A study to explore the perceptions that South African chiropractors have regarding the perceived role and impact of research within the profession.

By:

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I, Julani Gordon, 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 my best friend and husband, Jason Gordon, without whose love and support this would not have been possible.

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Abstract

Background: The Chiropractic profession has made significant progress with regard to the production of high quality and clinically relevant research in the last 20 years. This correlates with a spike in development within the chiropractic profession as well as its acceptance by the medical fraternity and public. The responsibility for continuing this positive trend is dependent on the chiropractic graduates and practitioners of the future. Therefore, it is important to establish the current perceptions and utilization of research by Chiropractors, so that future research can be built around the needs and requirements of today's practitioners, thereby ensuring the profession's continued development and future in health care. The aim of this study was to determine the perceptions that Chiropractors have of research and its relevance / utilization in practice.

Method: The study was a quantitative questionnaire based, self administered survey. The sample group included all Chiropractic practitioners currently practising in South Africa (N=515).

Results: There was a response rate of 35% (n=174). The results indicated that the perception of research was very positive overall, with the strongest positive response being that research adds credibility to the profession. However, most respondents disagreed with the statement that chiropractors who had done research had an advantage above those who had not. There was a positive, albeit weak correlation between perceptions and utilization of research, indicating that as perceptions increased, so did utilization of research. The area of greatest concern was that even though a high degree of research utilization was reported by chiropractors, research was least likely to be used to change conditions, policies or practices in practice.

Conclusion: The most significant factors associated with positive perceptions and utilization were found to be publishing in a journal and receiving referrals from other health care practitioners. Chiropractors who indicated an interest in doing research again were also very positively linked to utilization. It would seem that even though chiropractors perceive research positively, their implementation into practice has some hurdles that impede the full integration of research into practice. As very few demographic and personal attributes of the South African chiropractor were found to be primarily responsible for low utilization of research in practice, it can be hypothesised that the factors impeding research implementation are most likely environmental in nature.

Key Words: Chiropractic practitioner, research, perception, utilization

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Definitions

Attitude

Regularities of an individual's feelings, thoughts, and the predisposition to act toward some aspect of his or her environment (Milton, 1981).

Chiropractic

A system of complementary medicine based on the diagnosis and manipulative treatment of misalignments of the joints, especially those of the spinal column, which are believed to cause other disorders by affecting the nerves, muscles and organs (Oxford dictionaries, 2011).

Cognition

Cognition refers to the mental action or process of acquiring knowledge and understanding through thought, experience, and the senses (Oxford Dictionaries, 2011).

Content Validity

A questionnaire has content validity when the content of the questionnaire is considered effective, and well rounded enough to be able to assess a particular concept (Mouton, 1996). This was achieved by having the individuals in the focus group representative of the specific areas of expertise related to the research to be conducted as well as respondent representation (Dyer, 1997).

Face Validity

Face validity is the simplest type of validity, which is determined by agreement between researchers and those with a vested interest in the questionnaire (i.e. interpreted in this study as those participants of the focus group), that „on the face of it" the tool seems valid, unambiguous and easily interpreted by a lay person (Mouton, 1996).

Formal research

Research done at an accredited institution for the purpose of acquiring a masters or doctoral qualification and/or publication in a journal.

Perception

Perception is the process by which information about the world, as received by the senses, is analysed and made meaningful (Oxford concise medical dictionary, 2003)

Chapter One: Introduction

1.1. Background to the study:

Chiropractic research plays an important role among South African chiropractors, as South African Chiropractic Training Institutions are unique in that it requires the completion of a Masters in Chiropractic in order to qualify (CASA, 2011; AHPCSA - Act 63 of 1982, as amended). This would make it safe to assume that the majority of South African chiropractors will have had more exposure to and experience in conducting and using research as compared to chiropractors that qualified at overseas institutions, which is why South African Chiropractors are appropriate subjects for this study. Experience affects perception, and perception affects attitudes (Bergh and Theron, 1999). Chiropractors' attitudes toward research may impact on research development and can thus be argued to have a possible impact on the profession's development (Chapman-Smith, 2000).

Moore, as cited by Chapman-Smith (2000) said: "Although chiropractic has arrived as an institutionalised part of America's health care system, arrival does not automatically confer permanent success … medical movements as well as individuals operate in a dynamic world of constant flux." Chiropractic as a profession originated and developed in America (Chapman-Smith, 2000). American chiropractors fought suppression and extinction of the profession to ensure a future for chiropractic, which, according to Chapman-Smith (2000), can be based on a variety of internal and external factors in the profession. Most prominent among them are the strength of the identity of chiropractic, its role in the health care system and its ability to adapt to change in the health care system. The identity and role of chiropractic are both directly related to the data that substantiates its principles and supports its practice (Chapman-Smith, 2000). Similarly Chapman-Smith (2000) and Newell and Cunliffe (2003) that research is

largely dependent on the chiropractors' ability to adapt, adaptability being crucial for continuing professional development and research (Chapman-Smith, 2000).

The research in the form of a questionnaire has assisted the researcher evaluate the perception and utilization of research by chiropractors and the effect it has had on individual practices, as well as the chiropractic profession in the South African context.

1.2. Aims and objectives:

The aim of this study was to explore the perceptions that South African chiropractors have regarding the perceived role and impact of research within the profession.

Primary objectives:

- The first objective of this study was to determine the general perception that chiropractors have of research and its role in the chiropractic profession.
- The second objective was to determine the utilization of research among chiropractic practitioners and its practical application and influence on patient management and treatment protocol.

Secondary objective:

- The third objective was to determine any associations between the factors that influenced perception and usage of research when compared to the demographics, education and practice habits of practitioners, in order to establish whether or not there are observable relationships between these factors exist.

1.3. Rationale:

Chiropractic research is as old as the profession itself (Haldeman, 2005), though in the last 20 years the quality and relevance of this research has increased significantly (Newell and Cunliffe, 2003). It is not a coincidence that the timing correlates with huge development within the chiropractic profession as well as its acceptance by the medical fraternity and public (Chapman-Smith, 2000). The responsibility for continuing the positive trend within the profession is largely dependent on the current and future chiropractic graduates and practitioners (Zhang, 1996). Therefore it is important to know chiropractors' perceptions of research, so that future research can be built around the needs and requirements of today's practitioners.

1.4. Benefits:

The benefits of the study were to ascertain what the utilization and present perceptions are amongst South African chiropractors towards research and to gain insight into the possible factors contributing to their perceptions. Based on these results it may be possible to change certain factors that could influence future research – most significantly, improving the perception of research. This could increase research application in practice and thereby aid to improve collaboration between chiropractic and the medical profession. This could be of great benefit to patients as collaboration between their general and alternative practitioners would ensure better management of their individual cases.

1.5. Limitations:

It was assumed that the respondents were open and honest in answering the questionnaire in order that an accurate perspective of their views was achieved. However, in reality respondents may have answered the questionnaire in an attempt to please the researcher which may have skewed the results (Dyer,

1997). Also, a response rate of 35% could be considered low, which would further lead to an inaccurate generalization of perception.

1.6. Outline of Chapters:

Given the outline provided in Chapter One, Chapter Two is a review of available literature, followed by Chapter Three, which discusses the research methodology. The results and interpretation of the results are discussed in Chapter Four and the conclusion and recommendations follow respectively in Chapter Five.

Chapter Two: Literature Review

2.1 Perception

2.1.1 The perceptual process

Perception is a vast concept that is not only influenced by a reaction to events, people or things, but is also influenced by conditions within the individual (Milton, 1981).

Neisser, as cited by Hayes (1994), developed a theory of perception, which concluded that people are continually receiving information from their environment through their senses and interpreting it in ways that are most useful to them. This means that perception, in essence, is an active cycle of cognitive activities based on experiences (Hayes, 1994). Thus perception is the process by which information about the world, as received by the senses, is analysed and made meaningful (Oxford Concise Medical Dictionary, 2003)

2.1.2. What influences perception

In the above context, perception is affected and influenced by many factors that pertain to the:

a) Perceiver, (as related to this study: Chiropractors)
b) Environment/situation/context, (as related to this study: the chiropractic practice) and
c) Perceived object, (as related to this study: Research)

Table 2.1 - Factors that affect perception

1. PERCEIVER	2. ENVIRONMENT	3. OBJECT
a) Attitudes	a) Time	a) Motion
b) Motivation	b) Work setting	b) Novelty
c) Interests	c) Social setting	c) Sounds
d) Experience	d) External Influence	d) Proximity
e) Expectations		e) Background
		f) Size

Adapted from Bergh and Theron (1999) and Newell and Cunliffe (2003).

2.1.2.1 Factors in the perceiver

2.1.2.1.1 Attitudes

Attitudes are generally defined as “regularities of an individual’s feelings, thoughts, and predisposition to act toward some aspect of his or her environment” (Milton, 1981). Whereas researchers who took a more behavioural stance, defined attitudes as “predispositions to act in certain ways” (Hayes, 1994). Therefore attitudes may be constant or temporary and are likewise susceptible to influence and change (Bergh and Theron, 1999). Attitudes and values are closely related and both can be readily observable in behaviour (Bergh and Theron, 1999).

According to Milton (1981), human beings do not see things as they really are; rather, they view things through perceptual filters.

- an attitude has 3 components or elements:
  a) cognitive (thoughts, beliefs, ideas);
  b) emotional/affective (feeling) and
  c) behavioural (tendency to act consistently with an attitude) (Bergh and Theron, 1999; Milton, 1981),

therefore, Milton (1981) considered an attitude as a way of thinking, feeling and behaving.

Katz (1960), as cited by Anderson (2011), argued that attitudes serve four different functions (Bergh and Theron, 1999; Hayes, 1994):

1) A knowledge function, whereby attitudes can give meaning to people's experiences.
2) An adjustive or utilitarian function in that holding certain attitudes may make people more socially acceptable and so help with their social interaction.
3) A value-expressive function, allowing people to express what they experience as the more positive aspects of their own "inner selves" and their individual central values; and
4) An ego-defence function, which allows people to defend and protect their unconscious motives and ideas, as well as protecting individuals from acknowledging undesirable realities in themselves.

Factors that affect attitudes:

In a study compiled by Rieder (2010) factors that affected attitude in chiropractic students included gender, age, ethnicity, prior experience, and financial position. It affirmed the findings from a study done by Newell and Cunliffe (2003), which found that research training, experience and confidence had significant effects on undergraduate chiropractors' attitudes.

Of the five hundred and fifteen chiropractors listed by the AHPCSA (Terry, 2009), sixty percent were male. This is consistent with findings from other South African research studies (Black, 2008; Keyter, 2010) as well as demographics of a German chiropractic study of which 63% of respondents were male (Schwarz and Hondras, 2007). Therefore, it is expected that this study should yield a majority response from males.

This may impact on the responses regarding research, as although females and males have been found to participate in research education equally (Martin *et al*.,

2001; Bills, 2003), females complete at rates higher than men, which may suggest that females may have a more positive attitude to research compared to men. However, females were found to be less satisfied with their research education experience (Wright and Cochrane, 2000) and they reported having less confidence in doing research (Newell and Cunliffe, 2003). Despite the strong link between attitude and perception (Bergh and Theron, 1999) and the majority of respondents who are expected to be male, the effect that gender would have on the perception of research in this study may be only slightly positive or negligible.

Even though the first chiropractors came to South Africa in the early 1920's (CASA, 2011), the first chiropractic students were only accepted into the Technikon Natal in 1989. This, as well as previous chiropractic demographic studies (Black, 2008; Keyter, 2010) indicate that the chiropractic population will be young, with the majority of the respondents being between the ages of 25 and 40. In terms of the effect of age on the perception of research, it has been found that young people have limited experience and knowledge (Haverly, 1998), which may negatively affect their perception of research (Newell and Cunliffe, 2003).

In previous South African studies, the ethnic majority among chiropractors were found to be White (Black, 2008; Keyter, 2010). It is not a fair representation of the South African population as the African ethnic group makes up the majority of the population (Rattan, 2007; Statistics South Africa, 2011). But as Myburgh and Mouton (2007) have found, chiropractic is an underappreciated and underutilised form of treatment by the African population of South Africa, which could explain the small number of African chiropractic practitioners. Ellis (2001) found that African students were most dissatisfied with their research studies and may, therefore, have more negative attitudes towards research. As the chiropractors in this study are expected to be mostly White, the predominant attitude toward research could be assumed to be positive.

2.1.2.1.2 Motivation

According to Bergh and Theron (1999), motivation is a process that involves the purposiveness of behaviour, which refers to the causes of behaviour. Therefore, a motive can be seen as the power which prompts particular actions and thoughts (Bergh and Theron, 1999). Nash *et al*. (1990) describes two kinds of motivation: Intrinsic (internally motivated) and Extrinsic (imposed by your environment).

The most persuasive internal factors affecting perceptions are personal needs, as people tend to see whatever serves their needs (Milton, 1981). Emotion and motivation are also closely associated, leading to feelings often determining actions, and actions have an impact on feelings (Nash *et al*., 1990). As a result intrinsic or primary drives can be divided into two kinds: physiological drives (e.g. hunger, sleep, thirst.) and general drives (e.g. exploration, fear, manipulation, affection) (Hayes, 1994).

However, the type of motivation that relates most directly to perception is the survival-driven-necessity of the individual to maintain contact with their environment and to adapt behaviour to environmental change (Vernon, 1970).

Chiropractic has evolved from a hostile political environment, wherein research was greatly motivated by legitimisation and an improved public image, among other things (Keating *et al*., 1992). This can be illustrated in the study by Schwarz and Hondras (2007) where German chiropractors view recognition as the most pressing issue for the profession. Research can also be motivated by financial gain, which can be illustrated by the fact that medical aid coverage for chiropractic consultations became available following the shift in chiropractic paradigm towards scientific and evidence-based research (Chapman-Smith, 2000).

In the South African context, doing chiropractic research is part of a compulsory master's degree, required to qualify and practice as a Chiropractor as per the Allied Health Professions Act 63 of 1982 (as amended) (Chiropractic Association of South Africa, 2011; AHPCSA, 2011). Therefore the main motive being the acquisition of a qualification in order to practice.

Motivation between males and females may also differ, as males are most commonly considered to be the breadwinners of the family (Kozina, 2002), therefore their approach to their practices may differ from that of female practitioners. As most of the respondents are expected to be male and between the ages of 25 and 40 (Black, 2008; Keyter, 2010), they will be at a family and/or career driven age (Bergh and Theron, 1999; Hayes, 1994). In 2008, 53% of chiropractic graduates from the Durban University of Technology had to supplement their practice incomes by alternative means like lecturing, supplying patients with vitamins and / or ergonomic devices, and by accepting spousal or parental financial support (Black, 2008). This may indicate a strong financial motivation among chiropractic practitioners, as well as the obvious financial motivation among chiropractic students to carry out research so as to obtain their degree in order to start working. As research promotes acceptance of chiropractic among patients (Schwarz and Hondras, 2007) and patients are what makes a chiropractic practice, it can be expected that the chiropractors in this study would have a positive perception of research.

It is generally believed that the lengthiness and level of difficulty of a profession's training determines the level of prestige and achievement (Black, 2008). Having completed a master's degree in a health care profession such as chiropractic would therefore have a higher status and prestige linked to it (Ososki *et al*., 2006) as opposed to a career such as teaching (Singaravelu *et al*., 2005). The majority of respondents in this study would be expected to have completed their master's research dissertation (AHPCSA, 2011) and would, therefore, be expected to have a positive perception of research, as it provides them with status in a

profession where the education of chiropractors is often underestimated (Black, 2008; World Federation of Chiropractic, 2005).

2.1.2.1.3 Interests

Chiropractors' interest shifted from being predominantly patient-driven, to being a more patient-and-science driven profession by the 1980's (Peterson and Wiese, 1995). Chiropractors have also been expanding their interests to wellness care (Coulter, 1992). This, however, speaks only for chiropractors as a whole, whereas individual interests can vary from academic, to sports, paediatrics and other areas outside of chiropractic. Just over 30% of South African chiropractors chose to specialise or acquire additional qualifications after the completion of their degrees (Black, 2008; Keyter, 2010), 80% of which was related to the chiropractic field (Black, 2008). Enthusiasm (Soethout *et al*., 2004) as well as image, recognition and prestige (Arambewela, 2003) could be regarded as the most significant factors in choosing an area of speciality. Excitement and enthusiasm in a profession has been found to be directly proportional to the attitude of the practitioner (Dean *et al*., 2004; Liddell and Davidson, 2004). With almost a third of chiropractors acquiring additional qualifications, one could predict a generally positive attitude toward research among practitioners in this study.

2.1.2.1.4 Experience

The organisation and interpretation of environmental stimuli is influenced by learning from past experiences (Milton, 1981). It, therefore, stands to reason that older individuals would have had more experiences and, therefore, have relatively well-defined cognitive map, highlighting the likely influence that age has on perception (Bergh and Theron, 1999).

Hayes (1994) cited Erikson's whole-life theory of development, which states that each life stage has different psychosocial conflicts related to that particular stage. Most chiropractic practitioners will fall into these 3 stages:

> Young adulthood, mature adulthood and late adulthood, where the individual's goals develop from initially focusing on intimacy and trusting relationships to later focusing on achieving a productive and positive life, to eventually retrospection of life's achievements in either a positive or negative fashion (Berg and Theron, 1999; Hayes, 1994).

The focus of the individual in each of these stages are different, which could indicate a change of perception among qualified chiropractors, as they fall into different age groups.

Education will add to knowledge, which will impact on an individual's experience (Bergh and Theron, 1999; Wright and Cochrane, 2000). It can, therefore, be deduced that undereducated individuals may value their experiences higher in relation to highly educated individuals, as it would be the main or only frame of reference they have to substantiate their self-identity (Bergh and Theron, 1999). In a study done by Suter *et al.,* (2007), massage therapists showed a lower usage of evidence-based practice and a lower level of confidence when compared to chiropractic practitioners. Chiropractors have a longer course with more extensive training in medical, scientific and research components (Suter *et al.,* 2007). Most chiropractors also reported having some or a lot of experience with conducting a literature search and reading and appraising research when compared to massage therapists (Suter *et al.,* 2007). The differences in education length, difficulty and content can be attributed to their differences in research perception and utilization.

McCoy (2008) reviewed various surveys and studies and found evidence of positive outcomes in terms of research attitudes and productivity following the implementation of courses in research methodology. Based on Suter *et al's* (2007) findings, it can be hypothesized that the increased exposure to research during the research methodology courses as mentioned by McCoy (2008) could

result in an increase in confidence among practitioners, which could in turn promote a positive attitude toward (and perception of) research.

2.1.2.1.5 Expectations

Expectations refer to the individual's expectation of what will occur in a given situation and revolves around the idea that one can be in control of the consequences of behaviour (Bergh and Theron, 1999). It may be influenced by certain incentives or learned behaviours, which are reinforced by past experiences (Bergh and Theron, 1999).

Two kinds of individuals exist, according to Rotter (cited in Bergh and Theron, 1999):

- People who believe that they have control over their accomplishments and the results of their behaviour. They are believed to have an internal locus of control.
- On the other hand, people whose behaviour is reinforced by the expectancy that their accomplishments are ruled mostly by luck, fate and uncontrolled circumstances have an external locus of control.

Locus of control is very integrated in personal motivation, perception and performance and the two different expectancies react differently in most situations (Bergh and Theron, 1999). Therefore expectations may not only be generalisable by a behavioural pattern or trait, but may vary greatly between different personality types and specific situations. Factors that may influence expectancy are (Bergh and Theron, 1999):

1) the value of the potential outcomes,
2) the individual's abilities,
3) demographic factors and
4) other details relating to the specific situation.

Potential outcomes of research, when considered in the South African context, are obtaining a master's qualification, which holds great value as it is a requirement as per the AHPCSA (2011) to practice as a chiropractor (CASA, 2011).

As most South African chiropractors are expected to have qualified in South Africa (Keyter, 2010), the majority of chiropractors would have had extensive research training, with DUT allocating approximately 540 hours to research training and research activities over three years (DUT Chiropractic handbook, 2011). The research abilities of local chiropractors can, therefore, be expected to be reasonably high when compared to chiropractors in other countries.

In summary, the demographic factors as discussed above would indicate the majority of respondents to be Caucasian males in their late twenties or thirties (Black, 2008; Keyter, 2010) and with strong indicators of positive research attitudes.

2.1.2.2 Factors in the environment

According to Bergh and Theron (1999), human behaviour can seldom be interpreted without considering the context in which it occurs. Environmental influences involve all non-genetic factors that may come into play during an individual's lifetime and relates to the individual's development on all levels (Bergh and Theron, 1999):

1) psychosocial,
2) emotional,
3) cognitive and
4) physical development.

Psycho- (referring to mind, soul) –social (referring to society) refers to the interrelation of social factors and individual thought and behavior (Oxford Dictionaries, 2011) and involves an individual's mindset around and interaction

with his/her surroundings, both the environment and the people in it. In this study it refers to the chiropractor's interaction with his/her patients and fellow practitioners. Chiropractors can find themselves in a variety of surroundings, from solo practice, to multi-speciality group practices or even academic / teaching environments like universities. Each would have its own set of logistical and psychological challenges.

While a solo practice will allow the practitioner the freedom to run and manage his practice as he/she wishes, it may be difficult to take time off for holidays or even to attend postgraduate educational activities (Chung and Lau, n.d.). Reasons for this include the fact that when the practitioner leaves, his office closes and patients may be lost (Chung and Lau, n.d.). Locums may be hard to find and difficult to arrange, also, all the practice-expenses would be carried by the sole practitioner, therefore longer hours may be required to cover liabilities (Chung and Lau, n.d.).

Group practice has advantages as financial resources can be pooled to share expenses and working hours may be more flexible, depending on the arrangement. There is also ample opportunity for discussion of problem cases and exchange of medical news between colleagues (Chung and Lau, n.d.). Thus, group practice could be considered to be more advantageous as far as research activities and continuing education goes.

In a recent study done by Keyter (2010), 58.3% of South African chiropractors were in solo practice, 37.5% were involved with a multidisciplinary practice. Previously, Black (2008) indicated that the majority of chiropractors were in group multidisciplinary practices (53.2%) and only 33.9% were in solo practice, which may indicate a shift toward solo practice in the last few years. This could have a negative effect on continuing education among chiropractors and may lead to professional isolation (Chung and Lau, n.d.), though it would depend largely on

each individual practitioner and their motivation to keep abreast of current issues (Chung and Lau, n.d.).

The majority of chiropractors were found to practice in urban areas (72.5%), with 24.2% practicing in suburban areas and only 2.5% practicing in a rural area (Keyter, 2010). A possible explanation for chiropractors settling in cities could be that most patients seeking chiropractic care were based in cities (Lawrence and Meeker, 2007). Reid *et al.* (2011) found that urban medical practitioners rated professional and career development issues more highly than rural practitioners. If the same applies to chiropractic practitioners, urban chiropractors could be expected to be more involved in research and education as it is pivotal to the development of the chiropractic profession (Chapman-Smith, 2000).

Accessibility to colleagues and educational institutions may be another reason for chiropractors preferring to stay in urban areas – for example, members of CASA have monthly association meetings, which would be difficult for rural chiropractors to attend, due to travel expenses and time taken out of practice.

Emotional factors may refer to the way chiropractors feel about their surroundings, their patients and their career. When Black (2008) enquired as to whether chiropractic practitioners were satisfied at their choice of career 80% indicated that they would choose to be chiropractors again if given the choice. Mello *et al*. (2004) found that the way in which work is experienced by general practitioners correlated with the quality of care for the patients. Positive feelings, such as job satisfaction and feeling at ease, correlated with an increase of openness to patients and more attention to the psychosocial aspects of their complaints. If, like in Black's (2008) study, 80% of chiropractors have job satisfaction, they could be considered to have a generally positive outlook on their profession and, therefore, also the research that substantiates that profession.

Cognition refers to the mental action or process of acquiring knowledge and understanding through thought, experience, and the senses (Oxford Dictionaries, 2011). There are only two chiropractic training institutions in South Africa, the Durban University of Technology (DUT) and the University of Johannesburg (UJ), both of which award a Master's Degree in Chiropractic after a 5 year training programme (CASA, 2011). All South African Chiropractic graduates are required to do a master's research dissertation as part of their qualification (CASA, 2011; AHPCSA - Act 63 of 1982, as amended). Training in and exposure to research among South African graduates can, therefore, be expected to be high. In a study done by Suter *et al*. (2007), chiropractors and massage therapists' research perceptions and use was compared. Chiropractors showed a higher perceived level of research literacy (the ability to understand research) and research capacity (the ability to conduct research) when compared to massage therapists. It was thought to be due to differences in research skill, which was a result of differences in research education during professional training between the two groups (Suter *et al*., 2007). It could, therefore, be expected that South African chiropractors will have a good perception and a high level of utilization of research, as a result of their extensive training and experience with research as previously mentioned.

Physical development in this context refers to academic development. There are two chiropractic training institutions in South Africa, DUT and UJ (CASA, 2011). Findings from Bunge's (2007) research on UJ graduates, indicated that 56% reported low or no confidence in doing research, even after having done their dissertation (Bunge, 2007). The majority of UJ graduates suggested additional research tutors, more exposure to previous research, as well as practical research courses within the curriculum as necessary additions to make the research process go more smoothly (Bunge, 2007).

In a study on DUT graduates, research methods and techniques as a subject was deemed useful by only 17.7%, and the research process and dissertation

was found to be useful by only 48.4% of respondents (Black, 2008). Comments received by respondents from the same study suggested that these two subjects were not found to be practically useful in their professions (Black, 2008).

DUT students were also found to have negative attitudes about the research course, specifically with regards to its ability to prepare students to perform research (Rieder, 2010) – this may be partially due to the fact that all students were surveyed and 1st and 2nd years did not actually have experience enough to answer. However, students were more positive about questions with regards to research being a mandatory part of the chiropractic degree (Rieder, 2010).

Considering that DUT students, as well as graduates from both institutions, felt that research as a subject did not provide the necessary skills required in order to complete a masters dissertation, it can be reasoned that this will negatively affect their ability to do research. This may in turn contribute to them developing a negative attitude towards future research. Due to students struggling to complete their research as a result of perceived lack of preparation from the tertiary institutions, this negative attitude towards research is likely to be carried forward into their careers.

Some of the most prominent environmental factors that may influence perception are time, work and social setting, as well as external influences (Bergh and Theron, 1999).

In the South African context with its unique cultural diversity, it must be considered that environmental factors such as family, culture and community (Singaravelu *et al*., 2005) will also have an influence on individual perception. Rattan (2007) suggested that previously disadvantaged individuals may not have had exposure to the Chiropractic profession, which would likely affect their decision to study Chiropractic. However, as African chiropractors were found to

be in the minority (Rieder, 2010; Black, 2008), it may not have a significant effect on this study.

The chiropractic profession evolved in a very hostile political environment, which encouraged a preoccupation with public relations and image (Keating *et al*., 1992). It also caused practitioners to view challenges and criticism of chiropractic theory and practice in a hypersensitive manner. In light of this, chiropractic research was heavily relied upon to aid with legitimization and public image (Keating *et al*., 1992).

As previously stated, South African legislation, requires the completion of a master's degree in chiropractic in order to practice as per the Allied Health Professions Act 63 of 1982, as amended (CASA, 2011; AHPCSA, 2011). This differs from chiropractic legislation in other countries, where a master's is degree is a voluntary post graduate degree, which is not required for professional registration. Thereby, the environment in which South African chiropractic graduates train automatically results in an increase in exposure to research and research design when compared to graduates from other countries.

2.1.2.3 Factors in the perceived object

2.1.2.3.1 Motion

Motion refers to the global movement of chiropractors toward a scientific paradigm and evidence-based practice (Peterson and Wiese, 1995; Chapman-Smith, 2000; Haldeman, 2005). The body of research has grown greatly in the last 30 years (Chapman-Smith, 2000) and is still expanding. In 1994, the U.S. Health Resources and Services Administration's Chiropractic Demonstration Program was the first federal effort to facilitate collaborative research between chiropractic and medical institutions (Meeker and Haldeman, 2002). National meetings are also arranged to develop a research agenda for the chiropractic profession, which is aimed at targeting the need to increase the research capacity within Chiropractic (Hawk *et al*., 1997; Berman and Straus, 2004). This

may indicate that modern chiropractors should have a positive perception of research.

2.1.2.3.2 Novelty

Although chiropractic as a profession has been around for more than 100 years, most of its academic growth has only taken place in the last 20-30 years, during which time the body of literature has increased substantially (Chapman-Smith, 2000). However, chiropractic research and experimentation is not a new concept and has been done from the early stages of the profession, evidence-based research only came about in the more recent years of the profession (Keating *et al*., 1992; Haldeman, 2005). As the first chiropractic students were only accepted into the Technikon Natal in 1989 (CASA, 2011), South African graduates have only been exposed to the current state of chiropractic research, which is all evidence-based. The respondents in this study can, therefore, be expected to have a positive perception of research.

2.1.2.3.3. Sounds

Sound, as a factor influencing perception, refers to any form of communication that takes place through hearing. This may be in the form of media (as in television, radio, movies or simply through conversation with others) (Berg and Theron, 2000). In the case of chiropractic, sound may refer to the way in which the profession is portrayed on television, or what chiropractic is portrayed as through word of mouth. Chapman-Smith (2000) concludes that negative reports about chiropractic and chiropractors are far more likely to be portrayed in the media than achievements obtained by the profession in education, practice and research and that often information on chiropractic is received from a medical source, which may be based on a biased opinion. In a study done by Black (2008), only 1.6% of local chiropractors sourced patients via the radio / television / media. Botha (2009) found that the media also did not aid in forming a positive view of chiropractic among neurosurgeons, neurologists and orthopaedic

surgeons. This indicates that the media (as a communication medium) is failing to create accurate awareness of the chiropractic profession.

As research has brought awareness and acceptance to the chiropractic profession in the past (Chapman-Smith, 2000), it may still be relied upon by chiropractors to validate the profession, where the media is failing.

2.1.2.3.4 Proximity

Since the 1980's, when the focus of chiropractic changed to producing scientific research data, many organizations were established to concentrate on the production of research, specifically in the USA, Canada and Australia (Chapman-Smith, 2000). DUT and UJ are also producing scientific, chiropractic-based research in the form of a compulsory Master's dissertation (Allied Health Professions Act 63 of 1982 - as amended; CASA, 2011; AHPCSA, 2011). Research conferences are also being held annually, for example: The International Conference on Spinal Manipulation, as well as the locally organized Chiropractic Association of South Africa. With the internet becoming widely used and available to most countries, research data is readily available at a moment's notice. These factors all aid in increasing the availability of research, which could promote a positive perception of research.

However, in a study done by Mazloomdoost *et al*. (2007), it was found that the costs associated with internet access and purchasing hardware was a major barrier to gathering research information among medical students in Iran, which negatively affected their perceptions of research. A lack of access to computers was also found to be associated with lack of confidence in computer skills and research related activities (McCaughan *et al*., 2001). Females were found to use the internet less, because of lack of confidence in using computers, thereby negatively affecting their attitudes toward research (Meelissen and Drent, 2008).

Rieder (2010), however, found that as many as 91.3% of South African chiropractic students at the DUT had a computer at home and 73.2% had internet access at home. This may indicate a high level of access to computers and internet facilities among South African chiropractors and therefore more confidence with computer use. This would also indicate that both male and female chiropractors utilise computers.

As the majority of respondents in this study are expected to be male (Black, 2008; Keyter, 2010) and have home access to a computer and internet facilities, the overall computer literacy and research skills among respondents may be expected to be high, thereby predicting an overall positive perception of research.

2.1.2.3.5 Background

At the outset, chiropractic as a profession was mostly based on hypothesis and experience; no literature existed to support the practice (Keating *et al*., 1992; Haldeman, 2005). This changed in the early twentieth century when chiropractors were prosecuted in the USA for practising without a licence (Haldeman, 2005). This emphasised the chiropractic profession's need for legitimisation, which was achieved by the development of orientation, education and organisation within the profession (Keating *et al*., 1992; Haldeman, 2005). Watkins, as cited by Keating *et al.* (1992), initiated scientific organisation, which he believed was the key to producing research progression within the profession. It is believed that Watkins' (as cited by Keating *et al*., 1992) efforts inspired the establishment of the Chiropractic Research Foundation (CRF) in 1944 (Keating *et al*., 1992). Although numerous conceptualisations about the role of chiropractic existed, it was seldom based on empirical data (Haldeman, 2005). Focus on gaining a reputable body of knowledge in support of chiropractic grew, which resulted in researchers like Kelner and Coulter (as cited by Haldeman, 2005) setting out to explore accurate, empirical descriptions of chiropractic's education, practice and patients (Haldeman, 2005). This resulted in the improvement and setting of

sound educational standards for the chiropractic course and an increased emphasis on producing a body of evidence-based research substantiating previously unproven assumptions. The result of which changed the public and medical perception of the chiropractic profession, thereby gaining international acceptance (Chapman-Smith, 2000).

Chiropractic in the South African context is a relatively young profession, with the first South African chiropractic training institution only opening its doors to students in 1989 (CASA, 2011). Each chiropractic student has to complete a master's research dissertation before qualifying, thus awarding each chiropractic graduate with a master's in chiropractic (CASA, 2011). Despite this, Myburgh and Mouton (2007) found that there were still developmental issues in chiropractic from a patient and practitioner perspective: patients were confused by the lack of health care system integration and in turn displayed uncertainty in the status that a chiropractor could claim professionally and educationally. Keyter (2010) also found this to be a concern among South African chiropractors.

Scientifically based chiropractic research provided the profession with credibility among patients and the medical fraternity in the past (Chapman-Smith, 2000), which could lead to the hypothesis that modern chiropractors may place as much emphasis on research to substantiate and validate the profession (Schwarz and Hondras, 2007) in the current context. This could indicate that a generally positive perception of research may be found among chiropractic practitioners.

2.1.2.3.6 Size

Before the 1980's there was a paucity of literature available on chiropractic. However, in the last 20-30 years academic writing and research has shown dramatic growth. The profession now has an established literature base, both in its own periodicals and text books, as well as in other medical and health science publications (Chapman-Smith, 2000).

So far 353 research dissertations have been completed at the DUT alone (CASA, 2011) in the 22 years that the institution has been running, with more being completed every year. This is an average of approximately 18 new dissertations per year (CASA, 2011)

2.2 Behaviour (as it pertains to utilization)

2.2.1 Factors that influence behaviour

Milton (1981) describes two kinds of systems: open and closed. A closed system does not respond to anything outside itself. An open system, on the other hand, allows for the input of information, which is then transformed or changed in some manner to become outputs. Humans characteristically function as open systems, with sensory mechanisms (e.g. sight, sound, touch, taste, smell) regulating input and a central nervous system that interprets the inputs and responds with the output of behaviour (Milton, 1981).

Open systems have a tendency to learn or grow. In order to survive, humans have to learn, acquire new skills and develop and adopt new patterns of behaviour in a changing environment. This prevents the individual from becoming obsolete and losing material and psychological rewards (Milton, 1981).

Table 2.2 - Patterns of behaviour development (Milton, 1981):

Environment		Individual		Behaviour		Consequences
Object	⟺	Perception	⟺	Thinking	⟺	Favourable or
Person		Attitudes		Decisions		unfavourable
Things		Values		Evaluations		
		Motivation		Communications		

2.2.1.1 Perception

Since adaptive behaviour is necessary for adjusting to life's varied situations, perceptions are learned in terms of what is important, useful and favourable for the individual (Milton, 1981).

According to studies done by Suter *et al.,* (2007) and Schwarz and Hondras (2007) chiropractors have a generally positive perception of research and its importance to the profession, though it does not always translate into consistent research utilization in practice.

2.2.1.2 Motivation

Behavioural motivation can be seen as the power which drives or prompts particular actions and thoughts and is closely linked to emotion (Nash, *et al.,* 1990). In a study done by Schwarz and Hondras (2007), German chiropractors were primarily driven by the lack of legislation with regards to manipulation, as "lay practitioners" and medical doctors are also allowed to utilise manipulative techniques without much governance. Recognition of the profession may thus be seen as the main motivator behind the drive to improve chiropractic research efforts in Germany. German chiropractors also suggested implementing research activities in practice as a way to increase acceptance and establish chiropractic licensure (Schwarz and Hondras, 2007). South African chiropractors are well legislated (AHPCSA, 2011) and do not have the same concerns as German chiropractors, therefore, they may not be as highly motivated to do research as German chiropractors may be.

2.2.1.3 Thinking and representation – impact on behaviour

A schema is a form of representation, that people use to guide their actions and is described by both Bartlett and Piaget (as cited by Hayes, 1994) as the way in which humans use their past experiences to guide their behaviour. It includes memories and abstract associations that may be involved in a concept. Sensory associations, skills and plans as well as actions and knowledge are also used to create the representation (Hayes, 1994).

Anticipatory schemata refers to the individual's ability to predict or anticipate what will occur, which directs the individual's actions and the feedback from the environment allows for the schema (or expectation) to be modified as necessary. This cyclical system was described by Neisser (as cited by Hayes, 1994) and makes the strong link between perception and its integration and function in human behaviour (Hayes, 1994).

Both nurses and massage therapists have reported the negative impact of lack of knowledge about research on their utilization practices (Stetler 1994; Suter *et al*., 2007). In order to effectively utilise research in practice one has to have knowledge of the concepts of basic research and how to interpret and translate raw statistical data for use in practical situations (Stetler, 1994). As South African chiropractic students each have to complete a master's research dissertation before qualifying (CASA, 2011), it can be assumed that they have adequate knowledge in the concepts of basic research and its interpretation. However, translation into practical situations is not included in the training or research process and may be reliant solely on the individual chiropractors' ability to apply information in a practical manner. Its effect on this study can, therefore, not be accurately predicted.

2.2.1.4 Learning and behaviour

The existence of a "mental set" was demonstrated by Harlow in 1949 when his experiments with rhesus monkeys showed that they could develop generalised learning sets when repeatedly exposed to tasks which involve trial-and-error learning (Hayes, 1994).

Literature comparing research utilization between chiropractors and massage therapists reiterates the fact that an increase in research education or exposure translated into more evidence-based behaviour (Suter *et al.,* 2007). Mastery of research literature and capacity skills are critical for incorporating results of research studies into clinical practice (Suter *et al*., 2007).

Luchins, as cited by Hayes (1994), described the existence “of Einstellung” in 1942 when he demonstrated the power of a mindset in human problem solving. The subjects could solve a familiar type of puzzle very easily but their previous experience had made them less able to perceive a new solution. His study showed how previous experience can make approaches more rigid and prevent people from looking at problems with a clear perspective (Hayes, 1994). Based on this fact it can be hypothesised that older chiropractors who have been in practice for a long time may, therefore, be more likely to stick to their established practice protocols than change policies based on research. As the majority of respondents in this study are expected to be in their early 30’s and have been in practice for less than 10 years (Black, 2008; Keyter, 2010), they may be expected to be more open to utilising research findings in practice and changing practice protocols.

“Groupthink” refers to the assumption within long-term, real-life groups (in this context, chiropractors) that everyone in the group thinks in the same way. This puts group members under pressure and makes them less likely to disagree openly with one another (Hayes, 1994). When questioned about research, most chiropractors agree about its importance and value to the profession (Suter *et al*., 2007; Schwarz and Hondras, 2007). However, this seldom translates into practice (Suter *et al*., 2007; Schwarz and Hondras, 2007). As, the chiropractic profession, has research to thank for its current status as an accepted and legitimate form of therapy (Chapman-Smith, 2000), chiropractors as a group may feel obliged to have a positive perception of research. Personal opinion on the fact may not correlate with the “groupthink” mentality with regards to research. The fact that research is praised yet unutilised (Suter *et al*., 2007; Schwarz and Hondras, 2007) may be an indication of this.

Stetler (1994) describes conceptual utilization, which refers to changing the way one thinks about a situation. It is best described by the term enlightenment and

manifests as the non-specific, gradual changing of behaviour due to the changing understanding or awareness of a specific topic (Stetler, 1994). This type of utilization may occur more frequently than the concrete application of findings (Stetler, 1994).

2.1.5 Attitudes and behaviour

Milton (1981) describes attitudes as having 3 dimensions (Milton, 1981):

a) a cognitive dimension, which includes the reasons and explanations which people will give for why they hold a particular attitude.
b) an affective dimension, which includes the way they feel about their attitudes.
c) a behavioural or conative dimension, which is to do with how likely people are to act on the attitudes that they hold.

A positive attitude was linked to chiropractic students' progress status within the research process (Rieder, 2010).

2.2.1.6 Environmental effect on behaviour

Human behaviour is thought to be directed, controlled and formed by environmental and situational influences (Bergh and Theron, 1999).

Humans are conditioned to react in certain ways to a variety of environmental stimuli as a result of learned experiences (such as conditioning, association, imitation and modelling) from the individual's history or past (Bergh and Theron, 1999). Lasting behaviour patterns develop when these stimuli are repeatedly experienced and the response practised.

Stetler (1994) found that the setting in which nurses practiced greatly influenced their research utilization and was counted among the most significant barriers to effective utilization. Lack of time to investigate a problem or implement

innovations was cited to be an obstacle in research utilization (Stetler, 1994). Recently, the majority of local chiropractors were found to be in solo practice (Keyter, 2010), though multidisciplinary practices were most common three years ago among DUT graduates (Black, 2008). Practitioners in solo practice may have less time for research than their counterparts in multidisciplinary practices, due to being the sole practitioner responsible for patients and practice costs (Chung and Lau, n.d.). This could have a negative impact on their utilization (Stetler, 1994). In multidisciplinary practices there are also many opportunities for discussion of problem cases or research among practitioners of different professions, which may increase the occurrence of "conceptual utilization" as described previously (Stetler, 1994). Multidisciplinary practices may, therefore, be considered to facilitate research utilization in chiropractic practices.

2.3 Conclusion

Chiropractic as a profession has much to offer mainstream medicine (Chapman-Smith, 2000; Meeker and Haldeman, 2002). It is a cost-effective, non-invasive, drug free treatment for some of the most common complaints of the twenty-first century patient (Chapman-Smith, 2000). In modern society, professional groups and the general public are greatly influenced by the pronouncements made by scientists (Haldeman, 2005). This illustrates the major role that research plays in medicine (Chapman-Smith, 2000; Haldeman, 2005). If chiropractic can prioritise and collaborate their research efforts with other health care professionals, the profession can move toward a primary contact speciality role (Chapman-Smith, 2000) and ultimately ensure the future of chiropractic in health care. At the core of this are the practitioners who make up the chiropractic profession. Zhang (1996) stated the importance of chiropractic graduates as future researchers and their responsibility to continue the positive trend of relevant research activity. Research is the future of chiropractic and it is in the hands of its practitioners (Merritt, 2011; Zhang, 1996).

Therefore, this research aimed to determine how chiropractors perceive and utilise research, and to which extent utilization was affected or determined by perception and previous research exposure. If hindering factors were identified, steps can be taken to change negativity at a training level, thereby ensuring positive participation and utilization of research among all future chiropractic graduates.

Chapter Three: Methodology

3.1 Introduction

This chapter covers the study design, methodology used, sampling procedures employed, inclusion criteria, exclusion criteria, methods employed and data analysis.

3.2 Study Design

A population-based demographic study on South African chiropractors' utilization and perceptions of research was conducted. Therefore this study was a perception survey (Wisker, 2001), which was quantitative in nature and made use of a structured questionnaire (Appendix A) to collect data. A descriptive design was utilised in a quantitative questionnaire in order to evaluate, in a structured manner, the perceptions that chiropractors held with respect to research (Wisker, 2001 and Dyer, 1997). Questionnaires are generally considered to be an appropriate method of research, providing ways of ascertaining attitudes, opinions and perceptions (Booysen, 2003).

This study in its current design was approved by the Faculty of Health Sciences Research and Ethics Committee, indicating that this research fulfilled the requirements of the Declaration of Helsinki (1975) – see Appendix I.

3.3 Methodology

Survey research is a way of collecting information from a large and dispersed group of people (Dyer, 1997). Thus, the primary data for this research was collected by means of a questionnaire developed by the researcher after a review of the literature (Schwarz *et al*., 2007; Suter *et al*., 2007) and dissertations completed at DUT (Black, 2008; Butt, 2008; Heslop, 2008; Rieder, 2010).

3.4 Advertising

No advertising was used by the researcher.

3.5 Sampling Procedure

3.5.1 Participant Sampling

A list of addresses of chiropractors currently practising in South Africa was obtained from Korporaal (2010) as well as the AHPCSA (Terry, 2009).

a) Sample size

The sample in the study was the total population of chiropractors. Five hundred and fifteen chiropractors were identified in the nine provinces (as per correspondence with AHPCSA (Terry, 2009)), amended by Korporaal, (2009) (to ensure compliance with the inclusion and exclusion criteria) that made up the sample group. This figure also took into account the chiropractors that had to be excluded from the study due to their participation in the focus group and pilot study.

b) Allocation

All respondents were allocated to one group with subgroup analysis being utilized for statistical analysis only.

c) Method

The type of recruitment was total population selection; however respondents had an option as to whether they are willing to take part in the research or not – a process referred to as self selection (Mouton, 1996; Dyer, 1997). As a result of this process, the population group may not be accurately represented, resulting in a bias response (Mouton, 1996). It is, however, inevitable that any sampling process, no matter how

carefully carried out, will always result in a sample that is less than perfectly representative of the population (Dyer, 1997).

3.6 Sample characteristics

3.6.1 Inclusion criteria

- Only chiropractors that were practising in South Africa and were registered with the Allied Health Professions Council of South Africa at the time of the study were able to participate in the study.
- Informed consent was implied with the completion and return of the questionnaire.
- All questionnaires were utilized for data analysis. Missing or incomplete data was noted as such in data capture and analysis.

3.6.2 Exclusion criteria

- Chiropractors who participated in the research focus group.
- Chiropractors who participated in the pilot study.
- Chiropractic students registered with the Durban University of Technology, the University of Johannesburg or any other chiropractic college outside the boarders of South Africa.
- Chiropractors who do not meet the above inclusion criteria.
- Chiropractors who were unable to speak, understand or write in English. This did not exclude any practitioner as all practitioners qualifying in South Africa would have had to complete the masters degree in English in order to be able to practice (DUT handbook, 2011; AHPCSA, 2011).

3.7 Procedure

Once the questionnaire had been developed fully, the questionnaire was posted or emailed to all chiropractors that were practicing in South Africa as per the list received from the AHPCSA (Terry, 2009), as amended by Korporaal (2009).

The questionnaires were posted to 36 chiropractors who did not have email addresses and emailed to 479 of the registered chiropractors who had email addresses.

The email included the questionnaire (Appendix A), which was accompanied by the Letter of Information (Appendix B) to introduce the research project in general. The information included the title of the study, the objective of the study and reassured all respondents of the confidentiality of the information and the anonymity of their responses. Participation in the study was entirely voluntary. No informed consent form was included, as participation would be an implied consent with the return of the questionnaire (Mouton, 1996).

Posted questionnaires included the above, as well as a pre-addressed and stamped envelope to assist in the return of the questionnaire.

The respondents were given four weeks to complete the questionnaire, after which the questionnaire was re-mailed to non-respondents. Once the questionnaire was completed, the respondent was required to post, email or fax the questionnaire to Durban University of Technology (DUT) to a neutral third party in order to ensure anonymity (Appendix C).

The Department Research Officer then ticked off the names on the return e-mails / envelopes against a list of potential participants so that a response rate could be determined.

The Department Research Officer then printed out the questionnaires for use by the researcher, but first deleted the names of the participants, in order to retain anonymity. The hard copy was then stored in a locked filing cabinet.
If questionnaires had not been returned after another 8-week period, the participant in question was considered as “not participating” in the study.

Data analysis then took place.

3.8 Questionnaire Background and Design

3.8.1 Measurement tool

This was by means of a questionnaire. The researcher reviewed similar perception-related questionnaires, which were completed both locally and internationally (Schwarz *et al*., 2007; Suter *et al.,* 2007; Black, 2008; Butt, 2008; Heslop, 2008; Rieder, 2010). Questions were then developed which were specifically aimed at obtaining information regarding qualified chiropractors' utilization and perception of research. The questionnaire was then compiled, which was presented to a selected focus group for review and discussion.

The questionnaire design employed a simple answering system (Booysen, 2003), using marking boxes and limited open-ended questions (Booysen, 2003), which also facilitated fluent data collection (Booysen, 2003).

Questionnaires are the tool of choice for a project such as this, as they ensure that bias, on the side of the researcher, is kept to a minimum, and there is less choice of misinterpretation of results (Mouton, 1996).

3.8.2 Focus Group

In order to adapt the questionnaire and ensure that the questionnaire met the minimum requirements as set out by Mouton (1996), a focus group was set up to stimulate the members of the group's thinking and encourage them to develop ideas about the topic (Salant and Dillman, 1994). This enabled members of the focus group to critically assess the relevance of questions presented in the questionnaire as well as to add to, delete from or modify for clarity the questions, in order to establish the face validity of the adapted questionnaire. According to the minimum requirements, the focus group was required to have six to ten homogenous (viz. with the ultimate sample) participants that take part in a relatively structured interview (Mouton, 1996).

a) **Face Validity** was determined by agreement between researchers and those with an interest in the questionnaire (as pertaining to this study, would be the participants of the focus group), that on the face of it the measurement tool (that is, the questionnaire) seems valid, unambiguous and easily interpreted (Bernard, 2000).

b) **Construct Validity** measures how accurately answers to questions on a scale reflect theoretical predictions of a particular construct (Bernard, 2000) being measured. These validity constructs were achieved by ensuring that the individuals in the focus group were representative of the specific areas of expertise related to the research to be conducted.

The focus group consisted of seven people, which included: the researcher, the supervisor, who is a member of the Chiropractic Department, four qualified, practising chiropractors and one Chiropractic Student completing his master's degree at the Durban University of Technology. All of the participants were selected to take part due to their familiarity with the topic of the research and their similarity to the intended respondents of the survey.

Before commencing, each participant was required to read the Letter of Information (Appendix D), and sign the Letter of Informed Consent Form (Appendix E). A confidentiality statement (Appendix F) and a code of conduct statement (Appendix G) were also signed by the participants to ensure that these members would not disclose this information to the rest of the study sample. In the focus group each participant was given copies of the original questionnaire (Appendix H). The questions were discussed in sequential order, following the procedure as stated by Morgan (1998). Comments were requested on how the questionnaire could be modified in order to accurately assess South African chiropractors' utilization and perception of research.

Following the discussion of each question, some changes were made to the questionnaire to enhance the understanding of a few of the questions. The pre-pilot questionnaire was then developed (Appendix I).

3.8.2.1 Focus group Questionnaire changes:

Section A:

2.1) "Which chiropractic school did you graduate from" became "*Where did you attend chiropractic school?*"

2.2) "Which year did you graduate" became "*When did you complete the above course*"

2.3) "What qualification did you obtain from the chiropractic school became "*How many years of study were required to complete the chiropractic course?"*

2.4) "What other tertiary qualifications do you hold" became *"What other post-school qualifications do you hold"*

3.1) When asking how many years the respondent had been practising as a chiropractor, year increments increased from 5 years to 10 years.

3.2) When asked about the area that the respondent practiced in, City-urban and city-suburban fell away and became *"urban".* Also, "combination" became "*both*".

3.3) [Chiropractic and other alternative group practice] and [Chiropractic and medical group practice] combined to become "*Multi-speciality group practice"*.

3.4) The option of picking "Other SADEC country" fell away.

3.6) When indicating from which other health care practitioners the respondent received referrals, Homoeopaths, Orthopaedic specialists and Paediatricians were excluded. Instead, specialist physicians were included.

4) Abdominal, respiratory and cardiovascular examinations, as well as gait analysis were excluded from examination procedure use.

5) Blocking, immobilisation techniques, kinesio-taping, spinal manipulative therapy and strapping were excluded from treatment technique options.

6) “Have you ever conducted research for qualification purposes” was shortened to “*Have you ever conducted formal research?”*

Section B:

7.2) This question was shortened to “when did you conduct the abovementioned research?”

7.5) Would you do further/additional research if given the chance?” was shortened to “Would you do research again if given the chance”.

7.6) Requiring a reason to the yes/no question was excluded.

Section C:

General:

Choice of boxes changed from the 4-option “strongly agree, agree, disagree, strongly disagree” to a 5-option “strongly agree, agree and strongly disagree” with an option between each.

Statements that were excluded: (8.1), (8.10) and (8.21).

Statements that were combined included: (8.2) and (8.7), (8.8) and (8.16) as well as (8.12) and (8.13).

The following negative statements were changed to positive: (8.4), (8.5), (8.6), (8.15), (8.19) and (8.20).

Section D:

Statements (9.10) to (9.13) were excluded.

Section E:

Statements (11.5), (11.14) and (11.16) were excluded.

Statements (11.1) and (11.2) were combined, as well as statements (11.7) through (11.12).

3.8.3 Pilot study

After a pre-pilot group questionnaire was developed (Appendix I), the questionnaire was discussed by the Departmental Research Committee (members excluded from the main sample), after which a pilot study was conducted on four respondents that matched the inclusion / exclusion criteria of the study. They were given a chance for any comment on the questionnaire. The purpose of this was to see how long it took to complete the questionnaire and to ascertain whether or not the questions were appropriate and understandable, as well as if the information gained from the questions would be correct, necessary and usable. It was also assessed whether or not the questionnaire would yield results which answer the research question adequately (Fink and Kosecoff, 1985; Hicks, 2004). The pilot study participants were excluded from the main study.

Pilot study questionnaire corrections: No changes were made to the questionnaire.

Through this exercise, the final questionnaire was developed and printed for use in this study (Appendix A).

3.8.4 Final questionnaire

The final questionnaire consisted of 62 questions covering the following areas:

- Section A: The respondents demographic and practice data.
- Section B: The respondent's research participation.
- Section C: The respondent's perceptions pertaining to chiropractic research.
- Section D: The respondent's research utilization.
- Section E: The respondent's view of the future of chiropractic research in South Africa.

3.9 Statistical methodology

SPSS version 15.0 (SPSS Inc., Chicago, Illinois) was used to analyse the data. A *p* value <0.05 was considered as statistically significant. Perceptions were scored by summing together the responses to items under section C (after reversing the scoring so that a “strongly agree” response had the highest score) and dividing the sum by 90 and multiplying the result by 100 to obtain a percentage such that the higher the score, the more positive the perceptions. The same was done for utilization using items under section D (a) 1-9. Perceptions and utilization scores were compared between binary factors using independent samples t-tests and between more than two groups using ANOVA testing. Pearson’s correlation analysis was used to assess relationships between two quantitative variables.

Chapter Four - Results and Discussion

4.1 Introduction

This chapter is a representation of the statistical analysis of the results obtained from the respondents in this study as well as a discussion of these results. Even though this is not the norm for standard dissertation presentation, this format was used in order to enable a more concise approach to presenting the results and discussion, as writing it as two separate chapters can at times become complex in a perception study such as this.

4.2 Review of objectives

Primary objectives:

- The first objective of this study was to determine the general perception that chiropractors have of research and its perceived role in the chiropractic profession.
- The second objective was to determine the utilization of research among chiropractic practitioners and its practical application and influence on patient management and treatment protocols.

Secondary objective:

- The third objective was to determine any associations between the factors that influenced perception and usage of research when compared to the demographics, education and practice habits of practitioners, in order to establish whether or not there are observable relationships between these factors.

4.3 Data

- **4.3.1 Primary data**

Primary data was obtained from respondents in this study answering the questionnaire (Appendix A).

- **4.3.2 Secondary data**

This particular data came from many different sources, which included but where not limited to: textbooks, journal articles, specialist internet search sites and personal communications as cited in the reference list.

4.4 Abbreviations specific to this chapter

%	=	percentage.
<	=	refers to a figure “less than” the figure reported.
CMCC	–	Canadian Memorial Chiropractic College.
DUT	–	Durban University of Technology.
LACC	–	Los Angeles College of Chiropractic.
N	=	number.
n	=	refers to sample size.
p value	=	probability value.
Q	=	question.
SD	=	standard deviation.
UJ	–	University of Johannesburg.

4.5 Response rates

The total number of registered chiropractors as per correspondence with AHPCSA was 515:

- Ten of these had moved overseas,
- Ten were excluded by means of the focus group, pilot and departmental research meeting, and
- Thirteen were no longer in practice, rendering the total number of eligible chiropractors to be 482.

A thirty five percent response rate was required for the study to be viable. Fifteen chiropractors responded by declining participation and 159 chiropractors responded to the questionnaire, totalling 174 responses, which amount to a total response rate of just over 36%.

Non-response to the questionnaire is a possible source of bias (AP Statistics Tutorial, 2011; Barclay *et al*., 2002) in the study findings, and as little information exists on the non-responders, the potential impact on these results could not be assessed. Therefore non respondents were separated from those declining to participate in this study.

4.5.1 Discussion of the benefits and / or disadvantages of the percentage response

The overall response rate of 35% percent achieved was low, although still comparable to similar enquiry studies (Jette *et al*., 2003; Caldwell *et al*., 2007; Suter *et al.*, 2007; Black, 2008). According to Lindström (2007), a response rate in the range of 40-100% can be generalisable to the entire population, particularly if the sample is highly representative of the general population to which the data is applied. This may have implications with regard to generalisation of the findings in this study. Nonetheless, the present results

provide a preliminary insight into the perceptions of chiropractors, the views of which have been to a large extent lacking in the general literature.

The low response rate may, in part, be explained by the possibility that the participant's email and postal addresses contained in the member databases may not have been the most recent. Thus, the potential participants may not have been recruited because of addresses that were no longer valid (Terry, 2011). Conversely, response rates are inversely related to the length of the questionnaire. The questionnaire in this study consisted of 997 words, which could predict a higher response rate, as it was found in a study by Jepson *et al.* (2005) that questionnaires that fall below the 1 000 word threshold had a higher response than questionnaires with a higher number of words.

In order to improve responses, mailing advance incentives to all potential participants was suggested by Lapane *et al.* (2007) and Edwards *et al.* (2002) as a way to increase response rates. However, no incentives were offered prior to or on completion of this study and therefore an increase in response rate was not expected / manufactured.

However, the questionnaire in this study was e-mailed / mailed multiple times to all potential participants, as literature found that this approach could yield a better response rate as well as increasing the diversity of the respondent pool (Lapane *et al.*, 2007; Edwards *et al*., 2002).

Furthermore, the questions in this survey addressed a potentially sensitive subject, research, and respondents may have been familiar with the neutral third party who collected the completed questionnaire for the researcher. This may have influenced response rates. Questionnaires that contain questions of a sensitive nature were less likely to be returned (Edwards *et al*., 2002) therefore the response rate in this study may be negatively affected.

The relatively low overall response rate may also have biased the findings as it can be argued that chiropractors with positive perceptions of research may have been more likely to respond. It may be that only the very highly motivated and opinionated section of the sample would have taken the time to respond (Sociology Central, 2011). Thus, the results may not necessarily reflect the overall prevailing perception of chiropractors toward research (Suter *et al*., 2007).

To summarise: Factors that could have caused the response rate to be low are:

1) Lack of incentive,
2) Inaccurate mailing addresses,
3) The high sensitivity factor of the topic addressed and
4) The possibility of respondents' familiarity with the third party that collected the questionnaires on behalf of the researcher.

Factors that could have positively affected the response rate are:

1) The length of the questionnaire was less than 1000 words,
2) The questionnaire was mailed/e-mailed multiple times to each chiropractor,
3) Posted questionnaires each contained a pre-addressed, stamped envelope for easy return.

4.6 Results

4.6.1 Demographics, Education and Practice background

4.6.1.1 Age

Table 4.1 – Age of respondents

N	Valid	154
	Missing	5
Mean		36.40
Standard Deviation		11.759
Minimum		24
Maximum		75

4.6.1.2 Ethnicity

Table 4.2 – Ethnicity of respondents

	Frequency	Percent
African	1	0.6
Asian	3	1.9
Coloured	1	0.6
Indian	14	9.0
White	136	87.2
Other	1	0.6
Total	156	100.0

4.6.1.3 Gender

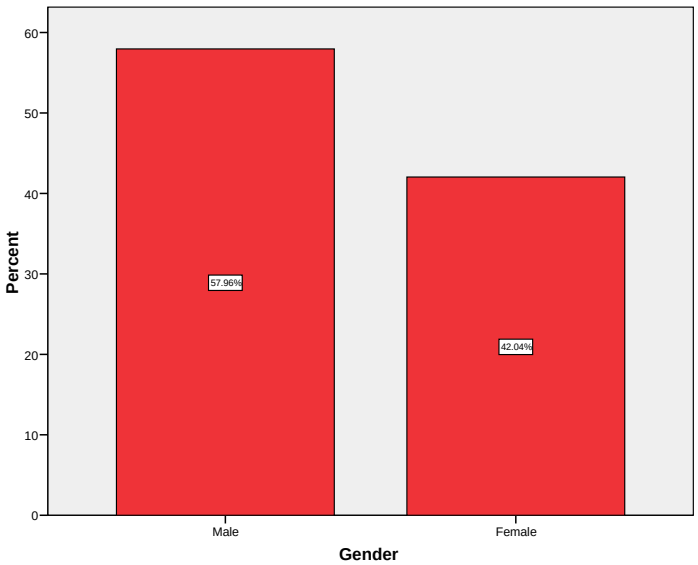

Figure 4.1 – Gender of respondents

4.6.1.4 Where did you attend Chiropractic school

Table 4.3 – Chiropractic institutions where respondents studied

	Frequency	Percent
Durban University of Technology: Durban, SA	84	52.8
University of Johannesburg: Johannesburg, SA	46	28.9
Palmer College of Chiropractic: USA	14	8.8
Anglo European College of Chiropractic: Bournemouth, UK	4	2.5
Life Chiropractic College: Atlanta, USA	2	1.3
Canadian Memorial Chiropractic College: Toronto, Canada	1	0.6
DUT and UJ: SA	1	0.6
Los Angeles College of Chiropractic: USA	1	0.6
Macquairie University: Sydney, Australia	1	0.6
Life Chiropractic College: Georgia, USA	1	0.6
National College of Chiropractic: Illinois, USA	1	0.6
National University of Health sciences: Chicago, USA	1	0.6
North-Western Health Sciences University: Minnesota, USA	1	0.6
Sherman College: South Carolina, USA	1	0.6
Total	159	100.0

4.6.1.5 When did you complete the course?

Table 4.4 – Year of chiropractic course completion

	Year	Frequency	Valid Percent	Year	Frequency	Valid Percent
Valid	1961	1	0.7	1994	5	3.3
	1963	2	1.3	1995	3	2.0
	1968	2	1.3	1996	4	2.6
	1969	3	2.0	1998	3	2.0
	1970	1	0.7	1999	2	1.3
	1972	1	0.7	2000	9	5.9
	1975	1	0.7	2001	6	3.9
	1977	1	0.7	2002	7	4.6
	1978	1	0.7	2003	8	5.3
	1980	1	0.7	2004	8	5.3
	1981	2	1.3	2005	16	10.5
	1985	2	1.3	2006	9	5.9
	1987	2	1.3	2007	11	7.2
	1988	1	0.7	2008	11	7.2
	1989	1	0.7	2009	17	11.2
				2010	11	7.2
Total		152		100.0		

4.6.1.6 How many years did you study?

Table 4.5 – Years of study

N	Valid	157
	Missing	2
Mean		6.334
Standard Deviation		1.1677
Minimum		3.0
Maximum		10.0

4.6.1.7 Additional studies

Table 4.6–Additional studies (to their chiropractic master's)

		Responses		Percent of Cases
		N	Percent	
(a) Other qualification	1) Short course	51	45.1%	54.3%
	2) Diploma	33	29.2%	35.1%
	3) Honours	3	2.7%	3.2%
	4) Bachelor's	20	17.7%	21.3%
	5) Master's	6	5.3%	6.4%
Total		113	100.0%	120.2%

4.6.1.8 How many years have you been practising as a chiropractor?

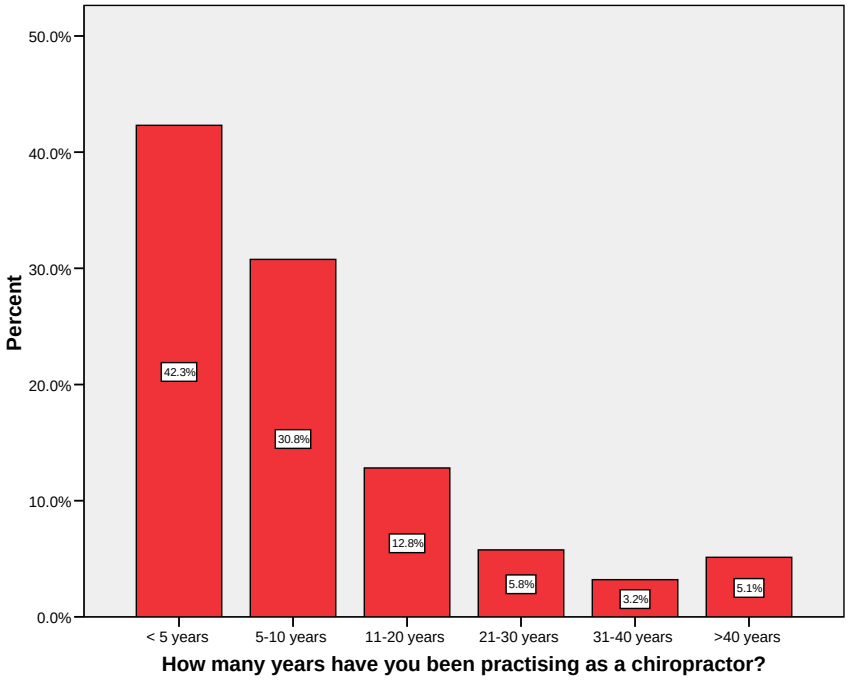

Figure 4.2 - Years in practice

In summary, 58% of the respondents were male (Figure 4.1), mainly White (87.2%) (Table 4.2). The mean age was 36.4 years of age with an age range of 24 to 75 years (Table 4.1). The majority of respondents qualified at DUT or UJ, with respondents having qualified as far back as 1961, to as recently as 2010. The majority of respondents (11.2%) qualified in 2009, with the average number of years studied indicated as 6.3 years (range from 3 to 10 years). In terms of additional studies, the majority of respondents had done an additional short course (54.3%).

4.6.1.9 Discussion of Respondent demographics

a) ***Gender***: Fifty eight percent of the respondents in this study were male. This is consistent with demographics of the 515 chiropractors listed by the AHPCSA (2011), as 60% are male. This gender percentage also correlates to a study done by Schwarz and Hondras (2007) on qualified German chiropractors. However, in recent findings from studies done by Rieder (2010), Fyfe (2006) and Newell and Cunliffe (2003), the majority of chiropractic students were female, which could indicate a possible shift in chiropractic, from being a predominantly male profession at current to becoming a more female dominated profession in future years (Black, 2008).

The male dominance could be explained by the fact that females would more likely to have parenting responsibilities (Dinham and Scott, 1999). This correlates to the predominant age of chiropractors in this study, as the average age was 36.4 years. In a study done by Black (2008), the majority of chiropractors were married and 37.7% had dependants. It was also found that often female graduates, especially in their thirties, take time out to raise their children (Chan and Willet, 2004), often preferring to settle for family life, whereas their male counterparts most often carry the responsibility of being the primary source of income for the household

(Dieden, 2004), thereby being more driven to pursue and continue their careers.

Motivation between males and females may also differ, as males are most commonly the primary income holder of the family, and therefore their approach to their practices may differ from that of female practitioners. Based on this, it could be hypothesised that males will focus their time in practice (viz. seeing patients), versus spending time on family responsibilities directly involving the children. Notwithstanding, the differences in motivation, Newell and Cunliffe (2003) found that there were only minor differences in perception of research between genders, the most significant being that female students had less confidence in doing research and male students were more positive when asked if they would consider being involved in research as part of their job in future. This could indicate that the females, in this study, may have a less positive experience and thus their perception of research may be similarly affected. This concurs with a study done by Wright and Cochrane (2000), where females were reported to be less satisfied with their research education experience, indicating that they may have a less positive perception of research than males. However, this conflicts with studies that have shown that female and male participation in research education is equal (Martin *et al*., 2001; Bills, 2003), with higher completion rates among females, which may suggest that females may have a more positive attitude to research compared to males.

Considering all the variable factors that pertain to gender, it is difficult to accurately anticipate and generalise the effect of gender on the perception of research.

b) ***Ethnicity***: Most respondents were White (87.2%), followed by Indian (9%). The least represented ethnic groups were African and Coloured groups with less than 1% each. This is in keeping with the demographics

of chiropractors as shown by Black (2008), but it is not a fair representation of the South African population as the African ethnic group makes up the majority of the population (Rattan, 2007; Statistics South Africa, 2011).

Ethnic minorities in a particular field may be due to factors in the environment, such as family, culture (Korporaal, 2008) and community (Singaravelu *et al*., 2005). Poor domestic circumstances and a lack of finance (Sukovieff, 1989) may also limit and possibly negatively affect an individual's career path. In a study done by Rieder (2010) on chiropractic students, 66.2% of the student population was White, 19.1% were Indian and 9.6% were African, which shows a significant change in White, Indian and African population groups.

Therefore, in terms of the effect that the ethnic groups bring to the perception of research within the chiropractic context, it must be considered that Ellis (2001) showed that African students were most dissatisfied with their research studies and may therefore have more negative attitudes towards research. This could indicate a possible negative effect on the overall perception; however, as the African population represents less than 1% of the respondents in this study, its effect could be regarded as negligible. This may, however, be a greater factor in future studies of a similar nature, as the African population will feature more strongly among qualified chiropractors in the years to come (Rieder, 2010).

c) ***Age***: The respondents were between the ages of 24 and 75, the mean age being 36.4 years. This is in keeping with the findings in Schwarz (2007), Suter *et al.* (2007) and Black (2008). In terms of the effect of age on the perception of research, it has been found that young people have limited experience and knowledge (Haverly, 1998), which may affect their perception. In contrast however, the majority of respondents fall into the

mature adulthood category, which is 35 – 55 years of age (Hayes, 1994; Berg and Theron, 1999). During this life stage, the focus is on achieving a productive and positive life (Hayes, 1994; Berg and Theron, 1999) and establishing a family and career. This could indicate an overall positive perception of research, as it could be considered to be integral to the validation and recognition of the individual's career path (Schwarz and Hondras, 2007). Therefore, it can be expected that a strong career drive among chiropractors of this age would have a positive effect on perception as it pertains to this study.

d) Practice time: The relatively young mean age, as well as the predominant short practice-time of less than 5 years, can be explained by the fact that chiropractic training institutions are a recent development in South Africa, with the very first Chiropractic students being accepted into the Technikon Natal (now DUT) in 1989 (CASA 2011). Just prior to this time (1970's and early 1980's) however, the chiropractic profession developed in a difficult political environment (Chapman-Smith, 2000; Haldeman, 2005), which encouraged a preoccupation with public relations and image within the profession (Keating *et al*., 1992), and chiropractic research was heavily relied upon to aid with legitimization and public image (Keating *et al*., 1992). Only in the late 1980's, early 1990's did common ground and cooperation exist between some medical professions and chiropractors (Brantingham and Snyder, 1999). This brought about a shift in the status and acceptance of the chiropractic profession (Chapman-Smith, 2000). As the first South African chiropractic training institution only started admitting students in 1989, it can be reasoned that chiropractic in South Africa was born into an evolving environment that was moving toward supporting and accepting chiropractic into the mainstream health care sector.

This may in turn have a negative effect on the perception of research, as research might not be considered to be as vitally important among South

African graduates as it may have been to the older generation of chiropractors who required this to validate their profession. However, it is possible that younger graduates would see research as a tool to further empower themselves to actively engage with other medical professionals and to further improve collaborations and interprofessional ties (viz. conferences, research workshops, and other presentations). Interprofessional ties and referrals have been shown to influence the perception of research positively (Ramsey *et al*., 2004).

e) Institutions of training; The University of Johannesburg (UJ) and the Durban University of Technology (DUT) are currently the only chiropractic training institutions in South Africa, which explains why the majority of respondents had studied at these institutions. Prior to the establishment of UJ and DUT, chiropractic had to be studied abroad (Chapman-Smith, 2000), which accounts for the smaller numbers reflected for other institutions in this study.

With particular reference to the South African chiropractic training institutions, these are the only institutions in the world that are required by legislation to enforce the completion of a compulsory master's degree in chiropractic in order to allow the graduate to qualify as a chiropractor and thus register as a chiropractor with the AHPCSA (as per the Allied Health Professions Act 63 of 1982, as amended). In all other countries that train chiropractors, the minimum requirement for registration is a bachelors / honours degree or equivalent, with a masters degree being voluntary (Anglo European College of Chiropractic, 2011; Life University, 2011; Palmer, 2011).

This means that all South African graduates will have had more experience with research than the average overseas graduate. As South African graduates would associate research with acquiring their qualification, it can be predicted that this would be a positive experience

for them, resulting in a positive perception of research (Rieder, 2010). However the masters research requirement is at times an arduous process and those students / graduates that are more practically / clinically inclined, may have found the process challenging and frustrating. This often results in a negative perception of research, as one's environment can have a substantial effect on perception (Bergh and Theron, 1999).

f) The ***average number of years that participants studied*** was 6.3 years, but ranging from 3 to 10 years. The minimum time in which a master's degree can be achieved at South African institutions is 5 years, but studying can be extended as a result of failing subjects or taking a longer time to complete research (DUT Chiropractic Handbook, 2011). Today, the maximum time available to complete the chiropractic programme is 12 years, consisting of a maximum of six years for the three year national diploma, a maximum of two years for the one year B.Tech degree and a maximum of four years to complete the two year M.Tech degree (DUT Handbook, 2011).

In 2010, 40.6% of DUT students reported having failed a subject (Rieder, 2010). Marquis and Brush (1966) associated subject failure, lower grades and an overall lower quality of research, to a delay in completing post-graduate research. Mouton (1996) then linked delays in completing research to negative perceptions of research. As the majority of respondents qualified within 6.3 years, the qualification was achieved within 1.3 years of the minimum time allocated to complete a master's qualification. This would indicate that there was a minimal delay in qualifying, which could indicate an overall positive perception of research among respondents.

Curricula at European and American Chiropractic training institutions vary anything from 3 years (Palmer College of Chiropractic, 2011; Life

University, 2011; Canadian Memorial Chiropractic College, 2011) to five years (AECC, 2011) with most institutions offering additional courses after the basic degree. During the average 3 to 4 year chiropractic training, an average of 30 to 50 hours is spent on research and research methodology (Cherkin and Mootz, 1997; Chapman-Smith, 2000). This is in keeping with The World Health Organisation's minimum requirement guidelines for Chiropractic Education (World Health Organisation, 2004), which recommends the equivalent of at least 32 hours of teaching of an applied research and biometrics course. In contrast the DUT Chiropractic programme has allocated approximately 540 hours to research training and research activities over three years (DUT Chiropractic Handbook, 2011).

To support this, it has been noted that significantly more positive attitudes were found in undergraduates with previous research experience (Newell and Cunliffe, 2003), with the opposite applying to poor research training (Aslam *et al.,* 2004). Also, an association was found between a higher educational level and research utilization (Rodgers, 2000). Therefore, it is expected that students from DUT/UJ should be more positive towards research following their extensive research training and should also have a higher level of research utilization in practice.

g) To support the above expectation, it was noted that 59% of the respondents in this study had done **additional studying,** either prior to or after completing the chiropractic degree, with 54.3% completing a short course and 35.1% having completed additional diplomas. In a prior study done on chiropractors' career paths (Black, 2008), more than 32.3% of participants had obtained additional qualifications to the chiropractic degree, 80% of which was relating to chiropractic field, indicating a growth in additional qualifications by approximately 27.7%.

Among respondents who had achieved a qualification before entering the chiropractic course, it can be reasoned that they would have developed better time-management and coping skills than those who had not studied before (Lazarus and Folkman, 1984). They would also have better developed academic literacy skills (Lazarus and Folkman, 1984). These factors would aid greatly in achieving research success (Mouton, 2001), which would lead us to expect that they would be better equipped to deal with the difficulties associated with conducting research. These factors, in addition to the possibility of previous research experience (Newell and Cunliffe, 2003), would, therefore, indicate that chiropractors who had acquired a qualification before studying chiropractic, would have a more positive attitude and perception of the process.

For those who studied further after completion of the chiropractic master's degree, it would seem that the main reason related to the lack of recognition of chiropractic education, as well of the lack of versatility and flexibility within the career (Black, 2008). Other possible reasons for doing additional studying and/or a speciality could include its relation to image, recognition and prestige (Arambewela, 2003), which could be tied back to the history where chiropractic sought recognition as a profession (Chapman-Smith, 2000; Schwarz and Hondras, 2007). Financial incentives may also play a role in acquiring additional qualifications (DeZee *et al.*, 2011). Irrespective of the reason for the choice, the increased exposure of these chiropractors to research within their subsequent qualifications would further have enhanced the likelihood that they would have a positive attitude (Newell and Cunliffe, 2003).

Therefore, based on the ***demographics of the chiropractors*** that participated in this study, it would seem that:

- Gender neither conclusively supports nor detracts from a possible positive perception and hence utilization of research.

- Age neither conclusively supports nor detracts from a possible positive perception and hence utilization of research.
- Ethnicity seems to support a positive perception and utilization of research.
- Time in practice neither conclusively supports nor detracts from a possible positive perception and hence utilization of research.
- The particular training institution seems to support a positive perception and utilization.
- Years studied, neither conclusively supports nor detracts from a possible positive perception and hence utilization of research.
- Additional studies seem to support a positive perception and utilization of research.

It is therefore anticipated that the participants in this study will show a favourable perception towards and positive utilization of research in clinical practice.

4.6.2 Practice demographics

Table 4.7- Practice demographics

		Count	Column N %
4.6.1.9.1 Type of area practiced in	Urban	136	87.2%
	Rural	12	7.7%
	Both	8	5.1%
4.6.1.9.2 Type of practice	Solo	69	45.4%
	Group	16	10.5%
	Chiropractic group	19	12.5%
	Multi speciality group	48	31.6%
4.6.1.9.3 Province in which you practice	Eastern Cape	5	3.4%
	Free State	3	2.1%
	Gauteng	56	38.4%
	Kwazulu-Natal	56	38.4%
	Mpumalanga	6	4.1%
	Northern Cape	1	0.7%
	North West Province	1	0.7%
	Western Cape	17	11.6%
	Limpopo	1	0.7%
4.6.1.9.4 Hours per week spent in practice	<10	14	9.1%
	11-20	9	5.8%
	21-30	24	15.6%
	31-40	52	33.8%
	41-50	42	27.3%
	>50	13	8.4%
4.6.1.9.5 Do you receive referrals from other practitioners?	No	9	5.8%
	Yes	146	94.2%

4.6.2.1 Which practitioners send referrals

Table 4.8 – Practitioner referrals

		Responses		Percent of Cases
		N	Percent	
(a)Referrals	General Practitioners	128	28.4%	87.7%
	Other chiropractors	84	18.7%	57.5%
	Physiotherapists	93	20.7%	63.7%
	Specialist physicians	75	16.7%	51.4%
	Other	70	15.6%	47.9%
Total		450	100.0%	308.2%

A Dichotomy group tabulated at value 1.

4.6.2.2 Which examination techniques are used in practice?

Table 4.9 – Preferred examination techniques

	Always		Sometimes		Never	
	Count	Row N %	Count	Row N %	Count	Row N %
Postural analysis	101	66.4%	47	30.9%	4	2.6%
Static palpation	123	81.5%	24	15.9%	4	2.6%
Motion palpation	140	90.9%	14	9.1%	0	.0%
Neurological examination	100	64.9%	54	35.1%	0	.0%
Orthopaedic examination	117	76.5%	36	23.5%	0	.0%
Muscle tests	72	47.1%	70	45.8%	11	7.2%
Vital signs	55	35.9%	91	59.5%	7	4.6%
Other	8	36.4%	8	36.4%	6	27.3%

4.6.2.3 Which treatment protocols are used in practice?

Table 4.10 – Preferred treatment protocols

	Always		**Sometimes**		**Never**	
	Count	Row N %	Count	Row N %	Count	Row N %
Acupuncture	10	8.2%	39	32.0%	73	59.8%
Activator	9	6.8%	60	45.1%	64	48.1%
Applied Kinesiology	6	5.0%	33	27.3%	82	67.8%
Cranial Technique	4	3.2%	36	29.0%	84	67.7%
Cryo/heat therapy	22	15.6%	98	69.5%	21	14.9%
Diversified technique	111	76.6%	28	19.3%	6	4.1%
Drop Piece adjustment	44	29.9%	91	61.9%	12	8.2%
Dry Needling	51	34.9%	79	54.1%	16	11.0%
Gonstead	15	11.5%	41	31.3%	75	57.3%
Interferential treatment	15	12.1%	38	30.6%	71	57.3%
Lifestyle advice	110	74.3%	37	25.0%	1	.7%
Massage	65	43.6%	69	46.3%	15	10.1%
Sacro-occipital technique	9	7.6%	34	28.8%	75	63.6%
Transcutaneous electrical nerve stimulation	3	2.4%	44	34.6%	80	63.0%
Thompson technique	13	10.4%	30	24.0%	82	65.6%
Traction (manual/ leander)	20	13.9%	90	62.5%	34	23.6%
Trigger point therapy	83	56.1%	57	38.5%	8	5.4%
Ultrasound	18	13.6%	42	31.8%	72	54.5%
Other	12	30.0%	25	62.5%	3	7.5%

4.6.2.4 Discussion of practice demographics

a) The majority of chiropractors were ***practicing in urban*** areas (87.2%) in solo practices (45.4%) and the majority were based in Gauteng (38.4) or Kwazulu-Natal (38.4). These results are in keeping with demographics found in other chiropractic studies both locally (Black, 2008; Keyter, 2010) and internationally (Schwarz and Hondras, 2007), where the majority of respondents were based in cities.

   In South Africa, both the chiropractic training institutions are in cities (Durban and Johannesburg), and the courses are full time for a minimum duration of 5 years (DUT Chiropractic Handbook, 2011). It stands to reason that after spending 5 or more years of one's young adult life in a particular city, one would already be settled and stay on. This could explain why the majority of chiropractors were found in Gauteng and Kwazulu-Natal provinces and not in the other two major South African urban areas, namely Cape Town and Bloemfontein. Practitioners were found to settle in rural areas mostly as a result of previous rural exposure, for example being raised in a rural setting or doing community service in a rural area (Reid *et al*., 2011). Another explanation for chiropractors settling in cities could be that most patients seeking chiropractic care are based in cities (Lawrence and Meeker 2007).

   In a study done by Reid *et al* (2011), professional and career development as well as family issues, were more highly rated among urban medical practitioners than rural medical practitioners as reasons for choosing to practise where they do. In the same study, urban respondents also rated their educational experiences as postgraduate students significantly higher than rural respondents in deciding where to practise (Reid *et al*., 2011). If the same applies to chiropractors, and urban chiropractors place a high value on professional and career development, it can be thought that the overall perception and utilization of research in this study might be

higher and more positive, because of the majority of chiropractors being urban-based.

b) The findings from Black's (2008) study indicated that the majority of chiropractors were in ***group multidisciplinary practices*** (53.2%) and only 33.9% were in solo practice, which is in contrast to current findings in which 45% of chiropractors were in solo practice. This could possibly indicate a shift from collaborative practice to solo practice in the last three years in South Africa. One could speculate that it may be linked to the recent recession forcing practitioners into solo practice as a means of survival, as a multidisciplinary practice set up takes more time and money. In the United Kingdom, 33% to 50% of medical graduates chose a career in solo practice as their first choice (Chung and Lau, n.d.), but in later years group practices grew, with 56% of general practitioners reporting to be in 3 to 5-partner group practices in 1980 (Chung and Lau, n.d.). While each kind of practice has its advantages and disadvantages, one of the drawbacks of solo practice is the fact that working alone means the practice no longer continues in the absence of the practicing physician. This may mean solo practitioners find it difficult to attend postgraduate educational activities, and if the practitioner is not a regular reader of medical journals he/she may lose out on continuing medical education (Chung and Lau, n.d.). Group practice, on the other hand, lends itself to the discussion of problem cases and the exchange of medical news between colleagues (Chung and Lau, n.d.), which could positively influence the perception of research as well as its utilization. As this study comprises mostly of solo-practitioners, it may negatively influence research utilization and perception.

c) Most chiropractors ***practiced an average of 31-40 hours per week***, which constitutes roughly 6 to 8 hours per day in a five day week and correlates with other chiropractic studies (Schwarz and Hondras, 2007). As many as 94% reported receiving referrals from other health

professionals, like general practitioners (87.7%), physiotherapists (57.5%), other chiropractors (51.4%) and specialist physicians (47.9%).

d) Black (2008) found that 62.9% of DUT chiropractic graduates felt accepted within the medical community. Of the 62.9%, almost 70% felt that they were part of a mutual active ***referral system***. In the same study, a total of 98.4% of the respondents indicated that they had received patient referrals from other health care professionals, 90.2% being from general practitioners.

The high report of referrals from general practitioners over the last two years could indicate that chiropractic is becoming a trusted and recommended form of alternative health care in the mainstream health circles and that there is a growing inter-professional relationship that has developed through the years between chiropractors and other health care professions (Black, 2008). According to Gorchynski (2005), the status of chiropractic as a health care profession is affected and determined by, among other things, inter-professional relationships and interactions between chiropractic and other relevant health care practitioners. Open lines of communication and collaboration with these practitioners aids in helping chiropractors achieve a higher level of confidence in their careers and a better self-belief (Ramsey *et al*., 2004). However, it also places a larger portion of responsibility on chiropractors as they are expected to integrate into the health care system, which requires that they are active members contributing to knowledge development, knowledge assimilation and research practice (Chapman-Smith, 2000; Koshy, 2005; Henning *et al.*, 2009).

This could suggest that chiropractic practitioners who practice in a manner that combines both chiropractic art, science and philosophy principles, would have a better incorporation of research and integration with the medical community (Kaptchuk and Eisenberg, 1998). Therefore, it is

anticipated that this research would show a positive perception and utilization of research among participants of this study.

e) The most ***commonly used examinations*** in the average chiropractic practice were motion palpation (90.9%), followed by static palpation (81.5%) and orthopaedic examination (76.5%). These results are likely because these techniques are being taught as part of the chiropractic curriculum internationally (Chapman-Smith, 2000), as chiropractic is about assessment of the locomotor system and the application of manual therapy (viz. adjusting) in order to restore normal function (Kaptchuk and Eisenberg, 1998; Chung and Lau, n.d.). Although the clinical usefulness of motion palpation has not been established, it is one of the most commonly used diagnostic methods by chiropractors (Gatterman, 1990; Leboeuf-Yde *et al.,* 2002). The reliability of mobility and joint position testing has not fared well in research studies (Cherkin and Mootz, 1997; Gatterman, 1990; Manley, 2010), appearing to be an unvalidated method of diagnosis (Leboeuf-Yde *et al*., 2002). This may be the reason that the practitioners employ static palpation and orthopaedic examinations to a large degree in order to validate the motion palpation findings or to reach a clinical diagnosis by triangulation of several different clinical parameters (Kaptchuk and Eisenberg, 1998; Haldeman, 2005). Or it could indicate that the majority of chiropractors are hesitant to change practice policy based on research, choosing instead to stick to practices developed within the profession over time. The former would support a positive research stance, whereas the latter could indicate a negative overall utilization of research among chiropractors in practice.

Muscle testing and vital signs were the highest reported techniques that were never used by chiropractors.

Chiropractors are taught general examination techniques to assess whether the patient falls into the scope of chiropractic practice or requires

referral to other health care practitioners (Chapman-Smith, 2000). Vital signs are the first step of a general examination (Haldeman, 2005), and is taught at chiropractic training institutions (Chapman-Smith, 2000), and Black (2008) found that 91.9% of DUT chiropractic graduates found the two years of diagnostics training useful in practice. The discrepancy could be explained by the fact that the majority of chiropractic patients were likely to live in urban areas, have a higher level of education, a higher level of household income and have fulltime employment (Lawrence and Meeker, 2007). These patients were also found to consult regularly with their family practitioner (Lawrence and Meeker, 2007), which implies that the patients' vital signs and general health would already be monitored by their family practitioner and instead they would be seeking chiropractic treatment for specific musculoskeletal complaints (this would, furthermore, concur with the high levels of reported inter-referrals). Thus, this should not have any impact on the perception or utilization of research, as it is simply a by-product of the patient demographics that are served by chiropractic practitioners.

f) The ***most commonly used treatments*** in practice were diversified technique, lifestyle advice and trigger point therapy. This correlates to practice demographics in other chiropractic studies (Waalen and Mior, 2005; Schwarz and Hondras, 2007).

"Diversified technique" is the label for the largest and most eclectic collection of different methods chiropractors use (Gatterman, 1990; Gitelman and Fligg, 1992). It is applied after a detailed consultation documenting symptomatology, with taking into account patient demographics and nature of the complaint (Haldeman, 2005). This technique is, therefore, considered the most ideal within the context of the reality of the clinical picture (Haldeman, 2005). This approach can be considered holistic, as described below, incorporating electrotherapy, osteopathic, naturopathic, extremity and other techniques (which most

often follow the evidence-based model for application of appropriate clinical measure in particular contexts) (Haldeman, 2005). Because diversified technique is so versatile and a large part of the chiropractic curriculum (Chapman-Smith, 2000), its popularity as a treatment method can be understood. It has been extensively researched and adapted (Haldeman, 2005) and its popularity among chiropractic practitioners could predict a general positive perception of research in this study, as well as a high rate of utilization of research findings in practice.

Essential to the philosophy of chiropractic is “Holism” (Gatterman, 1990; Chapman-Smith, 2000; Haldeman, 2005). “Holism refers to health as being a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (WHO definition, as cited by Chapman-Smith, 2000). The purpose of chiropractic care is, therefore, not just to relieve a symptom or address a cause of that symptom, but to facilitate complete health. Lifestyle advice is at the core of that philosophy, with the chiropractor using a variety of management techniques that relate to nutrition, exercises, posture, counselling and motivation (Chapman-Smith, 2000). Diversified technique and lifestyle advice go hand in hand (Haldeman, 2005); therefore, the same deductions can be made of practitioners that incorporate lifestyle advice into their practices as has been made of diversified practitioners. The deductions being: a general positive perception of research, as well as a high rate of utilization of research findings in practice.

Most often chiropractors draw on a variety of manoeuvres on the basis of education and personal affinity, and develop their own distinctive practice style (Kaptchuk and Eisenberg, 1998). Applied kinesiology, cranial technique and Thompson technique were reportedly never used by most chiropractors. This could be as a result of personal affinity, as mentioned above, or because these techniques are not taught in any of the South African chiropractic training institutions (Korporaal, 2011; DUT handbook,

2011). Practitioners are found to mostly use techniques in practice that was taught at their respective training institutions (Leone, 1999). In addition, findings from research have indicated that there are a number of differing opinions on the accuracy and reliability of applied kinesiology (Lüdtke *et al.*, 2001; Cuthbert and Goodheart, 2007). Cranial therapy and Thompson technique have both not been very well researched (Vickers and Zollman, 1999; Gleberzon, 2001).

This could indicate one of two tendencies, either that chiropractors are unlikely to incorporate new techniques into their practices that have not been taught in their curriculum, or that chiropractors are reluctant to utilise techniques that have not been shown to have scientific / clinical validity. The first tendency may indicate a low rate of utilization, which would be seen in this study. The second tendency may indicate a positive perception of research, in that techniques that lack the backing and validation of scientific research are not incorporated into practice.

Therefore, based on the ***demographics of the chiropractic practices*** that participated in the study, it would seem that:

- Urban or rural practice location seems to support a positive perception and utilization of research as the majority of practices are based in urban areas.
- Solo versus multidisciplinary practice seems to detract from a positive perception and utilization of research as the majority of respondents are in solo practice.
- Hours in practice and referral systems seems to support a positive perception and utilization of research.
- Examinations in practice neither conclusively support nor detract from a possible positive perception and, hence, utilization of research, as it seems to stem from the patient demographic profile and utility of different assessment measures in the particular patient context.

- Treatments / interventions seem to support a positive perception and utilization of research in practice.

It is, therefore, anticipated that the participants in this study will show a favourable perception towards and positive utilization of research in clinical practice.

4.7 The first objective of this study was to determine the general perception that chiropractors have of research and its role in the chiropractic profession.

Table 4.11 shows that responses to the perceptions on research questions were mainly towards agreement or strong agreement, indicating positive perceptions.

4.7.1 General perception of research

Table 4.11 – General perception of research

	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	N	%	n	%	n	%	n	%	n	%
Improves patient care (n=154)	9	5.8%	11	7.1%	39	25.3%	47	30.5%	48	31.2%
Promotes acceptance of chiropractic among patients (n=154	6	3.9%	22	14.3%	33	21.4%	43	27.9%	50	32.5%
Promotes acceptance of chiropractic among other health care disciplines (n=153)	5	3.3%	11	7.2%	16	10.5%	49	32.0%	72	47.1%
Promotes acceptance of chiropractic by medical aid schemes (n=155)	5	3.2%	15	9.7%	28	18.1%	47	30.3%	60	38.7%
Promotes acceptance of chiropractic by third party payers(n=155)	5	3.2%	16	10.3%	32	20.6%	52	33.5%	50	32.3%
Assists in evaluating existing treatments and their efficacy(n=154	4	2.6%	5	3.2%	16	10.4%	56	36.4%	73	47.4%
Helps to establish practice parameters/guidelines(n=155)	5	3.2%	11	7.1%	40	25.8%	41	26.5%	58	37.4%
Increases collaboration and integration of chiropractic within scientific circles (n=154)	5	3.2%	13	8.4%	21	13.6%	47	30.5%	68	44.2%
Adds credibility to the chiropractic profession (n=155)	4	2.6%	7	4.5%	10	6.5%	46	29.7%	88	56.8%
Should be a mandatory component of clinical training in chiropractic schools	8	5.2%	25	16.1%	27	17.4%	36	23.2%	59	38.1%
Aids to improve the clinical skills of practitioners	7	4.5%	37	24.0%	36	23.4%	47	30.5%	27	17.5%
Aids to improve the clinical knowledge of practitioners	4	2.6%	19	12.3%	26	16.8%	59	38.1%	47	30.3%
Is of benefit to chiropractic as a profession	6	3.9%	5	3.2%	13	8.4%	52	33.5%	79	51.0%
Inspires critical thinking	6	3.9%	10	6.5%	14	9.1%	53	34.4%	71	46.1%
Creates interest in the academic possibilities within the chiropractic profession	5	3.2%	11	7.1%	29	18.7%	56	36.1%	54	34.8%
Chiropractors that have done research have an advantage above those who have not done research	16	10.4%	27	17.5%	41	26.6%	33	21.4%	37	24.0%

4.7.2. Perceptions score

The mean perceptions score was 77.5% with a range from 22.5% to 100%, indicating very positive perceptions on the whole towards research.

Table 4.12 – Perceptions score

N	Valid	155
	Missing	4
Mean		77.5323
Std. Deviation		17.03638
Minimum		22.50
Maximum		100.00

All the statements were positively perceived, with the highest percentage responses in the "strongly agree" and "agree" categories, except "*Chiropractors that have done research have an advantage above those who have not done research*", which scored highest in the "neutral" category.

These findings concur with the anticipated responses in each of the demographics of the chiropractors and demographics of the chiropractic practices sections discussed in sections 4.6.1 (p46) and 4.6.2 (p58).

- Gender neither conclusively supports nor detracts from a possible positive perception and hence utilization of research. This supports the findings of Zhang (1996) that found that gender did not play a role in the attitudes of chiropractic students towards research. A possible reason for the gender indifference to utilization could be that even though females reported less computer and internet acumen in the past (Meelissen and Drent, 2008), computer access has become more widely available in recent years, with the majority of chiropractic students reporting having a computer at home (Rieder, 2010).
- Age and time neither conclusively supports nor detracts from a possible positive perception and hence utilization of research. Chiropractic in South Africa is a relatively young profession in comparison to other countries.

Most chiropractors in this study fall into the age group of between 30 and 40 years of age (Mean age: 36.4). Even though the majority of chiropractors in this study claim to get referrals from other practitioners and prior studies indicated that 62.9% of chiropractic graduates felt accepted within the medical community (Black, 2008), there must still be a general feeling among chiropractic practitioners that they would like to have more credibility among mainstream health practitioners and the public (as evidenced by the response that research supports professional integration - Table 4.11). This supports the work of Myburgh and Mouton (2007) who found that there were still developmental issues in chiropractic which included formal health care system integration. In the same study, chiropractors perceived the main developmental issues to be the lack of a clear and definite identity within the chiropractic profession, lack of a coherent, marketable model of practice and poor inter-professional relationships with mainstream health practitioners (Myburgh and Mouton, 2007). As research has chipped away at addressing these professional issues in the past, it is possible that chiropractors will turn to research again to aid the credibility of the chiropractic profession going forward and ultimately reach their goal of becoming an integrated mainstream primary health care discipline (Meeker and Haldeman, 2002; Murphy *et al.,* 2008). Therefore, this research seems to support this vantage point based on the positive perception displayed in this study.

- Ethnicity seems to support a positive perception and utilization of research. In this study, 87.2% of the respondents were White, which means that these results are in accordance with Ellis (2001), who indicated a more positive attitude to research in the White demographic. This is, however, contradictory to a study done by Rieder (2010) and Makuakane-Drechsel and Hagedorn (2000), who indicated that African students had a more positive attitude toward research and research training. However, as this study applies to qualified chiropractors only and there are only a few African chiropractors, the initial association between White chiropractors and positive attitudes remains (Ellis, 2001), with little

validation for other ethnic groups based on their respective numbers in this study.

- The institutions at which students trained, seems to support a positive perception and utilization. As 81.7% of respondents qualified locally it meant that they completed a research dissertation as part of a master's degree, thereby providing them with a high degree of exposure to research. The 'strongly positive' perception of research, as found in this study, is supported in a study done by Zhang (1996), which stated that previous research exposure had a significant positive effect on attitudes towards research.
- Years studied, neither conclusively supports nor detracts from a possible positive perception and hence utilization of research. The majority of DUT students were found to take 7 years or longer to finish studying chiropractic (Black, 2008), which could be attributed to subject failure or the long research process (Black, 2008). Mouton (2001) found that the research process has been associated with negative attitudes worldwide, because the average duration of writing a master's research dissertation is two to three years. But as many of the chiropractic students and graduates were found to have parental or spousal support, both emotionally and financially (Black, 2008; Rieder, 2010), it may contribute to keeping the students / graduates from developing negative perceptions toward the research process. Also, as most respondents in this study reportedly finished within 6.3 years, they may be expected to have better perceptions of research in general.
- Additional studies seem to support a positive perception and utilization of research. The statement *"research adds credibility to the chiropractic profession"* scored the highest percentage of "strongly agree" - 56.8%, which is consistent with studies done by Suter *et al.,* (2007), and Schwarz and Hondras (2007), that cited professional credibility and acceptance from other health care disciplines as being the most important purpose of research. Thus, the results of this study seem to validate the position that

one of the motivators for a positive perception of research is acceptance within the health care fraternity.

- Urban or rural practice location seems to support a positive perception and utilization of research as the majority of practices are in urban areas. As most rural health professionals were found to be African rather than White (Reid e*t al.,* 2011) and White respondents were found to have a more positive perception and utilization than other ethnic groups, it can indicate that there is a strong link between urban distribution and the positive perception and utilization of research.
- Solo versus multidisciplinary practice seems to detract from a positive perception and utilization of research as the majority of respondents were in solo practice. Chung and Lau (n.d.) speculated that solo practice would have a negative effect on continuing medical education and especially research utilization, as a result of the solo practitioner having less time to spend away from practice.
- Hours in practice and referral systems seems to support a positive perception and utilization of research. Health care practitioners that interacted and communicated with other health care professionals were found to achieve a higher level of confidence in their careers and a better self-belief (Ramsey *et al*., 2004; Gorchynski, 2005). There is a strong link between confidence and attitudes (Liddell and Davidson, 2004). As most respondents received and gave regular referrals to other health care practitioners, they could be expected to have positive attitudes. As for utilization: Connolly *et al*., (2001) showed a link between confidence to do research and the incorporation of results of research studies into clinical practice.
- Examinations in practice neither conclusively supports nor detracts from a possible positive perception and hence utilization of research as it seems to stem from the patient demographic profile and utility of different assessment measures in the particular patient context. Emphasis on certain examination procedures during training, as well as practitioner

preference and personal experience (Foster, 2007; Leone, 1999) may also be possible explanations for the above finding.

- Treatments / interventions seem to support a positive perception and utilization of research in practice. In a study done by Karthikeyan and Pais (2010), personal experience was found to guide practice more among health care practitioners than national consensus and economy. Li and Bombardier (2001) also found that chiropractic practitioners seldom stick to practice guidelines, for reasons that included among others, the therapists' own perceptions of treatment effectiveness. It can be reasoned that chiropractors who have a positive perception and utilization of research, may find treatment protocols in new literature that are more efficient in the treatment of their patients than those prescribed by original guidelines.

4.8 The second objective was to determine the utilization of research among chiropractic practitioners and its practical application and influence on patient management and treatment protocol.

4.8.1. Utilization of research in practice

Table 4.13 – Utilization of research in practice

	Always		Sometimes		Rarely		Never	
	n	%	N	%	n	%	n	%
I read journals to assist with patient education	16	10.3%	103	66.5%	28	18.1%	8	5.2%
I read journals to further my own knowledge	30	19.4%	97	62.6%	23	14.8%	5	3.2%
I read journals to look up specific patient conditions	32	20.6%	91	58.7%	22	14.2%	10	6.5%
I read journals on areas of special interest	35	22.7%	84	54.5%	28	18.2%	7	4.5%
I apply research findings in my practice	28	18.2%	91	59.1%	30	19.5%	5	3.2%
I discuss research findings with my colleagues	14	9.0%	82	52.9%	44	28.4%	15	9.7%
I use research findings to develop clinical practice guidelines	18	11.8%	74	48.4%	49	32.0%	12	7.8%
I use research to change conditions, policies or practices in my discipline	17	11.4%	72	48.3%	46	30.9%	14	9.4%
I use research for self-development	27	17.9%	86	57.0%	29	19.2%	9	6.0%

4.8.2. Research sources utilised by practitioners

Table 4.14 – Research sources

	At least once a week		1-3 times per month		Less than once a month		Never	
	n	%	n	%	n	%	N	%
Cochrane Database of Reviews	2	1.4%	13	9.4%	34	24.5%	90	64.7%
PubMed / Medline / other databases	12	8.0%	50	33.3%	65	43.3%	23	15.3%
Peer-reviewed journals	5	3.3%	45	30.0%	65	43.3%	35	23.3%
Clinical practice guidelines	6	4.2%	33	23.2%	71	50.0%	32	22.5%
Web sites	57	37.3%	66	43.1%	27	17.6%	3	2.0%
Textbooks / Handbooks	49	31.8%	67	43.5%	36	23.4%	2	1.3%
Colleagues	32	20.9%	59	38.6%	54	35.3%	8	5.2%
Other, specify:	1	3.3%	4	13.3%	7	23.3%	18	60.0%

The majority of the respondents reportedly read scientific journals, which is consistent with findings from Schwartz *et al*. (2007), which reported that 86% of German chiropractors read scientific journals, which may indicate that South

African and German chiropractors have similar professional priorities and research abilities, despite the difference in research training and experience.

4.8.3. Utilization

The mean utilization score was 69.7% indicating that there was a high degree of utilization of research by chiropractors. The range was between 25% to 100%.

Table 4.15 – Utilization score

N	Valid	155
	Missing	4
Mean		69.7312
Std. Deviation		14.67533
Minimum		25.00
Maximum		100.00
Percentiles	25	63.8889
	50	72.2222
	75	77.7778

Most of the respondents reported using research 'sometimes' for a variety of practice and personal reasons, with scores ranging from 48.3% to 66.5% for all statements. The statement that achieved the highest score was: "*I read journals on areas of special interest*", with 22.7% of the respondents reporting that they 'always' do this. The highest score in the 'never' category was achieved by the statement*: "I discuss research findings with my colleagues."* with 9.7% - which ironically seems to correlate with the solo practice. Suter *et al.* (2007) found that the majority of chiropractors and massage therapists reportedly applied research findings to clinical practice and the least common application of research was to change conditions, policies or practices in their respective disciplines.

This indicates that even though research findings are used in subtle ways to improve patient care and enhance practitioner knowledge, it seldom facilitates major changes within the practice setting.

The usage of information from highest to lowest is as follows:

1) Textbooks/Handbooks – 98.7%
2) Websites – 98.0%
3) Colleagues – 94.8%
4) PubMed/Medline – 84.7%
5) Clinical practice guidelines – 77.5%
6) Peer reviewed Journals – 76.7%
7) Cochrane database of reviews – 35.3%

The most regularly used source of research was found to be websites and textbooks, though websites had the highest rate of use, with 37.3% of respondents using it 'at least once a week' and 43.1% using it '1-3 times per month'. Cochrane Database of Reviews was least used, with 64.7% of respondents reportedly 'never' using it.

These preferences are in keeping with a similar study done by Suter *et al.,* (2007), which reported websites to be the most used and Cochrane database of reviews, the least used. German chiropractors showed similar preferences but gravitated more toward using scientific journals for an average of three hours per week (Schwarz and Hondras, 2007). However, it was noted that only a few of the journals listed by the German respondents were peer-reviewed (Schwarz and Hondras, 2007). Other professions, such as psychologists, have also shown a preference for discussing cases with colleagues, as a valuable source of information (Cohen e*t al.,* 1986) rather than utilising reading material.

The use of websites also seems to correlate with the high incidence of solo practice.

So despite realising the importance of research, German, Canadian and South African chiropractors indicated minimal use of hard evidence-based information sources such as peer reviewed journals, instead, indicating a preference for textbooks, websites and consulting with colleagues. Textbooks, however accurate, are not always filled with the most recent developments and current

information, when compared to scientific journals, thereby making them less up to date.

In addition, and for the purposes of this study, “websites” were specifically separated from scientifically oriented databases like PubMed that accesses the Medline database of references and abstracts on life sciences and biomedical topics. A website can contain any information, scientific or otherwise, therefore, for the purposes of this study PubMed was considered scientific and websites not. Similarly, ‘consulting with a colleague’ can contain information of scientific and non-scientific bases. Therefore, it would seem that the practitioners would prefer data from a source that is not necessarily scientific in nature, but then one also needs to consider that:

- Accessibility to purely scientific information (viz. PubMed) requires a financial outlay or affiliation with an educational institution (which chiropractors do not necessarily have) in order to access the information. When handbooks and textbooks are more readily available at no expense, it may well mean that the expense determines the choice of information vehicle.
- Another consideration, from both a financial as well as logistical perspective is access to a computer or the internet.
- Most practitioners have access to communicating with colleagues if need be. This may allow for contacting practitioners with particular specialisations, deal with particular types of patients and / or have resources that the other practitioner does not have (indicating that they may utilise colleagues in different medical fields to access information that they may not have readily available).
- The practitioners may also have access to conference proceedings / short courses (an option which was not included in this study), that may serve as a primary source of access to research information.
- Finally, it has been stated in the literature (Bierer and Chen, 2010) that research experience allows for the practitioner to evaluate information sources to the best of their ability, therefore, even if the practitioner utilises the internet or web based information (that is not peer reviewed), it does

not necessarily mean to imply that the information found and utilised in practice is necessarily non-scientific.

Also solo practitioners would most likely be found to rely on websites, their books and then possibly lastly consulting with a colleague by phone, as compared to practitioners in a multi-disciplinary setting.

Therefore, it would seem that although the practitioners perceive research positively, their implementation into practice has some hurdles that impede the full integration of research into practice. It is suggested the future studies explore the factors that impede the integration of research into practice as this would facilitate improved practitioner implementation of the research that they feel so strongly about.

4.9. The third objective was to determine any association between the perception and usage of research, as well das between demographics, education and practice habits of practitioners, and perceptions and usage of research.

4.9.1. Correlation between perceptions score and utilizations score.

There was a positive, albeit weak correlation between perceptions and utilization of research (r=0.436), indicating that as perceptions increased, so did utilization of research. Those with low perceptions scores had low utilization and vice versa. This is also shown in the scatter plot Figure 4.3.

Table 4.16 – Correlation between perceptions and utilization

		Utilization
Perceptions	Pearson Correlation	.436(**)
	Sig. (2-tailed)	.000
	N	155

** Correlation is significant at the 0.01 level (2-tailed).

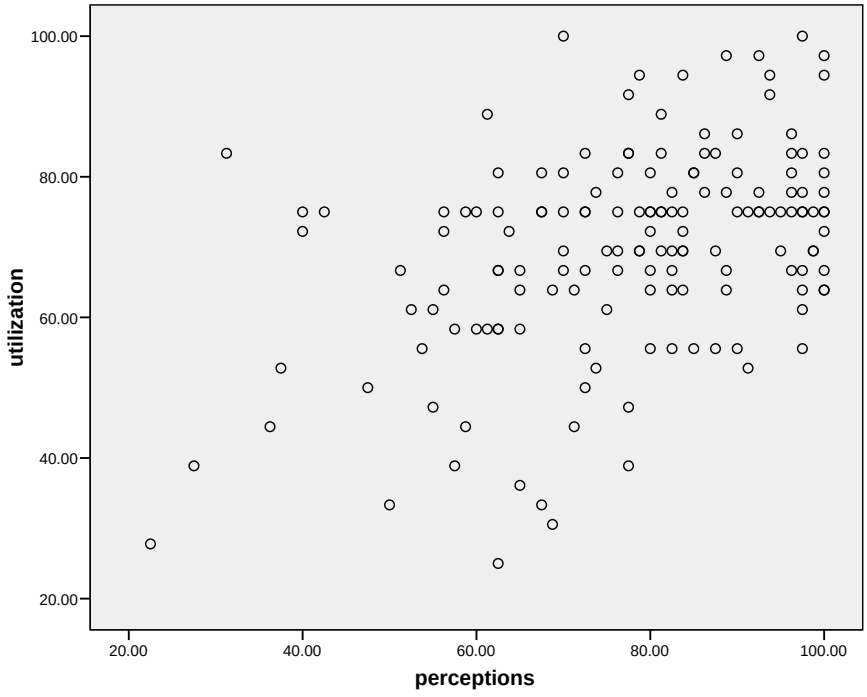

Figure 4.3 - Scatter plot of perceptions score vs. utilization score

Many factors, both individual and organizational affect research utilization (Stetler, 1994). In a studies done by Le May *et al*. (1998) and McKenna *et al*. (2004), it was found that there was a significant research practice gap in UK nursing, despite the government increasingly instituting evidence-based practice. It was thought that this could be the result of academic researchers and practitioners having different perspectives and priorities. It was suggested that research should be centred around topics that could be useful to practitioners and which meets their needs and requirements. Two years later, South and Tilford (2000) found that there still had been no great improvement. An improvement in research training and collaborative research projects as well as an increase in research funding and secondment opportunities were recommended to aid in research production and integration in practice (South and Tilford, 2000).

As per the results of this study, the majority of chiropractic research done in South Africa is produced by chiropractic master's students. Of the 159 respondents, 127 had done formal research and 119 did it in order to obtain a master's qualification, 117 of the 119 did so at one of the two South African chiropractic training institutions. Only one respondent reportedly did research to obtain a doctorate, (for which they would have had to have a master's qualification as a prerequisite) and 6 respondents did research as part of their academic career path – 5 of the 6 did so in South Africa. This could partly explain the positive link between perception and utilization in South Africa.

Suter *et al.,* (2007) found the opposite: even though 80% of practitioners had positive perceptions of research and acknowledged its relevance and value, this did not necessarily translate into practice. Approximately 25% reportedly applied research in their practice consistently. In this regard, mastery of research literacy was thought to be critical for incorporating the results of research studies into clinical practice (Suter *et al*., 2007), which could explain why South African chiropractors have a higher rate of utilization, compared to other studies (Le May *et al*., 1998; McKenna *et al.,* 2004; Schwarz and Hondras, 2007).

It could also be stated that by making research participation a part of the chiropractic qualification as done in South Africa, creates research mindedness in practitioners which would increase evidence-based practice (Suter *et al*., 2007). It has also been linked to more positive attitudes toward research in chiropractic students (Suter *et al*., 2007).

It is, however, noted that the link between perception and utilization in South Africa is weak and, therefore, it is suggested that a future study investigate the impediments to implementation of research in practice. This is particularly important in that within the South African context few, if any, of the personal attributes of the chiropractor are primarily responsible for the low utilization of research in practice (as all of these positively influenced perception to some degree). Therefore, it stands to reason that the factors impeding implementation are most likely environmental in nature (Berg and Theron, 1999).

4.9.2. Factors associated with perceptions and utilization

4.9.2.1 Demographic, education and practice factors by perceptions and utilization of research

Table 4.17		Perceptions		P value	Utilization		P value
		Mean	Standard Deviation		Mean	Standard Deviation	
Gender	Male	76.14	18.03	0.309	68.15	15.96	0.127
	Female	78.98	15.59		71.84	12.80	
1) Short course	No	77.41	16.95	0.892	69.97	14.69	0.768
	Yes	77.81	17.40		69.22	14.78	
2) Diploma	No	75.58	17.83	<0.001	68.36	14.36	0.022
	Yes	85.04	10.82		75.00	14.92	
3) Honours	No	78.03	16.69	0.009	69.68	14.77	0.768
	Yes	52.08	18.04		72.22	9.62	
4) Bachelors	No	78.36	16.04	0.104	69.83	14.54	0.819
	Yes	71.58	22.59		69.01	16.02	
5) Masters	No	77.30	17.24	0.397	69.44	14.89	0.001
	Yes	83.33	10.14		76.85	3.36	
How many years have you been practising as a chiropractor?	< 5 years	71.48	17.54	0.001	67.22	15.55	0.094
	5-10 years	79.09	14.31		72.45	11.70	
	11-20 years	87.70	12.59		65.35	16.15	
	21-30 years	87.22	14.08		78.70	8.10	
	31-40 years	79.75	18.34		73.89	17.85	
	>40 years	72.92	24.87		72.22	18.09	
Type of area practice in	Urban	78.34	16.51	0.239	69.63	14.85	0.288
	Rural	69.79	21.26		70.14	11.49	
	Both	76.79	10.75		78.57	13.00	
Type of practice	Solo	78.47	18.94	0.413	70.67	12.69	0.040
	Group	72.58	17.70		60.94	16.87	
	Chiropractic group	73.96	14.85		68.83	16.57	
	Multi speciality group	79.28	14.07		72.93	15.00	
Province	Eastern Cape	82.00	15.78	0.787	73.33	9.94	0.625
	Free State	62.92	27.42		74.07	8.02	
	Gauteng	79.39	15.84		69.70	15.15	
	KZN	76.27	18.10		69.49	16.11	
	Mpumalanga	76.04	20.10		75.46	2.09	
	Northern Cape	76.25	.		66.67	.	
	North West Province	70.00	.		100.00	.	
	Western Cape	76.41	15.04		67.36	12.02	
	Limpopo	93.75	.		75.00	.	

Table 4.17 continued		Perceptions		P value	Utilization		P value
		Mean	Standard Deviation		Mean	Standard Deviation	
Hours per week in practice	<10	76.92	25.31	0.845	63.68	21.02	0.301
	11-20	82.92	14.29		68.52	17.29	
	21-30	80.11	15.31		71.59	13.55	
	31-40	75.89	17.19		68.00	14.66	
	41-50	76.90	14.42		73.08	11.47	
	>50	78.56	18.06		72.65	15.08	
Do you receive referrals from other practitioners?	No	58.47	24.20	<0.001	49.69	18.29	<0.001
	Yes	78.79	15.53		71.37	13.39	

Table 4.17 shows that those who had a diploma had significantly higher perceptions and utilization of research than those without a diploma. However, those with an honours degree had a significantly lower perception and a non-significant but higher utilization, while those with a master's had a non-significant (but higher) perception and a significantly increased utilization. This, for the most part, agrees with Zhang (1996), Newell and Cunliffe (2003) as well as Suter *et al.* (2007), who stated that previous research exposure had a significant positive effect on perception and utilization. There is, however, one anomaly, which is that of the decreased perception of those practitioners who have an honours / bachelors degree. This may be attributed to the fact that the chiropractic qualifications of some chiropractors are only the equivalent to this level (as this is what countries outside of South Africa require for registration) and having been grandfathered into the regulations for registration, implies that although they see the value of research in practice, they themselves have limited research training (explaining the negative perception as a frustration of their limitation). This is however, conjecture and would require further research.

Years of practice were related to perceptions, with those with 11-20 years of practice having the highest perceptions. Ramsey *et al*. (2004) found that medical students who were sent to developing countries to gain experience gained a higher level of confidence and self-belief, which resulted in them becoming more competent doctors. The same counts for chiropractors, who gain confidence level

from experience and previous patient successes (Black, 2008). Since the first Chiropractic students were accepted into the Technikon Natal in 1989 (CASA, 2011), the longest time a locally qualified chiropractor could possibly be in practice, is 17 years, thereby falling in the 11-20 year practice bracket. As there is a strong positive link between confidence and attitudes (Liddell and Davidson, 2004), it can be hypothesised that chiropractors with a greater confidence will also have a more positive attitude to research and chiropractic issues in general. It is also very likely that those practitioners who first qualified in South Africa (and have been in practice 11-20 years) would be more likely to use research, as they see it as a relevant tool in the establishment of the profession, having been the initial pioneers in their own right.

Receiving referrals from other practitioners was highly significantly associated with both higher perceptions and utilization of research. This makes sense in view of the fact that the practitioners rated research as important in developing collaborations and professional interactions (viz. image and professional credibility). Therefore, it may indicate that there is a growing inter-professional relationship between chiropractors and other health care professions in South Africa (Black, 2008).

4.9.2.2 Correlations

Table 4.18 – Correlations between years of study and perception/utilization

		Age	How many years of study?
Perceptions	Pearson Correlation	0.086	-0.190(*)
	Sig. (2-tailed)	0.293	0.018
	N	150	153
Utilization	Pearson Correlation	0.051	-0.298(**)
	Sig. (2-tailed)	0.534	<0.001
	N	150	153

** Correlation is significant at the 0.01 level (2-tailed).

There was no correlation between age and perceptions or utilization of research, which may be attributed to the fact that the majority of the profession are young

which made it impossible to calculate a *p*-value given the close age range of the majority of the respondents.

As previously mentioned, “years studied” neither conclusively supports nor detracts from a possible positive perception and hence utilization of research. The majority of DUT students were found to take 7 years or longer to finish studying chiropractic (Black, 2008), which could be attributed to subject failure or the long research process (Black, 2008). Mouton (2001) found that the research process has been associated with negative attitudes worldwide, because the average duration of writing a master’s research dissertation is two to three years. But as many of the chiropractic students and graduates were found to have parental or spousal support, both emotionally and/or financially (Black, 2008; Rieder, 2010), it may contribute to keeping the students/graduates from developing negative perceptions toward the research process.

4.9.2.3. Examination procedures and perceptions and utilization of research.

Table 4.19		Perceptions		P value	Utilization		P value
		Mean	Standard Deviation		Mean	Standard Deviation	
Postural analysis	Always	79.44	16.84	0.091	71.46	13.90	0.260
	Sometimes	72.98	16.23		67.20	16.07	
	Never	80.00	16.93		70.14	9.72	
Static palpation	Always	77.54	16.54	0.531	70.02	15.04	0.217
	Sometimes	74.02	17.84		66.91	11.57	
	Never	82.50	17.68		80.56	17.57	
Motion palpation	Always	78.40	16.09	0.022	70.55	14.40	0.128
	Sometimes	67.31	20.42		64.10	15.90	
	Never	.	.		.	.	
Neurological exam	Always	78.94	16.20	0.140	73.08	13.18	<0.001
	Sometimes	74.75	17.45		64.45	15.46	
	Never	.	.		.	.	
Orthopaedic exam	Always	78.07	16.40	0.305	71.67	13.84	0.009
	Sometimes	74.75	17.54		64.37	15.94	
	Never	.	.		.	.	
Muscle tests	Always	79.89	15.47	0.080	73.51	11.83	0.009
	Sometimes	74.26	18.53		66.22	16.05	
	Never	82.84	11.13		73.48	16.87	
Vital signs	Always	76.42	18.04	0.482	73.43	13.54	0.005
	Sometimes	78.26	16.20		68.74	13.81	
	Never	70.42	9.51		54.63	22.20	
Other	Always	77.81	7.37	0.152	70.14	11.95	0.201
	Sometimes	70.16	18.62		73.26	13.28	
	Never	63.13	11.06		61.57	9.03	

Use of neurological examination, orthopaedic examination, muscle tests, and vital signs were significantly associated with higher utilization of research. This trend was expected as these techniques are scientifically based and taught at medical schools all over the world. These techniques are also taught at both of the South African universities where chiropractors are trained, and the majority of the respondents in this study qualified locally. As expected, the correlation can, therefore, be drawn between research exposure and the utilization of the abovementioned scientific examination procedures.

Motion palpation is a highly used mode of examination among respondents in this study, as it was also found to be in other studies (Leboeuf-Yde *et al.,* 2002; Gatterman, 1990), despite its clinical usefulness not being established. The reliability of mobility and joint position testing has not fared well in research studies (Gatterman, 1990; Cherkin and Mootz, 1997; Manley, 2010), appearing to be an unvalidated method of diagnosis (Leboeuf *et al*., 2002). This may be the reason that the practitioners employ static palpation and orthopaedic examinations to a large degree in order to validate the motion palpation findings or to reach a clinical diagnosis by triangulation of several different clinical parameters (Kaptchuk and Eisenberg, 1998; Haldeman, 2005).

4.9.2.4. Treatment techniques by perception and utilization of research

Table 4.20		Perceptions		P value	Utilization		*p* value
		Mean	Standard Deviation		Mean	Standard Deviation	
Acupuncture	Always	78.38	15.73	0.804	71.39	8.69	0.845
	Sometimes	75.83	16.68		68.59	15.43	
	Never	77.87	16.42		69.72	14.63	
Activator	Always	76.53	14.41	0.574	74.69	18.45	0.110
	Sometimes	75.78	15.68		71.89	12.50	
	Never	78.85	16.88		67.24	14.74	
Applied Kinesiology	Always	71.00	8.22	0.550	69.44	17.46	0.999
	Sometimes	76.33	14.85		69.70	13.98	
	Never	78.41	17.30		69.58	14.12	
Cranial Technique	Always	68.44	16.50	0.341	65.97	22.72	0.862
	Sometimes	80.21	12.69		69.21	16.36	
	Never	77.23	17.82		69.82	12.92	
Cry/heat therapy	Always	77.56	16.80	0.558	70.08	12.94	0.094
	Sometimes	78.54	16.49		71.19	14.56	
	Never	74.00	20.31		63.33	16.26	
Diversified Technique	Always	78.28	15.99	0.393	70.15	14.22	0.296
	Sometimes	73.44	20.20		65.97	15.71	
	Never	76.50	10.05		74.44	13.66	
Drop Piece adjustment	Always	75.95	17.53	0.610	69.51	14.32	0.407
	Sometimes	77.43	15.94		70.51	13.70	
	Never	81.46	21.94		64.58	19.43	
Dry Needling	Always	78.20	16.20	0.316	70.17	11.51	0.885
	Sometimes	77.44	16.17		68.88	14.84	
	Never	70.83	21.76		69.26	19.79	
Gonstead	Always	77.32	16.65	0.496	70.04	18.72	0.585
	Sometimes	74.57	18.58		71.54	13.32	
	Never	78.46	15.85		68.62	14.31	
Interferential Therapy	Always	78.17	12.09	0.882	70.19	11.85	0.729
	Sometimes	77.99	15.51		70.32	12.98	
	Never	76.47	18.95		68.12	16.40	
Lifestyle advice	Always	78.04	16.21	0.004	71.99	13.14	<0.001
	Sometimes	77.67	16.54		64.81	16.14	
	Never	22.50	.		27.78	.	
Massage	Always	81.19	14.80	0.002	70.44	10.49	0.010
	Sometimes	76.65	16.94		71.10	14.95	
	Never	64.29	19.26		58.73	21.57	
Sacro Occipital Technique	Always	82.36	12.86	0.385	70.99	18.69	0.974
	Sometimes	74.96	14.41		69.77	17.24	
	Never	78.73	17.68		70.17	12.61	

Table 4.20 continued		Perceptions		P value	Utilization		*p* value
		Mean	Standard Deviation		Mean	Standard Deviation	
Transcutaneous Electrical Nerve Stimulation	Always	70.00	12.99	0.334	62.96	6.42	0.424
	Sometimes	75.09	17.17		68.12	17.76	
	Never	79.10	16.69		70.87	12.11	
Thompson	Always	82.05	13.36	0.569	73.99	15.63	0.485
	Sometimes	76.04	16.21		71.11	12.84	
	Never	76.72	17.16		68.90	15.02	
Traction (manual/leander)	Always	84.00	14.35	0.137	71.39	14.45	0.592
	Sometimes	77.54	15.13		70.19	14.51	
	Never	74.81	20.03		67.68	13.26	
Trigger point therapy	Always	79.48	15.20	0.107	71.00	13.78	0.368
	Sometimes	75.64	17.34		69.25	14.29	
	Never	67.14	27.20		63.49	19.87	
Ultrasound	Always	83.47	14.31	0.133	71.14	9.95	0.522
	Sometimes	73.81	16.76		71.03	14.14	
	Never	77.84	18.13		68.13	15.75	
Other	Always	82.16	13.92	0.019	68.69	12.55	0.816
	Sometimes	77.30	13.97		70.11	14.53	
	Never	55.00	15.00		64.81	15.30	

The use of lifestyle advice and massage were associated with higher perceptions and utilization of research, while using “other” techniques was related to higher perceptions. Practitioners that incorporate lifestyle advice into their treatment protocols are holistically minded, focussing not only on the symptoms with which the patient presents, but also the causative factors (Gatterman, 1990; Chapman-Smith, 2000; Waalen and Mior, 2005). This could likely imply that a chiropractic practitioner with a holistic approach has a more open approach to the chiropractic profession, and would be more likely to use research to expand their horizons and treatment protocols.

In addition, the medical aid’s emphasis on evidence-based practice as well as the factors mentioned above with regards to the lack of chiropractic-specific ICD10 codes (diagnostic codes) may, therefore, also be pertinent in the association between research perception and treatment modalities of choice in the chiropractic practice. Having published in a journal was associated with a significantly higher perception and utilization of research, as did thinking that research contributed to their abilities as a chiropractor. Those who indicated that

they would do research again had significantly higher utilization scores than those who said they would not.

4.9.2.5 Research experience vs. perceptions and utilization of research

Table 4.21

		Perceptions		P value	Utilization		P value
		Mean	Standard Deviation		Mean	Standard Deviation	
Have you ever conducted formal research?	No	81.73	13.89	0.201	74.25	15.25	0.094
	Yes	77.12	17.23		68.95	14.42	
Reason for doing research?	To obtain a Master's	77.29	17.27	0.874	68.83	14.57	0.397
	To obtain a Doctorate	70.00	.		80.56	.	
	Academic career	79.38	13.69		75.46	4.45	
Have you ever published an article in a journal?	No	75.61	17.44	0.033	67.65	14.48	0.010
	Yes	85.31	10.76		77.43	9.56	
Would you do research again if given the chance?	No	75.09	18.20	0.138	64.46	13.84	<0.001
	Yes	79.66	15.68		74.57	12.75	
Has doing research contributed to your abilities as a chiropractor?	No	70.14	17.42	<0.001	65.12	15.14	0.004
	Yes	83.60	14.24		72.39	12.55	

Literature stating that previous research exposure had a significant positive effect on attitudes towards research is numerous (Zhang, 1996; Newell and Cunliffe, 2003; Suter *et al*., 2007). This would explain the overall positive perception of research among chiropractors that have published a journal. A chiropractor who has published in a journal could also be presumed to have an above average mastery of research literature, which could easily translate into the incorporation of such literature into practice (Suter *et. al*., 2007). Therefore, it may be possible that chiropractors who have published in a journal could be expected to have a more positive perception of and higher rate of research utilization than those who have not.

4.10 Limitations of the study

The relatively low overall response rate may have biased the findings as it could be argued that chiropractors with positive perceptions of research may have been more likely to respond (Suter *et al*., 2007). Thus, the results may not necessarily reflect the overall prevailing perception of South African chiropractors toward research. If it was assumed that non-responders have a less favourable perception of research, it may be argued that their practice is likely to be less evidence-based and that they may have less developed research skills compared to the survey respondents. This may support the findings that overall, evidence-based practice is limited (Suter *et al*., 2007). Follow-up research should be conducted, preferably with a higher response rate, to see if this assumption has any grounds.

4.11 Review of objectives

As a **primary objective** the general perception that chiropractors have of research was found to be very positive. Chiropractors' opinion of the role of research in the profession was that it adds credibility to the chiropractic profession and is, therefore, of great benefit to the profession where acceptance is concerned - by both mainstream health care practitioners and the public.

The **second objective** was to determine the utilization of research among chiropractic practitioners and its practical application and influence on patient management and treatment protocol. Respondents mostly read up on specific patient conditions and on special areas of interest. More than three quarters of respondents reportedly applied research findings in practice but they seldom used it to change treatment protocols within their practices or develop clinical practice guidelines.

The **third objective** was to determine any associations between the factors that influenced perception and usage of research.

There was a positive, albeit weak correlation between perceptions and utilization of research. Chiropractors with a Masters qualification had a significantly higher perception of research than those with an honours degree, indicating that education and perception is definitely linked. Having published in a journal was also associated with a significantly higher perception and utilization of research, as did thinking that research contributed to their abilities as a chiropractor. Those who indicated that they would do research again had significantly higher utilization scores than those who said they would not.

However, there was no correlation between age or any other demographic factor and perceptions or utilization of research.

Medically orientated diagnostic procedures such as neurological examination, orthopaedic examination, muscle tests, and vital signs were significantly associated with higher utilization of research. The treatment methods that were associated with higher perceptions and utilization of research were found to be lifestyle advice and massage.

This study ultimately supports the hypothesis that South African chiropractors would have a higher perception and utilization of research (when compared to graduates from other countries) as a result of their education and research experience in their final years of study.

4.12 Summary

In general, this study has contradicted existing literature. Previous studies found that even though chiropractors may have a positive perception of research, it rarely translates into practice (Suter *et. al*., 2007; Schwarz and Hondras, 2007).

South African chiropractors differ from chiropractors who qualified in other countries, as all of the chiropractors who qualified locally, had to complete a compulsory master's research dissertation (AHPCSA, 2011; DUT Handbook, 2011). This gives South African graduates more experience in finding and utilising research in an effective way. This may explain why South African chiropractors had both positive perceptions as well as regular utilization of research in their practices.

Chapter Five: Conclusions and Recommendations

5.1 Conclusion:

It was found that the average respondent to this research was a 36 year old White male. Most respondents had qualified locally, the majority at DUT and then at UJ. The average number of years participants studied chiropractic for was 6.3 years and most had been in practice for less than 5 years. Respondents were generally in solo practice in urban areas with equal distribution in Gauteng and Kwazulu-Natal. Average weekly working hours were between 31 and 40, with the vast majority reportedly receiving referrals from other health care practitioners, most commonly from general practitioners. Motion palpation was the most regularly used examination technique and Diversified technique, the most common treatment.

General perception of research was found to be very positive overall, with the strongest positive response being that research adds credibility to the profession. However, most respondents disagreed with the statement that chiropractors who had done research had an advantage above those who had not. Most respondents did reading on areas of special interest using mostly websites and textbooks. Even though a high degree of research utilization was reported by chiropractors, research was least likely to be used to change conditions, policies or practices in practice. There was a positive, albeit weak correlation between perceptions and utilization of research, indicating that as perceptions increased, so did utilization of research.

Factors that were positively linked to perceptions were: graduates who had an additional diploma or master's, those who had been in practice for 11-20 years, and those who reported receiving referrals from other practitioners.

Respondents who used lifestyle advice and massage were also found to have higher perceptions. Having published in a journal and thinking that research contributed to their abilities as a chiropractor also had positive links with perception among respondents.

Factors that were positively linked to utilization of research were: graduates with a diploma, who had published in a journal and who received referrals from other health care practitioners. Respondents who indicated that they would do research again also had significantly higher utilization scores than those who said they would not. Other factors included respondent's use of neurological, orthopaedic examinations, muscle tests and vital signs.

Factors with a negative correlation to perception and utilization were respondents with an honours degree and high numbers of years of study (implying failure along the way).

5.2 Recommendations:

Recommendations arising from the findings of this study are that: A longer time period be given for questionnaires to be returned to the researcher in order to have a larger sample group with which to work with. A larger sample group would ensure that the sample group and total population are homogenous allowing for greater generalisbility of the data. Telephonic contact could be made with potential respondents enquiring about their interest in the study and checking that contact details are correct to ensure the questionnaire reaches all potential respondents.

Despite the low response rate, this study has provided several areas of interest. The findings suggest a negative link between years of study and perception and utilization of research. Thus, future research could concentrate on the link between the study experience at training level and its influence on the career

paths and research utilization practices of qualified chiropractors, not only locally, but internationally.

The questionnaire should include greater areas of qualitative enquiry to get a more accurate idea of chiropractors' true perception, for example, asking: "what do you perceive chiropractic research's role to be in the chiropractic profession". Or asking "why" to questions like:"would you participate in a research study again, given the chance." This may allow for more accurate expression of ideas and perception, thereby decreasing the occurrence of question-led answers.

The most noteworthy point was the weak link between perception and utilization in South Africa. It would seem that even though chiropractors perceive research positively, their implementation into practice has some hurdles that impede the full integration of research into practice. As very few, if any of the personal attributes of the South African chiropractor was found to be primarily responsible for low utilization of research in practice, it can be hypothesised that the factors impeding research implementation are most likely environmental in nature. It is suggested the future studies explore the factors that impede the integration of research into practice as this would facilitate improved practitioner implementation of the research that they feel so strongly about.

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APPENDIX A: Final Questionnaire

Section A: Demographic and practice data								
Personal Information	What is your age?							
	Gender	Male			Female			
	Ethnicity	African	Asian	Coloured	Indian	White	Other:	
Education	Where did you attend chiropractic school?							
	When did you complete the above course?							
	How many years of study were required to complete the chiropractic course?							
	What *other* post-school qualifications do you Hold?	1) Short course		No	yes	Specify:		
		2) Diploma		No	yes	Specify:		
		3) Honours		No	yes	Specify:		
		4) Bachelors		No	yes	Specify:		
		5) Masters		No	yes	Specify:		
		6) PhD		No	yes	Specify:		
Practice Information	How many years have you been practising as a chiropractor	< 5 Years	5 - 10 years	11 - 20 years	21 - 30 years	31 - 40 years	> 40 years	
	What type of area do you Practice in?	Urban		Rural		Both		
	In what type of practice do you work?	Solo Practice	Partner-ship	Chiropractic group practice		Multi-speciality group practice		
	What province do you Practice in?	Eastern Cape	Free State	Gauteng	Kwazulu Natal	Mpumalanga		
		Northern Cape	North west Province	Western Cape	Limpopo			
	How many hours per week do you practice?	< 10 Hours	11 - 20 hours	21 - 30 hours	31 - 40 hours	41 - 50 hours	> 50 hours	
	Do you receive referrals from other medical or healthcare practitioners?	No	Yes, from:	General Practitioners				
				Other chiropractors				
				Physiotherapists				
				Specialist physicians				
				Other, please specify:				
	Please indicate your use of the following examination procedures:				**Always**	**Sometimes**	**Never**	
		Postural analysis						
		Static palpation						
		Motion palpation						
		Neurological exam						
		Orthopaedic exam						
		Muscle tests						
		Vital signs						
		Other						
		please specify:						

			Always	Sometimes	Never
	Please indicate your use of treatment techniques by ticking the appropriate box for each technique.	Acupuncture			
		Activator			
		Applied Kinesiology			
		Cranial Technique			
		Cryo/heat therapy			
		Diversified			
		Drop Piece adjustment			
		Dry Needling			
		Gonstead			
		IFC			
		Lifestyle advice			
		Massage			
		S.O.T.			
		TENS			
		Thompson			
		Traction (manual/leander)			
		Trigger point therapy			
		Ultrasound			
		Other			
		please specify:			
	Have you ever conducted formal research?	Yes	No (if no, skip section B, proceed to section C)		

(Only to be completed by participants who have completed a research dissertation)

Section B: Research Participation

	What was the primary reason for doing research?	To obtain a masters qualification	To obtain a doctorate Qualification	As part of an academic career
	When did you conduct the abovemention research?			
	Where did you conduct the abovemention research?			
	Have you ever published an article in a journal?	No	Yes, specify:	
	Would you do research again if given the chance?	Yes	No	
	Has doing research contributed to your abilities as a chiropractor?	Yes	No	

Section C: Perceptions pertaining Chiropractic Research

	Chiropractic research:	Strongly Agree		Neutral		Strongly Disagree
1	Improves patient care	1	2	3	4	5
2	Promotes acceptance of chiropractic among patients	1	2	3	4	5
3	Promotes acceptance of chiropractic among other health care disciplines	1	2	3	4	5
4	Promotes acceptance of chiropractic by medical aid schemes	1	2	3	4	5
5	Promotes acceptance of chiropractic by third party payers	1	2	3	4	5
6	Assists in evaluating existing treatments and their efficacy	1	2	3	4	5
7	Helps to establish practice parameters/guidelines	1	2	3	4	5
8	Increases collaboration and integration of chiropractic within scientific circles	1	2	3	4	5
9	Adds credibility to the chiropractic profession	1	2	3	4	5
10	Should be a mandatory component of clinical training in chiropractic schools	1	2	3	4	5
11	Aids to improve the clinical skills of practitioners	1	2	3	4	5
12	Aids to improve the clinical knowledge of practitioners	1	2	3	4	5
13	Is of benefit to chiropractic as a profession	1	2	3	4	5
14	Inspires critical thinking	1	2	3	4	5
15	Creates interest in the academic possibilities within the chiropractic profession	1	2	3	4	5
16	Chiropractors that have done research have an advantage above those who haven't done research	1	2	3	4	5

Section D: Research Utilization

	Personal use of research	Always	Sometimes	Rarely	Never
1	I read journals to assist with patient education	1	2	3	4
2	I read journals to further my own knowledge	1	2	3	4
3	I read journals to look up specific patient conditions	1	2	3	4
4	I read journals on areas of special interest	1	2	3	4
5	I apply research findings in my practice	1	2	3	4
6	I discuss research findings with my colleagues	1	2	3	4
7	I use research findings to develop clinical practice guidelines	1	2	3	4
8	I use research to change conditions, policies or practices in my discipline	1	2	3	4
9	I use research for self-development	1	2	3	4

	Use of research resources	At least once/wk	1-3 times per month	less than once/month	Never
1	Cochrane Database of Reviews	1	2	3	4
2	PubMed / Medline / other databases	1	2	3	4
3	Peer-reviewed journals	1	2	3	4
4	Clinical practice guidelines	1	2	3	4
5	Web sites	1	2	3	4
6	Textbooks / Handbooks	1	2	3	4
7	Colleagues	1	2	3	4
8	Other, specify:	1	2	3	4

Section E - The Future of Chiropractic Research in South Africa

Important goals to focus research on for the next 5 years are		Very Important	Important	Neutral	Not Important
1	Improving the effectiveness of chiropractic education	1	2	3	4
2	Evaluating the efficacy of chiropractic care for various musculoskeletal conditions	1	2	3	4
3	Building the ability of the profession to conduct its own research	1	2	3	4
4	Evaluating the validity and reliability of chiropractic techniques, procedures and equipment	1	2	3	4
5	Basic scientific research on the nature of the subluxation complex, And /or the physiological effects of adjustments.	1	2	3	4
6	Evaluating the efficacy of chiropractic care for various “visceral” Conditions	1	2	3	4
7	Health services research on chiropractic in the health industry (e.g. cost-effectiveness studies)	1	2	3	4
8	Other, please specify:	1	2	3	4

APPENDIX B
Letter of information - Chiropractors

Dear Participant
Welcome to my study and thank you for your interest. I am a student pursuing a Masters Degree at the Durban University of Technology.

Study Title:
The perceptions of South African chiropractors regarding the perceived role and impact of research within the profession.

Name of Supervisor:	Dr. C. Korporaal (0313732611/0832463562) M.Tech:Chiropractic
Name of Research Student:	Julani Gordon (0827478413)
Name of Institution:	Durban University of Technology

Purpose of the study:
The study will involve research on chiropractors currently practicing in South Africa to determine their perceptions of chiropractic and other research and its contribution to and use within the profession. The data obtained by means of this questionnaire will allow further assessment of the role of research in private chiropractic practices and its effect on assessment and treatment protocol. The questions are concerned with chiropractic demographic and practice data, the use of research in practices, the participation of chiropractors in research and chiropractic perceptions of research and the future of chiropractic research in South Africa. The questionnaire will only take a few minutes to complete, as most of the questions require you to tick the appropriate answer. There are only a few short written responses required**.**

Benefits:
Once the study has been completed you will have access to the results. You may also choose the option of receiving information on current chiropractic research, which may be useful to both you and your patients.

Risks/Discomforts and costs:
There are no risks/discomforts or cost involved from your participation in the study.

Confidentiality:
As with all questionnaires, the information which you will furnish will be treated in the utmost confidence. The questionnaires will be mailed and received by a research administrator and will remain anonymous from the researcher. Posted questionnaires will be delivered to the Durban University of Technology where the Research administrator will separate the completed questionnaires from the letter of informed consent, so as to retain anonymity of the respondents. You are free to withdraw from the study at any time. Please return the questionnaire in the provided envelope.

If you have any problems or complaints please contact Mr. V. Singh, Research co-ordinator for the Faculty of Health Sciences Research and Ethics Committee on 031 3732566.

Your time, opinion and assistance in this project is invaluable and greatly appreciated.
Yours sincerely,

……	**……**
Julani Gordon	Dr. C. Korporaal
Research student	Supervisor
(B.Tech.:Chiropractic)	(M.Tech.:Chiropractic)

APPENDIX C – Letter from neutral third party

D U R B A N
UNIVERSITY *of*
TECHNOLOGY

24 November 2009

TO WHOM IT MAY CONCERN

Ms. J. Gordon, a senior student in the Chiropractic Day Clinic, will be conducting her research in the new year - 2010. Part of her protocol might call for postal replies from participants, as opposed to e-mail replies. In this instance, an administrative person from the clinic is required to collect these postal replies from the departmental research administrator on her behalf. This letter serves to confirm that I am willing to assume this responsibility - my position is administration assistant in the Chiropractic Day Clinic. I can be contacted on extension 2511 or by e-mail at : patriciavdb@dut.ac.za.

Many thanks

Yours sincerely

[redacted]

P. Van den Berg

CHIROPRACTIC DAY CLINIC
P O Box 1334, Durban, 4000 South Africa
Tel: +27 (31) 373 2505/2513. Fax: +27 (31) 202 3003
Website: www.dut.ac.za

APPENDIX D
Letter of Information – Focus Group

Dear Participant,

I would like to welcome you into the focus group of my study, the title of my research project is:

A questionnaire study to determine how qualified chiropractors perceive the role of chiropractic research and its contribution to and use within the profession.

Background to the study:

Chiropractic only started producing a reasonable volume of research after the 1980's. This opened the profession to greater acceptance from both the medical faculty and the public. South African Chiropractic schools require a masters research dissertation to qualify and are some of the only schools in the world to do so. But chiropractic in South Africa is a young profession and chiropractic schools have only been in South Africa for a relatively short period of time, which implies that quite a few chiropractic practitioners in South Africa have studied and qualified abroad. The question raised is this: does the perception of chiropractic research and its utilization differ among chiropractors who have done research versus those who have not and what could the long term implication be for chiropractic as a profession. According to Chapman-Smith the greatest builders of the collaboration between medicine and chiropractic were practitioners that were active leaders in continuing education and research in both fields, which could be an indication of the future of chiropractic in the medical fraternity.

It is therefore the intention of the researcher to determine the current perception that chiropractors have with regards to chiropractic research and their personal utilization of it within their practices.

Objective of the study:

The data obtained by means of this questionnaire will allow for further assessment of the role of chiropractic research within the profession.
The questions are concerned with determining:

1) The specific perception of qualified chiropractors with regards to research as a component of the chiropractic course.
2) The utilization of research by qualified chiropractors.
3) The perceived contribution of research to the profession.

The questionnaire will only take a few minutes to complete, as most of the questions require you to tick or circle the appropriate answer. There are only a few short written responses that are required.

Your participation in this study is much appreciated and you are assured that your comments and contributions to the discussion will be kept confidential. The results of the discussion will only be used for research purposes.

If you have any further questions please feel free to contact either my supervisor or myself.

Julani Gordon

APPENDIX E
INFORMED CONSENT FORM
(TO BE COMPLETED BY THE PARTICIPANTS OF THE FOCUS GROUP)

DATE: **:**

TITLE OF RESEARCH PROJECT **:**
A questionnaire study to determine how qualified chiropractors perceive the role of chiropractic research and its contribution to and use within the profession.

NAME OF SUPERVISOR **: Dr G. Webb**
NAME OF CO-SUPERVISOR **: Dr C. Korporaal**

NAME OF RESEARCH STUDENT **: Julani Gordon**

Please circle the appropriate answer

	YES/NO	
1. Have you read the research information sheet?	Yes	No
2. Have you had an opportunity to ask questions regarding this study?	Yes	No
3. Have you received satisfactory answers to your questions?	Yes	No
4. Have you had an opportunity to discuss this study?	Yes	No
5. Have you received enough information about this study?	Yes	No
6. Do you understand the implications of your involvement in this study?	Yes	No
7. Do you understand that you are free to		
a) withdraw from this study at any time?	Yes	No
b) withdraw from the study at any time, without reasons given	Yes	No
c) withdraw from the study at any time without affecting your future health care or relationship with the Chiropractic day clinic at the Durban University of Technology.	Yes	No
8. Do you agree to voluntarily participate in this study	Yes	No
9. Who have you spoken to regarding this study?		

If you have answered <u>NO</u> to any of the above, please obtain the necessary information from the researcher and / or supervisor before signing. Thank You.

<u>Please Print in block letters:</u>

Focus Group Member: _____ Signature: _____

Witness Name: _____ Signature:_____

Researcher's Name: _____ Signature:_____

Supervisor's / Co-supervisor's Name: _____

Signature:_____

APPENDIX F

<u>IMPORTANT NOTICE</u>: THIS FORM IS TO BE READ AND FILLED IN BY EVERY MEMBER PARTICIPATING IN THE FOCUS GROUP, BEFORE THE FOCUS GROUP MEETING CONVENES.

<u>CONFIDENTIALITY STATEMENT – FOCUS GROUP DECLARATION</u>

1. All information contained in the research documents and any information discussed during the focus group meeting will be kept private and confidential. This is especially binding to any information that may identify any of the participants in the research process.

2. The returned questionnaires will be coded and kept anonymous in the research process.

3. None of the information shall be communicated to any other individual or organisation outside of this specific focus group as to the decisions of this focus group.

4. The information from this focus group will be made public in terms of a journal publication, which will in no way identify any participants of this research.

Once this form has been read and agreed to, please fill in the appropriate information below and sign to acknowledge agreement.

<u>Please Print in block letters:</u>

Focus Group Member: _____Signature:_____

Witness Name: _____Signature:_____

Researcher's Name: _____Signature:_____

Supervisor's /

Co-supervisor's Name: _____Signature:_____

APPENDIX G

CODE OF CONDUCT

This form needs to be completed by every member of the Focus Group prior to the commencement of the focus group meeting.

As a member of this committee I agree to abide by the following conditions:

1. All information contained in the research documents and any information discussed during the focus group meeting will be kept private and confidential. This is especially binding to any information that may identify any of the participants in the research process.
2. None of the information shall be communicated to any other individual or organisation outside of this specific focus group as to the decisions of this focus group.
3. The information from this focus group will be made public in terms of a journal publication, which will in no way identify any participants of this research.

Member represents	Member's Name	Signature	Contact Details

APPENDIX H – Pre-focus group Questionnaire

Please answer all of the questions that follow. Where required, please tick the appropriate box(es), otherwise please state your answer clearly in the space provided.

Section A: Demographic and practice data									
1) Personal Information	1.1) What is your age?								
	1.2) Gender	Male			Female				
	1.3) Ethnicity	Asian	Black	Coloured	Indian	White	Other:		
2) Education	2.1) Which chiropractic school did you graduate from? (No abbreviations please)								
	2.2) Which year did you graduate?								
	2.3) What qualification did you obtain from the chiropractic school?	Bachelors (DC)			Masters (DC)				
		PhD			Other:				
	2.4) What *other* tertiary qualifications do you hold?	1) Short course	No	Yes	Specify:				
		2) Diploma	No	Yes	Specify:				
		3) Honours	No	Yes	Specify:				
		4) Bachelors	No	Yes	Specify:				
		5) Masters	No	Yes	Specify:				
		6) PhD	No	Yes	Specify:				
3) Practice information	3.1) How many years have you been practising as a chiropractor?	< 5 years	6 - 10 years	11 - 15 years	16 - 20 years	21 - 25 years	26 – 30 years	> 30 years	
	3.2) What type of area do you practice in?	City – Urban	City – Suburban	Rural	Combination				
	3.3) In what type of practice do you work?	Solo practice	Partnership	Chiropractic group practice	Chiropractic and other alternative group practice	Chiropracticand medical group practice			
	3.4) What province do you practice in?	Eastern Cape	Free State	Gauteng	Kwazulu Natal	Mpumalanga			
		Northern Cape	North west Province	Western Cape	Limpopo	Other SADEC country			
	3.5) How many hours per week do you practice?	< 10 Hours	11 - 20 Hours	21 - 30 hours	31 - 40 hours	41 - 50 hours	> 50 hours		
	3.6) Do you receive referrals from other medical or healthcare practitioners?	No	Yes, from:	General Practitioners					
				Homoeopaths					
				Other chiropractors					
				Orthopaedic Specialist					
				Paediatricians					
				Physiotherapist					
				Other, please specify:					

4) Please indicate your use of the following examination procedures:								
4.1) Abdominal exam	**Always**	**Sometimes**	**Never**	4.8) Postural Analysis	**Always**	**Sometimes**	**Never**
4.2) Cardiovascular exam	**Always**	**Sometimes**	**Never**	4.8) Respiratory exam	**Always**	**Sometimes**	**Never**
4.3) Gait analysis	**Always**	**Sometimes**	**Never**	4.9) Static palpation	**Always**	**Sometimes**	**Never**
4.4) Motion palpation	**Always**	**Sometimes**	**Never**	4.10) Vital signs	**Always**	**Sometimes**	**Never**
4.5) Muscle testing	**Always**	**Sometimes**	**Never**	4.11) Other: please specify	**Always**	**Sometimes**	**Never**
4.6) Neurological exam	**Always**	**Sometimes**	**Never**				
4.7) Orthopaedic exam	**Always**	**Sometimes**	**Never**				

5) Please indicate your use of treatment techniques by ticking the appropriate box for each technique.	5.1) Acupuncture	**Regularly**	**Occasionally**	**Never**	5.14) Lifestyle Advice	**Regularly**	**Occasionally**	**Never**
	5.2) Activator	**Regularly**	**Occasionally**	**Never**	5.15) Massage	**Regularly**	**Occasionally**	**Never**
	5.3) Applied Kinesiology	**Regularly**	**Occasionally**	**Never**	5.16) Sacro-occiputal technique	**Regularly**	**Occasionally**	**Never**
	5.4) Blocking	**Regularly**	**Occasionally**	**Never**	5.17) Spinal Manipulative therapy	**Regularly**	**Occasionally**	**Never**
	5.5) Cranial Technique	**Regularly**	**Occasionally**	**Never**	5.18) Strapping	**Regularly**	**Occasionally**	**Never**
	5.6) Cryo/heat therapy	**Regularly**	**Occasionally**	**Never**	5.19) TENS	**Regularly**	**Occasionally**	**Never**
	5.7) Diversified	**Regularly**	**Occasionally**	**Never**	5.20) Thompson	**Regularly**	**Occasionally**	**Never**
	5.8) Drop Piece Adjustment	**Regularly**	**Occasionally**	**Never**	5.21)Traction (manual/leander)	**Regularly**	**Occasionally**	**Never**
	5.9) Dry Needling	**Regularly**	**Occasionally**	**Never**	5.22) Trigger point therapy	**Regularly**	**Occasionally**	**Never**
	5.10) Gonstead	**Regularly**	**Occasionally**	**Never**	5.23) Ultrasound	**Regularly**	**Occasionally**	**Never**
	5.11) Interferential therapy	**Regularly**	**Occasionally**	**Never**	5.24) Other, please specify:	**Regularly**	**Occasionally**	**Never**
	5.12) Immobilisation techniques	**Regularly**	**Occasionally**	**Never**				
	5.13) Kinesio-taping	**Regularly**	**Occasionally**	**Never**				

6) General	Have you ever conducted research for qualification purposes?	Yes	No (if no, skip section B, proceed to section C)

Section B: Research Involvement

(Only to be completed by participants who have completed a research dissertation)

	7.1) What was the primary reason for doing research?	a) To obtain a masters Qualification		b) To obtain a doctorate qualification	c) As part of an academic career path (not for a qualification)	
	7.2) How many research studies have you been involved in?		Describe the role you fulfilled in each (Supervisor /Publication /Conductor of Research) as well as the time period during which it took place:	Role:	Year Started:	Year completed:
				a)		
				b)		
				c)		
				d)		
	7.3) Where did you conduct the abovementioned research?					
	7.4) Have you ever published an article in a journal?	No: Give a Reason:		Yes, specify name of journal and year of publication: a) b) c)		
	7.5) Would you do further/additional research if given the chance?	No, Explain:		Yes, Explain:		
	7.6) Has doing research contributed to your abilities as a chiropractor?	No	Please give a reason for your answer:			
		Yes				

Section C: Perceptions pertaining to Chiropractic Research

	Chiropractic research:	Strongly Agree	Agree	Disagree	Strongly disagree
8.1	Adds cultural authority to the chiropractic profession.	1	2	3	4
8.2	Assists in evaluating existing treatments.	1	2	3	4
8.3	Creates interest in the academic possibilities within the chiropractic profession.	1	2	3	4
8.4	Does not promote the acceptance of chiropractic among patients.	1	2	3	4
8.5	Doesn't improve the clinical skills of practitioners.	1	2	3	4
8.6	Doesn't promote the acceptance of chiropractic by medical aid schemes.	1	2	3	4
8.7	Evaluates the efficacy of existing treatments.	1	2	3	4
8.8	Helps to establish practice parameters.	1	2	3	4
8.9	Improves patient care.	1	2	3	4
8.10	Improves the clinical attitude (doctor-patient interaction) of practitioners.	1	2	3	4
8.11	Improves the clinical knowledge of practitioners.	1	2	3	4
8.12	Increases collaboration of chiropractic with scientific circles.	1	2	3	4
8.13	Increases integration of chiropractic within scientific circles.	1	2	3	4
8.14	Inspires critical thinking.	1	2	3	4
8.15	Is not of benefit to chiropractic as a profession.	1	2	3	4
8.16	Is not useful in establishing practice guidelines.	1	2	3	4
8.17	Promotes acceptance of chiropractic among other health care disciplines.	1	2	3	4
8.18	Promotes the acceptance of chiropractic by third party payers.(eg. Workmen's comp)	1	2	3	4
8.19	Shouldn't have to be a mandatory component of clinical training in chiropractic schools.	1	2	3	4
8.20	Chiropractors that have done research do not have an advantage over those who have done research.	1	2	3	4

8.21) Define the advantage/disadvantage you refer to in question 8.20:

Section D: Research Utilization

Personal use of research with regards to chiropractic:		Yes	No
9.1	I read journals to assist with patient education.		
9.2	I read journals to further my own knowledge.		
9.3	I do read journals to look up specific patient conditions.		
9.4	I read journals on areas of special interest within my profession.		
9.5	I do apply research findings in my practice.		
9.6	I discuss research findings with my colleagues.		
9.7	I use research findings to develop clinical practice guidelines.		
9.8	I use research to change policies in my discipline.		
9.9	I use research for self-development.		
9.10	The focus of my research reading is mainly chiropractic.		
9.11	The focus of my research reading is general medical topics.		
9.12	I often read topics about specialized medical conditions and treatments.		
9.13	I read articles/journals on alternative therapies.		

	Use of research resources	At least once/wk	1-3 times per month	less than once/month	Never
10.1	Cochrane Database of Reviews	1	2	3	4
10.2	PubMed / Medline / other databases	1	2	3	4
10.3	Peer-reviewed journals (eg: JMPT/ JMMS/ JCM/ Chiro)	1	2	3	4
10.4	Clinical practice guidelines	1	2	3	4
10.5	Web sites (eg: DC consult/ chiro access/ chiro web)	1	2	3	4
10.6	Textbooks / Handbooks	1	2	3	4
10.7	Colleagues	1	2	3	4
10.8	Other, specify:	1	2	3	4

Section E - The Future of Chiropractic Research in South Africa

	Important goals to focus research on for the next 5 years are:	Very Important	Important	Not Important
11.1	Basic scientific research on the nature of the subluxation complex.	1	2	3
11.2	Basic scientific research on the physiological effects of adjustments.	1	2	3
11.3	Building the ability of the profession to conduct its own research.	1	2	3
11.4	Evaluating the efficacy of chiropractic care for various neuro-musculoskeletal conditions.	1	2	3
11.5	Evaluating the efficacy of chiropractic care for various somato-visceral conditions.	1	2	3
11.6	Evaluating the efficacy of chiropractic care for various visceral conditions.	1	2	3
11.7	Evaluating the validity of chiropractic techniques.	1	2	3
11.8	Evaluating the reliability of chiropractic procedures.	1	2	3
11.9	Evaluating the validity of chiropractic equipment.	1	2	3
11.10	Evaluating the reliability of chiropractic techniques.	1	2	3
11.11	Evaluating the validity of chiropractic procedures.	1	2	3
11.12	Evaluating the reliability of chiropractic equipment.	1	2	3
11.13	Health services research on chiropractic in the health industry (e.g. cost-effectiveness studies).	1	2	3
11.14	Improving the effectiveness	1	2	3
11.15	Improving the effectiveness of chiropractic education.	1	2	3
1.16	Whether or not cost-effectiveness studies on chiropractic treatment are of value.	1	2	3
11.16	Other, please specify:	1	2	3
11.17	Other, please specify:	1	2	3

APPENDIX I: Pre-Pilot questionnaire

Section A: Demographic and practice data							
Personal Information	What is your age?						
	Gender	Male			Female		
	Ethnicity	African	Asian	Coloured	Indian	White	Other:
Education	Where did you attend chiropractic school?						
	When did you complete the above course?						
	How many years of study were required to complete the chiropractic course?						
	What *other* post-school qualifications do you Hold?	1) Short course		no	Yes	Specify:	
		2) Diploma		no	Yes	Specify:	
		3) Honours		no	Yes	Specify:	
		4) Bachelors		no	Yes	Specify:	
		5) Masters		no	Yes	Specify:	
		6) PhD		no	Yes	Specify:	
Practice Information	How many years have you been practising as a Chiropractor	< 5 Years	5 - 10 years	11 - 20 years	21 – 30 Years	31 - 40 years	> 40 years
	What type of area do you Practice in?	Urban		Rural		Both	
	In what type of practice do you work?	Solo Practice	Partner-ship	Chiropractic group practice		Multi-speciality group practice	
	What province do you Practice in?	Eastern Cape	Free State	Gauteng	Kwazulu Natal	Mpumalanga	
		Northern Cape	North west Province	Western Cape	Limpopo		
	How many hours per week do you practice?	< 10 Hours	11 - 20 hours	21 - 30 hours	31 – 40 Hours	41 - 50 hours	> 50 hours
	Do you receive referrals from other medical or healthcare practitioners?	No	Yes, from:	General Practitioners			
				Other chiropractors			
				Physiotherapists			
				Specialist physicians			
				Other, please specify:			
	Please indicate your use of the following examination procedures:				**Always**	**Sometimes**	**Never**
		Postural analysis					
		Static palpation					
		Motion palpation					
		Neurological exam					
		Orthopaedic exam					
		Muscle tests					
		Vital signs					
		Other					
		please specify:					

			Always	Sometimes	Never
	Please indicate your use of treatment techniques by ticking the appropriate box for each technique.	Acupuncture			
		Activator			
		Applied Kinesiology			
		Cranial Technique			
		Cryo/heat therapy			
		Diversified			
		Drop Piece adjustment			
		Dry Needling			
		Gonstead			
		IFC			
		Lifestyle advice			
		Massage			
		S.O.T.			
		TENS			
		Thompson			
		Traction (manual/leander)			
		Trigger point therapy			
		Ultrasound			
		Other			
		please specify:			

	Have you ever conducted formal research?	Yes	No (if no, skip section B, proceed to section C)

(Only to be completed by participants who have completed a research dissertation)

Section B: Research Participation

	What was the primary reason for doing research?	To obtain a masters qualification	To obtain a doctorate qualification	As part of an academic career
	When did you conduct the abovemention research?			
	Where did you conduct the abovemention research?			
	Have you ever published an article in a journal?	No	Yes, specify:	
	Would you do research again if given the chance?	Yes	No	
	Has doing research contributed to your abilities as a chiropractor?	Yes	No	

Section C: Perceptions pertaining Chiropractic Research

	Chiropractic research:	Strongly Agree		Neutral		Strongly Disagree
1	Improves patient care	1	2	3	4	5
2	Promotes acceptance of chiropractic among patients	1	2	3	4	5
3	Promotes acceptance of chiropractic among other health care disciplines	1	2	3	4	5
4	Promotes acceptance of chiropractic by medical aid schemes	1	2	3	4	5
5	Promotes acceptance of chiropractic by third party payers	1	2	3	4	5
6	Assists in evaluating existing treatments and their efficacy	1	2	3	4	5
7	Helps to establish practice parameters/guidelines	1	2	3	4	5
8	Increases collaboration and integration of chiropractic within scientific circles	1	2	3	4	5
9	Adds credibility to the chiropractic profession	1	2	3	4	5
10	Should be a mandatory component of clinical training in chiropractic schools	1	2	3	4	5
11	Aids to improve the clinical skills of practitioners	1	2	3	4	5
12	Aids to improve the clinical knowledge of practitioners	1	2	3	4	5
13	Is of benefit to chiropractic as a profession	1	2	3	4	5
14	Inspires critical thinking	1	2	3	4	5
15	Creates interest in the academic possibilities within the chiropractic profession	1	2	3	4	5
16	Chiropractors that have done research have an advantage above those who haven't done research	1	2	3	4	5

Section D: Research Utilization

	Personal use of research	Always	Sometimes	Rarely	Never
1	I read journals to assist with patient education	1	2	3	4
2	I read journals to further my own knowledge	1	2	3	4
3	I read journals to look up specific patient conditions	1	2	3	4
4	I read journals on areas of special interest	1	2	3	4
5	I apply research findings in my practice	1	2	3	4
6	I discuss research findings with my colleagues	1	2	3	4
7	I use research findings to develop clinical practice guidelines	1	2	3	4
8	I use research to change conditions, policies or practices in my discipline	1	2	3	4
9	I use research for self-development	1	2	3	4

	Use of research resources	At least once/wk	1-3 times per month	less than once/month	Never
1	Cochrane Database of Reviews	1	2	3	4
2	PubMed / Medline / other databases	1	2	3	4
3	Peer-reviewed journals	1	2	3	4
4	Clinical practice guidelines	1	2	3	4
5	Web sites	1	2	3	4
6	Textbooks / Handbooks	1	2	3	4
7	Colleagues	1	2	3	4
8	Other, specify:	1	2	3	4

Section E - The Future of Chiropractic Research in South Africa

Important goals to focus research on for the next 5 years are		Very Important	Important	Neutral	Not Important
1	Improving the effectiveness of chiropractic education	1	2	3	4
2	Evaluating the efficacy of chiropractic care for various musculoskeletal conditions	1	2	3	4
3	Building the ability of the profession to conduct its own research	1	2	3	4
4	Evaluating the validity and reliability of chiropractic techniques, procedures and equipment	1	2	3	4
5	Basic scientific research on the nature of the subluxation complex, And /or the physiological effects of adjustments.	1	2	3	4
6	Evaluating the efficacy of chiropractic care for various “visceral” Conditions	1	2	3	4
7	Health services research on chiropractic in the health industry (e.g. cost-effectiveness studies)	1	2	3	4
8	Other, please specify:	1	2	3	4

APPENDIX I – Ethics Clearance certificate

Faculty of Health Sciences

ETHICS CLEARANCE CERTIFICATE

Student Name	[illegible]	Student No	[illegible]
Ethics Reference Number	[illegible]	Date of FRC Approval	[illegible]
Qualification	[illegible]		
Research Title:	[illegible]		

In terms of the ethical considerations for the conduct of research in the Faculty of Health Sciences, Durban University of Technology, this proposal meets with institutional requirements and confirms the following ethical undertakings:

1. The researcher has read and understood the research ethics policy and procedures as endorsed by the Durban University of Technology, has sufficiently answered all questions pertaining to ethics in the DUT 016 and agrees to comply with them.
2. The researcher will report any serious adverse events pertaining to the research to the Faculty of Health Sciences Research Ethics Committee.
3. The researcher will submit any major additions or changes to the research proposal after approval has been granted to the Faculty of Health Sciences Research Committee for consideration.
4. The researcher, with the supervisor and co-researchers will take full responsibility in ensuring that the protocol is adhered to.
5. *The following section must be completed if the research involves human participants:*

	YES	NO	N/A
❖ Provision has been made to obtain informed consent of the participants	✓		
❖ Potential psychological and physical risks have been considered and minimised			
❖ Provision has been made to avoid undue intrusion with regard to participants and community	✓		
❖ Rights of participants will be safe-guarded in relation to:			
- Measures for the protection of anonymity and the maintenance of Confidentiality.	✓		
- Access to research information and findings	✓		
- Termination of involvement without compromise	✓		
- Misleading promises regarding benefits of the research	✓		

[redacted]

[illegible]
CHAIR

[illegible]
DATE

[illegible]
DATE

[illegible]
DATE