	7.7%	0	0.0%
Q47	very important	2	5.1%	4	16.7%
	important	8	20.5%	6	25.0%
	not important	21	53.8%	7	29.2%
	irrelevant	8	20.5%	7	29.2%
Q48	very important	5	13.2%	2	8.7%
	important	17	44.7%	11	47.8%
	not important	13	34.2%	6	26.1%
	irrelevant	3	7.9%	4	17.4%
Q49	very important	4	10.5%	3	12.5%
	important	8	21.1%	6	25.0%
	not important	17	44.7%	8	33.3%
	irrelevant	9	23.7%	7	29.2%
Q50	very important	24	63.2%	15	62.5%
	important	14	36.8%	7	29.2%
	not important	0	0.0%	2	8.3%
Q51	very important	24	61.5%	15	62.5%
	important	11	28.2%	9	37.5%
	not important	4	10.3%	0	0.0%
Q52	very important	19	48.7%	5	20.8%
	important	16	41.0%	18	75.0%
	not important	4	10.3%	1	4.2%
Q53	very important	8	21.1%	2	8.3%
	important	18	47.4%	14	58.3%
	not important	10	26.3%	6	25.0%
	irrelevant	2	5.3%	2	8.3%
Q54	very important	18	46.2%	7	29.2%
	important	11	28.2%	13	54.2%
	not important	10	25.6%	3	12.5%
	irrelevant	0	0.0%	1	4.2%
Q55	very important	1	2.6%	0	0.0%
	important	10	26.3%	9	37.5%
	not important	20	52.6%	8	33.3%
	irrelevant	7	18.4%	7	29.2%
Q56	very important	3	7.9%	1	4.2%
	important	18	47.4%	9	37.5%
	not important	14	36.8%	10	41.7%
	irrelevant	3	7.9%	4	16.7%

Q57	very important	3	7.9%	2	8.3%
	important	13	34.2%	11	45.8%
	not important	19	50.0%	8	33.3%
	irrelevant	3	7.9%	3	12.5%
Q58	very important	4	10.5%	1	4.2%
	important	20	52.6%	18	75.0%
	not important	11	28.9%	4	16.7%
	irrelevant	3	7.9%	1	4.2%
Q59	very important	4	10.8%	2	8.3%
	important	14	37.8%	8	33.3%
	not important	15	40.5%	7	29.2%
	irrelevant	4	10.8%	7	29.2%
Q60	very important	1	2.7%	1	4.3%
	important	17	45.9%	7	30.4%
	not important	16	43.2%	8	34.8%
	irrelevant	3	8.1%	7	30.4%
Q61	very important	3	8.1%	2	8.3%
	important	15	40.5%	7	29.2%
	not important	15	40.5%	8	33.3%
	irrelevant	4	10.8%	7	29.2%
Q62	very important	3	7.9%	2	8.3%
	important	15	39.5%	10	41.7%
	not important	16	42.1%	6	25.0%
	irrelevant	4	10.5%	6	25.0%
Q63	very important	1	2.6%	2	8.3%
	important	17	44.7%	9	37.5%
	not important	15	39.5%	8	33.3%
	irrelevant	5	13.2%	5	20.8%
Q64	very important	0	0.0%	2	8.3%
	important	12	32.4%	5	20.8%
	not important	19	51.4%	10	41.7%
	irrelevant	6	16.2%	7	29.2%
Q65	very important	0	0.0%	2	8.3%
	important	5	13.2%	2	8.3%
	not important	23	60.5%	10	41.7%
	irrelevant	10	26.3%	10	41.7%
Q66	very important	2	5.4%	3	12.5%
	important	15	40.5%	6	25.0%
	not important	16	43.2%	8	33.3%
	irrelevant	4	10.8%	7	29.2%
Q67	very important	6	15.8%	5	20.8%
	important	16	42.1%	9	37.5%
	not important	13	34.2%	6	25.0%
	irrelevant	3	7.9%	4	16.7%
Q68	very important	4	10.5%	4	16.7%
	important	13	34.2%	5	20.8%
	not important	13	34.2%	8	33.3%
	irrelevant	8	21.1%	7	29.2%
Q69	very important	4	10.5%	3	12.5%
	important	16	42.1%	10	41.7%
	not important	13	34.2%	7	29.2%
	irrelevant	5	13.2%	4	16.7%
Q70	very important	3	7.9%	2	8.3%
	important	10	26.3%	5	20.8%
	not important	19	50.0%	9	37.5%
	irrelevant	6	15.8%	8	33.3%
Q71	very important	4	10.8%	1	4.2%
	important	12	32.4%	7	29.2%
	not important	16	43.2%	9	37.5%

	irrelevant	5	13.5%	7	29.2%
Q72	very important	9	23.7%	4	16.7%
	important	15	39.5%	16	66.7%
	not important	12	31.6%	2	8.3%
	irrelevant	2	5.3%	2	8.3%
Q73	very important	4	10.5%	1	4.2%
	important	17	44.7%	13	54.2%
	not important	14	36.8%	7	29.2%
	irrelevant	3	7.9%	3	12.5%
Q74	very important	3	8.1%	2	8.3%
	important	12	32.4%	10	41.7%
	not important	18	48.6%	6	25.0%
	irrelevant	4	10.8%	6	25.0%
Q75	very important	1	2.6%	0	0.0%
	important	14	36.8%	6	25.0%
	not important	18	47.4%	10	41.7%
	irrelevant	5	13.2%	8	33.3%
Q76	very important	3	8.3%	2	8.3%
	important	10	27.8%	4	16.7%
	not important	18	50.0%	10	41.7%
	irrelevant	5	13.9%	8	33.3%
Q77	very important	3	8.3%	1	4.2%
	important	12	33.3%	5	20.8%
	not important	16	44.4%	10	41.7%
	irrelevant	5	13.9%	8	33.3%
Q78	very important	4	10.5%	2	8.3%
	important	11	28.9%	7	29.2%
	not important	17	44.7%	10	41.7%
	irrelevant	6	15.8%	5	20.8%
Q79	very important	4	10.8%	2	8.3%
	important	13	35.1%	6	25.0%
	not important	15	40.5%	10	41.7%
	irrelevant	5	13.5%	6	25.0%
Q80	very important	5	13.2%	2	8.3%
	important	11	28.9%	5	20.8%
	not important	17	44.7%	11	45.8%
	irrelevant	5	13.2%	6	25.0%
Q81	very important	2	5.3%	1	4.2%
	important	5	13.2%	4	16.7%
	not important	22	57.9%	11	45.8%
	irrelevant	9	23.7%	8	33.3%
Q82	very important	1	2.7%	1	4.2%
	important	7	18.9%	5	20.8%
	not important	20	54.1%	10	41.7%
	irrelevant	9	24.3%	8	33.3%
Q83	very important	9	23.7%	6	25.0%
	important	11	28.9%	8	33.3%
	not important	13	34.2%	6	25.0%
	irrelevant	5	13.2%	4	16.7%
Q84	very important	3	8.1%	2	8.3%
	important	9	24.3%	4	16.7%
	not important	19	51.4%	11	45.8%
	irrelevant	6	16.2%	7	29.2%
Q85	very important	2	5.3%	3	13.0%
	important	13	34.2%	11	47.8%
	not important	18	47.4%	4	17.4%
	irrelevant	5	13.2%	5	21.7%
Q86	very important	2	5.3%	3	12.5%
	important	14	36.8%	5	20.8%

	not important	17	44.7%	11	45.8%
	irrelevant	5	13.2%	5	20.8%
Q87	very important	3	7.9%	2	8.3%
	important	10	26.3%	7	29.2%
	not important	18	47.4%	9	37.5%
	irrelevant	7	18.4%	6	25.0%
Q88	very important	1	2.6%	2	8.3%
	important	6	15.8%	3	12.5%
	not important	20	52.6%	8	33.3%
	irrelevant	11	28.9%	11	45.8%
Q89	very important	0	0.0%	1	4.2%
	important	7	18.4%	3	12.5%
	not important	20	52.6%	10	41.7%
	irrelevant	11	28.9%	10	41.7%
Q90	very important	13	34.2%	9	37.5%
	important	14	36.8%	8	33.3%
	not important	9	23.7%	4	16.7%
	irrelevant	2	5.3%	3	12.5%
Q91	very important	3	8.1%	1	4.3%
	important	5	13.5%	3	13.0%
	not important	18	48.6%	7	30.4%
	irrelevant	11	29.7%	12	52.2%
Q92	very important	7	18.4%	3	12.5%
	important	7	18.4%	8	33.3%
	not important	18	47.4%	4	16.7%
	irrelevant	6	15.8%	9	37.5%
Q93	very important	18	46.2%	16	66.7%
	important	19	48.7%	8	33.3%
	not important	2	5.1%	0	0.0%
Q94	very important	30	76.9%	21	87.5%
	important	9	23.1%	3	12.5%
Q95	very important	29	74.4%	19	79.2%
	important	9	23.1%	5	20.8%
	not important	1	2.6%	0	0.0%
Q96	very important	21	55.3%	13	54.2%
	important	14	36.8%	11	45.8%
	not important	3	7.9%	0	0.0%
Q97	very important	23	59.0%	16	66.7%
	important	16	41.0%	8	33.3%
Q98	very important	29	74.4%	17	70.8%
	important	10	25.6%	7	29.2%
Q99	very important	18	46.2%	4	17.4%
	important	17	43.6%	11	47.8%
	not important	3	7.7%	6	26.1%
	irrelevant	1	2.6%	2	8.7%
Q100	very important	20	51.3%	7	29.2%
	important	15	38.5%	14	58.3%
	not important	4	10.3%	3	12.5%
Q101	very important	27	71.1%	9	37.5%
	important	11	28.9%	13	54.2%
	not important	0	0.0%	2	8.3%
Q102	very important	26	66.7%	12	50.0%
	important	13	33.3%	12	50.0%

Appendix G3: Table 4.10 – Association between practitioner demographics and perception: Type of practice

		Type of Practice							
		Group		Individual		Multidisciplinary		Partnership	
		Count	Column N %	Count	Column N %	Count	Column N %	Count	Column N %
Q19	very important	2	22.2%	0	0.0%	1	3.6%	0	0.0%
	important	4	44.4%	4	22.2%	8	28.6%	3	50.0%
	not important	3	33.3%	11	61.1%	11	39.3%	2	33.3%
	irrelevant	0	0.0%	3	16.7%	8	28.6%	1	16.7%
Q20	very important	1	11.1%	4	22.2%	5	17.2%	0	0.0%
	important	6	66.7%	8	44.4%	11	37.9%	4	66.7%
	not important	2	22.2%	4	22.2%	10	34.5%	2	33.3%
	irrelevant	0	0.0%	2	11.1%	3	10.3%	0	0.0%
Q21	very important	0	0.0%	4	23.5%	6	20.7%	2	33.3%
	important	5	55.6%	10	58.8%	16	55.2%	3	50.0%
	not important	4	44.4%	2	11.8%	6	20.7%	1	16.7%
	irrelevant	0	0.0%	1	5.9%	1	3.4%	0	0.0%
Q22	very important	3	33.3%	6	33.3%	14	48.3%	3	50.0%
	important	5	55.6%	10	55.6%	9	31.0%	3	50.0%
	not important	1	11.1%	1	5.6%	4	13.8%	0	0.0%
	irrelevant	0	0.0%	1	5.6%	2	6.9%	0	0.0%
Q23	very important	1	11.1%	2	11.1%	7	25.0%	2	33.3%
	important	6	66.7%	9	50.0%	10	35.7%	1	16.7%
	not important	2	22.2%	5	27.8%	6	21.4%	3	50.0%
	irrelevant	0	0.0%	2	11.1%	5	17.9%	0	0.0%
Q24	very important	1	11.1%	5	27.8%	8	28.6%	2	33.3%
	important	7	77.8%	9	50.0%	9	32.1%	4	66.7%
	not important	1	11.1%	3	16.7%	7	25.0%	0	0.0%
	irrelevant	0	0.0%	1	5.6%	4	14.3%	0	0.0%
Q25	very important	1	11.1%	2	11.1%	4	13.8%	1	16.7%
	important	4	44.4%	12	66.7%	17	58.6%	2	33.3%
	not important	4	44.4%	4	22.2%	6	20.7%	3	50.0%
	irrelevant	0	0.0%	0	0.0%	2	6.9%	0	0.0%
Q26	very important	0	0.0%	1	5.6%	4	13.8%	0	0.0%
	important	2	22.2%	4	22.2%	13	44.8%	1	16.7%
	not important	7	77.8%	10	55.6%	8	27.6%	3	50.0%
	irrelevant	0	0.0%	3	16.7%	4	13.8%	2	33.3%
Q27	very important	3	33.3%	7	38.9%	12	41.4%	2	33.3%
	important	5	55.6%	11	61.1%	14	48.3%	4	66.7%
	not	1	11.1%	0	0.0%	2	6.9%	0	0.0%

	important								
	irrelevant	0	0.0%	0	0.0%	1	3.4%	0	0.0%
Q28	very important	3	33.3%	7	41.2%	8	28.6%	2	33.3%
	important	5	55.6%	8	47.1%	17	60.7%	4	66.7%
	not important	1	11.1%	1	5.9%	2	7.1%	0	0.0%
	irrelevant	0	0.0%	1	5.9%	1	3.6%	0	0.0%
Q29	very important	1	11.1%	2	11.1%	1	3.4%	2	33.3%
	important	5	55.6%	7	38.9%	20	69.0%	3	50.0%
	not important	3	33.3%	8	44.4%	5	17.2%	1	16.7%
	irrelevant	0	0.0%	1	5.6%	3	10.3%	0	0.0%
Q30	very important	5	55.6%	14	82.4%	17	58.6%	4	66.7%
	important	3	33.3%	3	17.6%	11	37.9%	2	33.3%
	not important	1	11.1%	0	0.0%	1	3.4%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q31	very important	5	55.6%	14	77.8%	19	67.9%	5	83.3%
	important	4	44.4%	4	22.2%	9	32.1%	1	16.7%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q32	very important	0	0.0%	0	0.0%	1	3.7%	0	0.0%
	important	2	22.2%	5	29.4%	10	37.0%	1	16.7%
	not important	6	66.7%	7	41.2%	10	37.0%	3	50.0%
	irrelevant	1	11.1%	5	29.4%	6	22.2%	2	33.3%
Q33	very important	0	0.0%	5	27.8%	5	17.9%	0	0.0%
	important	7	77.8%	7	38.9%	13	46.4%	3	50.0%
	not important	2	22.2%	6	33.3%	7	25.0%	3	50.0%
	irrelevant	0	0.0%	0	0.0%	3	10.7%	0	0.0%
Q34	very important	4	44.4%	13	76.5%	16	55.2%	4	66.7%
	important	5	55.6%	3	17.6%	13	44.8%	2	33.3%
	not important	0	0.0%	1	5.9%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q35	very important	3	33.3%	14	77.8%	17	58.6%	4	66.7%
	important	6	66.7%	4	22.2%	12	41.4%	2	33.3%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q36	very important	2	22.2%	10	55.6%	11	37.9%	3	50.0%
	important	5	55.6%	7	38.9%	14	48.3%	2	33.3%
	not important	2	22.2%	1	5.6%	2	6.9%	1	16.7%
	irrelevant	0	0.0%	0	0.0%	2	6.9%	0	0.0%
Q37	very important	2	22.2%	9	50.0%	7	24.1%	0	0.0%
	important	5	55.6%	7	38.9%	19	65.5%	6	100.0%
	not	2	22.2%	2	11.1%	3	10.3%	0	0.0%

	important								
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q38	very important	5	55.6%	16	88.9%	21	72.4%	3	50.0%
	important	4	44.4%	2	11.1%	8	27.6%	3	50.0%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q39	very important	7	77.8%	15	83.3%	21	72.4%	3	50.0%
	important	2	22.2%	3	16.7%	8	27.6%	3	50.0%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q40	very important	7	77.8%	15	83.3%	21	72.4%	3	50.0%
	important	2	22.2%	3	16.7%	8	27.6%	3	50.0%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q41	very important	8	88.9%	17	94.4%	24	82.8%	3	50.0%
	important	1	11.1%	1	5.6%	5	17.2%	3	50.0%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q42	very important	8	88.9%	14	82.4%	23	79.3%	3	50.0%
	important	1	11.1%	2	11.8%	6	20.7%	3	50.0%
	not important	0	0.0%	1	5.9%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q43	very important	1	11.1%	3	16.7%	4	13.8%	0	0.0%
	important	7	77.8%	9	50.0%	13	44.8%	3	50.0%
	not important	0	0.0%	6	33.3%	9	31.0%	3	50.0%
	irrelevant	1	11.1%	0	0.0%	3	10.3%	0	0.0%
Q44	very important	1	11.1%	5	27.8%	5	17.9%	0	0.0%
	important	4	44.4%	11	61.1%	12	42.9%	3	50.0%
	not important	4	44.4%	2	11.1%	8	28.6%	2	33.3%
	irrelevant	0	0.0%	0	0.0%	3	10.7%	1	16.7%
Q45	very important	7	77.8%	16	88.9%	20	69.0%	3	50.0%
	important	1	11.1%	2	11.1%	9	31.0%	3	50.0%
	not important	1	11.1%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q46	very important	6	66.7%	15	83.3%	23	79.3%	4	66.7%
	important	2	22.2%	2	11.1%	5	17.2%	2	33.3%
	not important	1	11.1%	1	5.6%	1	3.4%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q47	very important	1	11.1%	0	0.0%	3	10.3%	2	33.3%
	important	1	11.1%	7	38.9%	6	20.7%	0	0.0%
	not	6	66.7%	7	38.9%	12	41.4%	3	50.0%

	important								
	irrelevant	1	11.1%	4	22.2%	8	27.6%	1	16.7%
Q48	very important	1	11.1%	3	17.6%	3	10.7%	0	0.0%
	important	4	44.4%	8	47.1%	12	42.9%	3	50.0%
	not important	3	33.3%	4	23.5%	9	32.1%	3	50.0%
	irrelevant	1	11.1%	2	11.8%	4	14.3%	0	0.0%
Q49	very important	1	11.1%	1	5.6%	5	17.9%	0	0.0%
	important	1	11.1%	6	33.3%	5	17.9%	2	33.3%
	not important	6	66.7%	6	33.3%	9	32.1%	3	50.0%
	irrelevant	1	11.1%	5	27.8%	9	32.1%	1	16.7%
Q50	very important	4	44.4%	13	72.2%	19	67.9%	3	50.0%
	important	5	55.6%	4	22.2%	9	32.1%	2	33.3%
	not important	0	0.0%	1	5.6%	0	0.0%	1	16.7%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q51	very important	3	33.3%	12	66.7%	19	65.5%	4	66.7%
	important	3	33.3%	6	33.3%	9	31.0%	2	33.3%
	not important	3	33.3%	0	0.0%	1	3.4%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q52	very important	3	33.3%	9	50.0%	10	34.5%	2	33.3%
	important	5	55.6%	9	50.0%	15	51.7%	4	66.7%
	not important	1	11.1%	0	0.0%	4	13.8%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q53	very important	0	0.0%	5	27.8%	5	17.9%	0	0.0%
	important	6	66.7%	10	55.6%	12	42.9%	3	50.0%
	not important	3	33.3%	2	11.1%	8	28.6%	3	50.0%
	irrelevant	0	0.0%	1	5.6%	3	10.7%	0	0.0%
Q54	very important	5	55.6%	5	27.8%	13	44.8%	2	33.3%
	important	2	22.2%	12	66.7%	7	24.1%	2	33.3%
	not important	2	22.2%	1	5.6%	8	27.6%	2	33.3%
	irrelevant	0	0.0%	0	0.0%	1	3.4%	0	0.0%
Q55	very important	0	0.0%	0	0.0%	1	3.6%	0	0.0%
	important	1	11.1%	5	27.8%	8	28.6%	5	83.3%
	not important	7	77.8%	7	38.9%	13	46.4%	1	16.7%
	irrelevant	1	11.1%	6	33.3%	6	21.4%	0	0.0%
Q56	very important	0	0.0%	3	16.7%	1	3.6%	0	0.0%
	important	3	33.3%	9	50.0%	11	39.3%	4	66.7%
	not important	6	66.7%	4	22.2%	11	39.3%	2	33.3%
	irrelevant	0	0.0%	2	11.1%	5	17.9%	0	0.0%
Q57	very important	0	0.0%	0	0.0%	4	14.3%	1	16.7%
	important	1	11.1%	11	61.1%	8	28.6%	3	50.0%
	not	8	88.9%	6	33.3%	11	39.3%	2	33.3%

	important								
	irrelevant	0	0.0%	1	5.6%	5	17.9%	0	0.0%
Q58	very important	1	11.1%	1	5.6%	3	10.7%	0	0.0%
	important	6	66.7%	11	61.1%	15	53.6%	5	83.3%
	not important	2	22.2%	5	27.8%	7	25.0%	1	16.7%
	irrelevant	0	0.0%	1	5.6%	3	10.7%	0	0.0%
Q59	very important	0	0.0%	2	11.1%	3	11.1%	1	16.7%
	important	2	22.2%	9	50.0%	7	25.9%	3	50.0%
	not important	6	66.7%	4	22.2%	11	40.7%	1	16.7%
	irrelevant	1	11.1%	3	16.7%	6	22.2%	1	16.7%
Q60	very important	0	0.0%	1	5.9%	1	3.7%	0	0.0%
	important	2	22.2%	9	52.9%	10	37.0%	2	33.3%
	not important	6	66.7%	5	29.4%	10	37.0%	3	50.0%
	irrelevant	1	11.1%	2	11.8%	6	22.2%	1	16.7%
Q61	very important	0	0.0%	2	11.1%	2	7.4%	1	16.7%
	important	3	33.3%	8	44.4%	8	29.6%	2	33.3%
	not important	5	55.6%	5	27.8%	11	40.7%	2	33.3%
	irrelevant	1	11.1%	3	16.7%	6	22.2%	1	16.7%
Q62	very important	0	0.0%	0	0.0%	4	14.3%	1	16.7%
	important	1	11.1%	12	66.7%	9	32.1%	2	33.3%
	not important	7	77.8%	3	16.7%	9	32.1%	3	50.0%
	irrelevant	1	11.1%	3	16.7%	6	21.4%	0	0.0%
Q63	very important	0	0.0%	1	5.6%	1	3.6%	1	16.7%
	important	3	33.3%	9	50.0%	11	39.3%	3	50.0%
	not important	6	66.7%	4	22.2%	10	35.7%	2	33.3%
	irrelevant	0	0.0%	4	22.2%	6	21.4%	0	0.0%
Q64	very important	0	0.0%	1	5.9%	0	0.0%	1	16.7%
	important	3	33.3%	5	29.4%	7	25.0%	2	33.3%
	not important	6	66.7%	7	41.2%	13	46.4%	2	33.3%
	irrelevant	0	0.0%	4	23.5%	8	28.6%	1	16.7%
Q65	very important	0	0.0%	1	5.6%	1	3.6%	0	0.0%
	important	1	11.1%	3	16.7%	2	7.1%	1	16.7%
	not important	5	55.6%	7	38.9%	16	57.1%	4	66.7%
	irrelevant	3	33.3%	7	38.9%	9	32.1%	1	16.7%
Q66	very important	0	0.0%	1	5.6%	3	11.1%	1	16.7%
	important	2	22.2%	9	50.0%	6	22.2%	3	50.0%
	not important	6	66.7%	5	27.8%	12	44.4%	1	16.7%
	irrelevant	1	11.1%	3	16.7%	6	22.2%	1	16.7%
Q67	very important	0	0.0%	3	16.7%	7	25.0%	1	16.7%
	important	4	44.4%	10	55.6%	8	28.6%	2	33.3%
	not	4	44.4%	3	16.7%	9	32.1%	3	50.0%

	important								
	irrelevant	1	11.1%	2	11.1%	4	14.3%	0	0.0%
Q68	very important	1	11.1%	3	16.7%	3	10.7%	1	16.7%
	important	2	22.2%	4	22.2%	8	28.6%	3	50.0%
	not important	4	44.4%	6	33.3%	10	35.7%	1	16.7%
	irrelevant	2	22.2%	5	27.8%	7	25.0%	1	16.7%
Q69	very important	0	0.0%	3	16.7%	3	10.7%	1	16.7%
	important	3	33.3%	8	44.4%	11	39.3%	4	66.7%
	not important	5	55.6%	3	16.7%	10	35.7%	1	16.7%
	irrelevant	1	11.1%	4	22.2%	4	14.3%	0	0.0%
Q70	very important	0	0.0%	3	16.7%	2	7.1%	0	0.0%
	important	1	11.1%	3	16.7%	8	28.6%	3	50.0%
	not important	6	66.7%	8	44.4%	11	39.3%	2	33.3%
	irrelevant	2	22.2%	4	22.2%	7	25.0%	1	16.7%
Q71	very important	0	0.0%	1	5.9%	4	14.3%	0	0.0%
	important	3	33.3%	8	47.1%	5	17.9%	2	33.3%
	not important	5	55.6%	5	29.4%	12	42.9%	3	50.0%
	irrelevant	1	11.1%	3	17.6%	7	25.0%	1	16.7%
Q72	very important	0	0.0%	5	27.8%	8	28.6%	0	0.0%
	important	5	55.6%	10	55.6%	11	39.3%	4	66.7%
	not important	4	44.4%	2	11.1%	6	21.4%	2	33.3%
	irrelevant	0	0.0%	1	5.6%	3	10.7%	0	0.0%
Q73	very important	0	0.0%	1	5.6%	4	14.3%	0	0.0%
	important	3	33.3%	11	61.1%	12	42.9%	4	66.7%
	not important	6	66.7%	4	22.2%	8	28.6%	2	33.3%
	irrelevant	0	0.0%	2	11.1%	4	14.3%	0	0.0%
Q74	very important	0	0.0%	2	11.1%	3	11.1%	0	0.0%
	important	2	22.2%	8	44.4%	7	25.9%	4	66.7%
	not important	6	66.7%	5	27.8%	11	40.7%	2	33.3%
	irrelevant	1	11.1%	3	16.7%	6	22.2%	0	0.0%
Q75	very important	0	0.0%	0	0.0%	1	3.6%	0	0.0%
	important	3	33.3%	7	38.9%	9	32.1%	1	16.7%
	not important	5	55.6%	7	38.9%	11	39.3%	4	66.7%
	irrelevant	1	11.1%	4	22.2%	7	25.0%	1	16.7%
Q76	very important	0	0.0%	2	11.1%	3	11.1%	0	0.0%
	important	2	25.0%	4	22.2%	6	22.2%	1	16.7%
	not important	5	62.5%	8	44.4%	11	40.7%	4	66.7%
	irrelevant	1	12.5%	4	22.2%	7	25.9%	1	16.7%
Q77	very important	0	0.0%	2	11.1%	2	7.4%	0	0.0%
	important	2	25.0%	6	33.3%	7	25.9%	1	16.7%
	not	5	62.5%	5	27.8%	12	44.4%	4	66.7%

	important								
	irrelevant	1	12.5%	5	27.8%	6	22.2%	1	16.7%
Q78	very important	0	0.0%	2	11.1%	4	14.3%	0	0.0%
	important	3	33.3%	5	27.8%	6	21.4%	4	66.7%
	not important	4	44.4%	7	38.9%	13	46.4%	2	33.3%
	irrelevant	2	22.2%	4	22.2%	5	17.9%	0	0.0%
Q79	very important	0	0.0%	3	16.7%	3	11.1%	0	0.0%
	important	2	22.2%	5	27.8%	8	29.6%	3	50.0%
	not important	7	77.8%	6	33.3%	10	37.0%	2	33.3%
	irrelevant	0	0.0%	4	22.2%	6	22.2%	1	16.7%
Q80	very important	0	0.0%	4	22.2%	3	10.7%	0	0.0%
	important	2	22.2%	4	22.2%	7	25.0%	3	50.0%
	not important	7	77.8%	6	33.3%	12	42.9%	2	33.3%
	irrelevant	0	0.0%	4	22.2%	6	21.4%	1	16.7%
Q81	very important	0	0.0%	1	5.6%	2	7.1%	0	0.0%
	important	1	11.1%	4	22.2%	4	14.3%	0	0.0%
	not important	5	55.6%	8	44.4%	14	50.0%	5	83.3%
	irrelevant	3	33.3%	5	27.8%	8	28.6%	1	16.7%
Q82	very important	0	0.0%	1	5.9%	1	3.6%	0	0.0%
	important	1	11.1%	4	23.5%	5	17.9%	2	33.3%
	not important	5	55.6%	7	41.2%	14	50.0%	3	50.0%
	irrelevant	3	33.3%	5	29.4%	8	28.6%	1	16.7%
Q83	very important	1	11.1%	7	38.9%	5	17.9%	2	33.3%
	important	3	33.3%	5	27.8%	7	25.0%	3	50.0%
	not important	3	33.3%	4	22.2%	11	39.3%	1	16.7%
	irrelevant	2	22.2%	2	11.1%	5	17.9%	0	0.0%
Q84	very important	0	0.0%	3	16.7%	2	7.4%	0	0.0%
	important	2	22.2%	5	27.8%	4	14.8%	1	16.7%
	not important	5	55.6%	6	33.3%	15	55.6%	4	66.7%
	irrelevant	2	22.2%	4	22.2%	6	22.2%	1	16.7%
Q85	very important	0	0.0%	2	11.1%	2	7.4%	1	16.7%
	important	3	33.3%	9	50.0%	8	29.6%	3	50.0%
	not important	5	55.6%	5	27.8%	10	37.0%	2	33.3%
	irrelevant	1	11.1%	2	11.1%	7	25.9%	0	0.0%
Q86	very important	0	0.0%	1	5.6%	4	14.3%	0	0.0%
	important	2	22.2%	6	33.3%	8	28.6%	3	50.0%
	not important	6	66.7%	8	44.4%	10	35.7%	3	50.0%
	irrelevant	1	11.1%	3	16.7%	6	21.4%	0	0.0%
Q87	very important	0	0.0%	2	11.1%	3	10.7%	0	0.0%
	important	2	22.2%	4	22.2%	7	25.0%	4	66.7%
	not	5	55.6%	7	38.9%	12	42.9%	2	33.3%

	important								
	irrelevant	2	22.2%	5	27.8%	6	21.4%	0	0.0%
Q88	very important	0	0.0%	2	11.1%	1	3.6%	0	0.0%
	important	1	11.1%	4	22.2%	4	14.3%	0	0.0%
	not important	5	55.6%	6	33.3%	12	42.9%	5	83.3%
	irrelevant	3	33.3%	6	33.3%	11	39.3%	1	16.7%
Q89	very important	0	0.0%	1	5.6%	0	0.0%	0	0.0%
	important	1	11.1%	4	22.2%	5	17.9%	0	0.0%
	not important	5	55.6%	7	38.9%	12	42.9%	5	83.3%
	irrelevant	3	33.3%	6	33.3%	11	39.3%	1	16.7%
Q90	very important	1	11.1%	8	44.4%	10	35.7%	3	50.0%
	important	5	55.6%	6	33.3%	8	28.6%	2	33.3%
	not important	3	33.3%	3	16.7%	6	21.4%	1	16.7%
	irrelevant	0	0.0%	1	5.6%	4	14.3%	0	0.0%
Q91	very important	0	0.0%	3	16.7%	1	3.6%	0	0.0%
	important	1	12.5%	3	16.7%	4	14.3%	0	0.0%
	not important	4	50.0%	5	27.8%	11	39.3%	4	80.0%
	irrelevant	3	37.5%	7	38.9%	12	42.9%	1	20.0%
Q92	very important	1	11.1%	3	16.7%	5	17.9%	1	16.7%
	important	1	11.1%	6	33.3%	5	17.9%	2	33.3%
	not important	5	55.6%	5	27.8%	9	32.1%	3	50.0%
	irrelevant	2	22.2%	4	22.2%	9	32.1%	0	0.0%
Q93	very important	2	22.2%	7	38.9%	21	72.4%	3	50.0%
	important	6	66.7%	10	55.6%	8	27.6%	3	50.0%
	not important	1	11.1%	1	5.6%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q94	very important	6	66.7%	14	77.8%	24	82.8%	6	100.0%
	important	3	33.3%	4	22.2%	5	17.2%	0	0.0%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q95	very important	5	55.6%	12	66.7%	24	82.8%	6	100.0%
	important	3	33.3%	6	33.3%	5	17.2%	0	0.0%
	not important	1	11.1%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q96	very important	4	44.4%	7	38.9%	18	64.3%	4	66.7%
	important	4	44.4%	10	55.6%	9	32.1%	2	33.3%
	not important	1	11.1%	1	5.6%	1	3.6%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q97	very important	5	55.6%	10	55.6%	19	65.5%	4	66.7%
	important	4	44.4%	8	44.4%	10	34.5%	2	33.3%
	not	0	0.0%	0	0.0%	0	0.0%	0	0.0%

	important								
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q98	very important	7	77.8%	15	83.3%	19	65.5%	4	66.7%
	important	2	22.2%	3	16.7%	10	34.5%	2	33.3%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q99	very important	4	44.4%	6	33.3%	10	35.7%	2	33.3%
	important	3	33.3%	7	38.9%	14	50.0%	4	66.7%
	not important	1	11.1%	4	22.2%	3	10.7%	0	0.0%
	irrelevant	1	11.1%	1	5.6%	1	3.6%	0	0.0%
Q100	very important	4	44.4%	6	33.3%	15	51.7%	2	33.3%
	important	5	55.6%	11	61.1%	11	37.9%	2	33.3%
	not important	0	0.0%	1	5.6%	3	10.3%	2	33.3%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q101	very important	6	66.7%	11	61.1%	17	60.7%	2	33.3%
	important	3	33.3%	6	33.3%	10	35.7%	4	66.7%
	not important	0	0.0%	1	5.6%	1	3.6%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q102	very important	5	55.6%	11	61.1%	18	62.1%	4	66.7%
	important	4	44.4%	7	38.9%	11	37.9%	2	33.3%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Appendix G4: Table 4.11 – Association between practitioner demographics and perception: Years in practice

		Years in Practice							
		<5		5-10		11-20		>=21	
		Count	Column N %	Count	Column N %	Count	Column N %	Count	Column N %
Q19	very important	1	5.6%	0	0.0%	2	8.0%	0	0.0%
	important	4	22.2%	3	21.4%	10	40.0%	2	40.0%
	not important	10	55.6%	8	57.1%	8	32.0%	2	40.0%
	irrelevant	3	16.7%	3	21.4%	5	20.0%	1	20.0%
Q20	very important	3	16.7%	3	20.0%	4	16.0%	0	0.0%
	important	8	44.4%	8	53.3%	11	44.0%	3	60.0%
	not important	5	27.8%	3	20.0%	8	32.0%	2	40.0%
	irrelevant	2	11.1%	1	6.7%	2	8.0%	0	0.0%
Q21	very important	2	11.1%	3	21.4%	5	20.0%	2	40.0%
	important	11	61.1%	7	50.0%	15	60.0%	2	40.0%
	not important	4	22.2%	3	21.4%	5	20.0%	1	20.0%
	irrelevant	1	5.6%	1	7.1%	0	0.0%	0	0.0%

Q22	very important	6	33.3%	8	53.3%	10	40.0%	2	40.0%
	important	10	55.6%	5	33.3%	10	40.0%	3	60.0%
	not important	1	5.6%	1	6.7%	4	16.0%	0	0.0%
	irrelevant	1	5.6%	1	6.7%	1	4.0%	0	0.0%
Q23	very important	1	5.6%	4	28.6%	6	24.0%	1	20.0%
	important	8	44.4%	6	42.9%	11	44.0%	2	40.0%
	not important	7	38.9%	1	7.1%	6	24.0%	2	40.0%
	irrelevant	2	11.1%	3	21.4%	2	8.0%	0	0.0%
Q24	very important	3	16.7%	4	28.6%	6	24.0%	3	60.0%
	important	9	50.0%	7	50.0%	12	48.0%	2	40.0%
	not important	4	22.2%	2	14.3%	5	20.0%	0	0.0%
	irrelevant	2	11.1%	1	7.1%	2	8.0%	0	0.0%
Q25	very important	2	11.1%	1	6.7%	4	16.0%	1	20.0%
	important	8	44.4%	8	53.3%	16	64.0%	4	80.0%
	not important	8	44.4%	5	33.3%	4	16.0%	0	0.0%
	irrelevant	0	0.0%	1	6.7%	1	4.0%	0	0.0%
Q26	very important	0	0.0%	2	13.3%	2	8.0%	1	20.0%
	important	4	22.2%	5	33.3%	10	40.0%	1	20.0%
	not important	12	66.7%	4	26.7%	11	44.0%	2	40.0%
	irrelevant	2	11.1%	4	26.7%	2	8.0%	1	20.0%
Q27	very important	6	33.3%	4	26.7%	11	44.0%	3	60.0%
	important	9	50.0%	11	73.3%	13	52.0%	2	40.0%
	not important	3	16.7%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	1	4.0%	0	0.0%
Q28	very important	6	33.3%	4	26.7%	9	37.5%	1	25.0%
	important	10	55.6%	10	66.7%	14	58.3%	1	25.0%
	not important	2	11.1%	0	0.0%	0	0.0%	2	50.0%
	irrelevant	0	0.0%	1	6.7%	1	4.2%	0	0.0%
Q29	very important	0	0.0%	2	13.3%	3	12.0%	1	20.0%
	important	12	66.7%	6	40.0%	16	64.0%	2	40.0%
	not important	5	27.8%	6	40.0%	4	16.0%	2	40.0%
	irrelevant	1	5.6%	1	6.7%	2	8.0%	0	0.0%
Q30	very important	12	66.7%	9	64.3%	17	68.0%	3	60.0%
	important	4	22.2%	5	35.7%	8	32.0%	2	40.0%
	not important	2	11.1%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q31	very important	11	61.1%	10	66.7%	20	83.3%	3	60.0%
	important	7	38.9%	5	33.3%	4	16.7%	2	40.0%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q32	very important	0	0.0%	0	0.0%	1	4.0%	0	0.0%
	important	4	22.2%	3	25.0%	9	36.0%	2	40.0%
	not important	11	61.1%	3	25.0%	11	44.0%	2	40.0%
	irrelevant	3	16.7%	6	50.0%	4	16.0%	1	20.0%
Q33	very important	3	16.7%	2	14.3%	4	16.0%	1	20.0%
	important	7	38.9%	8	57.1%	15	60.0%	1	20.0%
	not important	7	38.9%	4	28.6%	4	16.0%	3	60.0%
	irrelevant	1	5.6%	0	0.0%	2	8.0%	0	0.0%

Q34	very important	11	61.1%	8	53.3%	16	64.0%	2	50.0%
	important	7	38.9%	7	46.7%	9	36.0%	1	25.0%
	not important	0	0.0%	0	0.0%	0	0.0%	1	25.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q35	very important	9	50.0%	10	66.7%	16	64.0%	3	60.0%
	important	9	50.0%	5	33.3%	9	36.0%	2	40.0%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q36	very important	6	33.3%	6	40.0%	10	40.0%	4	80.0%
	important	8	44.4%	8	53.3%	12	48.0%	1	20.0%
	not important	3	16.7%	1	6.7%	2	8.0%	0	0.0%
	irrelevant	1	5.6%	0	0.0%	1	4.0%	0	0.0%
Q37	very important	5	27.8%	4	26.7%	8	32.0%	1	20.0%
	important	10	55.6%	9	60.0%	15	60.0%	4	80.0%
	not important	3	16.7%	2	13.3%	2	8.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q38	very important	12	66.7%	11	73.3%	18	72.0%	4	80.0%
	important	6	33.3%	4	26.7%	6	24.0%	1	20.0%
	not important	0	0.0%	0	0.0%	1	4.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q39	very important	13	72.2%	11	73.3%	19	76.0%	3	60.0%
	important	5	27.8%	4	26.7%	5	20.0%	2	40.0%
	not important	0	0.0%	0	0.0%	1	4.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q40	very important	13	72.2%	10	66.7%	20	80.0%	3	60.0%
	important	5	27.8%	5	33.3%	4	16.0%	2	40.0%
	not important	0	0.0%	0	0.0%	1	4.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q41	very important	14	77.8%	12	80.0%	22	88.0%	5	100.0%
	important	4	22.2%	3	20.0%	3	12.0%	0	0.0%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q42	very important	14	77.8%	10	71.4%	21	84.0%	4	80.0%
	important	4	22.2%	4	28.6%	4	16.0%	0	0.0%
	not important	0	0.0%	0	0.0%	0	0.0%	1	20.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q43	very important	2	11.1%	2	13.3%	4	16.0%	0	0.0%
	important	9	50.0%	6	40.0%	14	56.0%	4	80.0%
	not important	6	33.3%	5	33.3%	6	24.0%	1	20.0%
	irrelevant	1	5.6%	2	13.3%	1	4.0%	0	0.0%
Q44	very important	1	5.9%	3	20.0%	6	24.0%	1	20.0%
	important	7	41.2%	8	53.3%	14	56.0%	2	40.0%
	not important	8	47.1%	3	20.0%	4	16.0%	1	20.0%
	irrelevant	1	5.9%	1	6.7%	1	4.0%	1	20.0%
Q45	very important	13	72.2%	10	66.7%	18	72.0%	5	100.0%
	important	5	27.8%	5	33.3%	6	24.0%	0	0.0%
	not important	0	0.0%	0	0.0%	1	4.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Q46	very important	14	77.8%	9	60.0%	21	84.0%	5	100.0%
	important	3	16.7%	5	33.3%	3	12.0%	0	0.0%
	not important	1	5.6%	1	6.7%	1	4.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q47	very important	1	5.6%	1	6.7%	2	8.0%	2	40.0%
	important	5	27.8%	4	26.7%	5	20.0%	0	0.0%
	not important	7	38.9%	6	40.0%	13	52.0%	2	40.0%
	irrelevant	5	27.8%	4	26.7%	5	20.0%	1	20.0%
Q48	very important	1	5.6%	2	14.3%	3	12.0%	1	25.0%
	important	7	38.9%	6	42.9%	13	52.0%	2	50.0%
	not important	8	44.4%	3	21.4%	8	32.0%	0	0.0%
	irrelevant	2	11.1%	3	21.4%	1	4.0%	1	25.0%
Q49	very important	1	5.6%	1	7.1%	3	12.0%	2	40.0%
	important	5	27.8%	3	21.4%	5	20.0%	1	20.0%
	not important	7	38.9%	5	35.7%	12	48.0%	1	20.0%
	irrelevant	5	27.8%	5	35.7%	5	20.0%	1	20.0%
Q50	very important	13	72.2%	8	57.1%	14	56.0%	4	80.0%
	important	5	27.8%	6	42.9%	9	36.0%	1	20.0%
	not important	0	0.0%	0	0.0%	2	8.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q51	very important	12	66.7%	8	53.3%	15	60.0%	4	80.0%
	important	4	22.2%	6	40.0%	9	36.0%	1	20.0%
	not important	2	11.1%	1	6.7%	1	4.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q52	very important	7	38.9%	6	40.0%	11	44.0%	0	0.0%
	important	8	44.4%	9	60.0%	13	52.0%	4	80.0%
	not important	3	16.7%	0	0.0%	1	4.0%	1	20.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q53	very important	2	11.1%	3	21.4%	4	16.0%	1	20.0%
	important	8	44.4%	6	42.9%	14	56.0%	4	80.0%
	not important	7	38.9%	3	21.4%	6	24.0%	0	0.0%
	irrelevant	1	5.6%	2	14.3%	1	4.0%	0	0.0%
Q54	very important	8	44.4%	4	26.7%	10	40.0%	3	60.0%
	important	3	16.7%	10	66.7%	9	36.0%	2	40.0%
	not important	7	38.9%	1	6.7%	5	20.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	1	4.0%	0	0.0%
Q55	very important	0	0.0%	0	0.0%	1	4.0%	0	0.0%
	important	5	27.8%	7	50.0%	4	16.0%	3	60.0%
	not important	10	55.6%	5	35.7%	12	48.0%	1	20.0%
	irrelevant	3	16.7%	2	14.3%	8	32.0%	1	20.0%
Q56	very important	2	11.1%	1	7.1%	0	0.0%	1	20.0%
	important	5	27.8%	9	64.3%	10	40.0%	3	60.0%
	not important	9	50.0%	3	21.4%	11	44.0%	1	20.0%
	irrelevant	2	11.1%	1	7.1%	4	16.0%	0	0.0%
Q57	very important	2	11.1%	2	14.3%	0	0.0%	1	20.0%
	important	5	27.8%	8	57.1%	8	32.0%	3	60.0%
	not important	10	55.6%	4	28.6%	12	48.0%	1	20.0%
	irrelevant	1	5.6%	0	0.0%	5	20.0%	0	0.0%

Q58	very important	3	16.7%	2	14.3%	0	0.0%	0	0.0%
	important	6	33.3%	9	64.3%	18	72.0%	5	100.0%
	not important	8	44.4%	2	14.3%	5	20.0%	0	0.0%
	irrelevant	1	5.6%	1	7.1%	2	8.0%	0	0.0%
Q59	very important	0	0.0%	3	21.4%	3	12.0%	0	0.0%
	important	3	17.6%	8	57.1%	7	28.0%	4	80.0%
	not important	11	64.7%	1	7.1%	9	36.0%	1	20.0%
	irrelevant	3	17.6%	2	14.3%	6	24.0%	0	0.0%
Q60	very important	0	0.0%	1	7.1%	1	4.0%	0	0.0%
	important	3	17.6%	9	64.3%	10	40.0%	2	50.0%
	not important	11	64.7%	2	14.3%	9	36.0%	2	50.0%
	irrelevant	3	17.6%	2	14.3%	5	20.0%	0	0.0%
Q61	very important	0	0.0%	3	21.4%	1	4.0%	1	20.0%
	important	4	23.5%	7	50.0%	8	32.0%	3	60.0%
	not important	10	58.8%	2	14.3%	10	40.0%	1	20.0%
	irrelevant	3	17.6%	2	14.3%	6	24.0%	0	0.0%
Q62	very important	1	5.6%	2	14.3%	1	4.0%	1	20.0%
	important	5	27.8%	8	57.1%	9	36.0%	3	60.0%
	not important	10	55.6%	2	14.3%	9	36.0%	1	20.0%
	irrelevant	2	11.1%	2	14.3%	6	24.0%	0	0.0%
Q63	very important	0	0.0%	2	14.3%	0	0.0%	1	20.0%
	important	6	33.3%	6	42.9%	11	44.0%	3	60.0%
	not important	10	55.6%	3	21.4%	9	36.0%	1	20.0%
	irrelevant	2	11.1%	3	21.4%	5	20.0%	0	0.0%
Q64	very important	0	0.0%	0	0.0%	0	0.0%	2	40.0%
	important	4	22.2%	5	38.5%	7	28.0%	1	20.0%
	not important	10	55.6%	6	46.2%	11	44.0%	2	40.0%
	irrelevant	4	22.2%	2	15.4%	7	28.0%	0	0.0%
Q65	very important	0	0.0%	1	7.1%	0	0.0%	1	20.0%
	important	2	11.1%	2	14.3%	3	12.0%	0	0.0%
	not important	10	55.6%	8	57.1%	12	48.0%	3	60.0%
	irrelevant	6	33.3%	3	21.4%	10	40.0%	1	20.0%
Q66	very important	0	0.0%	2	14.3%	1	4.0%	2	40.0%
	important	4	23.5%	7	50.0%	9	36.0%	1	20.0%
	not important	10	58.8%	3	21.4%	9	36.0%	2	40.0%
	irrelevant	3	17.6%	2	14.3%	6	24.0%	0	0.0%
Q67	very important	2	11.1%	3	21.4%	2	8.0%	4	80.0%
	important	7	38.9%	8	57.1%	10	40.0%	0	0.0%
	not important	8	44.4%	2	14.3%	8	32.0%	1	20.0%
	irrelevant	1	5.6%	1	7.1%	5	20.0%	0	0.0%
Q68	very important	0	0.0%	2	14.3%	3	12.0%	3	60.0%
	important	5	27.8%	5	35.7%	8	32.0%	0	0.0%
	not important	10	55.6%	3	21.4%	6	24.0%	2	40.0%
	irrelevant	3	16.7%	4	28.6%	8	32.0%	0	0.0%
Q69	very important	0	0.0%	4	28.6%	1	4.0%	2	40.0%
	important	7	38.9%	6	42.9%	11	44.0%	2	40.0%
	not important	9	50.0%	2	14.3%	8	32.0%	1	20.0%
	irrelevant	2	11.1%	2	14.3%	5	20.0%	0	0.0%

Q70	very important	1	5.6%	3	21.4%	0	0.0%	1	20.0%
	important	2	11.1%	4	28.6%	7	28.0%	2	40.0%
	not important	11	61.1%	4	28.6%	11	44.0%	2	40.0%
	irrelevant	4	22.2%	3	21.4%	7	28.0%	0	0.0%
Q71	very important	1	5.6%	3	23.1%	1	4.0%	0	0.0%
	important	2	11.1%	7	53.8%	9	36.0%	1	20.0%
	not important	11	61.1%	0	0.0%	10	40.0%	4	80.0%
	irrelevant	4	22.2%	3	23.1%	5	20.0%	0	0.0%
Q72	very important	3	16.7%	5	35.7%	3	12.0%	2	40.0%
	important	7	38.9%	7	50.0%	15	60.0%	2	40.0%
	not important	7	38.9%	2	14.3%	4	16.0%	1	20.0%
	irrelevant	1	5.6%	0	0.0%	3	12.0%	0	0.0%
Q73	very important	1	5.6%	2	14.3%	1	4.0%	1	20.0%
	important	6	33.3%	9	64.3%	11	44.0%	4	80.0%
	not important	10	55.6%	2	14.3%	9	36.0%	0	0.0%
	irrelevant	1	5.6%	1	7.1%	4	16.0%	0	0.0%
Q74	very important	1	5.9%	3	21.4%	0	0.0%	1	20.0%
	important	4	23.5%	6	42.9%	9	36.0%	3	60.0%
	not important	10	58.8%	3	21.4%	10	40.0%	1	20.0%
	irrelevant	2	11.8%	2	14.3%	6	24.0%	0	0.0%
Q75	very important	0	0.0%	1	7.1%	0	0.0%	0	0.0%
	important	5	27.8%	5	35.7%	8	32.0%	2	40.0%
	not important	9	50.0%	6	42.9%	10	40.0%	3	60.0%
	irrelevant	4	22.2%	2	14.3%	7	28.0%	0	0.0%
Q76	very important	0	0.0%	3	21.4%	1	4.2%	1	20.0%
	important	4	23.5%	4	28.6%	5	20.8%	1	20.0%
	not important	8	47.1%	5	35.7%	12	50.0%	3	60.0%
	irrelevant	5	29.4%	2	14.3%	6	25.0%	0	0.0%
Q77	very important	0	0.0%	3	21.4%	1	4.2%	0	0.0%
	important	3	17.6%	6	42.9%	7	29.2%	1	20.0%
	not important	10	58.8%	3	21.4%	9	37.5%	4	80.0%
	irrelevant	4	23.5%	2	14.3%	7	29.2%	0	0.0%
Q78	very important	0	0.0%	3	21.4%	2	8.0%	1	20.0%
	important	6	33.3%	5	35.7%	5	20.0%	2	40.0%
	not important	10	55.6%	3	21.4%	12	48.0%	2	40.0%
	irrelevant	2	11.1%	3	21.4%	6	24.0%	0	0.0%
Q79	very important	1	5.9%	3	21.4%	1	4.0%	1	20.0%
	important	2	11.8%	6	42.9%	8	32.0%	3	60.0%
	not important	10	58.8%	3	21.4%	11	44.0%	1	20.0%
	irrelevant	4	23.5%	2	14.3%	5	20.0%	0	0.0%
Q80	very important	1	5.6%	3	21.4%	2	8.0%	1	20.0%
	important	3	16.7%	6	42.9%	4	16.0%	3	60.0%
	not important	10	55.6%	3	21.4%	14	56.0%	1	20.0%
	irrelevant	4	22.2%	2	14.3%	5	20.0%	0	0.0%
Q81	very important	1	5.6%	1	7.1%	0	0.0%	1	20.0%
	important	1	5.6%	4	28.6%	3	12.0%	1	20.0%
	not important	10	55.6%	6	42.9%	14	56.0%	3	60.0%
	irrelevant	6	33.3%	3	21.4%	8	32.0%	0	0.0%

Q82	very important	0	0.0%	1	7.1%	0	0.0%	1	20.0%
	important	2	11.8%	5	35.7%	4	16.0%	1	20.0%
	not important	9	52.9%	5	35.7%	13	52.0%	3	60.0%
	irrelevant	6	35.3%	3	21.4%	8	32.0%	0	0.0%
Q83	very important	3	16.7%	6	42.9%	3	12.0%	3	60.0%
	important	5	27.8%	4	28.6%	10	40.0%	0	0.0%
	not important	8	44.4%	2	14.3%	7	28.0%	2	40.0%
	irrelevant	2	11.1%	2	14.3%	5	20.0%	0	0.0%
Q84	very important	0	0.0%	3	21.4%	1	4.0%	1	20.0%
	important	2	11.8%	5	35.7%	6	24.0%	0	0.0%
	not important	11	64.7%	3	21.4%	12	48.0%	4	80.0%
	irrelevant	4	23.5%	3	21.4%	6	24.0%	0	0.0%
Q85	very important	1	5.6%	2	14.3%	0	0.0%	2	40.0%
	important	4	22.2%	8	57.1%	10	41.7%	2	40.0%
	not important	11	61.1%	2	14.3%	8	33.3%	1	20.0%
	irrelevant	2	11.1%	2	14.3%	6	25.0%	0	0.0%
Q86	very important	2	11.1%	1	7.1%	1	4.0%	1	20.0%
	important	2	11.1%	7	50.0%	8	32.0%	2	40.0%
	not important	11	61.1%	4	28.6%	11	44.0%	2	40.0%
	irrelevant	3	16.7%	2	14.3%	5	20.0%	0	0.0%
Q87	very important	0	0.0%	3	21.4%	1	4.0%	1	20.0%
	important	4	22.2%	4	28.6%	6	24.0%	3	60.0%
	not important	11	61.1%	4	28.6%	11	44.0%	1	20.0%
	irrelevant	3	16.7%	3	21.4%	7	28.0%	0	0.0%
Q88	very important	0	0.0%	1	7.1%	0	0.0%	2	40.0%
	important	2	11.1%	4	28.6%	3	12.0%	0	0.0%
	not important	10	55.6%	6	42.9%	9	36.0%	3	60.0%
	irrelevant	6	33.3%	3	21.4%	13	52.0%	0	0.0%
Q89	very important	0	0.0%	0	0.0%	0	0.0%	1	20.0%
	important	2	11.1%	4	28.6%	3	12.0%	1	20.0%
	not important	10	55.6%	7	50.0%	10	40.0%	3	60.0%
	irrelevant	6	33.3%	3	21.4%	12	48.0%	0	0.0%
Q90	very important	5	27.8%	5	35.7%	8	32.0%	4	80.0%
	important	6	33.3%	7	50.0%	8	32.0%	1	20.0%
	not important	6	33.3%	1	7.1%	6	24.0%	0	0.0%
	irrelevant	1	5.6%	1	7.1%	3	12.0%	0	0.0%
Q91	very important	0	0.0%	3	21.4%	0	0.0%	1	25.0%
	important	2	11.1%	3	21.4%	3	12.5%	0	0.0%
	not important	10	55.6%	5	35.7%	9	37.5%	1	25.0%
	irrelevant	6	33.3%	3	21.4%	12	50.0%	2	50.0%
Q92	very important	2	11.1%	3	21.4%	3	12.0%	2	40.0%
	important	5	27.8%	4	28.6%	6	24.0%	0	0.0%
	not important	8	44.4%	5	35.7%	8	32.0%	1	20.0%
	irrelevant	3	16.7%	2	14.3%	8	32.0%	2	40.0%
Q93	very important	9	50.0%	7	46.7%	16	64.0%	2	40.0%
	important	9	50.0%	6	40.0%	9	36.0%	3	60.0%
	not important	0	0.0%	2	13.3%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Q94	very important	13	72.2%	12	80.0%	22	88.0%	4	80.0%
	important	5	27.8%	3	20.0%	3	12.0%	1	20.0%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q95	very important	13	72.2%	12	80.0%	20	80.0%	3	60.0%
	important	5	27.8%	3	20.0%	4	16.0%	2	40.0%
	not important	0	0.0%	0	0.0%	1	4.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q96	very important	9	50.0%	9	64.3%	16	64.0%	0	0.0%
	important	8	44.4%	5	35.7%	7	28.0%	5	100.0%
	not important	1	5.6%	0	0.0%	2	8.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q97	very important	12	66.7%	9	60.0%	17	68.0%	1	20.0%
	important	6	33.3%	6	40.0%	8	32.0%	4	80.0%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q98	very important	14	77.8%	10	66.7%	17	68.0%	5	100.0%
	important	4	22.2%	5	33.3%	8	32.0%	0	0.0%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q99	very important	10	55.6%	5	33.3%	7	29.2%	0	0.0%
	important	7	38.9%	9	60.0%	10	41.7%	2	40.0%
	not important	1	5.6%	0	0.0%	5	20.8%	3	60.0%
	irrelevant	0	0.0%	1	6.7%	2	8.3%	0	0.0%
Q100	very important	10	55.6%	6	40.0%	11	44.0%	0	0.0%
	important	7	38.9%	6	40.0%	12	48.0%	4	80.0%
	not important	1	5.6%	3	20.0%	2	8.0%	1	20.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q101	very important	12	70.6%	8	53.3%	16	64.0%	0	0.0%
	important	5	29.4%	6	40.0%	9	36.0%	4	80.0%
	not important	0	0.0%	1	6.7%	0	0.0%	1	20.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Q102	very important	13	72.2%	7	46.7%	17	68.0%	1	20.0%
	important	5	27.8%	8	53.3%	8	32.0%	4	80.0%
	not important	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Appendix G5: Table 4.12 – Association between practitioner demographics and perception: Previous research experience

		Previous Research Experience			
		Yes		No	
		Count	Column N %	Count	Column N %
Q19	very important	2	3.7%	1	12.5%

	important	19	35.2%	0	0.0%
	not important	23	42.6%	5	62.5%
	irrelevant	10	18.5%	2	25.0%
Q20	very important	7	13.0%	3	33.3%
	important	27	50.0%	3	33.3%
	not important	15	27.8%	3	33.3%
	irrelevant	5	9.3%	0	0.0%
Q21	very important	10	18.9%	2	22.2%
	important	28	52.8%	7	77.8%
	not important	13	24.5%	0	0.0%
	irrelevant	2	3.8%	0	0.0%
Q22	very important	21	38.9%	5	55.6%
	important	24	44.4%	4	44.4%
	not important	6	11.1%	0	0.0%
	irrelevant	3	5.6%	0	0.0%
Q23	very important	12	22.6%	0	0.0%
	important	20	37.7%	7	77.8%
	not important	14	26.4%	2	22.2%
	irrelevant	7	13.2%	0	0.0%
Q24	very important	13	24.5%	3	33.3%
	important	25	47.2%	5	55.6%
	not important	10	18.9%	1	11.1%
	irrelevant	5	9.4%	0	0.0%
Q25	very important	6	11.1%	2	22.2%
	important	30	55.6%	6	66.7%
	not important	16	29.6%	1	11.1%
	irrelevant	2	3.7%	0	0.0%
Q26	very important	5	9.3%	0	0.0%
	important	17	31.5%	3	33.3%
	not important	25	46.3%	4	44.4%
	irrelevant	7	13.0%	2	22.2%
Q27	very important	19	35.2%	5	55.6%
	important	31	57.4%	4	44.4%
	not important	3	5.6%	0	0.0%
	irrelevant	1	1.9%	0	0.0%

Q28	very important	16	30.8%	4	44.4%
	important	31	59.6%	4	44.4%
	not important	3	5.8%	1	11.1%
	irrelevant	2	3.8%	0	0.0%
Q29	very important	5	9.3%	1	11.1%
	important	31	57.4%	5	55.6%
	not important	14	25.9%	3	33.3%
	irrelevant	4	7.4%	0	0.0%
Q30	very important	34	64.2%	7	77.8%
	important	17	32.1%	2	22.2%
	not important	2	3.8%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q31	very important	37	69.8%	7	77.8%
	important	16	30.2%	2	22.2%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q32	very important	1	2.0%	0	0.0%
	important	15	29.4%	3	33.3%
	not important	22	43.1%	5	55.6%
	irrelevant	13	25.5%	1	11.1%
Q33	very important	9	17.0%	1	11.1%
	important	26	49.1%	5	55.6%
	not important	15	28.3%	3	33.3%
	irrelevant	3	5.7%	0	0.0%
Q34	very important	32	59.3%	5	62.5%
	important	21	38.9%	3	37.5%
	not important	1	1.9%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q35	very important	35	64.8%	3	33.3%
	important	19	35.2%	6	66.7%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q36	very important	21	38.9%	5	55.6%
	important	25	46.3%	4	44.4%
	not important	6	11.1%	0	0.0%

	irrelevant	2	3.7%	0	0.0%
Q37	very important	15	27.8%	3	33.3%
	important	33	61.1%	5	55.6%
	not important	6	11.1%	1	11.1%
	irrelevant	0	0.0%	0	0.0%
Q38	very important	39	72.2%	6	66.7%
	important	15	27.8%	2	22.2%
	not important	0	0.0%	1	11.1%
	irrelevant	0	0.0%	0	0.0%
Q39	very important	41	75.9%	5	55.6%
	important	13	24.1%	3	33.3%
	not important	0	0.0%	1	11.1%
	irrelevant	0	0.0%	0	0.0%
Q40	very important	40	74.1%	6	66.7%
	important	14	25.9%	2	22.2%
	not important	0	0.0%	1	11.1%
	irrelevant	0	0.0%	0	0.0%
Q41	very important	45	83.3%	8	88.9%
	important	9	16.7%	1	11.1%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q42	very important	42	79.2%	7	77.8%
	important	11	20.8%	1	11.1%
	not important	0	0.0%	1	11.1%
	irrelevant	0	0.0%	0	0.0%
Q43	very important	8	14.8%	0	0.0%
	important	25	46.3%	8	88.9%
	not important	17	31.5%	1	11.1%
	irrelevant	4	7.4%	0	0.0%
Q44	very important	10	18.9%	1	11.1%
	important	27	50.9%	4	44.4%
	not important	13	24.5%	3	33.3%
	irrelevant	3	5.7%	1	11.1%
Q45	very important	39	72.2%	7	77.8%
	important	14	25.9%	2	22.2%

	not important	1	1.9%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q46	very important	41	75.9%	8	88.9%
	important	10	18.5%	1	11.1%
	not important	3	5.6%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q47	very important	4	7.4%	2	22.2%
	important	13	24.1%	1	11.1%
	not important	24	44.4%	4	44.4%
	irrelevant	13	24.1%	2	22.2%
Q48	very important	6	11.5%	1	11.1%
	important	22	42.3%	6	66.7%
	not important	17	32.7%	2	22.2%
	irrelevant	7	13.5%	0	0.0%
Q49	very important	5	9.4%	2	22.2%
	important	12	22.6%	2	22.2%
	not important	21	39.6%	4	44.4%
	irrelevant	15	28.3%	1	11.1%
Q50	very important	33	62.3%	6	66.7%
	important	18	34.0%	3	33.3%
	not important	2	3.8%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q51	very important	33	61.1%	6	66.7%
	important	17	31.5%	3	33.3%
	not important	4	7.4%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q52	very important	22	40.7%	2	22.2%
	important	27	50.0%	7	77.8%
	not important	5	9.3%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q53	very important	8	15.1%	2	22.2%
	important	26	49.1%	6	66.7%
	not important	15	28.3%	1	11.1%
	irrelevant	4	7.5%	0	0.0%
Q54	very important	20	37.0%	5	55.6%

	important	21	38.9%	3	33.3%
	not important	12	22.2%	1	11.1%
	irrelevant	1	1.9%	0	0.0%
Q55	very important	1	1.9%	0	0.0%
	important	16	30.2%	3	33.3%
	not important	26	49.1%	2	22.2%
	irrelevant	10	18.9%	4	44.4%
Q56	very important	3	5.7%	1	11.1%
	important	23	43.4%	4	44.4%
	not important	20	37.7%	4	44.4%
	irrelevant	7	13.2%	0	0.0%
Q57	very important	4	7.5%	1	11.1%
	important	20	37.7%	4	44.4%
	not important	23	43.4%	4	44.4%
	irrelevant	6	11.3%	0	0.0%
Q58	very important	4	7.5%	1	11.1%
	important	31	58.5%	7	77.8%
	not important	14	26.4%	1	11.1%
	irrelevant	4	7.5%	0	0.0%
Q59	very important	6	11.5%	0	0.0%
	important	18	34.6%	4	44.4%
	not important	18	34.6%	4	44.4%
	irrelevant	10	19.2%	1	11.1%
Q60	very important	2	3.9%	0	0.0%
	important	20	39.2%	4	44.4%
	not important	19	37.3%	5	55.6%
	irrelevant	10	19.6%	0	0.0%
Q61	very important	4	7.7%	1	11.1%
	important	19	36.5%	3	33.3%
	not important	19	36.5%	4	44.4%
	irrelevant	10	19.2%	1	11.1%
Q62	very important	4	7.5%	1	11.1%
	important	21	39.6%	4	44.4%
	not important	19	35.8%	3	33.3%
	irrelevant	9	17.0%	1	11.1%

Q63	very important	2	3.8%	1	11.1%
	important	23	43.4%	3	33.3%
	not important	19	35.8%	4	44.4%
	irrelevant	9	17.0%	1	11.1%
Q64	very important	0	0.0%	2	22.2%
	important	17	32.7%	0	0.0%
	not important	24	46.2%	5	55.6%
	irrelevant	11	21.2%	2	22.2%
Q65	very important	1	1.9%	1	11.1%
	important	7	13.2%	0	0.0%
	not important	28	52.8%	5	55.6%
	irrelevant	17	32.1%	3	33.3%
Q66	very important	3	5.8%	2	22.2%
	important	19	36.5%	2	22.2%
	not important	20	38.5%	4	44.4%
	irrelevant	10	19.2%	1	11.1%
Q67	very important	9	17.0%	2	22.2%
	important	21	39.6%	4	44.4%
	not important	16	30.2%	3	33.3%
	irrelevant	7	13.2%	0	0.0%
Q68	very important	6	11.3%	2	22.2%
	important	15	28.3%	3	33.3%
	not important	18	34.0%	3	33.3%
	irrelevant	14	26.4%	1	11.1%
Q69	very important	5	9.4%	2	22.2%
	important	23	43.4%	3	33.3%
	not important	16	30.2%	4	44.4%
	irrelevant	9	17.0%	0	0.0%
Q70	very important	4	7.5%	1	11.1%
	important	14	26.4%	1	11.1%
	not important	23	43.4%	5	55.6%
	irrelevant	12	22.6%	2	22.2%
Q71	very important	5	9.6%	0	0.0%
	important	16	30.8%	3	33.3%
	not important	21	40.4%	4	44.4%

	irrelevant	10	19.2%	2	22.2%
Q72	very important	12	22.6%	1	11.1%
	important	26	49.1%	5	55.6%
	not important	11	20.8%	3	33.3%
	irrelevant	4	7.5%	0	0.0%
Q73	very important	5	9.4%	0	0.0%
	important	25	47.2%	5	55.6%
	not important	17	32.1%	4	44.4%
	irrelevant	6	11.3%	0	0.0%
Q74	very important	5	9.6%	0	0.0%
	important	17	32.7%	5	55.6%
	not important	21	40.4%	3	33.3%
	irrelevant	9	17.3%	1	11.1%
Q75	very important	1	1.9%	0	0.0%
	important	18	34.0%	2	22.2%
	not important	23	43.4%	5	55.6%
	irrelevant	11	20.8%	2	22.2%
Q76	very important	4	7.8%	1	11.1%
	important	12	23.5%	2	22.2%
	not important	24	47.1%	4	44.4%
	irrelevant	11	21.6%	2	22.2%
Q77	very important	4	7.8%	0	0.0%
	important	14	27.5%	3	33.3%
	not important	21	41.2%	5	55.6%
	irrelevant	12	23.5%	1	11.1%
Q78	very important	5	9.4%	1	11.1%
	important	17	32.1%	1	11.1%
	not important	22	41.5%	5	55.6%
	irrelevant	9	17.0%	2	22.2%
Q79	very important	5	9.6%	1	11.1%
	important	16	30.8%	3	33.3%
	not important	21	40.4%	4	44.4%
	irrelevant	10	19.2%	1	11.1%
Q80	very important	6	11.3%	1	11.1%
	important	14	26.4%	2	22.2%

	not important	23	43.4%	5	55.6%
	irrelevant	10	18.9%	1	11.1%
Q81	very important	2	3.8%	1	11.1%
	important	8	15.1%	1	11.1%
	not important	29	54.7%	4	44.4%
	irrelevant	14	26.4%	3	33.3%
Q82	very important	1	1.9%	1	11.1%
	important	11	21.2%	1	11.1%
	not important	26	50.0%	4	44.4%
	irrelevant	14	26.9%	3	33.3%
Q83	very important	13	24.5%	2	22.2%
	important	16	30.2%	3	33.3%
	not important	17	32.1%	2	22.2%
	irrelevant	7	13.2%	2	22.2%
Q84	very important	4	7.7%	1	11.1%
	important	11	21.2%	2	22.2%
	not important	25	48.1%	5	55.6%
	irrelevant	12	23.1%	1	11.1%
Q85	very important	2	3.8%	3	33.3%
	important	22	42.3%	2	22.2%
	not important	19	36.5%	3	33.3%
	irrelevant	9	17.3%	1	11.1%
Q86	very important	3	5.7%	2	22.2%
	important	18	34.0%	1	11.1%
	not important	23	43.4%	5	55.6%
	irrelevant	9	17.0%	1	11.1%
Q87	very important	4	7.5%	1	11.1%
	important	14	26.4%	3	33.3%
	not important	23	43.4%	4	44.4%
	irrelevant	12	22.6%	1	11.1%
Q88	very important	2	3.8%	1	11.1%
	important	9	17.0%	0	0.0%
	not important	24	45.3%	4	44.4%
	irrelevant	18	34.0%	4	44.4%
Q89	very important	0	0.0%	1	11.1%

	important	10	18.9%	0	0.0%
	not important	25	47.2%	5	55.6%
	irrelevant	18	34.0%	3	33.3%
Q90	very important	18	34.0%	4	44.4%
	important	17	32.1%	5	55.6%
	not important	13	24.5%	0	0.0%
	irrelevant	5	9.4%	0	0.0%
Q91	very important	3	5.8%	1	12.5%
	important	8	15.4%	0	0.0%
	not important	21	40.4%	4	50.0%
	irrelevant	20	38.5%	3	37.5%
Q92	very important	8	15.1%	2	22.2%
	important	11	20.8%	4	44.4%
	not important	21	39.6%	1	11.1%
	irrelevant	13	24.5%	2	22.2%
Q93	very important	29	53.7%	5	55.6%
	important	23	42.6%	4	44.4%
	not important	2	3.7%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q94	very important	44	81.5%	7	77.8%
	important	10	18.5%	2	22.2%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q95	very important	42	77.8%	6	66.7%
	important	11	20.4%	3	33.3%
	not important	1	1.9%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q96	very important	31	58.5%	3	33.3%
	important	19	35.8%	6	66.7%
	not important	3	5.7%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q97	very important	34	63.0%	5	55.6%
	important	20	37.0%	4	44.4%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%

Q98	very important	38	70.4%	8	88.9%
	important	16	29.6%	1	11.1%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q99	very important	18	34.0%	4	44.4%
	important	25	47.2%	3	33.3%
	not important	7	13.2%	2	22.2%
	irrelevant	3	5.7%	0	0.0%
Q100	very important	25	46.3%	2	22.2%
	important	24	44.4%	5	55.6%
	not important	5	9.3%	2	22.2%
	irrelevant	0	0.0%	0	0.0%
Q101	very important	32	60.4%	4	44.4%
	important	19	35.8%	5	55.6%
	not important	2	3.8%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q102	very important	33	61.1%	5	55.6%
	important	21	38.9%	4	44.4%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%

Appendix G6: Table 4.13 – Association between practitioner demographics and perception: Improved Chiropractic abilities

		Improved Chiropractic Abilities			
		Yes		No	
		Count	Column N %	Count	Column N %
Q19	very important	2	5.3%	1	5.6%
	important	13	34.2%	6	33.3%
	not important	18	47.4%	7	38.9%
	irrelevant	5	13.2%	4	22.2%
Q20	very important	7	18.4%	1	5.6%
	important	21	55.3%	7	38.9%
	not important	8	21.1%	8	44.4%

	irrelevant	2	5.3%	2	11.1%
Q21	very important	9	24.3%	1	5.6%
	important	20	54.1%	11	61.1%
	not important	7	18.9%	5	27.8%
	irrelevant	1	2.7%	1	5.6%
Q22	very important	19	50.0%	4	22.2%
	important	16	42.1%	8	44.4%
	not important	2	5.3%	4	22.2%
	irrelevant	1	2.6%	2	11.1%
Q23	very important	10	27.0%	2	11.1%
	important	16	43.2%	6	33.3%
	not important	8	21.6%	7	38.9%
	irrelevant	3	8.1%	3	16.7%
Q24	very important	10	27.0%	3	16.7%
	important	18	48.6%	9	50.0%
	not important	7	18.9%	4	22.2%
	irrelevant	2	5.4%	2	11.1%
Q25	very important	5	13.2%	2	11.1%
	important	21	55.3%	10	55.6%
	not important	12	31.6%	4	22.2%
	irrelevant	0	0.0%	2	11.1%
Q26	very important	4	10.5%	1	5.6%
	important	14	36.8%	4	22.2%
	not important	17	44.7%	10	55.6%
	irrelevant	3	7.9%	3	16.7%
Q27	very important	16	42.1%	5	27.8%
	important	20	52.6%	11	61.1%
	not important	2	5.3%	1	5.6%
	irrelevant	0	0.0%	1	5.6%
Q28	very important	16	42.1%	2	12.5%
	important	19	50.0%	12	75.0%
	not important	2	5.3%	1	6.3%
	irrelevant	1	2.6%	1	6.3%
Q29	very important	3	7.9%	2	11.1%
	important	26	68.4%	6	33.3%

	not important	6	15.8%	9	50.0%
	irrelevant	3	7.9%	1	5.6%
Q30	very important	26	70.3%	10	55.6%
	important	11	29.7%	6	33.3%
	not important	0	0.0%	2	11.1%
	irrelevant	0	0.0%	0	0.0%
Q31	very important	27	71.1%	12	70.6%
	important	11	28.9%	5	29.4%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q32	very important	0	0.0%	1	5.9%
	important	13	36.1%	2	11.8%
	not important	15	41.7%	10	58.8%
	irrelevant	8	22.2%	4	23.5%
Q33	very important	7	18.9%	2	11.1%
	important	23	62.2%	5	27.8%
	not important	6	16.2%	10	55.6%
	irrelevant	1	2.7%	1	5.6%
Q34	very important	25	65.8%	9	50.0%
	important	13	34.2%	8	44.4%
	not important	0	0.0%	1	5.6%
	irrelevant	0	0.0%	0	0.0%
Q35	very important	28	73.7%	8	44.4%
	important	10	26.3%	10	55.6%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q36	very important	16	42.1%	7	38.9%
	important	18	47.4%	7	38.9%
	not important	3	7.9%	3	16.7%
	irrelevant	1	2.6%	1	5.6%
Q37	very important	10	26.3%	6	33.3%
	important	25	65.8%	8	44.4%
	not important	3	7.9%	4	22.2%
	irrelevant	0	0.0%	0	0.0%
Q38	very important	29	76.3%	12	66.7%

	important	9	23.7%	6	33.3%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q39	very important	30	78.9%	13	72.2%
	important	8	21.1%	5	27.8%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q40	very important	31	81.6%	11	61.1%
	important	7	18.4%	7	38.9%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q41	very important	33	86.8%	14	77.8%
	important	5	13.2%	4	22.2%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q42	very important	32	86.5%	12	66.7%
	important	5	13.5%	6	33.3%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q43	very important	6	15.8%	2	11.1%
	important	20	52.6%	7	38.9%
	not important	10	26.3%	7	38.9%
	irrelevant	2	5.3%	2	11.1%
Q44	very important	7	18.4%	3	16.7%
	important	20	52.6%	8	44.4%
	not important	10	26.3%	5	27.8%
	irrelevant	1	2.6%	2	11.1%
Q45	very important	29	76.3%	12	66.7%
	important	8	21.1%	6	33.3%
	not important	1	2.6%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q46	very important	29	76.3%	14	77.8%
	important	7	18.4%	3	16.7%
	not important	2	5.3%	1	5.6%
	irrelevant	0	0.0%	0	0.0%

Q47	very important	4	10.5%	1	5.6%
	important	10	26.3%	3	16.7%
	not important	16	42.1%	10	55.6%
	irrelevant	8	21.1%	4	22.2%
Q48	very important	5	13.9%	1	5.6%
	important	16	44.4%	7	38.9%
	not important	10	27.8%	8	44.4%
	irrelevant	5	13.9%	2	11.1%
Q49	very important	4	10.8%	2	11.1%
	important	10	27.0%	2	11.1%
	not important	14	37.8%	9	50.0%
	irrelevant	9	24.3%	5	27.8%
Q50	very important	27	73.0%	7	38.9%
	important	9	24.3%	10	55.6%
	not important	1	2.7%	1	5.6%
	irrelevant	0	0.0%	0	0.0%
Q51	very important	24	63.2%	10	55.6%
	important	12	31.6%	6	33.3%
	not important	2	5.3%	2	11.1%
	irrelevant	0	0.0%	0	0.0%
Q52	very important	19	50.0%	4	22.2%
	important	16	42.1%	12	66.7%
	not important	3	7.9%	2	11.1%
	irrelevant	0	0.0%	0	0.0%
Q53	very important	5	13.5%	3	16.7%
	important	21	56.8%	7	38.9%
	not important	11	29.7%	5	27.8%
	irrelevant	0	0.0%	3	16.7%
Q54	very important	17	44.7%	5	27.8%
	important	14	36.8%	7	38.9%
	not important	7	18.4%	5	27.8%
	irrelevant	0	0.0%	1	5.6%
Q55	very important	0	0.0%	1	5.6%
	important	15	40.5%	1	5.6%
	not important	16	43.2%	11	61.1%

	irrelevant	6	16.2%	5	27.8%
Q56	very important	3	8.1%	0	0.0%
	important	18	48.6%	6	33.3%
	not important	13	35.1%	9	50.0%
	irrelevant	3	8.1%	3	16.7%
Q57	very important	3	8.1%	1	5.6%
	important	15	40.5%	6	33.3%
	not important	16	43.2%	9	50.0%
	irrelevant	3	8.1%	2	11.1%
Q58	very important	3	8.1%	2	11.1%
	important	26	70.3%	6	33.3%
	not important	7	18.9%	8	44.4%
	irrelevant	1	2.7%	2	11.1%
Q59	very important	5	13.9%	1	5.6%
	important	15	41.7%	3	16.7%
	not important	11	30.6%	10	55.6%
	irrelevant	5	13.9%	4	22.2%
Q60	very important	2	5.6%	0	0.0%
	important	17	47.2%	3	17.6%
	not important	12	33.3%	10	58.8%
	irrelevant	5	13.9%	4	23.5%
Q61	very important	3	8.3%	1	5.6%
	important	15	41.7%	4	22.2%
	not important	13	36.1%	9	50.0%
	irrelevant	5	13.9%	4	22.2%
Q62	very important	3	8.1%	1	5.6%
	important	16	43.2%	6	33.3%
	not important	14	37.8%	7	38.9%
	irrelevant	4	10.8%	4	22.2%
Q63	very important	2	5.4%	0	0.0%
	important	17	45.9%	7	38.9%
	not important	14	37.8%	7	38.9%
	irrelevant	4	10.8%	4	22.2%
Q64	very important	0	0.0%	0	0.0%
	important	12	33.3%	5	27.8%

	not important	17	47.2%	9	50.0%
	irrelevant	7	19.4%	4	22.2%
Q65	very important	1	2.7%	0	0.0%
	important	6	16.2%	1	5.6%
	not important	19	51.4%	10	55.6%
	irrelevant	11	29.7%	7	38.9%
Q66	very important	2	5.6%	1	5.6%
	important	15	41.7%	4	22.2%
	not important	14	38.9%	9	50.0%
	irrelevant	5	13.9%	4	22.2%
Q67	very important	7	18.9%	2	11.1%
	important	16	43.2%	6	33.3%
	not important	11	29.7%	7	38.9%
	irrelevant	3	8.1%	3	16.7%
Q68	very important	4	10.8%	2	11.1%
	important	12	32.4%	4	22.2%
	not important	12	32.4%	8	44.4%
	irrelevant	9	24.3%	4	22.2%
Q69	very important	4	10.8%	1	5.6%
	important	18	48.6%	6	33.3%
	not important	10	27.0%	8	44.4%
	irrelevant	5	13.5%	3	16.7%
Q70	very important	3	8.1%	1	5.6%
	important	11	29.7%	3	16.7%
	not important	15	40.5%	10	55.6%
	irrelevant	8	21.6%	4	22.2%
Q71	very important	4	11.1%	1	5.6%
	important	13	36.1%	3	16.7%
	not important	13	36.1%	10	55.6%
	irrelevant	6	16.7%	4	22.2%
Q72	very important	9	24.3%	3	16.7%
	important	20	54.1%	7	38.9%
	not important	7	18.9%	6	33.3%
	irrelevant	1	2.7%	2	11.1%
Q73	very important	4	10.8%	1	5.6%

	important	18	48.6%	7	38.9%
	not important	13	35.1%	7	38.9%
	irrelevant	2	5.4%	3	16.7%
Q74	very important	3	8.3%	2	11.1%
	important	14	38.9%	4	22.2%
	not important	15	41.7%	8	44.4%
	irrelevant	4	11.1%	4	22.2%
Q75	very important	0	0.0%	1	5.6%
	important	13	35.1%	5	27.8%
	not important	17	45.9%	8	44.4%
	irrelevant	7	18.9%	4	22.2%
Q76	very important	3	8.6%	1	5.6%
	important	8	22.9%	4	22.2%
	not important	17	48.6%	9	50.0%
	irrelevant	7	20.0%	4	22.2%
Q77	very important	3	8.6%	1	5.6%
	important	11	31.4%	3	16.7%
	not important	15	42.9%	9	50.0%
	irrelevant	6	17.1%	5	27.8%
Q78	very important	3	8.1%	2	11.1%
	important	13	35.1%	4	22.2%
	not important	15	40.5%	9	50.0%
	irrelevant	6	16.2%	3	16.7%
Q79	very important	4	11.1%	1	5.6%
	important	12	33.3%	4	22.2%
	not important	15	41.7%	9	50.0%
	irrelevant	5	13.9%	4	22.2%
Q80	very important	4	10.8%	2	11.1%
	important	11	29.7%	3	16.7%
	not important	17	45.9%	9	50.0%
	irrelevant	5	13.5%	4	22.2%
Q81	very important	1	2.7%	1	5.6%
	important	6	16.2%	2	11.1%
	not important	20	54.1%	10	55.6%
	irrelevant	10	27.0%	5	27.8%

Q82	very important	0	0.0%	1	5.6%
	important	9	25.0%	2	11.1%
	not important	17	47.2%	10	55.6%
	irrelevant	10	27.8%	5	27.8%
Q83	very important	10	27.0%	3	16.7%
	important	12	32.4%	5	27.8%
	not important	12	32.4%	6	33.3%
	irrelevant	3	8.1%	4	22.2%
Q84	very important	3	8.3%	1	5.6%
	important	10	27.8%	1	5.6%
	not important	16	44.4%	12	66.7%
	irrelevant	7	19.4%	4	22.2%
Q85	very important	2	5.6%	1	5.6%
	important	17	47.2%	5	27.8%
	not important	12	33.3%	9	50.0%
	irrelevant	5	13.9%	3	16.7%
Q86	very important	3	8.1%	1	5.6%
	important	14	37.8%	4	22.2%
	not important	15	40.5%	10	55.6%
	irrelevant	5	13.5%	3	16.7%
Q87	very important	2	5.4%	2	11.1%
	important	13	35.1%	2	11.1%
	not important	15	40.5%	10	55.6%
	irrelevant	7	18.9%	4	22.2%
Q88	very important	0	0.0%	2	11.1%
	important	7	18.9%	2	11.1%
	not important	18	48.6%	7	38.9%
	irrelevant	12	32.4%	7	38.9%
Q89	very important	0	0.0%	0	0.0%
	important	6	16.2%	4	22.2%
	not important	19	51.4%	7	38.9%
	irrelevant	12	32.4%	7	38.9%
Q90	very important	17	45.9%	2	11.1%
	important	10	27.0%	9	50.0%
	not important	7	18.9%	5	27.8%

	irrelevant	3	8.1%	2	11.1%
Q91	very important	2	5.6%	1	5.6%
	important	6	16.7%	2	11.1%
	not important	15	41.7%	7	38.9%
	irrelevant	13	36.1%	8	44.4%
Q92	very important	7	18.9%	1	5.6%
	important	9	24.3%	4	22.2%
	not important	15	40.5%	6	33.3%
	irrelevant	6	16.2%	7	38.9%
Q93	very important	20	52.6%	11	61.1%
	important	16	42.1%	7	38.9%
	not important	2	5.3%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q94	very important	31	81.6%	14	77.8%
	important	7	18.4%	4	22.2%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q95	very important	30	78.9%	13	72.2%
	important	7	18.4%	5	27.8%
	not important	1	2.6%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q96	very important	24	64.9%	8	44.4%
	important	10	27.0%	10	55.6%
	not important	3	8.1%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q97	very important	25	65.8%	11	61.1%
	important	13	34.2%	7	38.9%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q98	very important	28	73.7%	12	66.7%
	important	10	26.3%	6	33.3%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%
Q99	very important	15	40.5%	5	27.8%
	important	17	45.9%	8	44.4%

	not important	4	10.8%	3	16.7%
	irrelevant	1	2.7%	2	11.1%
Q100	very important	20	52.6%	6	33.3%
	important	14	36.8%	11	61.1%
	not important	4	10.5%	1	5.6%
	irrelevant	0	0.0%	0	0.0%
Q101	very important	26	70.3%	8	44.4%
	important	11	29.7%	8	44.4%
	not important	0	0.0%	2	11.1%
	irrelevant	0	0.0%	0	0.0%
Q102	very important	25	65.8%	10	55.6%
	important	13	34.2%	8	44.4%
	not important	0	0.0%	0	0.0%
	irrelevant	0	0.0%	0	0.0%

Appendix H: Student Research References

The following DUT Chiropractic student researchers focused on Manipulation techniques:

Sood,2008; Rodda,2007; Mey,2013; Campbell,2007; Higgs,2007; Tyfield,2006; Brown,2006; Wilson,2006; Uys,2006; Ferreira,2006; De,2013; Joseph,2005; Lewis,2005; Padayachy,2005; Botha,2005; Jacobs,2005; Botha,2005; Lindsey-Renton,2005; Köhne,2005; Dixon,2005; Harpham,2005; Shacksnovis,2005; Meuwese,2005; Morgan,2005; Turner,2005; Douglas,2004; Matkovich,2004; Terblanche,2004; Gillespie,2003; Bisset,2003; Blake,2003; Shearar,2003; Moulder,2003; Bekker-Smith,2003; Fonseca,2002; Allison,2012; Du,2002; Thompson,2002; Terry,2002; Dimopoulos,2002; Naidoo,2002; Boden,2002; Wilson,2002; Aaron,2002; Marszalek,2002; Moodley,2002; Walker,2002; Maharajh,2002; Azizi,2002; Govender,2002; White,2001; Pillay,2001; O'Connor,2001; Needham,2001; Kidson,2001; Tucker,2001; Allwood,2001; Roodt,2001; Ranwell,2001; Paton,2001; De,2001; Sawyer,2000; Shaik,2000; Petersen,2000; Kruger,2000; Stakes,2000; Thomson,2000; Morris,2000; Pooke,2000; Broughton,2000; Salter,1999; Munton,1999; Coetzer,1999; Munday,1999; Descoins,1999; Kruger,1999; Mercer,1999; White,1999; Moodley,1998; Myburgh,1998; Donkin,1998; Cascioli,1998; Bailes,1998; Wood,1997; Angus,1997; Belling,2011; Reid,1997; Russell,1997; Palmer,1996; Scott-Dawkins,1996; Urli,1995; Botha,2013; Lubbe,2011; Trollope,2010; Abdul-Rasheed,2013; Legoete,2010; Pastellides,2009; Forbes,2009; Cuningham,2009; Smit,2009; Blakeney,2009; Logtenberg,2009; Murray,2009; Jordan,2009)

The following DUT Chiropractic student researchers focused on Biomechanical changes as a result of the Chiropractic manipulation:

Botha, 2013 ; Abdul-Rasheed, 2013; Dwyer, 2013; Allison, 2012; Poacher, 2011; Lubbe, 2011; Marques. 2011; Turnbull, 2010; Legoete, 2010; Marshall, 2009; Payne, 2007; Brown, 2006; Wilson, 2006; Joseph, 2005; Harpham, 2005; Meuwese, 2005; Gillespie, 2003; Herholdt, 2003; Blake, 2003; Shearar, 2003; Moulder, 2003; Boden, 2002; Haswell, 2002; Aziz, 2005; Gaymans, 2001; Naidoo, 2001; Login, 2001; Botha, 2005; Scott, 2005; Jermyn, 2004; Sutherland, 2002; Kidson, 2001; Descoins, 1999; Kruger, 1999; Biera, 1996; Da Silva, 1994; Coetzee, 2013; Jordon, 2009; Jacobs, 2005; Botha, 2005; Douglas, 2004; Terry, 2002; Walker, 2002; Guiry, 2002; White, 2001; Roodt, 2001; Paton, 2001; Petersen, 2000; Kruger, 2000; Hammond, 2000; Munton, 1999; Munday, 1999; Pellow, 1999; Mercer, 1999; Schiller, 1999; Roberts, 1998; Cullinan, 1998; Ritchie, 1997; Angus, 1997; Hopkins, 1997; Parkin-

Smith, 1996; Mathews, 1995; Sood,2008; Campbell,2007; Higgs,2007; Tyfield,2006; Vadachia,2006; Uys,2006; Delgado,2006; Lewis,2005; Lindsey-Renton,2005; Köhne,2005; Matkovich,2004; Terblanche,2004; Hillermann,2003; Bisset,2003; Bekker-Smith,2003; Fonseca,2002; Du,2002; Thompson,2002; Dimopoulos,2002; Naidoo,2002; Boden,2002; Wilson,2002; Aaron,2002; Marszalek,2002; Moodley,2002; Maharajh,2002; Cartwright,2001; Pillay,2001; O'Connor,2001; Needham,2001; Login,2001; Tsolakis,2001; Bhoola,2001; Tucker,2001; Allwood,2001; Ranwell,2001; De,2001; Sawyer,2000; Shaik,2000; Atkinson,2000; Stakes,2000; Thomson,2000; Morris,2000; Pooke,2000; Lakhani,1999; Coetzer,1999; White,1999; Williamson,1999; Kavonic,1999; Moodley,1998; Myburgh,1998; Donkin,1998; Wood,1998; Webb,1998; Bailes,1998; Van Schalkwyk,1998; Wood,1997; Deutschmann,2011; Blakeney,2009; Murray,2009; Le Roux,2008

The following DUT Chiropractic student researchers focused on Myofascial assessment and Myofascial treatment techniques:

Abdul-Rasheed, 2013; Kinsman, 2013; Frandsen-Smith, 2012; Van der Westhuizen, 2012; Moodley, 2011; Seagreen, 2010; Subrayan, 2008; Van der Toorn, 2013; Pedlar, 2007; Berry, 2006; Georgio, 2006; Sookraj, 2005; Vaghmaria, 2005; Royce, 2005; Bedell-Sivright, 2005; Shacksnovis, 2005; Weyer-Henderson, 2005; Daly, 2005; Audie, 2005; Broadhurst, 2004; Thoresson, 2003; Pillay, 2003; Webb, 2003; Dippenaar, 2003; Cowie, 2003; Prithipal, 2003; Wilks, 2003; Gray, 2002; Van Aardenne, 2002; Walker, 2002; Chettiar, 2001; Pooke, 2000; MacDougall, 1999; Backlund, 1999; Roberts, 1998; Corin, 1998; Drew, 1998; Hutchings, 1998; Andersen, 1998; Hall, 1997; Morgan, 1997; Broome, 1996; Christie, 1995; Jones, 1994