The knowledge, perception and utilisation of vitamin and mineral supplements, natural medicines and pharmacological agents as adjuncts to Chiropractic practice in South Africa.

A dissertation submitted in partial compliance with the requirements for a Masters Degree in Technology, in the Department of Chiropractic at the Durban University of Technology.

By

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2009

I, Natalie De Gouveia, do declare that this dissertation is representative of my own work.

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DEDICATION

This Dissertation is dedicated to my parents, Manny and Janet De Gouveia, for their unconditional love, support and encouragement.

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ABSTRACT

ABSTRACT

Background: The aim of this study was to determine the knowledge, perception and utilisation of vitamins and minerals, natural medicines and pharmacological agents as adjuncts to Chiropractic practice in South Africa.

Method: This study was a population based cross sectional survey utilising a descriptive, quantitative questionnaire study design. The questionnaire was distributed to all practicing qualified Chiropractors (n=388) and masters Chiropractic students (n=102) in South Africa.

Results: The results obtained (30.4% response rate), indicated that the majority of the respondents (62.8%) felt qualified to advise patients on vitamins and mineral supplements and had a positive view of the use of vitamins and minerals as part of Chiropractic patient management (86.6%). The majority of the practitioners were aware that topical substances are part of the scope of practice and males were nearly twice as likely as females to use them. The majority thought biopuncture should be available to Chiropractors (82%) and felt that Chiropractors should challenge the legislation to incorporate biopuncture as part of the scope of practice (77.5%). Most respondents agreed with the statement indicating that NSAIDS should be part of Chiropractic scope of practice and 71% of respondents felt that being able to use NSAIDS in non-emergency situations would enhance patient retention. This study revealed that amongst the student population the majority, if allowed, would consider administering pharmacological agents in practice (55.1%).

Conclusion: A correlation exists between the perception, knowledge and utilisation of vitamins and minerals, natural medicines and pharmacological agents in the Chiropractic profession with respect to the demographic data and there is a significant difference in opinion between qualified Chiropractors and Chiropractic masters students regarding perception, knowledge and utilisation of these adjuncts to practice.

Key Words: Chiropractor, Chiropractic student, vitamins and minerals, natural medicines, pharmacological agents.

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DEFINITION OF TERMS

Adjustment:

any Chiropractic therapeutic procedure that utilises controlled force, leverage, direction, amplitude and velocity which is directed at specific joints or anatomical regions (Chapman-Smith, 2000).

Adjunct:

for the purpose of this research, adjuncts refer to all treatments used by Chiropractors in addition to their manipulative skills and may be included or excluded from the scope of practice. The term modality is used interchangeably.

Allopathic:

the treatment of disease by conventional means, i.e. with drugs having effects opposite to the symptoms (South African Concise Oxford Dictionary, 2007).

Chiropractic:

a health care profession concerned with the diagnosis, treatment and prevention of disorders of the neuro-musculo skeletal system and the effects of these disorders on general health (Chapman-Smith, 2000).

Drug:

a medicine or other substance which has a marked physiological effect when taken into the body. A substance with narcotic or stimulant effects (South African Concise Oxford Dictionary, 2007).

Natural medicine:

treatment that depends upon stimulating the organisms natural abilities for autoregulation. Treatment that uses naturally occurring therapeutic agents such as heat, light or herbs (Swayne, 2000). For the purpose of this research, it includes natural topical substances.

Master's Student:

for the purpose of this study masters student refers to chiropractic students in their final years and currently working in the relevant Institutes Clinic.

Perception:

the ability to see, hear or become aware of something through the senses. A way of regarding, understanding or interpreting something (South African Concise Oxford Dictionary, 2007).

Pharmacological agent:

for the purpose of this research, refers to drugs and pharmacological topical substances.

Practitioner:

for the purpose of this research practitioners are defined as qualified chiropractors

Remedy:

a means of curing or relieving a symptom or disease (Swayne, 2000).

Student:

for the purpose of this study, student refers to a master's Chiropractic student.

Traditional Complementary and alternative medicine (TCAM):

refers to a broad set of health care practices that are not part of a countries own tradition, or not integrated into its dominant health care system (World Health Organisation (WHO) traditional medicine Strategy, 2002-2005).

TCAM practitioners:

for the context of this study, all those who practice Traditional Complementary and Alternative Medicine, including Chiropractors.

Traditional Medicine:

Refers to the health practices, approaches, knowledge and beliefs which incorporate plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose and prevent illnesses and maintain well-being. In industrialised countries, adaptations of traditional medicine are termed “Complementary“ or “Alternative“ (World Health Organisation, 2008)

Chapter One: Introduction

1.1 Background

The Chiropractic health care system is defined as ‘a health care profession concerned with the diagnosis, treatment and prevention of disorders of the neuromusculoskeletal system and the effects of these disorders on general health’ (Chapman-Smith, 2000). In this context Chiropractic practice traditionally emphasises the conservative management of patients without the use of drugs or surgery and when necessary, patients are co-managed with other health care providers (World Federation of Chiropractic, 2003). According to the World Health Organisation, Chiropractors are trained with a background of Traditional, Complementary and Alternative Medicine (TCAM) (World Health Organisation, 2008) and in this respect holism is an important principle which suggests that the body is a network of systems that all have an effect and influence on one another (Chapman-Smith, 2000).

Although the adjustment is a Chiropractor’s primary treatment modality, they provide many other treatments and counselling services (Meeker and Haldeman, 1998). The National Board of Chiropractic Examiners (1993) indicates that most Chiropractors use conventional physical therapy such as corrective exercises, ice packs, bracing, bed rest, moist heat and massage. This study will highlight three adjunctive modalities namely vitamins and minerals, natural medicines and pharmacological agents.

In a South African context, Chiropractors are regulated by the Allied Health Professions Council (AHPCSA) under Act 63 of 1982 (as amended) and the associated statutory regulations. Under these laws, the Chiropractic scope of practice allows for the recommendation of vitamins and minerals for patient use, therefore nutrition is a subject that forms part of the Chiropractic curriculum and there are a number of post graduate courses available to Chiropractors for them to further their knowledge and training in nutrition. In addition and according to the 2001 regulation amendments, the Chiropractic scope of practice also includes the use of substances that are intended exclusively for application to the skin (2001 Regulations of Act 63 of

1982, as amended). In South Africa to date, there is limited literature on the use of vitamins, minerals and topical substances by Chiropractors or Chiropractic students.

As holistic practitioners, Chiropractors may seek further education in natural medicines or wish to expand their knowledge by doing post graduate studies in specialist areas. Some natural medicines, such as Biopuncture may appear to conform to the Chiropractic scope of practice. However, even though Biopuncture is 'natural' it is invasive, which conflicts with the founding principles of Chiropractic as well as the Act and associated regulations (Allied Health Professions Act 63 of 1982, as amended; Drake-Hoffman, 2008). Presently, it is unknown how South African Chiropractors perceive or utilise natural medicines.

Similarly, the use of pharmacological agents by Chiropractors is not part of the scope of practice. However, there are some Chiropractic practitioners in South Africa who perceive a need to include them as adjuncts to the treatment of musculoskeletal conditions in Chiropractic practice (Chiropractic Association of South Africa, 2007). Furthermore, it has been found that Non Steroidal Anti-Inflammatory Drugs (NSAIDs) are seen as the mainstay treatment for musculoskeletal conditions (Bellamy, 1996) for which a course is available to Chiropractors in South Africa that enables them to use an injectable NSAID in emergency cases (Drake-Hoffman, 2008).

Currently, those practitioners who have completed the NSAIDs course and choose to administer NSAIDs to their patients may do so, although this adjunct is not part of the Chiropractic scope of practice. Other patients requiring these agents would be referred to the appropriate allopathic practitioner (World Federation of Chiropractic, 2003). This inter-referral benefits the profession by creating inter-professional relationships. Some South African Chiropractors are against the use of drugs for this very reason. In South Africa, the knowledge, perception and utilisation of pharmacological agents by Chiropractors and Chiropractic students is currently unknown.

In conclusion, this study aims to determine the knowledge, perception and utilisation of vitamin and mineral supplements, natural medicines and pharmacological agents as adjuncts to chiropractic practice in South Africa.

1.2 Aims and Objectives

The aim of this study was to determine the knowledge, perception and utilisation of vitamin and mineral supplements, natural medicines and pharmacological agents as adjuncts to Chiropractic practice in South Africa.

The objectives of this study were:

1) To record the following demographic data with respect to the respondents:
    - Personal demographic data.
    - Educational background.
    - Practice information.
    - Therapeutic treatments utilised.
    - Chiropractic technique.
    - Any inter-professional relationships that the respondents may have established.

2) To determine the participants' perception, knowledge and utilisation of the use of vitamin and mineral supplements in the Chiropractic profession.

3) To determine the participants' perception, knowledge and utilisation of the use of topical substances in the Chiropractic profession.

4) To determine the participants' perception, knowledge and utilisation of the use of natural medicines in the Chiropractic profession.

5) To determine the participants' perception, knowledge and utilisation of the use of pharmacological agents in the Chiropractic profession.

6) To determine associations between perception, knowledge and utilisation of the use of vitamin and mineral supplements in the Chiropractic profession with respect to the demographic data.

7) To determine associations between perception, knowledge and utilisation of the use of topical substances in the Chiropractic profession with respect to the demographic data.

8) To determine associations between perception, knowledge and utilisation of the use of natural medicines in the Chiropractic profession with respect to the demographic data.

9) To determine associations between perception, knowledge and utilisation of the use of pharmacological agents in the Chiropractic profession with respect to the demographic data.

1.3 Rationale

1. The Allied Health Professions Act and regulations (2001 Regulations of Act 63 of 1982, as amended) states that Chiropractors are permitted to control and prescribe vitamins and minerals, nutritional supplements as well as topical substances. However the researcher is not aware of any studies in South Africa to determine the utilisation of these agents in Chiropractic practice.

2. Chiropractors may seek further education in natural medicines or wish to expand their knowledge by doing post graduate studies in specialist areas. Presently, it is unknown how South African Chiropractors perceive or utilise natural medicines.

3. Post-graduate courses such as learning to administer NSAIDs are exclusive adjuncts to practice, and are not included in the scope of practice of Chiropractic. To date, the researcher is not aware of any research that has been carried out to determine the knowledge, perception or utilisation of these adjuncts by the Chiropractic profession.

4. Conventional medical musculoskeletal specialists prescribe medications such as NSAIDs, corticosteroids, anaesthetics, muscle relaxants and anti-depressants as part of their treatment protocol. However, the researcher is not aware of any studies having been carried out to investigate whether the South African Chiropractic profession would like to include these adjuncts in their clinical armamentarium, as the overwhelming majority of conditions treated by this group of healthcare practitioners is related to musculoskeletal conditions.

5. Knowledge of the above will enable the researcher to determine the status quo regarding the utilisation of these adjuncts in Chiropractic practice in South Africa.

1.4 Benefits

The benefit of this study was to gain insight into the knowledge, perception and utilisation of vitamins and minerals, natural medicines and pharmacological agents as adjuncts to Chiropractic practice in South Africa. This will allow for the development of the appropriate regulation of additional adjunctive modalities that do not currently fall under the scope of practice as well as to determine the need for any additional training.

1.5 Limitations

As this study was questionnaire based, it was assumed that respondents would report openly and honestly in their responses.

1.6 Conclusion

In conclusion, this study aimed to determine the knowledge, perception and utilisation of vitamins and minerals, natural medicines and pharmacological agents as adjuncts to Chiropractic practice in South Africa by qualified Chiropractors as well as the Chiropractic student population, as they are the future professionals.

Chapter Two consists of a review of related literature, Chapter Three will analyse the methods and materials used to obtain the information required to meet the aims and objectives of the study. Although unconventional, the results are then presented and discussed in Chapter Four for ease of reading, with the conclusion and recommendations following respectively in Chapter Five.

Chapter Two: Literature Review

2.1 Perception

The study of perception is concerned with how people make sense of the information that they receive through the sense organs of the body (Hayes, 1994). It is the process of selection, organisation and interpretation of information to form a meaningful picture of the world (Chaffe, 1997). People reach or arrive at this "picture" through the process of perception which is based on their senses and their interpretation of their surroundings. This is referred to as a "bottom-up" process of perception, where perception results purely from the stimuli that are available around the person. Additionally, there is a "top-down" process which emphasises the importance of prior knowledge and other cognitive factors (viz. life experience, education and personal characteristics) in directing perception (Robbins, 1996).

A combination of these processes results in the formation of a "perceptual set" (Hayes, 1994); which the literature indicates forms as a result of a cumulative perception that is formed based on perceiver knowledge and expectations, object characteristics and current circumstances. This allows different people to perceive the same object at the same time and in the same environment but in a different light. Thus it has been suggested that the formation of a perceptual set includes but may not be limited to: expectations, motivation and emotion, culture, values and attitudes on the side of the perceiver; combined with various factors relating to the object as well as the environment in which the perceiver and the object interact (Hayes, 1994).

Robbins (1996) broadly classified this information into the following factors that influence perception:

Table 2.1	
The Perceiver • Attitude • Motive • Interests • Experience • Expectations	The Environment • Time • Work setting • Social setting
The Perceived Object • Novelty • Motion • Sounds • Size • Background • Proximity	

As a result of the manner in which a perceptual set is formed, there is always room for agreement or disagreement between the “top-down” processing and the “bottom-up” processing within the individual, as well as the possibility for conflict between the perceiver and the object, the perceiver and the environment or even between the object and the environment. This perception, if associated with disagreement, can be a source of conflict and debate.

It is this area of conflict and debate that this research focuses on, with the context of this study centred around the perceiver, who is identified as the Chiropractor / student. In this context the factors that will influence the Chiropractor’s attitudes, motives, interests, experience and expectations include but are not limited to:

1. Personal demographics and the effect on perceptions,
2. The expectations of health care, contribution to health care and expected outcomes of care received by a patient,
3. History of the Chiropractic profession,
4. Chiropractic education in South Africa and
5. Philosophy of Chiropractic.

In terms of the environmental factors these would include, but are not limited to:

1. History of the Chiropractic profession in South Africa,
2. The position of Chiropractic in the health care system,
3. Socioeconomic factors that govern South African healthcare,
4. Public perception of Chiropractic,
5. Chiropractic health care and practice in South Africa and
6. Chiropractic scope of practice.

With respect to the factors affecting the perceived objects (Vitamins and Mineral supplements, Natural medicines and Pharmacological agents); they will be discussed together under the individual object headings. These factors include but are not limited to:

1. Background,
2. Availability,
3. Effectiveness and
4. Suitability

2.2 The Perceiver (Chiropractors and masters Chiropractic students)

"The defining characteristics of any profession are the perspectives its members bring to the problems they face, this is termed paradigm consensus. Such consensus is evident when knowledge is applied to scholarly and practical problem solving in a systematic manner." (Kuhn, 1970).

2.2.1 Personal Demographics and the effect on perceptions.

Personal demographic factors such as gender, ethnicity, age, years in practice, previous education and training, inter-proffessional relationships and type of practice may influence individuals' perceptions about an object.

2.2.1.1 Gender

Gender is important when discussing perception of Chiropractic practitioners or students in South Africa. When one sets out to determine the views of a particular group of individuals (in this instance Chiropractors/students), it is essential to understand that their viewpoint is based on their inherent characteristics. According to Morgan, Isaac and Sansone (2001), it would seem that women are more likely to graduate from higher education institutions than men. This can be seen in the Chiropractic programme at the Durban University of Technology, where there are more female than male graduates (Kisten, 2009). One would expect that this would lead to a higher number of qualified female Chiropractors. This assertion is however in contrast to studies that have been completed in which male Chiropractors were the majority of respondents (Fletcher, 2005; Mathews, 2006; Bunge, 2007).

Possible reasons for this include that in the past, the Chiropractic profession was male dominated (Chapman-Smith, 2000). Additionally, it was suggested that this could be due to family commitments on the part of the female, who elected either not to continue with practice or limiting practice as the family grew in size (Maharaj, 2009). Currently, it is thought that the demographics in terms of gender may well be equal in status. However, it is not possible to determine the male to female ratio in South Africa as gender is not specified on the Allied Health professions register (Allied Health Professions Council of South Africa, 2008).

Research shows that women are more likely to utilise Traditional, Complementary and Alternative Medicine (TCAM) (Tatalias, 2006; Brown, Cooper, Franton, Steeves-Wall, Gillis-Ring, Barter, McCabe and Fernandez., 2007) as they are more non invasive and are perceived to have less side effects (MacLennan and Wilson, 1996; National Centre for Complementary and Alternative Medicine, 2004; Tatalias, 2006; Low, Murray, O'Mahony and O'B Hourihane, 2008).

This has been hypothesised to be related to the fact that women are normally the custodians of children within the family setting and the literature indicates that those caring for children have a tendency to make use of TCAM care more frequently than those that do not have children (Crawford, Cincotta, Lim and Powell, 2006; Hughes and Wingard, 2006; Lim, Cranswick, Skull, and South, 2006; Smith and Eckert, 2006; Tatalias, 2006; Wilson, Dowson and Mangin, 2007; Low *et al*., 2008).

Thus it would seem more likely that female practitioners would support a higher level of utilisation of vitamins and minerals and natural medicines compared to pharmacological agents in terms of those adjunctive modalities that they would utilise in practice as compared to their male counterparts. This is supported by Brown *et al.,* (2007), who indicated that positive attitudes towards TCAM and utilisation of TCAM among physicians was generally associated with the health care workers being younger and female.

2.2.1.2 Ethnicity

Ethnicity is intrinsically linked to the culture and tradition within which an individual is born and develops (Dreyer, 2004). Therefore, it is difficult to remove the trimmings of this upbringing and its bearing on the manner in which it influences perception (Philbin, Lozada, Zuniga, Mantsios, Case, Magis-Rodriguez, Latkin and Strathdee, 2008; Achilles, Aldelson, Antze, Biggs, Chabot, Gilmour, Jensen and Muldoon, 1999; Bodeker and Burford, 2007). It could therefore be stated that someone with a traditional African upbringing in South Africa, who is now a Chiropractor, may be more inclined

to utilise and suggest natural medicines in practice and be averse to the use of vitamins, minerals and other more medical adjunctive therapies (e.g. NSAIDs) as compared to a Caucasian Chiropractor who has possibly had a first world upbringing and more exposure to pharmacological agents.

A similar parallel could be drawn with the Chiropractor who is of Indian descent, where the culture and religion of this group of people places higher emphasis on natural healing abilities and natural healing methods (Khare, 1996; Singh, Naidoo and Harries, 2004). In this instance it would be expected that the Indian Chiropractor places more emphasis on the vitamins, minerals and the natural substances as compared to the pharmacological adjunctive therapies.

These parallel examples can be further enhanced / detracted from when one looks at the anecdotal evidence that suggests Chiropractors service largely White and Indian communities and are under represented in a more rural context (Myburgh and Mouton, 2007). It has been suggested that this is possible for several reasons:

- Traditional African culture does not recognise manual therapy as a form of healing (Korporaal and Talmage, 2008) and therefore it is unlikely that this ethnic group is represented within the context of the cohort of qualified Chiropractors (Rattan, 2007), as has been seen in previous studies (Mathews, 2006; Bunge, 2007). Nevertheless it could be expected that this group would tend towards the use of more natural substances when in practice as compared to allopathic interventions (e.g. NSAIDs). In contrast to the above however an argument could be made for the fact that in more recent times, the African culture has increased its reliance on the use of more allopathic medications (Hupkes, 1990). Therefore the stance of an African Chiropractor may be more difficult to isolate with regards to the use of vitamin and minerals, natural medicines and / or pharmacological applications.

- The Eastern philosophies that underpin the tradition and culture of the Indian community have always identified with the use of natural medicines, supplements as well as associated manual therapy (World Health Organisation, 2008). Therefore Indian Chiropractors, from within the cohort of qualified Chiropractors, that come from this background are likely to have questions / requests from their patients with regard to the available natural medicines, supplements and therapies available. It is thus expected that these practitioners would be more knowledgeable in this regard than in the application of allopathic medicines.

- In contrast to the above, the Caucasian Chiropractor comes from an eclectic background, where there is a wide variety of choice in terms of the possible combining influences (cultural, traditional and the setting of their development) that could influence their use of natural or allopathic substances as adjuncts in practice. Classically however, those drawn to the profession globally have a greater likelihood for natural, humanistic and conservative care (Chapman-Smith, 2000). Thus it would seem reasonable that they too would prefer the use of natural substances as adjuncts in practice as opposed to allopathic substances. There has however in recent years been increasing anecdotal evidence to the contrary in South Africa (Boshoff, 2006; Milani, 2006).

2.2.1.3 Age and years in practice

According to previous studies carried out in South Africa, the majority of Chiropractic practitioner respondents tended to be between the ages of 25 and 37 years of age (Fletcher, 2005; Mathews, 2006; Bunge, 2007) and Chiropractic students between 22 and 25 (Fyfe, 2006; Grant, 2006).

It was found in the literature that older individuals are more likely to utilise TCAM as compared to younger generations (Kayne, Beattie and Reeves, 1999; Menniti-Ippolito, Gargiulo, Bologna, Forcella and Raschetti, 2002; Reid, 2002; Tatalias, 2006). This may be due to an increased likelihood of exposure over the years to alternative health care methods and increased knowledge of the benefits as well as the risks of medical care (Maharaj, 2009). In addition, disappointments with previous medical care and the increased likelihood of having to deal with more chronic diseases are likely factors that push older individuals to resort to increased use of TCAM benefits and to prefer the natural treatment options as compared to the allopathic alternatives that are available (Kayne *et al*., 1999; Menniti-Ippolito *et al.,* 2002; Tatalias, 2006).

It would therefore be expected that older practitioners would be more likely to perceive the use of vitamins and minerals and natural substances more positively and have increased utilisation thereof as compared to younger practitioners or students. However, most individuals that study Chiropractic, which is a TCAM may be more inclined to use natural substances.

Furthermore, one must also consider the length of time that practitioners have been in practice as this may influence their perception, knowledge and utilisation of these various agents. Currently in the USA, Australia and Europe, there is evidence to suggest that health care consumers are moving to an alternative medical model, which displays a high use of TCAM and associated therapies (MacLennan and Wilson, 1996; Botting, 1997; Ernst, 2000; Willison, Gavin and Andrews, 2004).

Therefore those practitioners that have started practicing more recently are likely to have been influenced by this migration of patients more heavily than practitioners that have been in practice for longer (Hassim, Heywood and Berger, 2007). This may therefore mitigate against the possible effects that age has on the sample in this study as the majority of Chiropractic practitioners have spent less than ten years in practice (Fletcher, 2005; Mathews, 2006; Bunge, 2007).

2.2.1.4 Previous education and experience

In all countries (first or third world), many people seek out various types of natural remedies on the assumption that natural means safe (Pawluch, Cain, and Gillett, 2000). It is however also noted that frequently cited reasons for using TCAM in the literature include improving quality of life, prevention of illness and boosting of the immune system (Willison *et al.*, 2004) and dissatisfaction with conventional medical care (McGregor and Peay, 1999). Therefore, it is believed that personal and / or working experiences in a profession are the best sources of information to that particular profession (Cooperstein and Schwartz, 1992).

Previous education and training ranging from formal qualifications in an entirely separate field to additional qualifications in the health sciences field to short courses in areas of interest will all influence the type of practitioner qualifying or practicing as a Chiropractor as well as the way they will choose to practice. The type of courses chosen or additional qualifications obtained will affect the practitioner accordingly. Chiropractors that have had previous education in natural medicines such as Homeopathy or Biopuncture will have a greater knowledge in this area and may be more inclined to utilise these adjuncts more than someone that has had training in allopathic medicine such as pharmacology (Brown *et al.*, 2007).

2.2.1.5 Inter-referral relationships and type of practice

Good communication between health care professionals has been demonstrated to be an important aspect in ensuring high quality standards of patient care (Brussee, Assendelft and Breen, 2001). Inter-referral between different health care practitioners benefits the profession by creating inter professional relationships. It is thought that practitioners that have high inter-referral rates with other health care professionals may perceive utilisation of adjunctive modalities more negatively as they would rather refer to the necessary practitioners to assist the patient. However, high inter-referral rates with specific practitioners could indicate a level of acceptance and belief in a

specific area of treatment and could therefore suggest higher utilisation levels in practice.

Another aspect that would affect the inter-referral rate amongst practitioners is the type of practice setting the practitioner works in. It has been found that most medical specialists in South Africa practice in private settings (About SA, 2006; Bunge, 2007). Studies show that private practitioners are more likely to refer (Greene *et al.,* 2006). However, if accessibility to other practitioners is low, the Chiropractor in a private setting may be more inclined to utilise many additional adjunctive modalities to benefit the patient and improve patient centred care. Chiropractors practicing in a multi disciplinary practice with a variety of practitioners may also indicate high referral rates (Pillay, 2006) which as previously mentioned will ultimately affect practitioner's perceptions.

2.2.2 The expectations of health care, contribution to health care and expected outcomes of care received by a patient

Individuals perceive things differently and many different factors contribute to this perceptual process (Hayes, 1994). Due to the lack of a clear identity in the Chiropractic profession (Coulter, 1992), many different terms have been used to describe Chiropractic practitioners such as Primary Care Practitioners, Neuromusculoskeletal Specialists, Complementary and Alternative Medicine Practitioners or Holistic Health Specialists (Nelson, Lawrence, Triano, Bronfort, Perle, Metz, Hegetschweiler and LaBrot, 2005). However, it is possibly the way the individual practitioner views himself that will determine how he will choose to practice.

Chiropractic is a holistic profession where a patient centred approach is embraced; this concept is associated with high levels of patient satisfaction. The three most important demands of patient centred care are defined as (Miller and Gemmell, 2004):

- Communication with patients;
- Working in an equal partnership with the patient towards a common goal;
- Focusing beyond the specific condition by looking at health promotion and healthy lifestyles.

This approach lends itself well to Chiropractic practice and has the potential to become the leading health care paradigm of the twenty-first century (Jamison, 2001). However, the use of patient centred care without adequate evidence based guidelines to assist practitioners and patient's decisions could lead to the patient being offered less effective treatment (Miller and Gemmell, 2004). This being said, although Chiropractors may be selective in how they choose to practice and as to what type of practitioner they see themselves as, they are legally bound by Act 63 of 1982, (as amended) to treat within their legislated scope of practice and refer the necessary patients that fall outside of their scope of practice to the appropriate practitioners (Chiropractic Association of South Africa, 2008).

2.2.3 The history of the Chiropractic Profession

According to Haldeman (1992), "spinal adjustment is one of the oldest and most widely practiced healing methods." Daniel David Palmer (who originally practiced as a lay magnetic healer), reportedly gave his first spinal adjustment on 18 September 1895 and is credited with professionalising the practice of spinal adjustments (Haldeman, 1992).

He integrated natural health and scientific models to present a unique theory of Chiropractic. He did this by incorporating the concept of an inherent healing ability of the body, which he named "innate intelligence," into concepts drawn from contemporary knowledge about anatomy and physiology (Meeker and Haldeman, 2002). He avoided the use of drugs and surgery and saw them as

unnatural invasions to the body. He focused on what he perceived as normalising the function of the nervous system as the key to health (Meeker and Haldeman, 2002).

The history of the first century of Chiropractic includes many important events to achieve professionalisation (Meeker and Haldeman, 2002). From the beginning, Chiropractors understood that independent legal status was crucial for survival. Although Chiropractic originated in the United States, it took less than 10 years for Chiropractors to begin practicing in other countries. Today, Chiropractors are licensed, regulated and permitted to practice in most countries around the world (Chapman-Smith, 2000).

According to Coulter (1992), it is evident that Chiropractic history failed to represent normal social development and therefore it is understandable that this may have an affect on how practitioners will perceive the future of the Chiropractic profession.

2.2.4 Chiropractic education

In order to standardise Chiropractic education, systems are needed to monitor education and training of practitioners (World Health Organisation, 2005). The Chiropractic profession began in the United States of America (USA). The first Chiropractic school, Palmer College was opened in 1897 and as the demand for Chiropractors has increased worldwide, it has resulted in the formation of many new Chiropractic schools outside of the USA (Chapman-Smith, 2000).

The Council of Chiropractic Education International (CCEI) is responsible for the monitoring of the many Chiropractic training institutions around the world which are based on a core curriculum of basic science, diagnostic and clinical courses (Chiropractic Council of Education International, 2008). Although there is a vast amount of confusion about the extent and quality of Chiropractic education, much of this stems from the philosophical split due to the unresolved ‘straight/mixer’ conflict (Wardwell, 1992), referred to in section 2.2.4. Durban University of Technology (DUT) was the first institute to offer

Chiropractic training in South Africa, with the first students accepted in 1989. Thereafter the University of Johannesburg (UJ) opened in 1994, both institutes offering a five year undergraduate degree in Chiropractic. Prior to this, Chiropractors practicing in South Africa would have had to obtain international qualifications. There are however still practitioners that elect to study overseas.

The first three years of the Chiropractic programme in South Africa consists primarily of all the medical science subjects. These are anatomy, physiology, pathology, pharmacology and diagnostics. In the third year there is a focus on the principles and practice of Chiropractic, which progresses in the latter years until the final year where supervised experience takes place in the institutions' Chiropractic Clinic. The five year course culminates in a Masters degree in Technology: Chiropractic. A one year internship must also be completed after the fifth year as determined by the Allied Health Professions Council of South Africa (AHPCSA) (Chiropractic Association of South Africa, 2008). In South Africa,,students are trained in diversified technique but this is not necessarily the case on an international level. Techniques taught internationally range from Best, Sacro Occipital Technique, Gonstead, Activator and many others.

"The education of any profession is the foundation of that profession" (Bunge, 2007). The type of education individual practitioners obtain will strongly influence their philosophy of Chiropractic (discussed in Section 2.2.5) and ultimately the way they practice. Chiropractors with international qualifications, especially those from philosophical institutes, may tend to have a more philosophical approach that would limit their inclusion of additional modalities whereas practitioners that qualified in South Africa after 1989 were taught in a more evidence-based paradigm which may have encouraged the use of additional modalities that may have been found in research and literature to benefit patients. However, in terms of their treatment methods and philosophical orientations, this also relates to practitioners that have a South African qualification but have practiced overseas once qualified.

A practitioner's education is further reinforced by the professional body they choose to join. In the United States there are a variety of professional bodies that are in constant conflict with each other about what the profession is and where it is headed. In South Africa there is only one professional body, the Chiropractic Association of South Africa (CASA) that Chiropractors may join. This could ultimately lead to South African Chiropractors having a more united perception of the professions' identity in terms of the scope of practice and the use of additional modalities in practice. The Institution that an individual qualifies from may therefore affect their perception, knowledge and utilisation in practice.

2.2.5 Philosophy of Chiropractic

The concepts and principles that discern and differentiate the philosophy of Chiropractic from the other health care professions are of major importance to most Chiropractors and strongly influence their attitude and approach towards health care (World Health Organisation, 2005).

Traditional Chiropractic, whose practitioners are known as 'straights' tend to rely exclusively on spinal adjustments to emphasise innate intelligence (Kaptchuk and Eisenberg, 1998), also referred to as the concept of vitalism (Haldeman, 1992). However, according to Paris (2000), most Chiropractors today are 'mixers', those practitioners who mix the traditional Chiropractic concepts of vitalism and holism with physiotherapy and rehabilitative techniques.

'Mixers' tend to be more open to conventional medicine and scientific belief and some see themselves less as traditional Chiropractors and more as practitioners of a generic complementary medicine. Another group of 'mixers' seek to position themselves in the broader mainstream health care system as specialists in musculoskeletal disorders (Kaptchuk and Eisenberg, 1998).

According to Nelson *et al.,* (2005), there is a long historical legacy of vitalism and although it continues to be a feature within many contemporary belief systems, there are a substantial number of Chiropractors that wish to disregard the concepts of vitalism entirely, as they feel to retain it will ensure Chiropractic operates completely outside the scientific healthcare community. Kaptchuk and Eisenburg (1998) proposed that the history of conflict between the 'straights' and 'mixers' is still used today to describe an unresolved split in the profession and this has resulted in the delayed formation of a united identity to communicate to the public and increase inter professional activity.

The 'straight' practitioner's dogmatic view against using any modality other than adjustments to treat patients could potentially prevent them using vitamins and minerals, natural medicines and pharmacological agents as part of their practice. Whereas 'mixers', many of whom have a belief in the innate ability of the patient to heal themselves, look at the patient as the centre and will include any modality that will aid the patient in restoring or maintaining health and may therefore be more likely to positively perceive and incorporate additional modalities into their scope of practice.

2.3 The environment

2.3.1 The history of the Chiropractic Profession in South Africa

The first Chiropractors came to South Africa in the early 1920's, although dates and names are not confirmed (CASA, 2008). The first association was formed in 1939 by the Payne brothers. The association was known as the South African Manipulative Practitioners Association or SAMPA. In the 1950's some of the South African Chiropractors broke away and formed the Pan-African Chiropractor's Association (PACA) which included mixers and straights. Dr Josh Haldeman was unhappy with the mixer philosophy and in 1952 the South African Chiropractor's Association (SACA) was formed. PACA and SACA fused in 1971 to form the present day Chiropractic Association of South Africa or CASA (Brantingham and Snyder, 1999).

Although the first Chiropractic legislation was passed which licensed the profession and recognised CASA, it made no provision for the registration of new Chiropractors (Till, 1997). After years of protest by CASA, they were invited to give a presentation to the South African Medical and Dental Council (SAMDC) as well as members of the Ministry. The voting was 17-16 against incorporation of Chiropractic into the SAMDC. This then paved the way for separate legislation for Chiropractic in South Africa (CASA, 2008).

In 1982, the Chiropractors, Homeopaths and Allied Health Services Professions Council was formed, a statutory body that wrote Chiropractic into law (CASA, 2008). Although a major step forward, it still failed to open the register for new Chiropractors and the profession remained in danger of failure (Till, 1997).

The South African Associated Health service professions board authorised Dr Milani, Dr van der Veen and Dr Till to visit Chiropractic colleges overseas. As a result of the reports and documents submitted to the Department of Health after their investigation in 1984, legislation was changed and the register re-opened for licensing of new Chiropractors. This was opened in 1985 allowing growth to occur in the profession (Till, 1997). This led to the opportunity to offer an education programme in South Africa. After touring many overseas institutes, a curriculum was drawn up and the first Chiropractic students were accepted into Technikon Natal in 1989 (CASA, 2008) now known as DUT and in 1994 into the Witwatersrand Technikon now known as UJ as discussed in section 2.2.4.

The history of the Chiropractic profession in South Africa may change the perception of practitioners depending on when they started practicing in the Country. For example, Chiropractors qualifying from South African institutions started practicing in an era where legislation had been granted. Therefore historical progression of the profession may influence practitioners and students perceptions. Pioneers in the profession may have a difference in opinion to newer graduates who have not been involved in the struggle for Chiropractic legislation in South Africa.

2.3.2 The position of chiropractic in the health care system

Chiropractic is an emerging health care profession with functions, values, traditions and training institutions similar to those of other professions (Meeker and Haldeman, 2002). At present there are approximately 450 Chiropractors registered with the Allied Health Professions Council of South Africa (AHPCSA) and the profession is growing each year as graduates from DUT and UJ qualify. In South Africa most practitioners work in a private setting but strive for integration with mainstream medicine. The Chiropractic Association of South Africa (CASA) has aligned itself with the World Federation of Chiropractic (WFC) and adopted the WFC identity for the practice of Chiropractic (CASA, 2008). Chiropractors use the information from the case history and examination to determine the patient's state of health and to form a diagnostic impression with additional studies obtained as needed (Meeker and Haldeman, 2002).

The state of health has changed dramatically since the time Chiropractic began in 1895 compared to the late 1980's when it was first taught in South Africa. Diseases such as HIV/Aids and many others have meant Chiropractors may have to adapt their thought processes when dealing with these chronic conditions and the way they manifest in the musculoskeletal system, which may make the use of nutritional advice and other modalities a necessity. In South Africa, unlike the United States, Chiropractors, by law, are primary care practitioners which may require more extensive diagnostic ability and ultimately could require an increased therapeutic index. All these factors will affect practitioner's perceptions of the Chiropractic scope of practice and it is therefore necessary to determine the perception of South African Chiropractic practitioners towards the use of adjunctive therapies in practice.

2.3.3 Socioeconomic factors that govern South African healthcare

Most Chiropractors in South Africa work in the private sector (CASA, 2008), which caters for middle and high income earners who tend to be members of medical schemes (18% of the population) (About South Africa> Health, 2006). Majority of medical aid schemes provide reimbursement for Chiropractic care, however, it depends on each person's payment plan as to the extent to which they are covered.

The high levels of poverty (71% in rural areas and 50% overall) and unemployment (at least 38%) make it difficult for most people to belong to a medical aid scheme or pay for health services in South Africa (About South Africa> Health, 2006). This indicates that a large number of people are not even exposed to Chiropractic due to affordability issues (Rattan, 2007). However, since 1994, Chiropractic care has been covered by Workmen's Compensation also known as Compensation for Occupational Injury and Disease (COIDS) allowing any injury which occurs whilst on duty to be treated by a Chiropractor. All costs including X-rays, if necessary, will be reimbursed by COIDS (CASA, 2008). This allows for greater exposure of Chiropractic to the general public.

Socioeconomic circumstances in South Africa are possibly one of the many causes of the current crisis in the health care system. Other factors include a shortage of resources, high and rising costs of health care, lack of inter-professional co-operation and under utilisation of more cost effective treatments (Hupkes, 1990). Chiropractors, as primary care practitioners, could play a role in minimising this crisis by aligning themselves with mainstream medicine. An individual with this perception may be more amenable to additional modalities in practice.

2.3.4 Public perceptions of Chiropractic

A good knowledge of Chiropractic in the general public and other medical health professions is necessary for the growth of the Chiropractic profession in South Africa. According to Hurwitz, Coulter, Adams, Genovese and Shekelle (1998), most patients go to Chiropractors for musculoskeletal problems; approximately 60% with low back pain, and the remainder with head, neck, and extremity symptoms. Furthermore, about half of the patients seeking Chiropractic care have chronic symptoms with only a small number seeking care for other conditions (Hurwitz *et al*., 1998).

According to Kaptchuk and Eisenburg (1998), many large surveys leave little doubt that Chiropractic works. The results of these surveys show that most patients are satisfied with Chiropractic treatments (Sanchez, 1991; Wardwell, 1992; Kaptchuk and Eisenburg, 1998). A study by Caplan, Kenneth and Associates (1994) found that the public and Chiropractors have very different perspectives of the Chiropractic profession and what it can offer. According to Chapman-Smith (2000), “if a product or profession is not understood it is not used. “ Chiropractors think they have a major role to play in prevention whilst the public, including Chiropractic patients, don’t understand this and have very little understanding about Chiropractic education, qualifications and scope of practice (Caplan *et al*., 1994).

It has however been suggested that public perception of Chiropractic is often based on ignorance, bias and misinformation rather than on fact (Kew, 2006). Gaps in public knowledge of Chiropractic translate to non utilisation. The more unclear the public understanding of the Chiropractic profession’s scope of practice is, the more likely they will not identify a condition as one that can be treated by Chiropractic (Sanchez, 1991).

In South Africa and around the world there has been a move to increase the utilisation of TCAM therapies. (Meeker and Haldeman, 2002). The majority of the public perceive Chiropractors to be complementary and alternative therapists who practice without the use of surgery or drugs (World Federation

of Chiropractic, 2005). Therefore the growth of the Chiropractic profession is at a significant risk if the perceived view of Chiropractic by the public is altered by practitioners including modalities that do not conform to the so called TCAM scope of practice.

2.3.5 Chiropractic health care and practice in South Africa

Many years after its foundation, the Chiropractic profession failed to identify itself in a way that is understandable, credible and scientifically coherent. This has prevented the profession from establishing cultural authority over any specific area of health (Coulter, 1992). There is still widespread ignorance amongst the public, politicians and policy makers about what Chiropractic is and where it fits into the health care system (Coulter, 1992). However, Chiropractic is the largest, most regulated and best recognised of the professions that have traditionally functioned outside of mainstream medicine and falls into the category of traditional complementary and alternative medicine or TCAM (Meeker and Haldeman, 2002).

Due to these advances, many feel that to call Chiropractic “alternative” is difficult in many ways and that it is distinctly mainstream (Kaptchuk and Eisenberg, 1998). Contraindications exist not only between Chiropractic and mainstream medicine but within the Chiropractic profession itself. In a study done by Langworthy and Pollentier (2007), they found that 98% of Chiropractors considered themselves to be primary contact practitioners. However the concept of primary care is routinely misunderstood (Nelson *et al*., 2005). Initially it was a term denoting the point at which the patient enters the health care system (Coulter, 1992). The Institute of Medicine defined it as “the provision of integrated accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients and practicing in the context of the family and the community” (Donaldson, Yordy, Lohr and Vanselow, 1996).

Kranz (1985) concluded that “Primary care therefore would be care that provides for the general health needs of the patient; is a first or direct contact service; provides an assessment of health; is accessible to those who need it; is acceptable to the consumer of health care services; is accountable; provides education and counselling; provides coordinated, continuous, comprehensive and essential care”. He also points out that although Chiropractic is primary contact and provides initial health care assessment, there is a lack of evidence to confirm the other criteria. According to Kranz (1985), Chiropractic runs the risk of misrepresentation to the public if it takes accountability for primary care but is unable to deliver it.

Chiropractic still maintains remnants of an alternative health care profession in image, attitude, and practice (Meeker and Haldeman, 2002). The profession has not resolved questions of professional and social identity, and it has not come to an agreement on the implications of integration into mainstream health care delivery systems and processes. In today’s vibrant health care system Chiropractic stands at a defining moment between mainstream and alternative medicine. Its future role will be improved by its commitment to interdisciplinary cooperation and science based practice (Meeker and Haldeman, 2002).

This controversy highlights the importance of a common understanding regarding the scope of practice and the use of additional modalities amongst the Chiropractic profession so that there is uniformity, which will limit the amount of confusion by the public and other health care professionals.

2.3.6 Chiropractic Scope of Practice

Chiropractic practice traditionally emphasises the conservative management of patients without the use of drugs or surgery and where necessary patients are co-managed with other health care providers (World Federation of Chiropractic, 2003). According to the WHO, Chiropractors are trained with a background of TCAM health (World Health Organisation, 2004) and in this respect holism is an important principle which suggests that the body is a

network of systems that all have an effect and influence on one another (Chapman-Smith, 2000).

Although spinal adjustment is a Chiropractor's primary modality, they provide many other treatments and counselling services (Meeker and Haldeman, 1998). The National Board of Chiropractic Examiners (1993) indicates that most Chiropractors use conventional physical therapy such as corrective exercises, ice packs, bracing, bed rest, moist heat and massage.

In a South African context, Chiropractors are monitored by the Allied Health Professions Council of South Africa (AHPCSA) and the statutory regulations.

The scope of practice according to the AHPCSA includes (Act 63 of 1982, AHPCSA, 2001):

- Adjustment or adjustments,
- Electrotherapy,
- Exercise therapy,
- Hydrotherapy,
- Traction therapy,
- Thermal therapy,
- Vibration therapy,
- Immobilization therapy,
- Neuro-muscular reflex therapy,
- Massage therapy,
- Acupuncture or acupressure therapy and remedies and
- Dietary advice or dietary supplementation.

According to the 2001 regulations, the Chiropractic scope of practice includes the use of substances that are intended exclusively for application to the skin (2001 Regulations of Act 63 of 1982, as amended). These could include topical drugs such as voltaren gel and topical homeopathic remedies such as arnica and traumeel gel.

In contrast to the above scope of practice, many other countries have a severely restrictive scope of practice that only allows for adjustment and limited manual therapy techniques. However, most of these countries with regulated Chiropractic legislation are first world countries with very different demands on health care to South Africa and so it may be perceived that a broader scope of practice is required in South Africa.

2.4 The Perceived Object

2.4.1 Vitamins and Minerals

Vitamins are defined as “a group of organic compounds which are essential for normal nutrition and have to be supplied in the diet because they cannot be synthesized by the body” (Pigford and Hartmann – Petersen, 1991). Minerals are “inorganic substances needed by the human body for good health, such as calcium and iron” (Pigford and Hartmann – Petersen, 1991). Most vitamins and minerals are unscheduled and are available to the general public on an over the counter basis. In a US study on college students, it was found that 40-60% believed even with a balanced diet it was necessary to take a vitamin and mineral supplement (Levy, Neuhouser and Patterson, 1999).

Other reasons for people taking vitamin and mineral supplements include; decreasing their susceptibility to health problems such as colds, stress, heart conditions and cancer (Balluz, Kieszak, Philen, and Mulinare, 2000). According to Balluz *et al.,* (2000) dietary supplements are commonly used without supervision and health professionals should be aware of the potential limited adverse effects to using supplements. Although most consumers receive health care primarily from physicians and nurses, the majority of supplement use was based on recommendations from family and friends (Levy *et al.,* 1999). Due to the increase in TCAM use by the general public and patients possible lack of trust in mainstream medicine (Hupkes, 1990), more patients could potentially seek advice or recommendations on vitamins and minerals from Chiropractors as they are commonly perceived as holistic practitioners (Chapman-Smith, 2000)

Nutrition is a subject that forms part of the South African Chiropractic curriculum; however it is not known whether practitioners feel they have sufficient knowledge in this area. There are a number of post graduate courses available to Chiropractors for further knowledge and training in the use of vitamins and minerals, but it will depend on the individual practitioner's level of knowledge as well as their perception of the importance of vitamin and mineral advice as to whether they choose to attend these courses.

According to the National Board of Chiropractic Examiners (1993), nutritional supplements are the next leading non manipulative therapy in "mixer" practice. A United States study revealed that 96.7% of Chiropractors felt that vitamin and mineral advice was part of the Chiropractic scope of practice (n=687) (Durkin, McDonald and Pfefer, 2003). Based on the fact that there are similarities in the demographics between Chiropractors in South Africa and the United States (Walker and Buchbinder, 1997; Coulter and Shekelle, 2005; Fletcher, 2005; Mathews, 2006; Bunge, 2007), similar findings could be expected in South Africa. Despite practitioner's thoughts on this, as stated in Section 2.3.6 above, healthy eating plans and the recommendation of vitamins and minerals for patient use is part of the South African scope of practice of a Chiropractor (Act 63 of 1982, as amended) and it is therefore assumed that South African Chiropractors will have a high level of utilisation of these adjuncts but this has yet to be investigated.

2.4.2 Natural Medicine

Chiropractors, like other health care practitioners may obtain other qualifications in disciplines such as Homeopathy, Naturopathy, Acupuncture, Chinese medicine, Reflexology and many others. In South Africa most of these natural medicines fall under the same legislating body, the Allied Health Professions Council of South Africa (AHPCSA), as well as being grouped together as TCAM.

Biopuncture has recently become very popular as a natural medicine. It involves the utilisation of homeopathic remedies that are injected into specific locations in the body to stimulate the natural self-healing capacities of the body (Gagnier, 2007). These remedies have been shown to work via the immune system to include both inhibition of Inter Leuken-1Beta and Tumor Necrosis Factor-alpha secretion, providing an anti inflammatory mechanism (Branski, Cahalon, Lider, Oberbaum, Porozov and Weiser, 2004). Biopuncture treatment has been shown to be very successful in treating musculoskeletal conditions; therefore those practitioners that view themselves as musculoskeletal specialists may perceive a need to include this as an additional modality in practice. However some of these qualifications may be viewed as contradictory to the concepts of holism and conservative management, which will prevent Chiropractors with a strong philosophical and historical belief system from using these natural medicines in practice.

In September 2008, the Allied Health Professions Council of South Africa (AHPCSA) issued a letter stating that the use of Biopuncture falls outside the scope of practice of a Chiropractor, however further investigation into the knowledge and perception of the modality will assist in allowing for the development of the appropriate regulation for the potential utilisation by Chiropractors.

2.4.3 Pharmacological therapies

Pharmacology is defined as “the study of drugs and their action on the body” (Pigford and Hartmann – Petersen, 1991). Philosophical commitment to a natural form of health care does not exempt practitioners who function in a drug utilising health care system from understanding the potential use and abuse of these pharmacological agents (Jamison, 1991). The Chiropractic curriculum in South Africa has a one year pharmacology course to give practitioners a basic pharmacological knowledge, however some practitioners may perceive this to be insufficient knowledge to utilise these agents in practice.

Giles and Muller (2003) found that Chiropractic treatment is often more successful than medical treatment and patient satisfaction with Chiropractic care is generally higher. The art, philosophy and science of Chiropractic have always emphasised the inherent recuperative power of the body to heal itself without the use of drugs or surgery (World Federation of Chiropractic, 2003), therefore it is expected that those practitioners with a strong philosophical stance may be less likely to utilise pharmacological agents.

A study in the United States on the Chiropractic scope of practice found that the right to prescribe drugs was a dividing issue in the profession and that only 39.8% of all prescriptions are viewed as beneficial (Durkin *et al.,* 2003). Findings in South Africa could be similar, however being a third world country with different health care demands, more practitioners could view the use of these agents as beneficial adjuncts to practice. Although a small minority of Chiropractors have advocated seeking an expansion of the scope of practice to include rights to prescribe drugs, the use of pharmacological therapies does not form part of the current scope of practice (World Federation of Chiropractic, 2006).

In South Africa a post graduate Non Steroidal Anti Inflammatory Drug (NSAID) course is available to Chiropractors enabling them to use an injectable NSAID (Diclofenac Sodium) in emergency cases (Drake-Hoffman, 2008). NSAIDs have anti-inflammatory, analgesic and antipyretic actions and are used to treat pain and inflammatory conditions as well as myalgia, headaches and pyrexia (Johnson and Stovitz, 2003). NSAID medication is appropriate for use especially in the short-term treatment of a wide variety of musculoskeletal conditions with only a small percentage having adverse effects (Aglas, Chlud and Fruhwald, 1998). NSAIDs are the mainstay treatment for musculoskeletal conditions (Bellamy, 1996). There are some practitioners in South Africa who perceive a need to include them, as well as other pharmacological agents as adjuncts to the treatment of musculoskeletal conditions in Chiropractic practice (Chiropractic Association of South Africa, 2007).

2.5 Summary

In conclusion, within the Chiropractic profession much debate centres on the perceived views of these various concepts. Perception is strongly influenced by an individual's knowledge which in turn affects utilisation. This study aims to determine the knowledge, perception and utilisation of vitamin and mineral supplements, natural medicines and pharmacological agents as adjuncts to Chiropractic practice in South Africa by the general Chiropractic population as well as the Chiropractic student population as they are the future professionals.

Chapter Three: Methodology

3.1 Introduction

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

3.2 Study Design

This study was a population based cross sectional survey utilising a descriptive quantitative questionnaire design study. The questionnaire used for the data collection made use of a simple answering system thus facilitating easy data collection. A pre-validated questionnaire was used and modified after a review of the literature (Rubens, 1994; Hunter, 2003; Louw, 2005).

This research study was approved by the Faculty of Health Sciences Research Committee of Durban University of Technology, an ethics clearance certificate was issued (Appendix L) indicating that this research met the ethical standards of the Faculty of Health Sciences Research Committee which are in line with the declaration of Helsinski 1975 (Johnson, 2005).

3.3 Methodology

3.3.1 Sampling Procedure

This research study did not require any form of advertising as the total population was invited to participate. Permission was obtained from the Durban University of Technology (DUT) and the University of Johannesburg (UJ) to conduct the research on all masters Chiropractic students registered at each institute. A list of all qualified Chiropractors was obtained form the Allied Health Professions Council of South Africa (AHPCSA) and once the list was obtained (n=418) those respondents not meeting the inclusion/exclusion criteria were excluded resulting in (n=388). The total masters student

population was invited to participate (n=102) therefore the total population of this study was (n=490).

3.3.2 Participant sampling

In order for this study to be statistically valid, a minimum questionnaire return rate of 30% was needed for both the student and qualified Chiropractor groups (Esterhuizen, 2008). Returns exceeding the minimum required rate were included in the analysis, as this makes the study stronger.

3.3.3 Allocation

All respondents were allocated to one group. Subgroups (qualified Chiropractors and students) were analysed individually and collectively to allow comparisons between the subgroups.

3.3.4 Sample characteristics

Inclusion and exclusion criteria to the study was as follows:

Inclusion criteria:

All qualified Chiropractors participating in this study had to comply with the following inclusion criteria:

- All respondents had to be registered with the Allied Health Professions Council of South Africa.

All Chiropractic students participating in this study had to comply with the following inclusion criteria:

- All respondents had to be registered as a current master's Chiropractic student with Durban University of Technology (DUT) or the University of Johannesburg (UJ).

Exclusion criteria:

Respondents were excluded from the study if they had:

- Participated in the research focus group.
- Participated in the research pilot study.

3.4 Procedure

The developed questionnaire was sent out to all practicing Chiropractors in South Africa that were registered with the Allied Health Professions Council of South Africa at the time as well as all master's Chiropractic students registered at UJ or DUT. The Questionnaire (Appendix I) was accompanied by a Letter of Information and Informed Consent Form (Appendix H), which explained what the research was about and what was expected in terms of the completion of the Questionnaire. Each participant was required to complete the Questionnaire.

3.4.1 Method of distribution and data collection

Procedure for qualified Chiropractors:

Each Chiropractor was contacted telephonically to ask for their participation in the study. Once they agreed to participate, the Questionnaire and the Letter of Information with the Informed Consent Form was sent to them either by post or e-mail.

It was explained to each participant that to maintain anonymity to the researcher, an independent person (the subject librarian) would receive all returned Questionnaires and Informed Consent Forms. She would then separate the Informed Consent Forms from the Questionnaires, thus ensuring that there was no way the researcher could identify the person who filled out the Questionnaire. A time period of four weeks was given to allow for the completion and the return of the questionnaires, thereafter the sample group

was contacted telephonically as a reminder. This procedure continued until the minimum response rate was reached.

Post

The Questionnaires sent by post had a self-addressed envelope included and were returned to:
Faculty of Health Sciences Subject Librarian
Mrs S Naidoo
Alan Pittendright Library
Steve Biko Campus
P.O. Box 1334
Durban
4001

e-mail

The Questionnaires sent by email were returned to: naidoose@dut.ac.za

Procedure for Chiropractic students:

The questionnaires were administrated by a third party to all master's students registered at DUT and UJ and were later collected. The third party was used as the information the respondents were asked to fill in might have been jeopardized if the Questionnaire was returned to the researcher. The third party had two boxes one for the Questionnaires and one for the Informed Consent forms. This ensured anonymity.

The Questionnaires were stored in the Department of Health Sciences at Durban University of Technology and were only accessible to the researcher and supervisor. This ensured respondent confidentiality. All returned Questionnaires were analyzed and where data was missing it was regarded as such and included in the study.

3.5 Questionnaire background and development

This questionnaire was compiled after a review of the literature of previous perception studies completed in South Africa (Rubens, 1994; Hunter, 2003; Louw, 2005) and modified according to this study. Using previous questionnaires allowed for the maintenance of the construct validity that had been built in them previously.

Reliable and valid questionnaires are a good source of information (Mouton, 1996). A questionnaire is the tool of choice, as it ensures that bias is kept to a minimum, and there is also less chance of misinterpretation of the results (Mouton, 1996). The questionnaire used in this study made use of a simple answering system thus facilitating easy data collection. There were limited open ended questions included, adding a qualitative aspect to the study (Dyer, 1997).

The questionnaire was divided into six parts each containing questions pertaining to knowledge, perception and utilisation.

- Part One required demographic information about the respondents to determine correlations between these variables and the knowledge, perception and utilisation of vitamin and mineral supplements, natural medicine and pharmacological agents as adjuncts to Chiropractic practice in South Africa.

- Part Two's questions referred to vitamin and mineral supplements.

- Part Three referred to questions on topical substances.

- Part Four was on natural medicines.

- Part Five on non-steroidal anti-inflammatories.

- Part Six on pharmacological agents.

3.5.1 Focus Group

A Focus Group was set up to ensure the questionnaire met the requirements of reliability and validity (Mouton, 1996). Face validity is determined by an agreement between the researcher and those with a vested interest in the questionnaire, that on “the face of it” the tool seems valid (Bernard, 2000). The focus group was conducted as a meeting, attended by the researcher, two registered Chiropractors, two master’s Chiropractic students, supervisor and co-supervisor.

During the focus group meeting a Letter of Information (Appendix A), Informed Consent Form (Appendix B), Confidentiality Statement (Appendix C) and a Code of Conduct form (Appendix D) was completed and signed by the respondents.

The group met to discuss the Questionnaire (Appendix E) and the issues that it covered, thus ruling out any ambiguity and confusion. Relevant questions were included while other questions deemed irrelevant were omitted. Changes (Appendix F) were only made to the questions if there was general consensus among all the respondents resulting in the post group questionnaire (Appendix G).

3.5.2 Pilot Study

A pilot study involves administering the questionnaire to a very small sample from the population for which it is intended. In this study Chiropractors and master's Chiropractic students were used. The purpose of this was to see how long it took to complete the questionnaire and to identify any problem areas in the questionnaire. Comments and suggestions were taken into consideration and the questionnaire was changed accordingly. The final, corrected questionnaire was developed and printed for use in this study (Appendix I).

3.5.3 Final Questionnaire

The final questionnaire consisted of six parts:

Part One - Demographic
Part Two - Vitamin and Mineral Supplements
Part Three - Topical Substances
Part Four - Natural medicine
Part Five - Non-Steroidal Anti-Inflammatories
Part Six - Pharmacological agents

- Demographic questions were included in Part One (Q1-16).

- Knowledge questions included; Part Two (Q1,6), Part Three (Q1), Part Four (Q2) and Part Five (Q4,5,6,7,19).

- Perception questions included; Part Two (Q3,4,5), Part Five (Q1,2,3,4,5,6,11,12,13,14,15,17,20,21) and Part Six (Q3).

- Utilisation questions included; Part Two (Q2,6,7,8), Part Three (Q2,3), Part Four (Q1), Part Five (Q8,9,10,16,18) and Part Six (Q1,2,3)

3.5.4 Data Analysis

A qualified statistician was consulted with regards to the statistical analysis. SPSS version 15.0 (SPSS Inc., Chicago, Illinois, USA) was used to analyse the data. Descriptive statistics entailed the use of frequency tables for categorical variables, and summary statistics such as mean, standard deviation and range in the case of parametric data, and median, inter-quartile range and range for non parametric data. Hypothesis testing involved the use of the Pearson's chi square test for categorical data, t-test for a quantitative normally distributed dependant variable and the Mann-Whitney test for non parametric data. In order to assess the independent effects of demographics, knowledge and perceptions on utilization of the various natural remedies, binary logistic regression analysis was carried out (Esterhuizen, 2009).

A separate model was constructed for each type of natural remedy individually. Backward stepwise selection was used, based on likelihood ratios to arrive at a final model for each type of natural remedy. In order to assess the independent effects of demographics on perceptions and knowledge of the various natural remedies, binary logistic regression analysis was carried out. A separate model was constructed for each selected perception or knowledge question individually. Backward stepwise selection was used, based on likelihood ratios to arrive at a final model for each question. Odds ratios and 95% confidence intervals were reported. A p value <0.05 was considered as statistically significant (Esterhuizen, 2009).

Chapter Four: Results and Discussion

4.1 Introduction

This chapter represents the statistical analysis of the data collected and the discussion of the results. In order to facilitate ease of reference it was decided for expediency to include the discussion within this chapter. It is however noted that this is not standard protocol in dissertation writing. The data will be discussed according to the Questionnaire format:

- **Part One** – Demographics
- **Part Two** – Vitamins and Minerals
- **Part Three** – Topical Substances
- **Part Four** – Natural Medicines
- **Part Five** – Non Steroidal Anti-inflammatory Drugs (NSAIDs) and Biopuncture
- **Part Six** – Pharmacological agents

4.2 Primary Data

Primary sources included information collected from the respondents of the study in the form of a completed Questionnaire (Appendix I).

4.3 Secondary Data

This data refers to the data acquired from the literature, personal interviews, journals, books and Internet that was used to construct arguments and hypotheses and with which to compare the results of the study.

4.4 Key of abbreviations for this chapter:

n	=	Sample size
ANOVA	=	Analysis of variance
Df	=	Degrees of freedom
N	=	Number
SD	=	Standard deviation
%	=	Percentage
Q	=	Question
***p* –value**	=	The probability of the results being due to chance or random error. If the *p* value is very small then it can be concluded that the results are significant (Hicks, 2004).

4.5 Response rate

According to the Allied Health Professions Council (AHPCSA) register there were 418 registered Chiropractors in South Africa at the date of this study's approval (AHPCSA, 2008). Therefore an attempt was made to contact all 418 registered Chiropractors.

According to Russell *et al.,* (2004) the number of contacts with the target population was identified as the strongest predictor of the response rate. "For every additional contact with the population, the response rate can increase by about 10%" (Russell *et al.,* 2004). Therefore an attempt was made to contact all respondents on the AHPCSA register telephonically before the Questionnaires were distributed.

This attempt revealed that the data set provided by the AHPCSA register was outdated and that not all registered practitioners were eligible for this study due to:

- Having emigrated (10),
- Having passed away (4),
- Having retired (7) and / or
- Practitioners no longer working as Chiropractors (5).

Additionally incorrect contact details for practitioners (4) created an obstacle in terms of the researcher being able to contact these potential respondents.

This left a total sample group of 388 registered Chiropractors and Questionnaires were distributed to all respondents (n=388). For the Chiropractic student group, Questionnaires were distributed to the entire sample group (n=102). Eighty qualified Chiropractors (20.6%) and 69 (67.6%) Chiropractic students completed Questionnaires (n=149) giving a total response rate of 30.4%. This is in keeping with the required minimum of 30% (Esterhuizen, 2009).

It has been suggested in the literature that a response rate of 20-100% has been shown to be generalisable within the confines of the study criteria, when the respondents are a select group of individuals that conform to specific criteria with the exclusion of others (Caldwell, Coleman, Copp, Bell and Ghazi, 2007; Mearns and Reader, 2007).

The response rate achieved in this study compared favorably to other studies performed on similar sample groups (Fletcher, 2005; Fyfe, 2006; Mathews, 2006; Bunge, 2007; Black, 2008) and therefore it is possible that the results of this study are generalisable to the whole population even though only a sample returned the questionnaires.

4.6 Discussion of results

It should be noted that all questions were analysed according to the total number of respondents that responded to the individual questions. This is as a result of the fact that not all respondents were eligible or felt that it was necessary to answer particular questions. Therefore not all Tables and Figures will have a total number of n=80 qualified Chiropractors or n=69 students.

4.6.1 Part One: Demographics

4.6.1.1 Q1 - 'Gender'

There were slightly more male (54.7%) than female respondents (45.3%) in the sample as a whole. In the qualified Chiropractor group males made up (68.4%) and the Chiropractic student group consisted mostly of females (60.9%).

Table 4.1.1: Summary statistics for gender

		Group					
		Qualified		Student		Total	
		Count	Column %	Count	Column %	Count	Column %
Gender	Male	54	68.4%	27	39.1%	81	54.7%
	Female	25	31.6%	42	60.9%	67	45.3%

4.6.1.2 Q2 – 'State your age'

The mean age of the sample was 32.23 years (SD 12.07 years) with a range from 21 to 73 years. Table 4.1.2 shows the mean age of the students being 24.78 years and the qualified Chiropractors being 38.56 years.

Table 4.1.2: Summary statistics for age

Group	Mean	N	Std. Deviation
Qualified	38.56	80	13.280
Student	24.78	68	2.698
Total	32.23	148	12.066

4.6.1.3 Q3 – 'Ethnic group'

Table 4.1.3 shows that the majority of the sample were White, qualified Chiropractors (94.9%) and students (85.5%). The other ethnic groups were represented in smaller proportions.

Table 4.1.3: Summary statistics for ethnic group

Ethnic group		Group					
		Qualified		Student		Total	
		Count	Column %	Count	Column %	Count	Column %
1	White	75	94.9%	59	85.5%	134	90.5%
2	Black	0	0%	2	2.9%	2	1.4%
3	Indian	4	5.1%	8	11.6%	12	8.1%
4	Other	0	0%	0	0%	0	0%

4.6.1.4 Q1.4 – 'Which institution did you graduate from, or are you currently studying at?'

Table 4.1.4 shows that the most frequent institutions attended by respondents were DUT (53.8%) and UJ (33.1%). The other institutions were attended in smaller proportions.

Table 4.1.4: Summary statistics for Institution

Institution	Qualified		Student		Total	
	Count	Column %	Count	Column %	Count	Column %
Durban University of Technology (SA)	35	46.1%	43	62.3%	78	53.8%
University of Johannesburg (SA)	22	28.9%	26	37.7%	48	33.1%
Palmer College	12	15.8%	0	0%	12	8.3%
Anglo-European College of Chiropractic	2	2.6%	0	0%	2	1.4%
North Western Chiropractic College	3	3.9%	0	0%	3	2.1%
Western States Chiropractic College	2	2.6%	0	0%	2	1.4%

The following questions were only answered by qualified Chiropractors.

4.6.1.5 Q1.5 – 'What qualification have you obtained?'

Table 4.1.5 shows that the majority of practitioners had M.Tech: Chiropractic qualifications (68.8%).

Table 4.1.5: Qualification of Chiropractors

		Frequency	Percent
Valid	M.Tech: Chiropractic	55	68.8
	Doctor of Chiropractic	25	31.3
	Total	80	100.0

4.6.1.6 Q1.6 – 'How many months/years have you been practicing as a Chiropractor?

The median duration of practice was 7.5 years (range 0 to 47 years).

Table 4.1.6: Median duration of practice in qualified Chiropractors		
N	Valid	80
Minimum		0
Maximum		47
Percentiles	25	4.00
	50	7.50
	75	14.19

4.6.1.7 Q1.7 'Do you practice?'

- Part Time
- Full Time
- Academic
- Not Practicing

Figure 4.1 shows that the majority of qualified Chiropractors were in full time practice (74.4%).

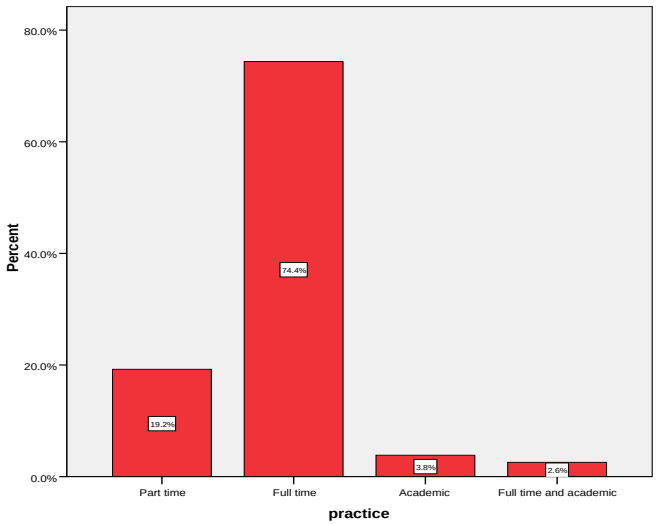

Figure 4.1: Type of practice of qualified Chiropractors

4.6.1.8 Q1.8 – 'Which type of practice do you work in?

The majority were in private practice (57.1%) and 39% were part of a multidisciplinary practice. In Table 4.1.8, the combinations of the multidisciplinary practices are noted, as outlined by the Chiropractors.

Table 4.1.7: Type of practice of Chiropractors

		Frequency	Percent
Valid	Private	44	57.1
	Multidisciplinary	30	39.0
	Hospital outpatients	3	3.9
	Total	77	100.00

Table 4.1.8: Other practitioners in the multidisciplinary practices.	
Audiologist, Biokinetisist, General Practitioner, Homeopath, Physiotherapist, Psychologist	1
Audiologist, Dentist, Physiotherapist	1
Biokinetisist, Dietitian, Massage therapist, Physiotherapist	2
Biokinetisist , Occupational Therapist, Physiotherapist, Podiatrist, Speech Therapist	1
Dentist, Dietician, General Practitioner , Hypnotherapist, Ophthalmologist, Physiotherapist, Psychologist	1
Dentist, General Practitioner, Physiotherapist, Psychologist	1
Dentist, General Practitioner , Psychologist	1
General Practitioner, Dentist, Optometrist, Orthopod, Pharmacist, Radiologist,	1
General Practitioner, Optometrist	1
General Practitioner, Physiotherapist, Psychologist	1
General Practitioner, Physiotherapist, Psychologist, Massage therapist	1
Homeopath	3
Homeopath, Acupuncturist	1
Homeopathy, Massage therapist	4
Massage therapist, Midwife	1
Physiotherapist, Rehabilitation	1
Pilates, Physiotherapist	1
Reflexologist, Sports Massage therapist	1
Total	24

4.6.1.9 Q1.9 – 'In what type of area is the practice situated?'

Figure 4.2 shows that most Chiropractors practiced in urban areas (58%), while 37% practiced in suburban areas, with few practicing in rural areas.

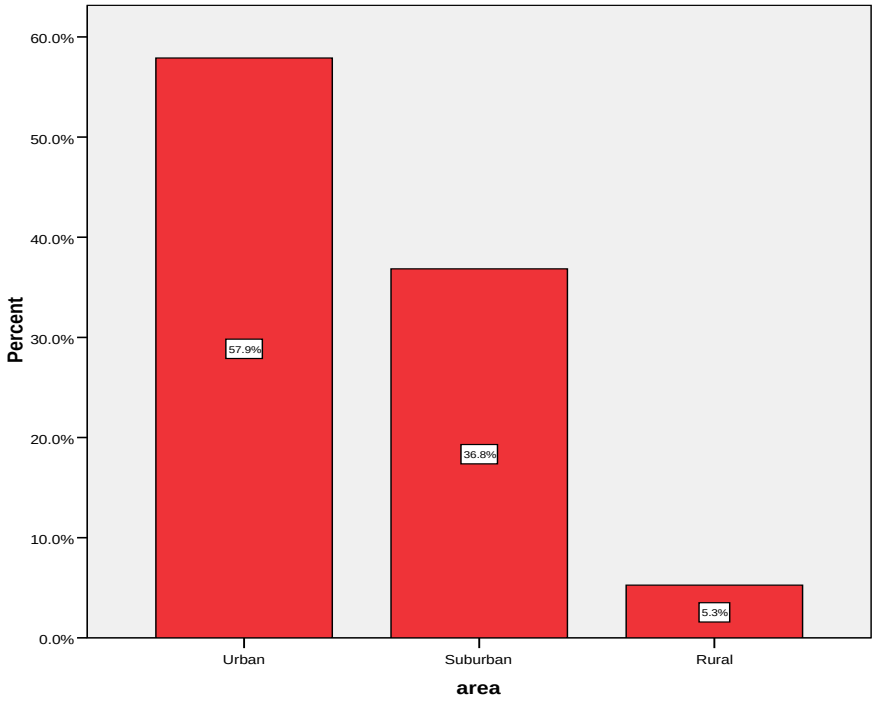

Figure 4.2: Bar chart of practice area of Chiropractors

4.6.1.10 Q1.10 – 'Have you ever practiced outside of South Africa?

Table 4.1.9 shows that one third of Chiropractors had practiced outside South Africa.

Table 4.1.9: Have you ever practiced outside SA

		Frequency	Percent
Valid	Yes	26	33.3
	No	52	66.7
	Total	78	100.0

Table 4.1.10 specifies the other countries South African Chiropractors had practiced in. In line with Table 4.1.9, it was again noted that three practitioners did not complete this section of the question.

Table 4.1.10: Specified Country			
Australia	1	Netherlands	1
Canada	1	Saudi Arabia	1
Hawaii	1	United Kingdom	8
Ireland	1	United States	6
Italy	1	Zambia	1
Namibia	1		

4.6.1.11 Q1.11 – 'Have you taken any health related short courses since you qualified?

Table 4.1.11 shows that 68% had completed health related short courses.

Table 4.1.11: Have you taken any health related short courses since you qualified?			
		Frequency	Percent
Valid	Yes	54	68.4
	No	25	31.6
	Total	79	100.0

4.6.1.12 1.12 – 'Please specify the nature of your short course?

Table 4.1.12 shows a list of health related short courses obtained by respondents.

Table 4.1.12: Nature of short course			
Adjustments	1	Neuro-Impulse Protocol	5
Athletic trainer	1	Neurology	3
Basic life support	4	NSAIDs	11
Best	2	Nutrition	1
Biopuncture	10	Orthopaedics	1
Body alignment	2	Piers Stillwagon	1
Cranio-sacral	1	Postural course	1
Diagnostic and manipulative course	1	Quantum therapy	1
Dry needling	3	RAD	1
Extremity course	3	Rehab	3
Gonstead	1	Reiki	2
Graston Technique	3	Sacral occipital Technique	3
Infra red laser	1	Sports massage	1
Injectables	1	Surgery	1
International team physicians course	1	Thompson	2
Kinesiology	4	TMJ course	1
Kinesio-taping	7	Toftness	1
Koren specific	1	Torque release	1
Muscle activation	2		

4.6.1.13 Q1.13 – 'Do you have any additional qualifications apart from your Chiropractic qualification?

Table 4.1.13 shows that one third had additional qualifications apart from their Chiropractic qualification.

Table 4.1.13: Additional qualifications apart from Chiropractic

		Frequency	Percent
Valid	Yes	26	33.3
	No	52	66.7
	Total	78	100.0

Table 4.1.14 shows a list of the additional qualifications obtained by Chiropractors.

Table 4.1.14: Specified additional qualifications

Acupuncture	1	Homotoxicology	2
B.Education	1	International Chiropractic Sports Science Diploma	16
BA, BTh, Dip Agriculture	1	N.D food brewing	1
Bachelor of Sciences	3	National Diploma (pharmacology)	1
Business management	1	Paediatrics	2
Emergency medicine	1	Pilates	2
Engineering	1	Sports Medicine	2
Graston technique	1	Veterinary	1
Homeopathy	2		

4.6.1.14 Q1.14 – 'Do you use any of the following in your practice?'

Figure 4.3 shows the percentage of Chiropractors who responded that they use the treatment options listed (these are shown in order of frequency). Manipulation of the spine was used by 100% of respondents, followed by manipulation of extremities (96.1%). Ultra shortwave was the least used technique (5.3%).

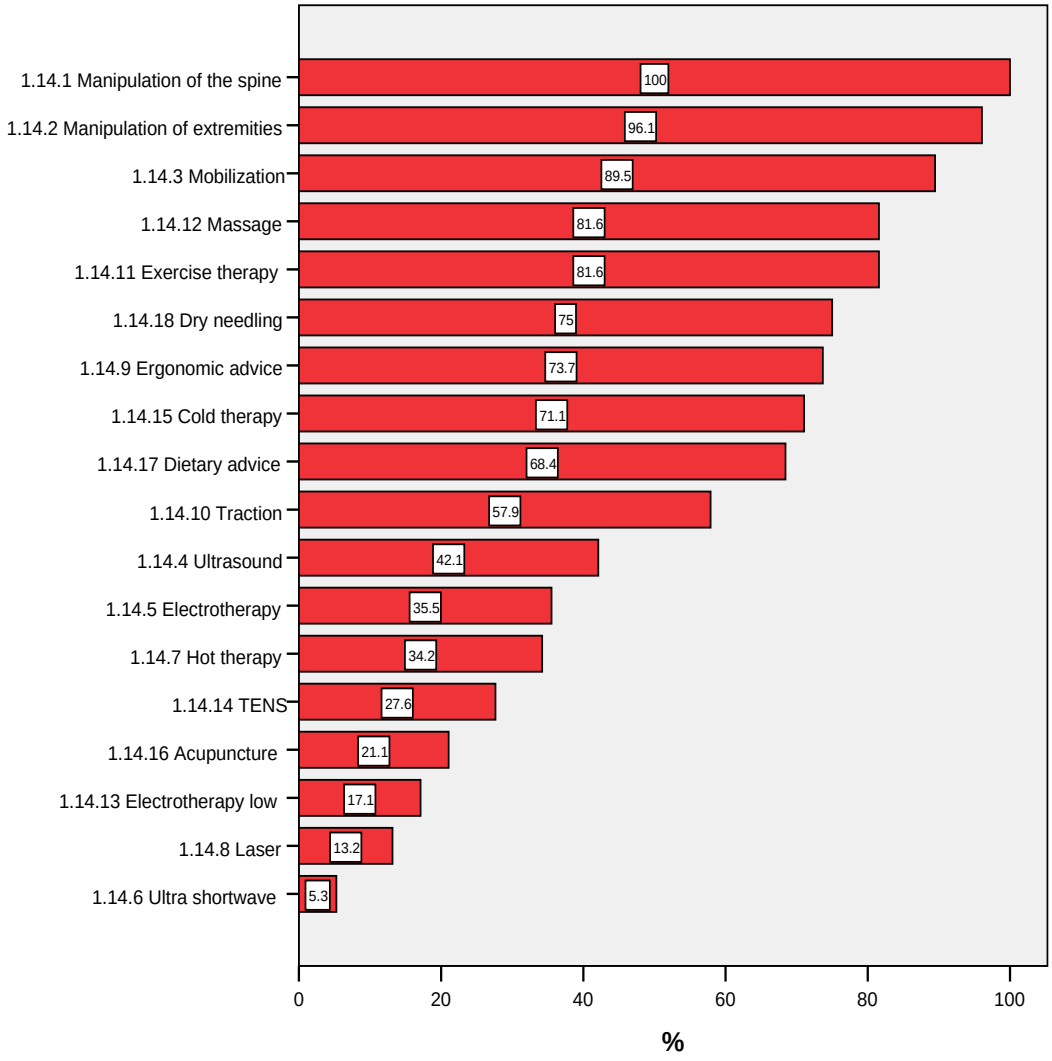

Figure 4.3: Treatments utilised in practice

4.6.1.15 Q1.15 – 'What type/s of Chiropractic technique do you utilise in your practice?

The most used Chiropractic technique according to Table 4.1.15 was diversified technique (97.5%).

Table 4.1.15: Type of Chiropractic technique utilised			
		Count	Column %
1.15.1 Best	Yes	4	5.0%
	No	76	95.0%
1.15.2 Diversified	Yes	78	97.5%
	No	2	2.5%
1.15.3 Sacro Occipital Therapy	Yes	20	25.0%
	No	60	75.0%

Table 4.1.16 shows a list of other techniques utilised in practice.

Table 4.1.16: Specified Techniques			
Activator	6	Koren specific	1
Active release Technique	1	Logan Basic	1
Applied Kinesiology	2	Mc-Mannis distraction	1
Biophysics Technique	1	Neuro-emotional Technique	1
Blair Technique	1	Neuro-Impulse Protocol	2
Cox/Flexion Technique	1	Palmer Technique	1
Cranial Technique	1	Pierce Results System	1
Drop pieces	1	Thompsons Terminal Point	12
Framework Low Force Technique	1	Toggle Recoil	3
Gonstead	5	Torque release Technique	1

4.6.1.16 Q1.16 – 'Do you have inter-professional relationships (where there is mutual referral) with any of the following medical practitioners?'

The majority had inter-professional referrals with General Practitioners (GP) (87.3%), Homeopaths (68.4%), and Physiotherapists (72.2%) as shown in Table 4.1.17.

Table 4.1.17: Inter-professional relationships with medical practitioners

		Count	Column %
1.16.1 General Practitioner	Yes	69	87.3%
	No	10	12.7%
1.16.2 Homeopaths	Yes	54	68.4%
	No	25	31.6%
1.16.3 Neurologists	Yes	33	41.8%
	No	46	58.2%
1.16.4 Nutritionists	Yes	25	31.6%
	No	54	68.4%
1.16.5 Orthopod	Yes	39	49.4%
	No	40	50.6%
1.16.6 Physiotherapists	Yes	57	72.2%
	No	22	27.8%

Table 4.1.18 shows a list of other practitioners with whom Chiropractors have inter-professional relationships with.

Table 4.1.18: Specified Inter-professional relationships

Biokinetisists	6	Paediatrician	1
Craniosacral therapist	1	Perinatal clinic	1
Gynaecologist	1	Personal trainer	1
Massage therapist	5	Podiatrist	2
Neurosurgeon	4	Reflexologist	1
Occupational Therapist	1		

4.6.1.1.7 Summary of Demographics

One hundred and forty nine respondents participated in this study. There were slightly more males than females in the sample as a whole (54.7% males and 45.3% females) as seen in Table 4.1.1. This finding is consistent with previous studies done (Fletcher, 2005; Mathews, 2006; Bunge, 2007) despite the fact that it would seem that women are more likely to graduate from higher education institutions than men (Morgan *et al.*, 2001). According to Brown *et al.*, (2007) it is expected that males will have lower utilisation levels of natural medicines than females. Keeping this in mind, it is expected that the responses to the knowledge, perception and utilisation would be less favourable for the sections pertaining to vitamins and minerals as well as natural medicines and more favourable with regards to pharmacological agents and NSAIDs.

Age may have an effect on the response to the questions posed in the Questionnaire, particularly as this study had both student and qualified practitioner groups. According to previous studies done in South Africa, the majority of Chiropractic practitioners tended to be between the ages of 25 and 38 years of age (Fletcher, 2005; Mathews, 2006; Bunge, 2007) which correlates with the average age of the qualified Chiropractors in this study, which was 38.6 years. The average age of the Chiropractic students was 24.8 years, which is in keeping with previous studies where Chiropractic students were between the ages of 22 and 25 (Fyfe, 2006 and Grant, 2006). However, this study was limited to those students in their master's year and therefore the average age of students was expected to be slightly higher than previous studies that included all students. The average age of the students in this study is significantly younger than the qualified Chiropractors and this will influence the results, as according to Kayne *et al*., (1999); Menniti-Ippolito *et al.,* (2002); Reid, (2002); Tatalias, (2006) older practitioners are more likely to utilise complementary and alternative therapies as compared to younger generations. It is expected that the qualified Chiropractors would be more likely to perceive the use of vitamins and minerals

and natural substances more positively and have increased utilisation thereof as compared to pharmacological agents. However, conversely, it is also possible that the students are more likely to view vitamins, minerals and natural substances more positively than expected as they train alongside homoeopathic students at both the DUT and UJ campuses (Korporaal, 2009) and therefore may have increased exposure that would modify the age expected responses. With the average age of South African Chiropractic practitioners being young for Health Care professionals (32.23 years), the results obtained in this study may possibly cater for both options as compared to a clear favourite adjunctive modality within the groups.

In this study the majority of the sample was White (90.5%) with 8.1% being Indian and only 1.4% being Black. These results were expected as it was noted by Myburgh and Mouton (2007) that Chiropractic is under appreciated by the Black population. Most individuals drawn to the Chiropractic profession globally tend to have a greater likelihood for natural, humanistic and conservative care (Chapman-Smith, 2000) which is often linked to their cultural upbringing or other cultural influences (Coulter, 1992; Wardwell, 1992). Thus it would seem reasonable that Chiropractors and students would prefer the use of vitamins, minerals and natural substances as adjuncts in practice as opposed to pharmacological agents. There has however in recent years been increasing anecdotal evidence to the contrary in South Africa (Boshoff, 2006 and Milani 2006) in favour of pharmacological agents. It would therefore be of interest to see what the effect of background and culture potentially has on the choices that were made by the respondents.

Table 4.1.4 shows that the most frequent institutions attended by respondents were DUT (53.8%) and UJ (33.1%) which correlates well with the majority of respondents having an M.Tech: Chiropractic qualification (68.8%).

The average time that the respondents have been in practice was 7.5 years with a range from 0 to 47 years. This correlates well with other studies showing that the majority of Chiropractic practitioners have spent less than ten years in practice (Fletcher, 2005; Mathews, 2006; Bunge, 2007). However, it is in contrast to the average age of Chiropractors being 38.6 years, as most Chiropractors start practicing soon after they qualify (Bunge, 2007). This would imply that either the average age of practitioners should be about 32 years or the average time in practice should be greater than 7.5 years. This is an unaccounted for anomaly and one that would require further research. However, in terms of this study, the effects of time in practice would have been influenced by evidence that suggests that health care consumers are moving to an alternative medical model, which displays a high use of TCAM and associated therapies (Botting, 1997; Ernst, 2000; Willison, Gavin and Andrews, 2004). Therefore, those practitioners that have started practicing more recently and been in practice for a shorter period of time are likely to have been influenced by this migration of patients more heavily than practitioners that have been in practice for longer (Hassim, Heywood and Berger, 2007).

The majority of Chiropractors were in full time (74.4%) private (57.1%) practice in urban areas (58%). Based on the literature, this demographic of practitioners tend to have a high referral rate (Greene *et al.*, 2006) and therefore they are less likely to want to incorporate adjuncts that fall outside of their scope of practice as they would rather refer to the appropriate practitioner. This is further supported by Pillay (2006) who found that those Chiropractors in multidisciplinary practices are more likely to refer. Table 4.1.17 shows that the majority of respondents had inter-professional referrals with General Practitioners (87.3%), Homeopaths (68.4%), and Physiotherapists (72.2%). Due to this high level of inter-referral and based on the literature (Brussee, Assendelft and Breen, 2001), it is thought that these practitioners may perceive utilisation of adjunctive modalities more negatively as they would rather refer to the necessary practitioners to assist with the patient. Therefore, it is expected that the knowledge and perception of all the

adjunctive modalities in this study will be good, but that the utilisation would vary between the practice types and location.

Table 4.1.9 shows that one third of Chiropractors have practiced outside of South Africa and Table 4.1.10 provides a list of the other countries where South African Chiropractors have practiced. Practitioners that have practiced overseas may have been exposed to different philosophical views of Chiropractic which may alter the perceived need for adjunctive therapy. However these practitioners were in the minority in this study, therefore the effect of this may not be seen. Additionally, perception may be further altered by the effects of disease profile differences between first world countries and the South African context (World Health Organisation, 2008). The reason for this is that in the South African context the increased likelihood of contra-indications to manipulative therapy as well as the increased likelihood that patients present with conditions that are not amenable to manipulative therapy may result in changes in the mode of practice of the practitioners and therefore also their knowledge, perception and / or utilisation of adjunctive modalities.

As seen in Table 4.1.11 the majority of respondents had taken health related short courses (68%) and one third had additional qualifications, with the majority of these being health related and possibly allied to their interests in practice or health care (see Table 4.1.12). These latter findings concur with findings that were highlighted by Fletcher (2006) on Chiropractic treatment regimes in South Africa. Additionally, the qualifications and short courses that Chiropractors have previously completed are therefore expected to result in an increased knowledge in this area and improved perception (as pertinent to the knowledge / perception questions asked in this study). Furthermore, these respondents may be more inclined to utilise or refer for these adjuncts more than someone that has not had training (Brown *et al.*, 2007). It could be reasoned that the type of short course or qualification completed could also influence the tendency of the respondent to have an inherent bias to the use of more natural medicines (remedies) as

compared to the more synthetic substances (pharmaceuticals). Therefore the effects of these interactions will need to be addressed in the discussion surrounding the outcomes of this study.

The most used Chiropractic technique according to Table 4.1.15 was ‘diversified technique’ (97.5%) which stands to reason as most respondents in this study qualified in South Africa and the ‘diversified technique’ is taught as part of the curriculum at both institutions in South Africa (DUT Handbook, 2009; UJ Handbook, 2009).

When asked about the treatment options used (Figure 4.3), it was seen that ‘manipulation’ presented with the highest percentage of use which is expected as it is a Chiropractor’s primary modality (Chapman-Smith, 2000; CASA, 2008).

4.6.2 Part Two: Vitamins and Minerals

The questionnaire only included perception and utilisation questions on vitamin and mineral supplements. It was assumed that all qualified Chiropractors and Chiropractic students would have knowledge of vitamins and minerals, as it is part of the Chiropractic curriculum (CCEI, 2009; DUT Handbook, 2009; UJ Handbook 2009). It is however noted in hindsight that knowledge questions should have been included for those practitioners that did not have training in South Africa, as their knowledge of vitamins and minerals may have been a possible factor that could have affected their perception and utilisation of these substances.

4.6.2.1 Perceptions

4.6.2.1.1 Q2.1 – 'The Act (Act 63 1982, as amended) states that Chiropractors are allowed to advise patients on vitamins and minerals, do you feel that you are adequately qualified to do so?'

Table 4.2.1: Q2.1

			Group			P value
			Qualified	Student	Total	
2.1	Yes	Count	53	40	93	0.351
		%	66.3%	58.8%	62.8%	
	No	Count	27	28	55	
		%	33.8%	41.2%	37.2%	

More than half the respondents (62.8%) felt qualified to advise patients on vitamins and mineral supplements, which is expected as it is taught as part of the Chiropractic curriculum in South Africa ((DUT Handbook, 2009; UJ Handbook 2009) and the majority of the respondents in this study qualified in South Africa (Table 4.1.4).

Table 4.2.2: Logistic regression analysis of factors associated with Q2.1					
		P value	OR	95.0% C.I. for OR	
				Lower	Upper
Step 9(a)	Age	0.063	0.954	.908	1.003
	2.1 Yes vs. No	<0.001	13.180	3.194	54.383
	Constant	0.790	1.303		

a Variable(s) entered on step 1: group, gender, age, ethnic, @2.1, @2.3, @2.4.1, @2.4.2, @2.4.3, @2.5, @2.6.

There was a significant association between the positive responses to Question 2.1 (The Act states that Chiropractors are allowed to advise patients on vitamins and minerals, do you feel that you are adequately qualified to do so?) and using vitamins and minerals in practice. Those who responded yes to Question 2.1 were 13 times more likely to use vitamins and minerals. This shows a correlation between positive perception and utilisation as stated in previous studies (Butt, 2008; Heslop, 2008; Maharaj, 2009).

4.6.2.1.2 Q2.3 – 'What is your view of the use of vitamins and minerals as part of Chiropractic management?'

Table 4.2.3: Q2.3						
			Group			P value
			Qualified	Student	Total	
2.3	Positive	Count	57	66	123	<0.001
		%	76.0%	98.5%	86.6%	
	Neutral	Count	2	0	2	
		%	2.7%	0%	1.4%	
	Negative	Count	16	1	17	
		%	21.3%	1.5%	12.0%	

Most respondents had a positive view of the use of vitamins and minerals as part of the Chiropractic management (86.6%) but there was nonetheless a significant difference between the students and the qualified practitioners; in favour of students having a more positive view than the practitioners. This was in contrast to what was expected according to the literature, where the older (Kayne *et* al., 1999; Menniti-Ippolito *et al.,* 2002; Reid, 2002; Tatalias, 2006), female (Tatalias, 2006; Brown *et al*., 2007) that is more educated and that has been well trained in a particular field (Brown *et al*., 2007) is more likely to utilise vitamins and minerals. However, these results may suggest that the students have not been influenced as much by the dynamics of inter and multidisciplinary practice (Table, 4.6.1.8 and Table 4.6.1.16), where it may actually be easier and more efficient for the Chiropractor to refer the patient to a Nutritionist, Homoeopath or other practitioner for the patient to obtain a more rounded treatment program. Additionally, it must also be considered that students have had more recent exposure to vitamin and mineral education than qualified Chiropractors. This may also influence students to utilise them more often.

4.6.2.1.3 Q2.4 – Do you think using vitamins and minerals as part of Chiropractic patient clinical outcome has improved the following:

- 2.4.1 patient management
- 2.4.2 patient referral
- 2.4.3 patient retention

Table 4.2.4: Q2.4

			Group			P value
			Qualified	Student	Total	
2.4.1 Patient management	Yes	Count	55	56	111	0.012
		%	75.3%	91.8%	82.8%	
	No	Count	18	5	23	
		%	24.7%	8.2%	17.2%	
2.4.2 Patient referral	Yes	Count	22	26	48	0.166
		%	31.0%	42.6%	36.4%	
	No	Count	49	35	84	
		%	69.0%	57.4%	63.6%	
2.4.3 Patient retention	Yes	Count	35	45	80	0.005
		%	50.0%	73.8%	61.1%	
	No	Count	35	16	51	
		%	50.0%	26.2%	38.9%	

Overall, most respondents felt that the use of vitamins and minerals has improved patient management, and to some degree patient retention, but most felt it had not improved patient referral. There was a statistically significant high percentage of “yes” responses to patient management and patient retention in the student group compared to the qualified Chiropractors. This could be due to the fact that more students had a positive view of the inclusion of vitamins and minerals as part of Chiropractic management (Table 4.2.3). The results of this section support the findings in Section 4.6.2.1.2, indicating that patient management is important to both the student and the qualified Chiropractor, but that they may be achieved by different methods – the students seem to use the

management strategy of providing the patients with recommendations and advice as a patient retention strategy as compared to the practitioners that may utilise the inter-referral systems within which they work and manage patients. These approaches to patient management reflect a further important element that needs to be considered in the review of the responses to the questionnaires and that is the "practice maturity" of the respondent.

Students are generally "immature" in patient management and may be fearful of losing patients and thus see the use of vitamins and minerals and any adjunct for that matter as a mechanism to provide a "full service" and thus retain the patient in their "practice", whereas practitioners who have been in practice for longer periods of time, are less likely to be practice "immature" and therefore also more likely to rely on other practitioner's assistance in managing patient care.

Table 4.2.5: Logistic regression analysis of factors (age) associated with Q2.4.1

		P value	OR	95.0% C.I. for OR	
				Lower	Upper
Step 9(a)	Age	0.063	0.954	0.908	1.003
	2.4.1 Yes vs. No	0.001	9.338	2.624	33.225
	Constant	0.790	1.303		

a Variable(s) entered on step 1: group, gender, age, ethnic, @2.4.1, @2.4.2, @2.4.3

Those who responded "yes" to the question on whether the use of vitamins has improved patient management (Table 4.2.1) were 9 times more likely to use vitamins and minerals (p=0.001). Thus perception is linked to the utilisation of vitamins and minerals.

It can also be seen from Table 4.2.4, that the students reported increased patient retention which was significantly higher than the practitioners (*p*=0.005). This re-inforces that in contrast to the literature (Kayne *et* al., 1999; Menniti-Ippolito *et al.,* 2002; Reid, 2002; Tatalias, 2006) practitioners (generally the older respondents), are less likely to perceive vitamins and minerals as important or of value in their practice with regards to patient retention.

Table 4.2.6: Logistic regression analysis of factors (group) associated with Q4.2.1

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Group (Student vs. Qualified)	0.024	3.400	1.172	9.862
	Constant	0.000	3.235		

a Variable(s) entered on step 1: group, gender, age, ethnic.

Chiropractic students were 3.4 times more likely to think that using vitamins and minerals had improved patient management than qualified Chiropractors (*p*=0.024) as noted in Table 4.2.5 It would therefore seem that students link the utilisation of vitamins and minerals to better patient management, whereas it would seem that practitioners in the field would perceive better patient management as a good working knowledge and perception, but that they see vitamins and minerals as part of a multidisciplinary approach as opposed the Chiropractor being totally responsible for the advice, recommendation and treatment of the patient.

Table 4.2.7: Logistic regression analysis of factors (ethnicity) associated with Q4.2.2

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Ethnic	0.111			
	Ethnic (Blacks vs Whites)	1.000	000	000	.
	Ethnic (Indians vs Whites)	0.036	3.850	1.093	13.567
	Constant	0.001	0.519		

Variables in the Equation, Variable(s) entered on step 1: group, gender, age, ethnic.

Furthermore it was established that Indian Chiropractors were 3.9 times more likely than White Chiropractors to think that the use of vitamins and minerals had improved patient referral (*p*=0.036). This would concur with the literature, as it was expected that Indians would place higher emphasis on natural healing abilities and natural healing methods, based on their cultural upbringing (Singh *et al.,* 2004). However it may also be that within the Indian culture, there is an expectation by the patient, that the "doctor" (irrespective of qualification type e.g. Homeopath, Chiropractor, General Practitioner), is expected to be able to address all the ailments with which a patient presents (Khare, 1996).

Table 4.2.8: Logistic regression analysis of factors (group) associated with Q4.2.3

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Group (Student vs. Qualified)	0.009	2.671	1.272	5.609
	Constant	0.904	1.029		

Variables in the Equation, Variable(s) entered on step 1: group, gender, age, ethnic.

Chiropractic students were 2.7 times more likely to think that using vitamins and minerals improved patient retention than qualified Chiropractors (*p*=0.009), which concurs with the findings of Table 4.2.4. This correlates with the discussion in Section 4.6.2.1.2 and those discussions surrounding Tables 4.2.4 - 4.2.6.

4.6.2.1.4 Q2.5 – 'Do you feel that there should be more information supplied on vitamins and minerals in Chiropractic training?

Table 4.2.9: Q2.5

			Group			P value
			Qualified	Student	Total	
2.5	Yes	Count	66	65	131	0.029
		%	84.6%	95.6%	89.7%	
	No	Count	12	3	15	
		%	15.4%	4.4%	10.3%	

Most respondents felt that there needed to be more information supplied on vitamins and minerals in Chiropractic training (89.7% overall) and this percentage was significantly higher in the students (*p*=0.029). This re-inforces that students value the use of vitamins and minerals in practice (particularly patient management and retention) (Tables 4.2.4), as they not only identify it as an important tool (Table 4.2.4), but they also feel that they would be advantaged in practice with increased knowledge on vitamins and minerals.

Table 4.2.10: Logistic regression analysis of factors (group) associated with Q2.5

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Group (Student vs. Qualified)	0.060	3.556	0.948	13.338
	Constant	0.000	6.000		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Students were 3.6 times more likely to think that there should be more information supplied on vitamins and minerals in Chiropractic training than qualified Chiropractors (*p*=0.060) as seen in Table 4.2.9 which also supports the outcomes.

4.6.2.1.5 Q2.6 – 'Would you be interested in doing a post graduate course on vitamins and minerals?'

Table 4.2.11: Q2.6

			Group			P value
			Qualified	Student	Total	
2.6	Yes	Count	52	53	105	0.105
		%	65.8%	77.9%	71.4%	
	No	Count	27	15	42	
		%	34.2%	22.1%	28.6%	

Of all the respondents, 71.4% wanted to do a postgraduate course on vitamins and minerals and this percentage did not differ significantly between the groups. This would concur with the students and qualified Chiropractors wanting to improve overall patient management, but would not affect the strategy behind patient retention or referral.

Table 4.2.12: Logistic regression analysis of factors (gender) associated with Q2.6

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Gender (Females vs. Males)	0.001	3.965	1.765	8.908
	Constant	0.115	1.438		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Females were 4 times more likely to be interested in doing a post graduate course on vitamins and minerals than males. Based on the literature, this is likely due to the fact that women are more likely to use these adjuncts themselves (Tatalias, 2006; Brown *et al.*, 2007) and therefore perceive a greater need to improve their knowledge base.

4.6.2.1.6 Summary of the perception of vitamins and minerals

The majority of the respondents (62.8%) felt qualified to advise patients on vitamins and mineral supplements which is expected as this is taught as part of the Chiropractic curriculum in South Africa (DUT Handbook, 2009; UJ Handbook 2009) and the majority of the respondents in this study qualified in South Africa (Table 4.1.4). As seen in Table 4.2.2 there was a significant association between those respondents who felt that they were adequately qualified to advise patients and the value of using vitamins and minerals in practice. Those who responded yes were 13 times more likely to use vitamins and minerals in practice. This shows a correlation between positive perception and utilisation as stated in previous studies (Butt, 2008; Heslop, 2008; Maharaj, 2009).

The majority had a positive view of the use of vitamins and minerals as part of Chiropractic management (86.6%). There was nonetheless a significant difference between the students and the qualified practitioners; in favour of students having a more positive view than practitioners. This could be due to the fact that students have had a more recent exposure to vitamin and mineral education than qualified Chiropractors. Furthermore students appear to perceive vitamins and minerals as a patient retention strategy when compared to qualified practitioners who seem to utilise a referral network or multidisciplinary / inter-disciplinary network to achieve the same means.

There was a statistically significant high percentage of “yes” responses to patient management and patient retention (Table 4.2.4) in students compared to qualified Chiropractors. Those who responded yes to patient management improving patient clinical outcome were 9 times more likely to use vitamins and minerals (p=0.001). Chiropractic students were 3.4 times more likely to think that using vitamins and minerals had improved patient management (Table 4.2.6) and 2.7 times more likely to think that using vitamins and minerals had improved patient retention than qualified Chiropractors (Table 4.2.8).

Overall, most respondents felt that the use of vitamins and minerals had improved patient management, and to some degree patient retention, but that it had not improved patient referral. This concurs with the previous discussions in this section, where the students perceive vitamins and minerals as a retention strategy whilst they are managing the patient’s condition, whereas the qualified Chiropractors see vitamins and minerals as being more important in patient management than retention. In both instances, there was no reported association with improved patient referral, as the respondents collectively did not perceive that patients were being referred to them for reasons of their ability to advise on / treat with vitamins and minerals. This may be because there are other practitioners within the health care system that would be the preferred providers for those patients.

Therefore it was expected that the outcomes would be in contrast to what was expected as according to the literature it was found that older individuals were more likely to utilise complementary and alternative therapies as compared to younger generations (Kayne *et al*., 1999; Menniti-Ippolito *et al.,* 2002; Reid, 2002 and Tatalias, 2006). This is because the literature is based on the self utilisation of complementary and alternative therapies as opposed to utilising them as an intervention in practice for the treatment of another individual (patient).

However, in keeping with the literature in that women are more likely to utilise TCAM (Traditional, Complementary and Alternative Medicine) (Tatalias, 2006) the findings in this study were that females were 4 times more likely to be interested in doing a post graduate course on vitamins and minerals than males. Similarly, Indian Chiropractors were 3.9 times more likely than White Chiropractors to think that the use of vitamins and minerals has improved patient referral (p=0.036). This was also in keeping with what was found in the literature in that the Indian community have always identified with the use of natural medicines and supplements as well as associated manual therapy (World Health Organisation, 2008). Overall, 71.4% of the respondents wanted to do a postgraduate course on vitamins and minerals.

4.6.2.2 Utilisation

4.6.2.2.1 Q2.2 – 'Do you give advice to patients on vitamins and minerals as part of Chiropractic management?

Table 4.2.13: Q2.2

			Group			P value
			Qualified	Student	Total	
2.2	Yes	Count	57	55	112	0.124
		%	71.3%	82.1%	76.2%	
	No	Count	23	12	35	
		%	28.8%	17.9%	23.8%	

Table 4.2.13 shows that overall 76.2% of Chiropractors gave advice to patients on vitamins and minerals as part of Chiropractic management. These results echo a United States study where Durkin *et al*., *(*2003) found that 96.7% of Chiropractors felt that vitamin and mineral advice was part of the Chiropractic scope of practice (n=687). The percentage did not differ significantly between the qualified Chiropractors and Chiropractic students (*p*=0.124) which is unexpected as there was a significant difference between the students and the qualified practitioners in Table 4.2.3 in favour of students having a more positive view on the use of vitamins and minerals in practice than practitioners. This concurs with the initial discussions in Section 4.6.2.1.2, where it would seem that the use of vitamins and minerals in the management of patients is commonly agreed to between the student and the qualified practitioner; it is only the motive behind the utilisation that is different.

4.6.2.2.2 Q2.7 – 'On average what percentage of your patients do you recommend vitamins and minerals and natural remedies per week'

Table : 4.2.14: Q2.7					
		Group			P value
		Qualified	Student	Total	
2.7	Median (inter-quartile range)	25 (10-50)	30 (10-50)	25 (10-50)	0.949[#]

There was no difference in the percentage of patients that were recommended vitamins and minerals per week between the groups and the overall median value was 25%. This result was expected to be slightly higher due to the majority of respondents (76.2%) giving advice to patents on vitamins and minerals as part of Chiropractic management which concurs with section 4.6.2.2.1.

4.6.2.2.2 Q2.8 – 'For what conditions do you recommend vitamins and minerals and please provide an example?

Table 4.2.15: Q2.8						
			Qualified	Student	Total	P value
2.8.1 Musculoskeletal system	Yes	Count	63	56	119	0.519
		%	86.3%	82.4%	84.4%	
	No	Count	10	12	22	
		%	13.7%	17.6%	15.6%	
2.8.2 Cardiovascular system	Yes	Count	25	12	37	0.025
		%	34.2%	17.6%	26.2%	
	No	Count	48	56	104	
		%	65.8%	82.4%	73.8%	
2.8.3 Respiratory system	Yes	Count	14	7	21	0.113
		%	20.0%	10.3%	15.2%	
	No	Count	56	61	117	
		%	80.0%	89.7%	84.8%	
2.8.4 Gastrointestinal system	Yes	Count	30	23	53	0.218
		%	44.1%	33.8%	39.0%	
	No	Count	38	45	83	
		%	55.9%	66.2%	61.0%	

2.8.5 Neurological system	Yes	Count	46	32	78	0.026
		%	66.7%	47.8%	57.4%	
	No	Count	23	35	58	
		%	33.3%	52.2%	42.6%	
2.8.6 Genitourinary system	Yes	Count	14	12	26	0.724
		%	20.3%	17.9%	19.1%	
	No	Count	55	55	110	
		%	79.7%	82.1%	80.9%	

Table 4.2.15 shows that overall 84% recommended vitamins and minerals for the musculoskeletal system and this did not differ between the groups. However vitamin and mineral recommendations for the neurological (57.4%) and cardiovascular systems (26.2%) were significantly higher in qualified Chiropractors (p=0.026 and p=0.025 respectively). This could be attributed to qualified practitioners having more years in practice and more clinical experience than students (see Table 4.1.6). This implies that the qualified Chiropractor tends to be more “holistic” in their management of patients and due to the high inter-referral rates amongst practitioners (Table 4.1.17), they may be more likely to refer the patient or advise the patient on referral for conditions that patients may have and utilise the referral network to manage those conditions. Conversely, students have not had the experience to utilise referral networks and therefore will tend to limit their advice and utilisation of vitamins and minerals to the areas that are traditionally more musculoskeletal in nature (which is their domain of influence) (CASA, 2008; Chapman-Smith, 2000).

The results of Table 4.2.15 however, need to be read with caution, as it was assumed that there was a common understanding of the possible conditions that fall within each of the systems listed in the Questionnaire. It is possible that the understanding between students and qualified practitioners was different and therefore makes these results in this Table misleading. A list of conditions for which vitamins and minerals are recommended can be seen in appendix J.

4.6.2.2.4 Summary of the utilisation of vitamins and minerals

Although only 62.8% of respondents felt adequately qualified to advise patients on vitamins and mineral supplements, Table 4.2.13 shows that overall 76.2% of Chiropractors gave advice to patients on vitamins and minerals as part of Chiropractic management. This percentage did not differ significantly between the qualified Chiropractors and Chiropractic students (p=0.124). There was no difference in the percentage of patients that were recommended vitamins and minerals per week between the groups and the overall median value was 25%. This result was however expected to be higher due to the majority of respondents (76.2%) giving advice to patients on vitamins and minerals as part of Chiropractic management. Overall, most respondents recommended vitamins and minerals for the musculoskeletal (84.4%) and neurological systems (57.4%).

4.6.3 Part Three: Topical Substances

4.6.3.1 Knowledge

4.6.3.1.1 Q3.1.1 – 'Do you know that the 2001 regulation of Act 63, 1982 allows Chiropractors to use orthodox medicinal topical substances'

Table 4.3.1: Q3.1.1

			Qualified	Student	Total
3.1.1	Yes	Count	44	36	80
		%	56.4%	53.7%	55.2%
	No	Count	34	31	65
		%	43.6%	46.3%	44.8%
Total		Count	78	67	145
		%	100.0%	100.0%	100.0%

Pearson's chi square =0.105, p=0.746

The correct answer to this knowledge question was "yes". Only 55.2% of the respondents knew the correct answer and this did not differ significantly between qualified Chiropractors and students. As this information is stated in the Allied Health Professions Act 63 of 1982 (as amended), it is unknown why more respondents were not aware of this. Yet there is a possibility that the amendment of the Regulations to the Act in 2001 which added the ability of Chiropractors to utilise topical substances, was not well publicised and therefore those practitioners qualifying before this time may not have been aware of these changes and prefer to err on the side of caution / remain with the "old" regulations and not utilise these interventions.

Table 4.3.2: Logistic regression analysis of factors associated with Q3.1.1					
		P value	OR	95.0% C.I. for OR	
				Lower	Upper
Step 5(a)	Gender - Male	0.104	1.992	0.868	4.572
	@3.1.1	<0.001	10.922	3.892	30.651
	Constant	<0.001	0.055		

a Variable(s) entered on step 1: group, gender, age, ethnic, @3.1.1, @3.1.2.

Those who knew Chiropractors were allowed to use orthodox medicinal topical substances were 10.9 times more likely to use them. Males were nearly twice as likely as females to use them but this was not statistically significant. This result was expected, as previously mentioned there was a significant correlation between knowledge and utilisation and based on the literature it was expected that as females have an increased likelihood to use TCAM (Tatalias, 2006; Brown, *et al.,* 2007), males may be more likely to favour orthodox or allopathic substances.

4.6.3.1.2 Q3.1.2 – 'Do you know that the 2001 regulation of Act 63, 1982 allows Chiropractors to use natural topical substances'

Table 4.3.3: Q3.1.2					
			Qualified	Student	Total
3.1.2	Yes	Count	57	36	93
		%	75.0%	53.7%	65.0%
	No	Count	19	31	50
		%	25.0%	46.3%	35.0%
Total		Count	76	67	143
		%	100.0%	100.0%	100.0%

Pearson's chi square =7.084, p=0.008

Only 65% knew the correct answer to this question overall, which was also "yes". This could be due to Chiropractors seeing themselves as holistic practitioners that practice without the use of surgery or drugs (Meeker and Haldeman, 2002)

and therefore would be more likely to perceive the use of natural substances being congruent with practice rather than medicinal substances.

Qualified Chiropractors were more likely than students to know the correct answer to this question. The 2001 Regulations of the Allied Health Professions Act 63 of 1982, as amended, states that Chiropractors can utilise substances that are intended exclusively for application to the skin and it was expected that both practitioner and student would have a similar knowledge of this.

Table 4.3.4: Logistic regression analysis of factors associated with Q3.1.2

		P value	OR	95.0% C.I. for OR	
				Lower	Upper
Step 6(a)	@3.1.2	<0.001	7.663	3.518	16.693
	Constant	0.008	0.441		

a Variable(s) entered on step 1: group, gender, age, ethnic, @3.1.1, @3.1.2.

Those who knew Chiropractors were allowed to use natural topical substances were 7.6 times more likely to use them. This again highlights the correlation between knowledge and utilisation as seen in Table 4.3.2.

Table 4.3.5: Logistic regression analysis of factors (group) associated with Q3.1.2

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Group (Qualified vs. Students)	0.010	2.538	1.250	5.152
	Constant	0.542	1.161		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Qualified Chiropractors were 2.5 times more likely than Chiropractic students to know the correct answer to this Question as stated in Table 4.3.3.

4.6.3.1.3 Summary of the knowledge of topical substances

The correct answer to whether or not respondents were aware that the 2001 regulation of Act 63, 1982 allowed Chiropractors to use orthodox medicinal topical substances was “yes”. However, only 55.2% of respondents knew the correct answer. Those who knew Chiropractors were allowed to use orthodox medicinal topical substances were 10.9 times more likely to use them. The knowledge an individual has will ultimately affect their level of utlisation of an object (Robbins, 1996; Hayes, 1994 and Chaffe, 1997). In contrast to the literature where it would seem more likely that female practitioners would support a higher level of utilisation of natural medicines, males were nearly twice as likely as females to use them but this was not statistically significant.

A higher percentage of respondents (65%) knew the correct answer to whether or not respondents were aware that the 2001 regulation of Act 63, 1982 allowed Chiropractors to use orthodox natural topical substances. Qualified Chiropractors were more likely than Chiropractic students to know the correct answer, this could be due to more clinical experience in practice than Chiropractic students. As stated in the literature, experience and years in practice are factors that will affect perception, knowledge and utilisation. Those who knew Chiropractors were allowed to use natural topical substances were 7.6 times more likely to use them.

4.6.3.2 Utilisation

4.6.3.2.1 Q3.2 – 'Do you use orthodox medicinal topical substances in practice?

Table 4.3.6: Q3.2						
			Qualified	Student	Total	P value
3.2	Yes	Count	22	20	42	0.911
		Column N %	28.6%	29.4%	29.0%	
	No	Count	55	48	103	
		Column N %	71.4%	70.6%	71.0%	

Table 4.3.7: Examples of orthodox medicinal topical substances used in practice			
Arnica	3	Spasmed	1
Deep heat	2	Spray n stretch	1
Iceman	8	Transact	2
Myogesic balm	1	Traumeel	2
Panamor gel	5	Voltaren	17
Reparil	3		

Only 29% of respondents used orthodox medicinal topical substances in practice and this did not differ between the qualified Chiropractors and Chiropractic students (p=0.911). The students were expected to have a low utilisation level as there is a limitation with respect to clinical practice in the Chiropractic Day Clinics at both institutions. The qualified Chiropractors however do have access to these substances, and with 56.4% of practitioners being aware that these substances are part of the scope of practice, it is unknown why these substances are not often used. It could however stem back to the fact that historically Chiropractic is a drugless profession and practitioners may want to maintain that approach.

4.6.3.2.2 Q3.3 – 'Do you use natural topical substances in practice?

Table 4.3.8: Q3.3						
			Group			
			Qualified	Student	Total	P value
3.3	Yes	Count	52	34	86	0.041
		Column N %	66.7%	50.0%	58.9%	
	No	Count	26	34	60	
		Column N %	33.3%	50.0%	41.1%	

Table 4.3.9: Examples of natural topical substances used in practice			
Arnica	35	Iceman	6
Aromatherapy oil	3	Magphos	1
Biofreeze	4	Natura creams	1
Flexidrin	3	Natures kiss	1
Herbal cooling gel	2	Traumeel	27

In total, 58.9% of respondents used natural topical substances and there was a significant difference between the qualified Chiropractors and Chiropractic students (p=0.041) with qualified Chiropractors being more likely to use them. This was expected due to the response in Table 4.3.3 where significantly more qualified Chiropractors (75%) were aware that the regulation allowed for the use of natural substances in practice compared to students (53.7%).

4.6.3.2.3 Summary of the utilisation of topical substances

Only 29% of respondents used orthodox medicinal topical substances in practice and this did not differ between the qualified Chiropractors and Chiropractic students (p=0.911). Due to the fact that more respondents were aware that natural topical substances were part of the Chiropractic scope of practice it was expected that the utilisation level would be higher than that of orthodox substances. In total 59% of respondents used natural topical substances and the qualified Chiropractors were more likely to use them than the Chiropractic students (p=0.041). The utilisation percentage for natural topical substances could however be higher as there does seem to be a small level of confusion by respondents as to what exactly constitutes an orthodox topical substance. As seen in the examples of orthodox topical substances stated by respondents (Table 4.3.7) there are natural substances listed such as Arnica and Traumeel. This could indicate error on the respondent's behalf and therefore could not be an accurate result.

4.6.4 Part Four: Natural Medicines

4.6.4.1 Utilisation

4.6.4.1.1 Q4.1 – 'Do you use any of the following natural medicines in your Chiropractic practice?

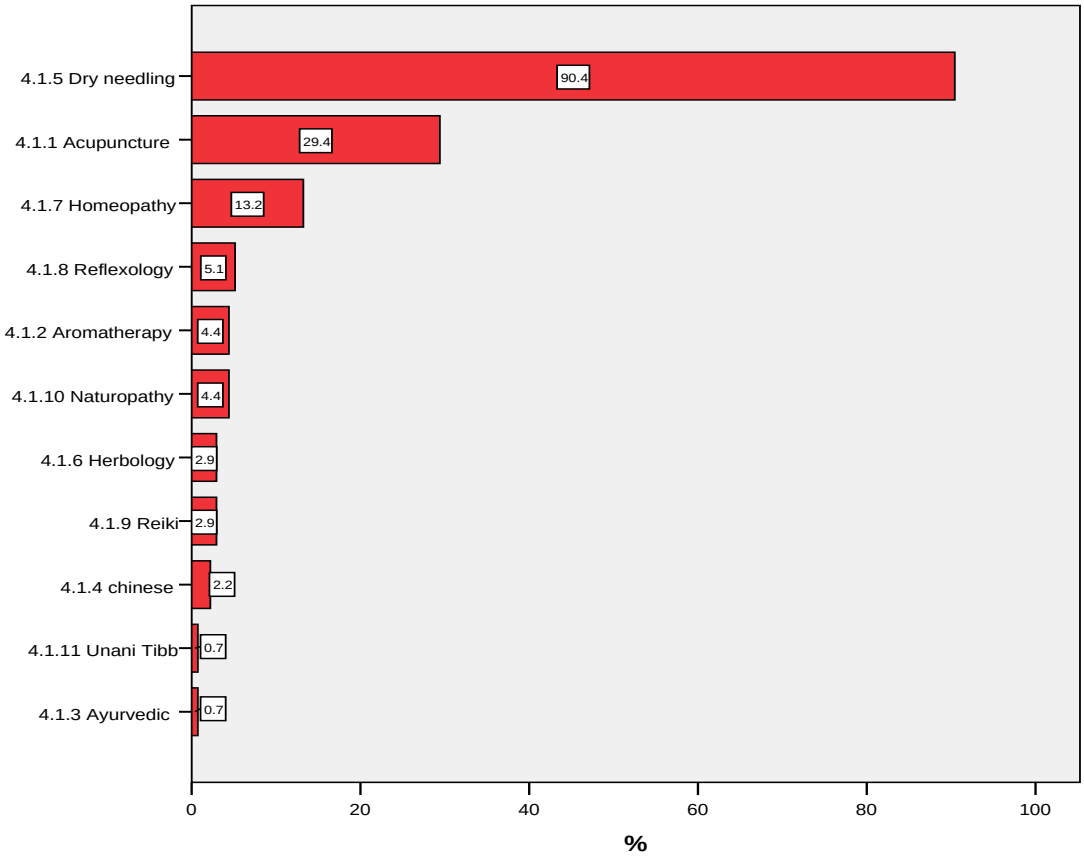

Figure 4.4: Natural Medicine utilisation by sample

Table 4.4.1: Q 4.1						
			Qualified	Student	Total	P value
4.1.1 Acupuncture	Yes	Count	19	22	41	0.470
		%	26.8%	32.4%	29.5%	
	No	Count	52	46	98	
		%	73.2%	67.6%	70.5%	
4.1.2 Aromatherapy	Yes	Count	3	3	6	0.957
		%	4.2%	4.4%	4.3%	
	No	Count	68	65	133	
		%	95.8%	95.6%	95.7%	
4.1.3 Ayurvedic	Yes	Count	1	0	1	0.326
		%	1.4%	.0%	.7%	
	No	Count	70	68	138	
		%	98.6%	100.0%	99.3%	
4.1.4 Chinese	Yes	Count	3	0	3	0.087
		%	4.2%	0%	2.2%	
	No	Count	68	68	136	
		%	95.8%	100.0%	97.8%	
4.1.5 Dry needling	Yes	Count	58	68	126	<0.001
		%	81.7%	100.0%	90.6%	
	No	Count	13	0	13	
		%	18.3%	0%	9.4%	
4.1.6 Herbology	Yes	Count	3	1	4	0.331
		%	4.2%	1.5%	2.9%	
	No	Count	68	67	135	
		%	95.8%	98.5%	97.1%	
4.1.7 Homeopathy	Yes	Count	11	8	19	0.522
		%	15.5%	11.8%	13.7%	
	No	Count	60	60	120	
		%	84.5%	88.2%	86.3%	
4.1.8 Reflexology	Yes	Count	5	2	7	0.328
		%	7.0%	2.9%	5.0%	
	No	Count	65	66	131	
		%	91.5%	97.1%	94.2%	

4.1.9 Reiki	Yes	Count	4	0	4	0.049
		%	5.6%	0%	2.9%	
	No	Count	67	67	134	
		%	94.4%	100.0%	97.1%	
4.1.10 Naturopathy	Yes	Count	5	1	6	0.105
		%	7.1%	1.5%	4.4%	
	No	Count	65	66	131	
		%	92.9%	98.5%	95.6%	

Table 4.4.2: Other Natural Therapies	
Best	1
Biopuncture	1
Gold vitamins	1
Kinesio	1
Osteopathy	1
Massage therapy	2

Over 90% utilised Dry Needling and the use was significantly different between the qualified Chiropractors and Chiropractic students, (p<0.001), with all the students using it. In terms of time, students possibly have greater resources at the institute's clinics than private practitioners and are more likely to use adjunctive therapies. In terms of patient demographics, the institute's clinics tend to attract patients with more chronic problems (Benjamen, 2007; Jaman, 2007; Kandehai, 2007; Venketsamy, 2007) therefore there may be a greater myofascial component than those patients seen by private practitioners (Morris, 2006). Acupuncture was the second most frequently used with 26.8% and the other natural medicines were very rarely used, as shown in Figure 4. Reiki was significantly more used by qualified Chiropractors (5.6%) than students (p=0.049) which is probably due to the fact that reiki is a postgraduate qualification.

4.6.4.1.2 Q4.2 – 'Do you have post graduate qualification(s) in any of the above mentioned natural medicines?

Table 4.4.3: Q4.2					
			Group		Total
			Qualified	Student	Qualified
4.2	Yes	Count	9	8	17
		% within 4.2	52.9%	47.1%	100.0%
	No	Count	65	59	124
		% within 4.2	52.4%	47.6%	100.0%
Total		Count	74	67	141
		% within 4.2	52.5%	47.5%	100.0%

Pearson's chi square = 0.002, p=0.968

Table: 4.4.4: Specified post graduate qualifications			
Acupuncture	1	Homeopathy	1
Best	1	Kinesio	1
Dry Needling	1	Massage	1
Herbology	1	Quantum	1

There was no significant association between qualified Chiropractors and Chiropractic students in their responses with 52.9% of qualified Chiropractors and 47.1% of students having additional qualifications. In theory, this would suggest that both groups would have similar perceptions with regards to natural medicines.

Table 4.4.5: Use of natural medicine					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	9	6.0	6.5	6.5
	Yes	130	87.2	93.5	100.0
	Total	139	93.3	100.0	
Missing	System	10	6.7		
Total		149	100.0		

The use of natural medicines was summarized by recoding those who responded positively to using any of the listed natural remedies in Question 4.1 as “yes” and those who said they used none of them as “no”.

Table 4.4.6: Logistic regression analysis of factors associated with Q4.2					
		P value	OR	95.0% C.I. for OR	
				Lower	Upper
Step 5(a)	age	<0.001	0.863	0.807	0.922
	Constant	0	7672.330		

a Variable(s) entered on step 1: group, gender, age, ethnic, @4.2.

Age was the only factor significantly associated with the use of natural medicines (p<0.001). With every one year increase in age, the probability of use of natural remedies decreased by 13.7%. This is in contrast to what was expected in the literature where it is found that older individuals resort to increased use of TCAM benefits and prefer the natural treatment options as compared to the allopathic alternatives that are available (Kayne *et al.,* 1999; Menniti-Ippolito *et al.,* 2002 and Tatalias, 2006).

4.6.4.1.3 Summary of the utilisation of natural medicines

More than 90% of respondents utilised dry needling, with acupuncture being the second most frequently used modality (28.6%). Reiki was significantly more used by the qualified Chiropractors than by the students (*p*=0.049), which could be due to the fact that reiki is a postgraduate qualification. There was no significant association between qualified Chiropractors (52.9%) and Chiropractic students (47.2%) in response to whether or not they had additional qualifications. The additional qualifications included Acupuncture, Best, Dry Needling, Herbology, Homeopathy, Kinesio Taping, Massage and Quantum Therapy. Age was the only factor significantly associated with the use of natural remedies ($p<0.001$). With every one year increase in age, the probability of using natural remedies decreased by 13.7%.

4.6.5 Part Five: Non Steroidal Anti-inflammatory Drugs (NSAIDs) and Biopuncture

4.6.5.1 Perception

4.6.5.1.1 Q5.1 – 'Please state your opinion for the following statements:'

- Chiropractors should have access to the NSAIDs and Biopuncture courses (5.1.1 and 5.1.2).
- The use of NSAIDs and Biopuncture by Chiropractors is useful for good patient management (5.2.1 and 5.2.2).
- The use of NSAIDs and Biopuncture by Chiropractors is needed in South Africa (5.3.1 and 5.3.2).
- The use of NSAIDs and Biopuncture by Chiropractors conflicts with the traditional philosophy of Chiropractic (5.4.1 and 5.4.2).
- The use of NSAIDs and Biopuncture by Chiropractors is encroaching on the scope of practice of another profession (5.5.1 and 5.5.2).

Table 4.5.1: Median response in a scale of 1 to 4 with 1 being Strongly Disagree, 2 being Disagree, 3 being Agree and 4 being strongly agree

		Group			P value[#]
		Qualified	Student	Total	
5.1.1	Median	3	4	4	<0.001
5.1.2	Median	3	4	4	<0.001
5.2.1	Median	3	4	4	<0.001
5.2.2	Median	3	4	3	0.001
5.3.1	Median	3	4	3	<0.001
5.3.2	Median	3	4	3	<0.001
5.4.1	Median	3	2	3	0.001
5.4.2	Median	3	2	2	0.002
5.5.1	Median	2	2	2	<0.001
5.5.2	Median	2	2	2	<0.001

Mann- Whitney U test

Students were more likely to strongly agree with Chiropractors having access to the NSAIDS and Biopuncture courses than qualified Chiropractors (p<0.001). Students also found NSAIDS and Biopuncture significantly more useful and necessary than the qualified Chiropractors. These results seem to suggest that the initial discussion presented under vitamins and minerals relating to students being more in favour of including adjunctive modalities in practice (section 4.6.2), is equally applicable to the NSAIDs and Biopuncture. This will however only be confirmed or refuted as the results are presented in this section.

Students tended to disagree more than qualified Chiropractors about the conflict between traditional Chiropractic principles and the use of NSAIDS and Biopuncture. Students also disagreed more than qualified Chiropractors that the use of NSAIDS and Biopuncture encroaches on another profession's scope of practice. There is a strong sense that with increased adjunctive modalities, students seem to perceive that they will be more successful in practice, whereas the qualified Chiropractors seem to be more settled in their role as a Chiropractor and do not perceive the need for adjunctive modalities. This may be due to the qualified practitioners having seen the results of manipulative therapy and therefore having the experience to know when and where adjunctive modalities are indeed necessary. They can therefore be more selective in their choice of modalities included in a treatment / management protocol, as compared to the student cohort which does not have the same experience.

4.6.5.1.2 Q5.11 – 'Do you think that being able to use NSAIDs in emergency situations has enhanced your patient clinical outcomes in terms of:

- 5.17.1 patient management
- 5.17.2 patient referral
- 5.17.3 patient retention

Table 4.5.2: Q5.11

			Qualified	Student	Total	P value
5.11.1 Patient Management	Yes	Count	33	32	65	0.134
		%	60.0%	74.4%	66.3%	
	No	Count	22	11	33	
		%	40.0%	25.6%	33.7%	
5.11.2 Patient referral	Yes	Count	24	24	48	0.266
		%	44.4%	55.8%	49.5%	
	No	Count	30	19	49	
		%	55.6%	44.2%	50.5%	
5.11.3 Patient retention	Yes	Count	27	31	58	0.035
		%	50.9%	72.1%	60.4%	
	No	Count	26	12	38	
		%	49.1%	27.9%	39.6%	

Table 4.5.2 shows that there was a significantly higher positive response to NSAIDS regarding patient retention in the students relative to the qualified Chiropractors (p=0.035). These results concur with the suggested reasons for the findings in section 4.6.5.1.1.

Table 4.5.3: Logistic regression analysis of factors associated with Q5.11.1

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Age	0.073	0.969	0.937	1.003
	Constant	0.006	5.437		

Variables in the Equation, Variable(s) entered on step 1: group, gender, age, ethnic.

The age of the Chiropractor was significantly associated with whether they thought being able to use NSAIDS had enhanced patient clinical outcome in terms of patient management (*p*=0.073). For every one year increase in age the probability of them agreeing to this question decreased by 3.1%. This concurs with the suggestion that the older qualified Chiropractor is less likely to utilise NSAIDs / Biopuncture as their perceived necessity is not based on the need to retain patients within their practice.

Table 4.5.4: Logistic regression analysis of factors associated with Q5.11.3					
		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Group (Students vs Qualified)	0.045	2.407	1.020	5.684
	Constant	0.891	1.038		

Variables in the Equation, Variable(s) entered on step 1: group, gender, age, ethnic.

Students were 2.4 times more likely than qualified Chiropractors to agree with whether they thought being able to use NSAIDs had enhanced their patient clinical outcomes in terms of patient retention (*p*=0.045). This is further highlighted by the age of Chiropractors (qualified or students), in that the practitioner is more than likely the older person.

4.6.5.1.3 Q5.12 – 'What is your view of the use of emergency NSAIDs in practice?

Table 4.5.5: Q5.12						
			Qualified	Student	Total	P value
5.12	Positive	Count	35	47	82	<0.001
		%	51.5%	88.7%	67.8%	
	Neutral	Count	5	5	10	
		%	7.4%	9.4%	8.3%	
	Negative	Count	28	1	29	
		%	41.2%	1.9%	24.0%	

The students' views regarding use of emergency NSAIDS were also more positive than the qualified Chiropractors' (p<0.001). This result seems to suggest that the student cohort in this study perceived that they did not have the skills to deal with acute patients and required an additional adjunctive modality to assist them in doing so as compared to the qualified Chiropractors, who evidently felt that they had sufficient ability to deal with acute patients or would utilise the previously mentioned referral systems (Table 4.1.17).

4.6.5.1.4 Q5.13 – 'Do you think that Chiropractors should be allowed to recommend NSAID Tablets and NSAID cream

Table 4.5.6: Q5.13

			Qualified	Student	Total	P value
5.13.1 NSAID Tablets	Yes	Count	65	60	125	0.576
		%	85.5%	88.2%	86.8%	
	No	Count	9	5	14	
		%	11.8%	7.4%	9.7%	
	Don't know	Count	2	3	5	
		%	2.6%	4.4%	3.5%	
5.13.2 NSAID Cream	Yes	Count	64	66	130	0.026
		%	84.2%	97.1%	90.3%	
	No	Count	10	1	11	
		%	13.2%	1.5%	7.6%	
	Don't know	Count	2	1	3	
		%	2.6%	1.5%	2.1%	

The students felt more strongly that Chiropractors should be allowed to recommend NSAID tablets (88.2%) and cream (97.1%). These results could indicate that the students, at a younger age, may have a better understanding of the regulations as pertinent to the Allied Health Professions Act 63 of 1982 (as amended) (See section 2.3.6 which refers to topical applications) as a result of the regulations having been recently amended (2001). In principle it must therefore be recognized that the response to this question may actually not truly

reflect whether the respondents think that NSAID tablets and cream should be allowed to be recommended as much as whether the respondents actually see the application of these interventions to be legal or not. It is therefore suggested that future research look at defining this area more explicitly.

Table 4.5.7: Logistic regression analysis of factors associated with Q5.13.1

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Age	0.058	0.961	0.922	1.001
	Constant	0.000	32.828		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

The age of the Chiropractor was significantly negatively associated with whether respondents thought that Chiropractors should be able to recommend NSAID tablets (*p*=0.058). For every one year increase in age, the probability of them agreeing to this question decreased by 3.9%. These results re-inforce the suggested reasons for the findings obtained under Section 4.6.5.1.1.

Table 4.5.8: Logistic regression analysis of factors associated with Q5.13.2

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Group (Student vs Qualified)	0..028	10.317	1.283	82.969
	Constant	0.000	6.300		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Students were 10.3 times more likely than qualified Chiropractors to think that they should be allowed to recommend NSAID cream (*p*=0.028). This result reflects both the association with age as well as the patient retention tendency as has been discussed under Section 4.6.5.1.1.

4.6.5.1.5 Q5.14 – 'Do you think that Chiropractors should be allowed to dispense NSAID tablets and NSAID cream?'

Table 4.5.9: Q5.14

			Qualified	Student	Total	P value
5.14.1 NSAID tablets	Yes	Count	32	45	77	0.010
		%	42.7%	68.2%	54.6%	
	No	Count	38	19	57	
		%	50.7%	28.8%	40.4%	
	Don't know	Count	5	2	7	
		%	6.7%	3.0%	5.0%	
5.14.2 NSAID cream	Yes	Count	39	51	90	0.008
		%	52.7%	77.3%	64.3%	
	No	Count	30	14	44	
		%	40.5%	21.2%	31.4%	
	Don't know	Count	5	1	6	
		%	6.8%	1.5%	4.3%	

Students felt more strongly that Chiropractors should be allowed to dispense NSAID tablets and cream (p=0.010 and 0.008). This question indicates the same problems indicated under Table 4.6.5.1.4 and additionally it re-inforces the strong perceived need that students have for retaining patients within their future clinics. It would appear that students have a perception that there is a limited market share for Chiropractic service or that their ability is not perceived to be sufficient only with their Chiropractic training. Also, students may not have the confidence in their ability to address all concerns that patients may bring to them and it is therefore recommended that a survey of students be carried out or interviews be conducted to more accurately ascertain the motivational factors behind the need for perceived patient retention.

Table 4.5.10: Logistic regression analysis of factors associated with Q5.14.1					
		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 2(a)	Group (Student vs Qualified)	0.001	4.556	1.900	10.924
	Gender (Male vs Female)	0.009	3.199	1.339	7.642
	Ethnic	0.101			
	Ethnic (Black vs White)	0.999	000	000	.
	Ethnic (Indian vs White)	0.032	10.602	1.223	91.887
	Constant	0.008	0.330		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Students were 4.6 times more likely than qualified Chiropractors to think that Chiropractors should be allowed to dispense NSAIDs Tablets. This concurs with the previously discussed results (Section 4.6.5.1.1).

Furthermore, it was found that males were 3.2 times more likely than females to want to dispense NSAID tablets. This concurs with the literature indicating that females are more likely to recommend complementary alternative therapy options as compared to males (Tatalias, 2006; Brown *et al*., 2007). Indians were 10.6 times more likely than Whites to agree with this question. This is in contrast to the literature which indicates that Indian culture is more likely to suggest that the practitioner should opt for a complementary alternative approach (Khare, 1996; Singh, Naidoo and Harries, 2004). However, this needs to be counterbalanced by the fact that it has also been documented in the literature that Indian patients are more likely to expect their “doctors” to be able to deal with all their concerns, as compared to being a specialist in a particular field (Khare, 1996).

Table 4.5.11: Logistic regression analysis of factors associated with Q5.14.2					
		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 2(a)	Group (Student vs Qualified)	0.061	2.520	0.958	6.628
	Gender (Male vs female)	0.018	2.873	1.194	6.914
	Age	0.071	0.961	0.921	1.003
	Constant	0.226	2.745		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Students were 2.5 times more likely than qualified Chiropractors to think that Chiropractors should be allowed to dispense NSAID cream. Males were 2.873 times more likely than females to agree with this question. This predictably concurs with the discussion under Table 4.5.10.

4.6.5.1.6 Q5.15 – 'In your opinion do you think that NSAIDs should be made available for use by Chiropractors in non-emergency situations?

Table 4.5.12: Q5.15						
			Qualified	Student	Total	P value
5.15	Yes	Count	45	59	104	
		%	60.0%	86.8%	72.7%	0.001
	No	Count	28	9	37	
		%	37.3%	13.2%	25.9%	
	Don't know	Count	2	0	2	
		%	2.7%	.0%	1.4%	

Students felt more strongly that NSAIDs should be made available for use by Chiropractors in non emergency situations (p=0.001). This was not unpredictable based on the foregoing results that the students felt the need to be able to utilise NSAIDs for non-emergency purposes.

Table 4.5.13: Logistic regression analysis of factors associated with Q5.15					
		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Group (Student vs Qualified)	0.001	4.101	1.758	9.567
	Constant	0.062	1.571		

Variables in the Equation, Variable(s) entered on step 1: group, gender, age, ethnic.

Table 4.5.13 confirms the high degree of significance between the students and the qualified Chiropractors in terms of utilising NSAIDs in emergency situations.

4.6.5.1.7 Q5.16 – 'Under what conditions would you like to use non-emergency NSAID's for in your practice?

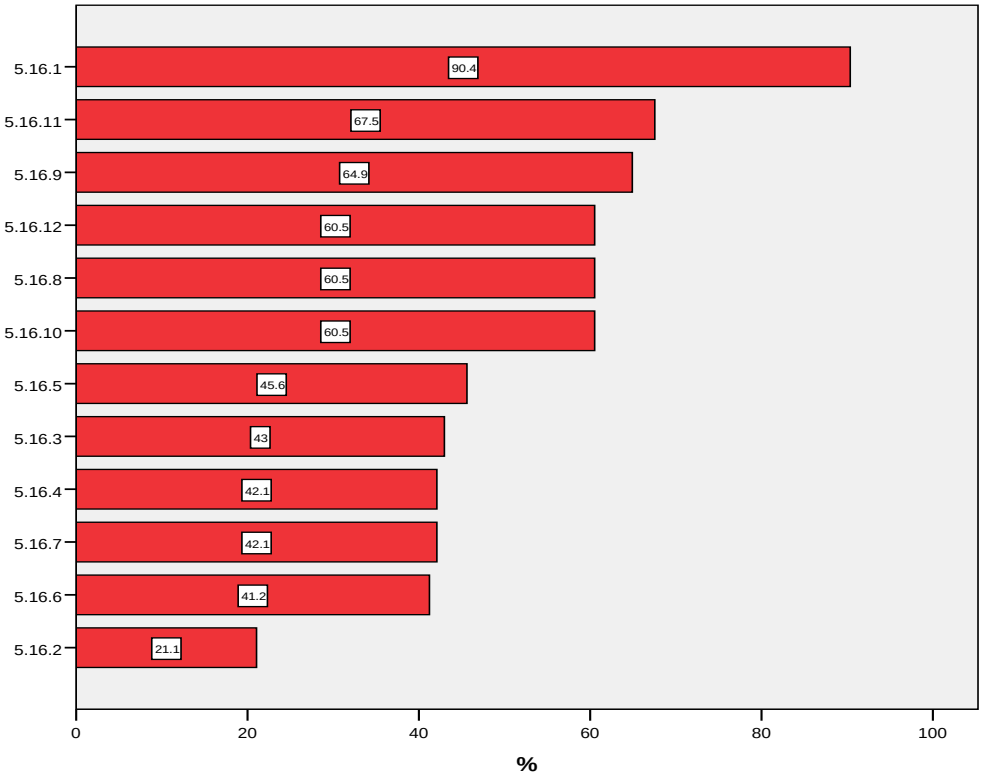

Figure 5: Respondents' responses to conditions they would like to use non-emergency NSAIDS for in their practice.

Table 4.5.14: Q5.16						
			Qualified	Student	Total	P value
5.16.1 Patient in severe acute pain	Yes	Count	46	61	107	0.014
		%	83.6%	96.8%	90.7%	
	No	Count	9	2	11	
		%	16.4%	3.2%	9.3%	
5.16.2 Patient in mild pain	Yes	Count	8	16	24	0.144
		%	14.5%	25.4%	20.3%	
	No	Count	47	47	94	
		%	85.5%	74.6%	79.7%	
5.16.3 Patient reluctant to go to GP	Yes	Count	24	26	50	0.863
		%	43.6%	41.9%	42.7%	
	No	Count	31	36	67	
		%	56.4%	58.1%	57.3%	
5.16.4 Facet syndrome	Yes	Count	27	21	48	0.082
		%	49.1%	33.3%	40.7%	
	No	Count	28	42	70	
		%	50.9%	66.7%	59.3%	
5.16.5 Nerve root entrapment	Yes	Count	32	22	54	0.018
		%	58.2%	34.9%	45.8%	
	No	Count	22	41	63	
		%	40.0%	65.1%	53.4%	
5.16.6 Headaches	Yes	Count	24	24	48	0.514
		%	43.6%	38.1%	40.7%	
	No	Count	31	39	70	
		%	56.4%	61.9%	59.3%	
5.16.7 Myofascial pain dysfunction	Yes	Count	19	30	49	0.151
		%	34.5%	47.6%	41.5%	
	No	Count	36	33	69	
		%	65.5%	52.4%	58.5%	
5.16.8 Discogenic pain	Yes	Count	35	36	71	0.472
		%	63.6%	57.1%	60.2%	
	No	Count	20	27	47	
		%	36.4%	42.9%	39.8%	

5.16.9 Tendonitis	Yes	Count	29	46	75	0.022
		%	52.7%	73.0%	63.6%	
	No	Count	26	17	43	
		%	47.3%	27.0%	36.4%	
5.16.10 Bursitis	Yes	Count	30	40	70	0.383
		%	55.6%	63.5%	59.8%	
	No	Count	24	23	47	
		%	44.4%	36.5%	40.2%	
5.16.11 Sprains	Yes	Count	28	49	77	0.005
		%	52.8%	77.8%	66.4%	
	No	Count	25	14	39	
		%	47.2%	22.2%	33.6%	
5.16.12 Strains	Yes	Count	25	44	69	0.018
		%	48.1%	69.8%	60.0%	
	No	Count	27	19	46	
		%	51.9%	30.2%	40.0%	

Severe acute pain (90.4%) followed by sprains (66.4%) were the two most common conditions that Chiropractors and students would use non-emergency NSAIDs for in practice. Significant differences between qualified Chiropractors and students were noted for severe acute pain (*p*=0.014), followed by tendonitis (*p*=0.022), sprains (*p*=0.005) and strains (*p*=0.018) (which concurs with the results seen in Table 4.5.12 and 4.5.13).

Table 4.5.15: Logistic regression analysis of factors associated with Q5.16.1

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Age	0.006	0.945	0.908	0.984
	Constant	0.000	67.655		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Age was identified as having an association with non-emergency NSAID use for patients in severe acute pain (Question 5.16.1). As age increased by 1 year, the probability of agreeing decreased by 5.5%. This concurs with the number of years in practice and / or the age of practitioners (see Tables 4.1.6 and 4.1.2).

Table 4.5.16: Logistic regression analysis of factors associated with Q5.16.2

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 2(a)	Group (Student vs Qualified)	0.097	2.443	0.851	7.017
	Gender (Male vs Female)	0.051	2.946	0.994	8.730
	Ethnic	0.101			
	Ethnic (Black vs White)	1.000	0.000	0.000	.
	Ethnic (Indian vs White)	0.032	4.447	1.133	17.448
	Constant	0.000	0.066		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Students were more likely to agree with non-emergency NSAID use for patients in mild pain (Question 5.16.2) than qualified Chiropractors (OR = 2.4), males were more likely than females (OR = 2.9) and Indian respondents were 4.4 times more likely than Whites to agree with this question. These results again concur with the literature with regards to age (Kayne *et* al., 1999; Menniti-Ippolito *et al.,* 2002; Reid, 2002; Tatalias, 2006) and gender (Tatalias, 2006; Brown *et al.*, 2007); however the culture seems to contradict the literature (Singh *et al*., 2004), but may concur with the suggestions / possibilities in Table 4.5.10.

Table 4.5.17: Logistic regression analysis of factors associated with Q5.16.4

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Group (Qualified vs Student)	0.054	2.100	0.988	4.462
	Constant	0.006	0.476		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

The qualified Chiropractors were 2.1 times more likely than the students to agree with non-emergency NSAID use for patients with facet syndrome (question 5.16.4) (p=0.054). It would seem that there are particular conditions for which the qualified Chiropractors do agree, but these seem to be selective as compared to the students who seem to have a more generalized and non specialist approach to the utilisation of the emergency and non-emergency use of NSAID tablets and / or creams.

Table 4.5.18: Logistic regression analysis of factors associated with Q5.16.5

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 3(a)	Group (Qualified vs Student)	<0.001	5.778	2.173	15.364
	Age	.036	.956	.918	.997
	Constant	.464	1.538		

Variables in the Equation, Variable(s) entered on step 1: group, gender, age, ethnic.

The qualified Chiropractors were 5.8 times more likely than the students to agree with non-emergency NSAID use for patients with nerve root entrapment (Question 5.16.5) (*p*<0.001). This concurs with section 5.16.4 and shows that qualified Chiropractors tend to be more selective of the particular conditions they would use non-emergency NSAIDs for. Age was associated with this question (*p*=0.036) indicating that the students were more likely to agree than practitioners and that a one year increase in age was associated with a decrease in probability of agreement by 4.4%.

Table 4.5.19: Logistic regression analysis of factors associated with Q5.16.6

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 2(a)	Group (Qualified vs Student)	0.034	2.870	1.081	7.623
	Gender (Females vs Males)	0.074	2.144	0.928	4.953
	Age	0.117	0.964	0.920	1.009
	Constant	0.893	0.906		

Variables in the Equation, Variable(s) entered on step 1: group, gender, age, ethnic.

The qualified Chiropractors were 2.9 times more likely than the students to agree with non-emergency NSAID use for patients with headaches (question 5.16.6) (*p*=0.034). Again this is a particular diagnosis and different from the more nonspecific approach of the students.

In contrast to the literature, females were 2.1 times more likely to agree to the use of NSAIDs for headaches. This may be related to the increased incidence and prevalence of headaches in the female population (Lipton, Stewart, Diamond, Diamond and Reed, 2001; Lyngberg, Rasmussen, Jørgensen and Jensen, 2004), a factor which seems to have a larger influence than the reported tendency for females to have a greater disposition to suggest complementary and alternative therapies for the treatment of conditions.

In contrast to the previous results, age was insignificantly associated with agreement to question 5.16.6 (*p*=0.117). A one year increase in age was associated with a decrease in probability of agreement by 3.6%. This change may be attributed to the increased numbers of females responding to the positive use of NSAIDs for this non-emergency condition.

Table 4.5.20: Logistic regression analysis of factors associated with Q5.16.8

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 2(a)	Gender (Males vs. Females)	0.007	3.275	1.376	7.796
	Age	0.058	0.966	0.932	1.001
	Ethnic	0.343			
	Ethnic (Black vs White)	1.000	0.000	0.000	
	Ethnic (Indian vs White)	0.144	3.386	0.660	17.364
	Constant	0.155	2.263		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Males were more likely to agree with non-emergency NSAID use for patients with discogenic pain (Question 5.16.8) (OR = 3.3, *p*=0.007) while age was again associated with agreement. Indians were 3.4 times more likely than Whites to agree (*p*=0.144). This reverts to concurring with the results presented at the outset at Section 4.6.5.1.1, indicating that qualified Chiropractors are not likely (based on their experience) to utilise NSAIDs for this condition for the same reasons that the use of NSAIDs in generalised conditions is not deemed appropriate.

Table 4.5.21: Logistic regression analysis of factors associated with Q5.16.9

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Group (Student vs. Qualified)	0.036	2.282	1.053	4.943
	Constant	0.587	1.160		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Students were 2.3 times more likely than qualified Chiropractors to agree with non-emergency NSAID use for patients with tendonitis (Question 5.16.9). This outcome reflects the very generalist approach of the students.

Table 4.5.22: Logistic regression analysis of factors associated with Q5.16.10

		Sig.	Exp (B)	9 5.0% C.I.for EXP(B)	
				Lower	Upper
Step 2(a)	Gender (Males vs Females)	0.053	2.320	0.991	5.434
	Age	0.090	0.970	0.937	1.005
	Ethnic	0.163			
	Ethnic (Black vs White)	1.000	653748021.290	0.000	.
	Ethnic (Indian vs white)	0.057	7.858	0.941	65.650
	Constant	0.181	2.143		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic

Males were 2.3 times more likely to agree with non-emergency NSAID use for patients with bursitis (Question 5.16.10) than females. This would seem to suggest that for the more generalist conditions where students are more likely to agree, the likelihood of males agreeing as well as Indians increases (Indians were 7.8 times more likely to agree than Whites). These results concur with the literature with regards to age (Kayne *et* al., 1999; Menniti-Ippolito *et al.,* 2002; Reid, 2002; Tatalias, 2006) and gender (Tatalias, 2006; Brown *et al.*, 2007) and it is suggested that the ethnicity follows a similar trend as seen before in the results, but ethnicity requires further research as there is conflicting evidence in this regard in the literature and the results presented in this study.

Table 4.5.23: Logistic regression analysis of factors associated with Q5.16.11

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 2(a)	Group (Student vs. Qualified)	0.099	2.380	0.850	6.666
	Gender (Males vs Females)	0.107	2.161	0.847	5.513
	Age	0.080	0.963	0.923	1.004
	Constant	0.229	2.842		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Students were 2.4 times more likely to agree with non-emergency NSAID use for patients with sprains (Question 5.16.11) than qualified Chiropractors. Males were 2.2 times more likely to agree but their age was negatively associated with agreement (3.7% decrease in probability of agreement with every one year increase in age). Again these results concur with the literature with regards to age (Kayne *et* al., 1999; Menniti-Ippolito *et al.,* 2002; Reid, 2002; Tatalias, 2006) and gender (Tatalias, 2006; Brown *et al.*, 2007).

Table 4.5.24: Logistic regression analysis of factors associated with Q5.16.12					
		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 3(a)	Group (Student vs. Qualified)	0.009	3.163	1.331	7.515
	Gender (Males vs females)	0.080	2.170	0.913	5.160
	Constant	0.163	0.546		

Variables in the Equation, Variable(s) entered on step 1: group, gender, age, ethnic.

Students were 3.2 times more likely to agree with non-emergency NSAID use for patients with strains (Question 5.16.12) than qualified Chiropractors. Males were 2.2 times more likely to agree for the same reasons highlighted in Table 4.5.23 above.

For the entire section of 4.6.5.1.7, it would seem that practitioners preferred to select conditions for which they would utilise NSAIDs as compared to the students. This in principle indicates that for the most part, the practitioners may not perceive a particular role for NSAIDs within a practice setting as compared to students. This agreement or lack thereof between the students and the practitioners is however not a factor that can conclusively be laid down to any particular group of factors as they include age, gender, experience, perceived practitioner skill, perceived practitioner comfort in practice and perceived practice "maturity". All these factors affect the ability of the practitioner in determining whether the patient has the clinical need for a particular intervention and then also does not indicate whether the Chiropractor administers the therapy or another practitioner (e.g. general practitioner in a multidisciplinary setting).

4.6.5.1.8 Q5.17 – 'Do you think that by being able to use NSAIDs in non-emergency situations would enhance your patient clinical outcomes in terms of :'

- 5.17.1 patient management
- 5.17.2 patient referral
- 5.17.3 patient retention

Table 4.5.25: Q5.17

			Qualified	Student	Total	P value
5.17.1 Patient management	Yes	Count	40	60	100	<0.001
		%	56.3%	87.0%	71.4%	
	No	Count	31	9	40	
		%	43.7%	13.0%	28.6%	
5.17.2 Patient referral	Yes	Count	34	46	80	0.025
		%	47.9%	66.7%	57.1%	
	No	Count	37	23	60	
		%	52.1%	33.3%	42.9%	
5.17.3 Patient retention	Yes	Count	38	57	95	<0.001
		%	53.5%	82.6%	67.9%	
	No	Count	33	12	45	
		%	46.5%	17.4%	32.1%	

Table 4.5.25 shows that 71.4% felt that being able to use NSAIDs in non-emergency situations would enhance patient management. A significantly higher percentage of students responded positively to this question *(p*<0.001) as well as to patient referral (*p*=0.025) and patient retention (*p*<0.001).

Table 4.5.26: Logistic regression analysis of factors associated with Q5.17.1

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
		Lower	Upper	Lower	Upper
Step 2(a)	Group (Student vs. Qualified)	0.019	3.443	1.230	9.640
	Gender (Male vs Females)	0.060	2.439	0.962	6.181
	Age	0.014	0.949	0.911	0.990
	Constant	0.039	5.307		

Variables in the Equation, Variable(s) entered on step 1: group, gender, age, ethnic.

Students were 3.4 times more likely to agree with Question 5.17.1 (Do you think that by being able to use NSAIDs in non-emergency situations would enhance your patient clinical outcomes in terms of patient management?) than qualified Chiropractors. Males were also 2.4 times more likely to agree. Age was associated with agreement to this question. As age increased by one year, the probability of agreement decreased by 5.1%.

Table 4.5.27: Logistic regression analysis of factors associated with Q5.17.2

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 3(a)	Gender (Male vs Females)	0.027	2.346	1.100	5.000
	Age	0.004	0.950	0.917	0.984
	Constant	0.008	4.365		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Males were 2.3 times more likely to agree with Question 5.17.2 (Do you think that by being able to use NSAIDs in non-emergency situations would enhance your patient clinical outcomes in terms of patient referral?). Age was associated with agreement to this question. As age increased by one year, the probability of agreement decreased by 5%.

Table 4.5.28: Logistic regression analysis of factors associated with Q5.17.3

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 2(a)	Group (Student vs. Qualified)	0.039	2.830	1.056	7.582
	Gender (Male vs Females)	0.015	3.095	1.244	7.699
	Age	0.007	0.943	0.904	0.985
	Constant	0.050	5.051		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Students were 2.8 times more likely to agree with Question 5.17.3 (Do you think that by being able to use NSAIDs in non-emergency situations would enhance your patient clinical outcomes in terms of patient retention?) than qualified Chiropractors. Males were 3.1 times more likely to agree. Age was associated with agreement to this question. As age increased by one year, the probability of agreement decreased by 5.7%.

The above findings show that students and males (qualified Chiropractors and students) perceive the use of NSAIDs more positively, which corresponds with the literature which shows that older individuals are more likely to utilise complementary and alternative therapies (Kayne *et al.,* 1999; Menniti-Ippolito *et al.,* 2002; Reid, 2002 and Tatalias, 2006) as compared to younger generations who will in contrast, be more likely to want to include allopathic medicine. Similarly, females are more likely to utilise TCAM (Tatalias, 2006) and are therefore less likely to want to include allopathic adjuncts than their male counterparts.

4.6.5.1.9 Q5.18 – 'If you have not completed the NSAIDs course would you consider doing so?'

Table 4.5.29: Q5.18

			Qualified	Student	Total	P value
5.18	Yes	Count	27	61	88	<0.001
		%	57.4%	98.4%	80.7%	
	No	Count	20	1	21	
		%	42.6%	1.6%	19.3%	

More students wanted to complete an NSAIDS course (p<0.001). This result was expected based on the findings in Tables 4.5.2 and 4.5.25 which indicated that students were more likely to perceive NSAIDs as an enhancement to patient clinical outcomes in terms of patient management, referrals and retention.

Table 4.5.30: Logistic regression analysis of factors associated with Q5.18					
		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 3(a)	Group (Student vs. Qualified)	0.007	19.892	2.284	173.232
	Age	0.018	0.943	0.898	0.990
	Constant	0.010	12.886		

Variables in the Equation, Variable(s) entered on step 1: group, gender, age, ethnic.

Students were 19.9 times more likely to want to complete a NSAIDs course than qualified Chiropractors and age was also associated with agreement to this question. As age increased by one year, the probability of agreement decreased by 5.7%. Based on the literature which shows that older individuals are more likely to utilise complementary and alternative therapies (Kayne, Beattie and Reeves, 1999; Menniti-Ippolito *et al.,* 2002; Reid, 2002 and Tatalias, 2006) as compared to younger generations who would be more likely to want to include allopathic medicine, this result was expected.

4.6.5.1.10 Q5.20 – 'Do you think that Biopuncture is a modality that should be available to Chiropractors?

Table 4.5.31: Q5.20						
			Qualified	Student	Total	P value
5.20	Yes	Count	52	53	105	0.172
		%	77.6%	86.9%	82.0%	
	No	Count	15	8	23	
		%	22.4%	13.1%	18.0%	

The majority thought Biopuncture should be made available to qualified Chiropractors (77.6%) and students (86.9%). This could be due to literature supporting its effectiveness in the treatment of musculoskeletal conditions (Branski *et al*., 2004) and as it is a natural medicine, it is still congruent with the natural holistic approach associated with the Chiropractic profession (Chapman-Smith, 2000).

4.6.5.1.11 Q5.21 – 'Do you think that Chiropractors should challenge the legislation to incorporate Biopuncture?

Table 4.5.32: Q5.21						
			Qualified	Student	Total	P value
5.21	Yes	Count	49	51	100	0.117
		%	72.1%	83.6%	77.5%	
	No	Count	19	10	29	
		%	27.9%	16.4%	22.5%	

More respondents felt that Chiropractors should challenge the legislation to incorporate Biopuncture, qualified Chiropractors (72.1%) and students (83.6%). This result was expected as the majority of respondents thought Biopuncture should be available to Chiropractors (82%) as seen in Table 4.5.31.

Table 4.5.33: Logistic regression analysis of factors associated with Q5.21					
		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Gender (Females vs. Males)	0.100	2.062	0.871	4.883
	Constant	0.001	2.474		

Variables in the Equation a Variable(s) entered on step 1: group, gender, age, ethnic.

In keeping with the above results, females were 2 times more likely than males to agree to challenge the legislation regarding Biopuncture. According to the literature, females are more likely to utilise TCAM therapies as they are more non invasive and are perceived to have less side effects (MacLennan and Wilson, 1996; National Centre for Complementary and Alternative Medicine, 2004; Tatalias, 2006; Low *et al.*, 2008).

4.6.5.1.12 Summary of the perception of Non Steroidal Anti-inflammatory Drugs (NSAIDs) and Biopuncture

On average this study revealed that students were more likely to perceive NSAIDs and Biopuncture in a more positive light than qualified Chiropractors and found them significantly more useful and necessary. They strongly agreed with Chiropractors having access to both the NSAIDs and Biopuncture courses and disagreed more than the qualified Chiropractors about the conflict between traditional Chiropractic principles and the use of NSAIDs and Biopuncture. Students also felt that the use of NSAIDs and Biopuncture did not encroach on another professions scope of practice. Potential reasons for this could be due to students having a limited clinical experience and therefore placing less emphasis on the adjustment compared to qualified practitioners who have perfected their technique. This may indicate that they don't necessarily feel the need to incorporate new modalities into their treatment regimes. The introduction of these courses is fairly recent and therefore students and younger graduates may have had increased exposure to them.

There were significantly higher positive responses to NSAIDs regarding patient retention in the students and they were 2.4 times more likely to agree with whether they thought being able to use NSAIDs would enhance patient clinical outcomes in terms of patient retention (p=0.045). Age was associated with whether they thought being able to use NSAIDs would enhance patient clinical outcomes in terms of patient management (p=0.073) as well as whether they thought that Chiropractors should be able to recommend NSAID tablets (p=0.058). For every one year increase in age the probability of respondents agreeing to these questions decreased by 3.1%. and 3.9% respectively.

Students were 19.9 times more likely to want to complete an NSAIDs course than qualified Chiropractors and overall the students' views regarding the use of emergency NSAIDs were more positive than the qualified Chiropractors' ($p<0.001$). The questionnaire allowed for respondents to provide reasons as to why they felt the way they did and the following reasons were given:

- Benefits to patients
- Avoids having to refer patients away
- Avoids patients having to pay two consultation fees
- Good in rural settings
- Broadens scope of treatment
- Good adjunct if correctly trained

Reasons were also given by those respondents who had a negative perception about the use of emergency NSAIDs as to why they felt this way, these included:

- Risks outweigh benefits
- Beyond our scope of practice
- Insufficient knowledge
- Dangerous due to drug interactions and anaphylactic shock
- Not aligned with Chiropractic philosophy

Students felt more strongly that Chiropractors should be allowed to dispense NSAID cream and tablets ($p=0.010$ and $p=0.008$) and 4.6 times more likely than qualified Chiropractors to think that Chiropractors should be allowed to dispense NSAID tablets. Males were 3.2 times more likely than females and Indians 10.6 times more likely than Whites to agree with this question. Males and students were also more likely than females and qualified Chiropractors to think that Chiropractors should be allowed to dispense NSAID cream and students felt more strongly that NSAIDs should be made available for use by Chiropractors in non emergency situations ($p=0.001$).

When asked for which conditions practitioners would like to use NSAIDs in practice, severe acute pain was the condition which was most frequently chosen. Age was associated with agreeing to this question, as age increased by 1 year, the probability of agreeing decreased by 5.5%. Table 4.5.25 indicates that 71% felt that being able to use NSAIDs in non-emergency situations would enhance patient management. A significantly higher percentage of students responded positively to this question ($p<0.001$) as well as to patient referral ($p=0.025$) and patient retention ($p<0.001$). Students and males (qualified chiropractors and students) were more likely to agree with non-emergency NSAID use enhancing patient clinical outcomes in terms of patient management, patient referral and patient retention (4.6.5.1.8)**.**

These findings show that students and males (qualified chiropractors and students) perceive the use of NSAIDs more positively which corresponds with the literature which shows that older individuals are more likely to utilise complementary and alternative therapies (Kayne *et* al., 1999; Menniti-Ippolito *et al.,* 2002; Reid, 2002 and Tatalias, 2006) as compared to younger generations who will in contrast be more likely to want to include allopathic medicine. Similarly females are more likely to utilise TCAM (Tatalias, 2006) and are therefore less likely to want to include allopathic adjuncts than their male counterparts. This study also revealed that Indians were more likely than Whites to think that Chiropractors should be allowed to dispense NSAID tablets which was not expected due to the fact that the Indian community have always identified with the use of natural medicines and supplements (World Health Organisation, 2005) and thus it was expected that these practitioners would be more knowledgeable in this regard than in the application of allopathic medicines.

The majority of respondents thought Biopuncture should be available to Chiropractors. In keeping with this approach, females were 2 times more likely than males to agree to challenge the legislation regarding Biopuncture. Females were more likely to utilise TCAM therapies as they were more non invasive and

were perceived to have less side effects (MacLennan and Wilson, 1996; National Centre for Complementary and Alternative Medicine, 2004; Tatalias, 2006; Low, *et* al., 2008).

4.6.5.2 Knowledge

4.6.5.2.1 Q5.6 – 'The use of NSAID's and Biopuncture is part of the Chiropractic scope of practice. '

Table 4.5.34: Q5.6

			Qualified	Student	Total	P value
5.6.1 NSAIDs	Strongly disagree	Count	18	2	20	<0.001
		%	24.3%	3.0%	14.2%	
	Disagree	Count	21	12	33	
		%	28.4%	17.9%	23.4%	
	Agree	Count	24	34	58	
		%	32.4%	50.7%	41.1%	
	Strongly agree	Count	11	19	30	
		%	14.9%	28.4%	21.3%	
5.6.2 Biopuncture	Strongly disagree	Count	10	1	11	0.003
		%	13.9%	1.6%	8.3%	
	Disagree	Count	22	9	31	
		%	30.6%	14.8%	23.3%	
	Agree	Count	28	33	61	
		%	38.9%	54.1%	45.9%	
	Strongly agree	Count	12	18	30	
		%	16.7%	29.5%	22.6%	

Overall, the majority 'agreed' / 'strongly agreed' that NSAIDs (62.2%) and Biopuncture (68.5%) are part of the Chiropractic scope of practice, but there was a statistically significant difference between responses of students and qualified Chiropractors for both statements. The level of agreement was higher in the students than in the qualified Chiropractors (p<0.001 and p=0.003 for NSAIDs

and Biopuncture respectively). This could be due to the students viewing the use of NSAIDs more positively (as seen in Table 4.4.5) and therefore being more likely to want to use them and for NSAIDs to be part of the scope of practice. Furthermore, as previously mentioned, potential reasons for this could be due to students being taught in an evidence based paradigm with limited clinical experience and the recent introduction of an injectible NSAID and Biopuncture course.

4.6.5.2.2 Q5.19 – 'Do you know what Biopuncture is?

Table 4.5.35: Q5.19

			Qualified	Student	Total	P value
5.19.1	Yes	Count	62	40	102	0.002
		Column N %	81.6%	58.0%	70.3%	
	No	Count	14	29	43	
		Column N %	18.4%	42.0%	29.7%	
5.19.2	Correct	Count	46	31	77	0.556
		Column N %	90.2%	86.1%	88.5%	
	Incorrect	Count	5	5	10	
		Column N %	9.8%	13.9%	11.5%	

Although there was a significantly higher proportion of self reported knowledge of Biopuncture in the qualified Chiropractors than the students (p=0.002), the correctness of the definition did not differ between the groups. Overall, 88.5% knew the correct definition. This could come down to experience and exposure to different modalities in practice compared to the somewhat sheltered environment of the institution's clinics.

Table 4.5.36: Logistic regression analysis of factors associated with Q5.19

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 3(a)	Group (Qualified vs. Students)	0.001	5.741	2.076	15.880
	Age	0.062	0.962	0.923	1.002
	Constant	0.028	3.533		

Variables in the Equation, Variable(s) entered on step 1: group, gender, age, ethnic.

Qualified Chiropractors were 5.7 times more likely to know what Biopuncture is (p=0.001). Age was associated with this question (p=0.062). A one year increase in age reduced the probability of knowledge by 3.8%. These modalities have only recently (within the last five years) been introduced to Chiropractors and therefore, older practitioners with established practices may feel less inclined to perceive a need to further their knowledge or utilisation of additional modalities in practice.

4.6.5.2.3 Summary of the knowledge of Non Steroidal Anti-inflammatory Drugs (NSAIDs) and Biopuncture

Overall, the majority of respondents agreed with the the use of NSAIDs being part of the Chiropractic scope of practice (62.2%) as well as the use of Biopuncture being part of the Chiropractic scope of practice (68.5%). Only those Chiropractors that have completed the NSAIDs course are allowed to use NSAIDs in emergency situations. In terms of Biopuncture, according to legislation, Chiropractors are not allowed to utilise it. However, these results show that more than half of the respondents agree that both NSAIDs and Biopuncture are part of the Chiropractic scope of practice but presently legislation does not allow for this (CASA, 2008; Allied Health Professions Act 63 of 1982, as amended). There was a statistically significant difference between responses of students and qualified Chiropractors for both statements. The level of agreement was higher in the students than in the qualified Chiropractors (p<0.001 and p=0.003 for NSAIDs and Biopuncture respectively).

Although there was a significantly higher proportion of self reported knowledge of Biopuncture in the qualified Chiropractors than the students (p=0.002) the correctness of the definition did not differ between the groups and overall 88.5% knew the correct definition. Qualified Chiropractors were 5.7 times more likely to know what Biopuncture is (p=0.001) and age was associated with this question

(*p*=0.062). A one year increase in age reduced the probability of knowledge by 3.8%.

4.6.5.3 Utilisation

There are no utilisation questions pertaining to Biopuncture in this section as according to legislation, it is not allowed to be utilised by Chiropractors (CASA, 2008; Allied Health Professions Act 63 of 1982, as amended).

4.6.5.3.1 Q5.7 – 'Are you aware of the NSAIDs course?

Table 4.5.37: Q5.7

			Qualified	Student	Total	P value
5.7	Yes	Count	65	45	110	0.007
		Column N %	84.4%	65.2%	75.3%	
	No	Count	12	24	36	
		Column N %	15.6%	34.8%	24.7%	

Significantly more qualified Chiropractors were aware of the NSAIDs course (*p*=0.007) which is understandable as it is a post graduate course.

Table 4.5.38: Logistic regression analysis of factors associated with Q5.7

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 3(a)	Group (Qualified vs. Students)	0.003	3.365	1.502	7.541
	Ethnic	0.286			
	Ethnic (Blacks vs Whites)	0.999	1072232471.291	0.000	.
	Ethnic (Indians vs Whites)	0.114	5.500	0.665	45.499
	Constant	0.125	1.507		

Variables in the Equation, Variable(s) entered on step 1: group, gender, age, ethnic.

As seen in Table 4.5.38, qualified Chiropractors were 3.4 times more likely to know about the NSAIDs course and Indian respondents were 5.5 times more likely than the Whites to know about the course. This could be due to the increased number of Indian respondents that felt that Chiropractors should be allowed to administer NSAID tablets (Table 4.5.10) which suggests they have a positive perception of the use of these substances and may therefore want to expand their knowledge.

4.6.5.3.2 Q5.8 – 'Have you completed the NSAIDs course?

Table 4.5.39: Q5.8

			Group			P value
			Qualified	Student	Total	
5.8	Yes	Count	38	7	45	<0.001
		Column N %	52.8%	14.6%	37.5%	
	No	Count	32	41	73	
		Column N %	44.4%	85.4%	60.8%	

Significantly more qualified Chiropractors had completed the course (p<0.001) as it is theoretically a post graduate course. However, master's students that have completed their 5th year may attend the course but is not allowed to be utilised in the institution's clinics.

Table 4.5.40: Logistic regression analysis of factors associated with Q5.8

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Group (Qualified vs. Students)	<0.001	6.607	2.602	16.780
	Constant	0.000	0.175		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Qualified Chiropractors were 6.6 times more likely to have done the NSAIDs course (p<0.001) which was already suggested in Table 4.5.39.

Q5.9 – 'On average what percentage of your patients do you administer emergency NSAIDs to per week:

Table 4.5.41: Q5.9					
		Qualified	Student	Total	P value
5.9	Median (Inter-quartile range)	0 (0-5)	0 (0)	0 (0-5)	0.084

Even though 52.8% of qualified Chiropractors had completed the course, the majority of respondents did not administer emergency NSAIDs to their patients every week. The reasons for this are unknown but could be due to practitioners not seeing emergency patients on a weekly basis or that practitioner's interest in the course was more from a knowledge and curiosity stand than a practical one. This could also be due to the reasons given by those respondents that had a negative view of the use of NSAIDs in practice, as stated in 4.6.5.1.12.

4.6.5.3.4 Q5.10 – 'What conditions have you commonly administered emergency NSAIDs for and please provide an example?'

Table 4.5.42: Q5.10						
			Qualified	Student	Total	P value
5.10.1 Musculoskeletal system	Yes	Count	32	14	46	0.003
		Column N %	53.3%	25.9%	40.4%	
	No	Count	28	40	68	
		Column N %	46.7%	74.1%	59.6%	
5.10.5 Neurological system	Yes	Count	11	1	12	0.003
		Column N %	19.0%	1.9%	10.7%	
	No	Count	47	53	100	
		Column N %	81.0%	98.1%	89.3%	
5.10.7 Emergency cases	Yes	Count	19	4	23	0.001
		Column N %	32.8%	7.5%	20.7%	
	No	Count	39	49	88	
		Column N %	67.2%	92.5%	79.3%	

Overall, 40% of respondents used emergency NSAIDs for the musculoskeletal system and the use was higher in the qualified Chiropractors (p=0.003). This result was expected as more qualified Chiropractors had completed the course and a Chiropractor's primary role is to treat musculoskeletal conditions. However the NSAIDs course was designed for use in emergency cases only (CASA, 2007) and as seen in Table 2.5.39 this is not necessarily the case. More respondents administer NSAIDs for musculoskeletal conditions (40.4%) than emergencies (20.7%), however it is possible that the musculoskeletal conditions could also be emergency cases. Examples of conditions for which the NSAIDs are used can be seen in appendix K.

4.5.43 Use of NSAIDS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	68	45.6	59.6	59.6
	Yes	46	30.9	40.4	100.0
	Total	114	76.5	100.0	
Missing	System	35	23.5		
Total		149	100.0		

As seen in Table 4.5.40, the use of NSAIDs for emergency situations was re-categorised using any positive responses to Question 5.10.

Table 4.5.44: Logistic regression analysis of factors associated with Q5.10

		P value	OR	95.0% C.I. for OR	
				Lower	Upper
Step 12(a)	Group (Qualified vs. Student)	0.001	41.743	4.456	391.012
	Ethnic (White vs. Indian)	0.082	19.962	0.687	579.719
	@5.3.1	0.053	3.161	0.987	10.123
	@5.15 (Yes)	0.006	540.962	6.266	46706.360
	@5.17.2 (Yes)	0.086	7.007	0.759	64.726
	Constant	0.001	0.000		

a Variable(s) entered on step 1: group, gender, age, ethnic, @5.1.1, @5.2.1, @5.3.1, @5.4.1, @5.5.1, @5.6.1, @5.11.1, @5.11.2, @5.11.3, @5.12, @5.15, @5.17.1, @5.17.2, @5.17.3.

As expected, the qualified Chiropractors were 42 times more likely to use emergency NSAIDs than the students (p=0.001). Whites were also 20 times more likely to use them than Indians This is surprising as Indians were 10.6 times more likely than Whites to think that Chiropractors should be allowed to dispense NSAID tablets. The more the respondents agreed with Question 5.3.1 (The use of NSAIDs by Chiropractors is needed in South Africa), the more likely they were to use NSAIDs.

Those respondents who agreed with Question 5.15 (In your opinion do you think that NSAIDs should be made available for use by Chiropractors in non-emergency situations?) were 541 times more likely to use NSAIDs. Those who answered “yes” to Question 5.17.2 (Do you think that by being able to use NSAIDs in non-emergency situations you would enhance your patient clinical outcomes in terms of patient referral) were 7 times more likely to use NSAIDs. This again highlights the correlation between respondent’s knowledge and perception affecting their utilisation.

4.6.5.4.4 Summary of the utilisation of Non Steroidal Anti-inflammatory Drugs (NSAIDs)

Qualified Chiropractors and Indian respondents were more likely to know about the NSAIDs course. The qualified Chiropractors were 6.6 times more likely to have done the NSAIDs course (p<0.001). Even though 52.8% of qualified Chiropractors had completed the course, the majority of respondents did not administer emergency NSAIDs to their patients on a weekly basis. The reasons for this are unknown but could be due to a negative perception of the use of NSAIDs in practice for reasons stated in 4.6.5.1.12.

Overall, 40% of respondents used emergency NSAIDs for the musculoskeletal system, 21% for emergency situations and only 11% overall used them for neurological complaints. Whites were also 20 times more likely to use emergency NSAIDs than Indians. The more the respondents agreed with the use of NSAIDs by Chiropractors being needed in South Africa (Question 5.3.1), the more likely they were to use NSAIDs. Those respondents who agreed with NSAIDs being made available for use by Chiropractors in non-emergency situations (Question 5.15) were 541 times more likely to use NSAIDs. Respondents who answered "yes" to NSAIDs in non-emergency situations would enhance patient clinical outcomes in terms of patient referral (Question 5.17.2) were 7 times more likely to use NSAIDS. Therefore, this highlights the correlation between knowledge, perception and utilisation.

4.6.1 Part Six: Pharmacological agents

4.6.6.1 Perception

4.6.6.1.1 Q6.1 – 'If you were allowed, would you consider administering any other pharmacological agents in practice?

Table 4.6.1: Q6.1						
			Qualified	Student	Total	P value
6.1	Yes	Count	26	38	64	0.017
		%	35.1%	55.1%	44.8%	
	No	Count	48	31	79	
		%	64.9%	44.9%	55.2%	

Less than half of the respondents would consider administering pharmacological agents in practice and this was significantly higher in students (*p*=0.017). Chiropractic practice traditionally emphasises the conservative management of patients without the use of drugs or surgery and when necessary patients are co-managed with other health care providers. In fact, positioning the profession as non-drug, non-surgical health care is viewed as being integral to how the profession should be perceived by the general public (Carey, Clum and Dixon, 2005). Due to the above mentioned statements, it is expected that more practitioners would be against the inclusion of pharmacological agents in practice. This study however reveals that the majority of the student population, if allowed, would consider administering pharmacological agents in practice. However, the converse was indicated by qualified Chiropractors.

Table 4.6.2: Logistic regression analysis of factors associated with Q6.1					
		P value	OR	95.0% C.I. for OR	
				Lower	Upper
Step 3(a)	Gender (Male)	0.008	6.791	1.646	28.012
	Age	0.006	0.894	0.826	0.968
	Constant	0.132	0.098		

a Variable(s) entered on step 1: group, gender, age, ethnic, @6.2.1, @6.2.2, @6.2.3, @6.2.4, @6.3.

Since pharmacological agents are not used by Chiropractors, as they fall outside the current scope of practice (CASA, 2008; Allied Health Professions Act 63 of 1982, as amended), Question 6.1 was used as a proxy indicator of use. Males would be 7 times more likely than females to use pharmacological agents, with the probability of the use decreasing by 10.6% with every one year increase in age. This is in keeping with the literature (Kayne *et al.,* 1999; Menniti-Ippolito *et al.,* 2002; Reid, 2002 and Tatalias, 2006).

4.6.6.1.2 Q6.2 – 'Please list the pharmacological agents you would use?

- 6.2.1 Anti-depressants
- 6.2.2 Corticosteroids
- 6.2.3 Local anaesthetic
- 6.2.4 Muscle relaxants

Table 4.6.4: Q6.2

			Qualified	Student	Total	P value
6.2.1 Anti-depressants	Yes	Count	4	2	6	0.436
		%	6.0%	3.1%	4.6%	
	No	Count	63	62	125	
		%	94.0%	96.9%	95.4%	
6.2.2 Corticosteroids	Yes	Count	12	22	34	0.032
		%	17.9%	34.4%	26.0%	
	No	Count	55	42	97	
		%	82.1%	65.6%	74.0%	
6.2.3 Local anaesthetic	Yes	Count	20	21	41	0.715
		%	29.9%	32.8%	31.3%	
	No	Count	47	43	90	
		%	70.1%	67.2%	68.7%	
6.2.4 Muscle relaxants	Yes	Count	32	44	76	0.014
		%	47.8%	69.8%	58.5%	
	No	Count	34	19	53	
		%	50.7%	30.2%	40.8%	

Most respondents would like to recommend muscle relaxants (58.5%) which could be due to some practitioners perceiving themselves as musculoskeletal specialists and therefore wanting to include any modality necessary to assist patient wellbeing, regardless of what the modality is. Significantly more students than qualified Chiropractors wanted to administer corticosteroids and muscle relaxants.

Table 4.6.3: Logistic regression analysis of factors associated with Q6.2					
		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 3(a)	Gender (Males vs. Females)	0.017	2.481	1.178	5.225
	Age	0.002	0.926	0.883	0.972
	Constant	0.023	4.925		

Variables in the Equation, Variable(s) entered on step 1: group, gender, age, ethnic.

Males were 2.5 times more likely to want to administer other pharmacological agents than females and age was significantly associated with this question (one year increase in age reduced the probability of agreement by 7.4%) for the same reasons as above (Table 4.6.2).

4.6.6.1.3 Q6.3 – 'Would you be interested in post graduate courses in order to be able to administer additional pharmacological agents in practice?

Table 4.6.5: Q6.3						
6.3	Yes	Count	43	44	87	0.430
		%	57.3%	63.8%	60.4%	
	No	Count	32	25	57	
		%	42.7%	36.2%	39.6%	

More respondents (60.4%) would be interested in a course regarding administration of pharmacological agents. To establish the reasons for practitioners and students responses, the questionnaire allowed for them to

explain their answer and from these responses it could be seen that the majority of practitioners welcomed the academic content as opposed to obtaining a skill for use in practice.

Table 4.6.6: Logistic regression analysis of factors associated with Q6.3

		P value	OR	95.0% C.I. for OR	
				Lower	Upper
	@6.3(1)	0.001	39.430	4.138	375.749
	Constant	0.132	0.098		

a Variable(s) entered on step 1: group, gender, age, ethnic @ 6.3.

However, in contrast to these responses, those who wanted to attend a course to administer pharmacological agents were 39 times more likely to report wanting to administer these agents. Based on this fundamental conflict between these results (Table 4.6.5 and 4.6.6), it is necessary to question the honesty with which the respondents answered these questions.

Table 4.6.7: Logistic regression analysis of factors (age) associated with Q6.3

		Sig.	Exp(B)	95.0% C.I.for EXP(B)	
				Lower	Upper
Step 4(a)	Age	0.035	0.966	0.936	0.998
	Constant	0.006	4.407		

Variables in the Equation

a Variable(s) entered on step 1: group, gender, age, ethnic.

Age was significantly associated with Question 6.3 (Would you be interested in post graduate courses in order to be able to administer additional pharmacological agents in practice?) (p=0.035). A one year increase in age reduced the probability of agreement by 3.4%, which based on the literature, was expected (Kayne, Beattie and Reeves, 1999; Menniti-Ippolito *et al.,* 2002; Reid, 2002 and Tatalias, 2006).

4.6.6.1.4 Summary of the perception of pharmacological agents

Less than half of the respondents would consider administering pharmacological agents in practice and this was significantly higher in students (p=0.017). Amongst the student population the majority, if allowed, would consider administering pharmacological agents in practice. However, the converse seemed true in qualified Chiropractors.

Males would be 7 times more likely than females to use pharmacological agents and with every one year increase in age, the probability of the use of pharmacological agents would decrease by 10.6%, which is in keeping with the literature (Kayne *et al*., 1999; Menniti-Ippolito *et al.,* 2002; Reid, 2002 and Tatalias, 2006). Very few respondents would administer anti-depressants (4.6%), 26% would administer corticosteroids, 31% local anaesthetic and 58% muscle relaxants. Significantly more students wanted to administer corticosteroids and muscle relaxants.

It was found that 60.4% of respondents would be interested in a course regarding administration of pharmacological agents and those who wanted to attend a course to administer pharmacological agents were 39 times more likely to report wanting to administer these agents. Age was significantly associated with this question and a one year increase in age reduced the probability of agreement by 3.4%.

4.7 Summary and review of Objectives

Objective 1: To record the demographic data with respect to the respondents.

One hundred and forty nine respondents participated in this study. There were slightly more males than females in the sample as a whole (54.7% males and 45.3% females). The average age of the qualified Chiropractors in this study was 38.56 years and the average age of the Chiropractic students was 24.78 years. In this study, the majority of the sample was White (90.5%) with 8.1% being Indian and only 1.4% being black. The most frequent institutions attended by respondents were DUT (53.8%) and UJ (33.1%), which correlated with the majority of respondents having an M.Tech qualification (68.8%).

The average time that the respondents had been in practice was 7.5 years, which ranged from 0 to 47 years. The majority of Chiropractors were in full time (74.4%), private practice (57.1%) in urban areas (58%). One third of Chiropractors had practiced outside South Africa and many had taken health related short courses (68%), whereas only one third had additional qualifications apart from their Chiropractic qualification. The most used Chiropractic technique was ‘diversified technique’ (97.5%) and spinal manipulation presented with the highest percentage of use (100%). The majority of practitioners had inter-professional referrals with General Practitioners (87.3%), Homeopaths (68.4%), and Physiotherapists (72.2%).

Objective 2: To determine the respondents’ perception, knowledge and utilisation of the use of vitamin and mineral supplements in the Chiropractic profession.

Majority of the respondents (62.8%) felt qualified to advise patients on vitamins and mineral supplements. There was a significant association between those respondents that felt that they were adequately qualified to advise patients on the

use of vitamins and minerals and using them in practice. The majority had a positive view of the use of vitamins and minerals as part of Chiropractic management (86.6%) and overall most respondents felt that the use of vitamins and minerals had improved patient management, and to some degree patient retention, but that it had not improved patient referral.

Most respondents felt that there needed to be more information supplied on vitamins and minerals in Chiropractic training (89.7% overall) and overall 71.4% wanted to do a postgraduate course on vitamins and minerals. The number of patients that were recommended vitamins and minerals per week was 25% and overall 76% of Chiropractors gave advice to patients on vitamins and minerals as part of Chiropractic management.

Objective 3: To determine associations between perception, knowledge and utilisation of the use of vitamin and mineral supplements in the Chiropractic profession with respect to the demographic data.

Chiropractic students were more likely to think that using vitamins and minerals had improved patient management and patient retention than qualified Chiropractors. Those who responded yes to patient management improving patient clinical outcome (Table 4.2.1) were more likely to use vitamins and minerals (p=0.001) in practice. Females were more likely to be interested in doing a post graduate course on vitamins and minerals than males and students were more likely to think that there needed to be more information supplied on vitamins and minerals in Chiropractic training than qualified Chiropractors (p=0.060). For every one year increase in age, the probability of using vitamins and minerals decreased by 4.6% (Table 4.2.5) but this was not quite statistically significant. Indian Chiropractors were 3.9 times more likely than White Chiropractors to think that the use of vitamins and minerals had improved patient referral (p=0.036)

Objective 4: To determine the respondents' perception, knowledge and utilisation of the use of topical substances in the Chiropractic profession.

The correct answer to whether or not respondents were aware that the 2001 regulation of Act 63, 1982 allowed Chiropractors to use orthodox medicinal topical substances was "yes". However only 55% of respondents knew the correct answer. Those who knew Chiropractors were allowed to use orthodox medicinal topical substances were 10.9 times more likely to use them.

A higher percentage of respondents (65%) knew the correct answer as to whether or not respondents were aware that the 2001 regulation of Act 63, 1982 allowed Chiropractors to use natural topical substances and those who knew this were 7.6 times more likely to use them. The majority of the practitioners were aware that topical substances are part of the scope of practice and only 29% of respondents used orthodox medicinal topical substances in practice and 59% of respondents used natural topical substances.

Objective 5: To determine associations between perception, knowledge and utilisation of the use of topical substances in the Chiropractic profession with respect to the demographic data.

Males were nearly twice as likely as females to use topical substances but this was not quite statistically significant. Qualified Chiropractors were 2.5 times more likely than Chiropractic students to know the correct answer as to whether or not respondents were aware that the 2001 regulation of Act 63, 1982 allowed Chiropractors to use natural topical substances. They were also more likely to use natural topical substances than the Chiropractic students.

Objective 6: To determine the respondents' perception, knowledge and utilisation of the use of natural medicines in the Chiropractic profession.

More than 90,4% of respondents utilised dry needling, with acupuncture being the second most frequently used modality (29,4%). There were 52.9% qualified Chiropractors and 47.2% students that had additional qualifications apart from Chiropractic. These qualifications were not always related to health care. The majority thought Biopuncture should be available to Chiropractors and more respondents felt that Chiropractors should challenge the legislation to incorporate Biopuncture. Overall, the majority agreed with the statement for Biopuncture being part of the scope of practice (46%) and 88.5% knew the correct definition of Biopuncture.

Objective 7: To determine associations between perception, knowledge and utilisation of the use of natural medicines in the Chiropractic profession with respect to the demographic data.

The use of dry needling was significantly different between the qualified Chiropractors and Chiropractic students ($p<0.001$), with all the students using it. Reiki was significantly used more by qualified Chiropractors than students ($p=0.049$). Only age was significantly associated with the use of natural remedies ($p<0.001$). With every one year increase in age, the probability of use of natural remedies decreased by 13.7%

Students were more likely to strongly agree with Chiropractors having access to Biopuncture courses and also found Biopuncture significantly more useful and necessary than qualified Chiropractors. Students tended to disagree more than qualified Chiropractors about the conflict between traditional Chiropractic principles and the use of Biopuncture.

Students also disagreed more than qualified Chiropractors that the use of Biopuncture encroaches on another professions scope of practice. The level of agreement with regards to the statement for Biopuncture being part of the scope of practice was higher in the students than in the qualified Chiropractors (p=0.003).

There was a significantly higher proportion of self reported knowledge of Biopuncture in the qualified Chiropractors than the students (p=0.002) and the qualified Chiropractors were 5.7 times more likely to know what Biopuncture is (p=0.001). Age was associated with this question (p=0.062) and females were 2 times more likely than males to agree to challenge the legislation regarding Biopuncture.

Objective 8: To determine the respondents' perception, knowledge and utilisation of the use of pharmacological agents in the Chiropractic profession.

Overall, the majority agreed with the statement for NSAIDs being part of Chiropractic scope of practice and 71% of respondents felt that being able to use NSAIDs in non-emergency situations would enhance patient management. Even though 52.8% of qualified Chiropractors had completed the NSAIDs course, the majority of respondents did not administer emergency NSAIDs to their patients. Overall, 40% of respondents used emergency NSAIDs for the musculoskeletal system, 21% for emergency situations and only 11% overall used them for neurological complaints.

Overall, about 60% would be interested in a course regarding administration of pharmacological agents and those who wanted to attend a course to administer pharmacological agents were 39 times more likely to report wanting to administer these agents.

Objective 9: To determine associations between perception, knowledge and utilisation of the use of pharmacological agents in the Chiropractic profession with respect to the demographic data.

Students were more likely to 'strongly agree' with Chiropractors having access to NSAIDs courses and to 'disagree' more about the conflict between traditional Chiropractic principles and the use of NSAIDs than qualified Chiropractors ($p<0.001$). Students found NSAIDs significantly more useful and necessary than the qualified Chiropractors and disagreed more that the use of NSAIDs encroached on another professions scope of practice.

There was a significantly higher positive response to NSAIDs regarding patient retention in the students and they were 2.4 times more likely to agree with whether they thought being able to use NSAIDs had enhanced patient clinical outcome in terms of patient retention ($p=0.045$). Age was associated with whether they thought being able to use NSAIDs had enhanced patient clinical outcome in terms of patient management ($p=0.073$) as well as whether they thought that Chiropractors should be able to recommend NSAID tablets ($p=0.058$). For every one year increase in age, the probability of them agreeing to this question decreased by 3.1% and 3.9% respectively. Students were 19.9 times more likely to want to complete an NSAIDs course than qualified Chiropractors and overall the students' views regarding the use of emergency NSAIDs were more positive than the qualified Chiropractors.

Students felt more strongly that Chiropractors should be allowed to dispense NSAID cream and tablets ($p=0.010$ and 0.008) and 4.6 times more likely than qualified Chiropractors to think that Chiropractors should be allowed to dispense NSAID tablets. Males were 3.2 times more likely than females to agree with this question. Similarly, Indians were 10.6 times more likely than Whites to also agree. Males and students were also more likely than females and qualified Chiropractors to think that Chiropractors should be allowed to dispense NSAID

cream and students felt more strongly that NSAIDs should be made available for use by Chiropractors in non emergency situations (p=0.001).

When asked for which conditions practitioners would like to use NSAIDs in practice, severe acute pain was the condition which was most frequently chosen. Age was associated with agreeing to the use of non-emergency NSAIDs for patients in severe acute pain (question 5.16.1). As age increased by 1 year, the probability of agreeing decreased by 5.5%. Students and males were more likely to agree with non-emergency NSAID use enhancing patient clinical outcomes in terms of patient management, patient referral and patient retention. Age was associated with agreement to these questions as age increased by one year, the probability of agreement decreased by 5.1% (patient management), 5% (patient referral) and 5.7% (patient retention). Qualified Chiropractors and Indian respondents were more likely to know about the NSAIDs course and qualified Chiropractors were 6.6 times more likely than students to have done the NSAIDs course ($p<0.001$). Whites were also 20 times more likely to use emergency NSAIDs than Indians.

This study revealed that the majority of the student population, if allowed, would consider administering pharmacological agents in practice. However, the converse was seen in qualified Chiropractors. Males would be 7 times more likely than females to use pharmacological agents and with every one year increase in age, the probability of the use of pharmacological agents decreased by 10.6%. Very few would administer anti-depressants (4.6%), 26% would administer corticosteroids, 31% local anaesthetic and 58% muscle relaxants. Significantly more students wanted to administer corticosteroids and muscle relaxants.

Chapter Five: Conclusions and Recommendations

5.1 Introduction

The following chapter serves to conclude the study that determined the knowledge, perception and utilisation of vitamin and mineral supplements, natural medicine and pharmacological agents as adjuncts to Chiropractic practice in South Africa. Conclusions will be drawn from the results and the discussion of those results from Chapter 4. Recommendations will be made regarding both possible methodological changes and for the profession of Chiropractic based on the outcomes of the study.

5.2 Conclusions

1 The majority of the respondents (students more so than qualified Chiropractors) felt qualified to advise patients on vitamins and mineral supplements and had a positive view of the use of vitamins and minerals as part of the Chiropractic management.

2 Most respondents felt that there needed to be more information supplied on vitamins and minerals in Chiropractic training and most wanted to do a postgraduate course on vitamins and minerals.

3 The majority of the practitioners were aware that topical substances are part of the scope of practice. Only 29% of respondents used orthodox medicinal topical substances in practice and 59% of respondents used natural topical substances. Males and qualified Chiropractors were more likely to use these substances.

4 The majority thought Biopuncture should be available to Chiropractors and more respondents felt that Chiropractors should challenge the legislation to incorporate biopuncture. Age was significantly associated with the use of natural remedies overall and as age increased, probability of use decreased.

5 Overall, the majority agreed with the statement for NSAIDs being part of Chiropractic scope of practice and 71% of respondents felt that being able to use NSAIDs in non-emergency situations would enhance patient management. However, the majority of respondents did not administer emergency NSAIDs to their patients.

6 Students and males were more likely to want to use NSAIDs and pharmacological agents in practice and Whites were 20 times more likely to use emergency NSAIDs than Indians. However, Indians were 10.6 times more likely to think that Chiropractors should be allowed to dispense NSAIDs tablets.

7 About 60% of respondents would be interested in doing a course regarding administration of pharmacological agents.

8 Students were more inclined to use adjunctive therapies irrespective of the modality, for patient retention. Whereas qualified Chiropractors may be more likely to utilise inter-referral systems to assist with patient management.

5.3 Recommendations

5.3.1 Methodological recommendations

- The questionnaire was of medium length in order to obtain greater insight into Chiropractors and students perception, knowledge and utilisation of adjuncts to Chiropractic practice. However, a slightly shorter questionnaire might have yielded a better response.

- As the response rate to this survey was relatively low, in order to achieve a higher response rate, it may be useful to change the design, making questionnaires as short as possible, obviously focusing on the most pertinent topics.

- The response rate from this study was 30.4%. It therefore stands to reason that it can not be assumed to be representative of all the Chiropractors and students in South Africa. A study of non-responders was not performed. The possibility of sample bias cannot be ruled out.

- All possible contacts between the researcher and the respondents should take place. Ways in which to do this may include: sending an advance email in which the study can be introduced and telephonic calls to encourage the non-responders to return the questionnaire after it was administered. “For every additional contact with the population, the response rate can increase by about 10%” (Russell, *et al.,* 2004).

- The questionnaire should have included knowledge, perception and utilisation questions in all sections.

- As this was an exploratory study, further investigation into vitamins and minerals, natural medicines and pharmacological agents as adjuncts in practice should be done.

- It is recommended that a survey of students be done or interviews be conducted to more accurately ascertain the motivational factors behind the need for perceived patient retention.

5.3.2 Recommendations for the profession based on the outcomes of the study

- Curriculum changes may need to be made in terms of the nutrition subject, supplying more information on vitamins and minerals and increasing the depth of the pharmacology course.

- CASA should be advised on the need for additional courses on vitamins and minerals and pharmacological agents by its members.

- With regards to the Indian population, it was expected that they would less likely support the use of NSAIDs and pharmacological agents. However, this study revealed that the contrary was true and therefore further research surrounding this phenomenon would need to be investigated.

- The relevant associations need to take into account the findings in this study and allow for the development of the appropriate regulation of additional adjunctive modalities that do not fall under the current scope of practice.

Finally the results of this study could encourage further research in this area.

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Appendix A

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 B

CONFIDENTIALITY STATEMENT – FOCUS GROUP DECLARATION

IMPORTANT NOTICE:

THIS FORM IS TO BE READ AND FILLED IN BY EVERY MEMBER PARTICIPATING IN THE FOCUS GROUP, BEFORE THE FOCUS GROUP MEETING CONVENES.

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.

Member represents	Member's Name	Signature	Contact Details

Appendix C

INFORMED CONSENT FORM

(TO BE COMPLETED BY THE PARTICIPANT OF THE STUDY AND SIGNED BY THE PARTICIPANT AND A WITNESS)

DATE:

TITLE OF RESEARCH PROJECT:

A study into the view of qualified chiropractors and masters chiropractic students in South Africa regarding the knowledge, perception and utilization of vitamin and mineral supplements, natural therapies and pharmacological agents in practice.

NAME OF RESEARCH STUDENT:

Dr L. Wilson (031 373 2094)

NAME OF RESEARCH STUDENT:

Natalie De Gouveia (082 806 1503)

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?	Yes	No

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

Please Print in block letters:

Participant name: _____ Signature: _____

Witness Name: _____ Signature:_____

Researcher's Name: _____ Signature:_____

Supervisor's Name: _____ Signature:_____

Appendix D

Dear Participant
Welcome to my research study. Thank you for your interest.

Title: A study into the view of qualified chiropractors and masters chiropractic students in South Africa regarding the knowledge, perception and utilisation of vitamin and mineral supplements, natural therapies and pharmacological agents in practice.

Name of researcher: Natalie De Gouveia (082 806 1503)
Name of supervisor: Dr L Wilson (031 373 2094)
Name of Institution: Durban University of Technology

Introduction:

Perception is the process by which people select, organise and interpret information to form a meaningful picture of the world (Chaffe, 1997). In the chiropractic profession a practitioner's perception of the concepts of holism and conservative management, may strongly influence the way the practitioner practices and how they utilise adjunctive therapies as taught in the undergraduate and postgraduate education.

Chiropractic has traditionally been a non-invasive, drug and surgery free profession and a large percentage of chiropractors use vitamin and mineral therapy and natural therapies as part of their treatment protocol. According to Act 63 of 1982, as amended, vitamins and minerals and natural remedies fall under the scope of practice of a chiropractor.

In South Africa there are post graduate courses available to qualified chiropractors, two of these include Biopuncture and the NSAID course. Both involve the injection of substances. In the case of biopuncture, natural remedies are used and for NSAID's the drug Diclofenac Sodium. The introduction of the NSAID course has been controversial as it is perceived that a traditionally drugless profession is now administering drugs. To date no study has been undertaken to assess qualified chiropractors knowledge, perception and utilisation of vitamin and mineral supplements, natural therapies and pharmacological agents in practice.

Procedure:

You are requested to complete the questionnaire pertaining to your knowledge, perception and utilisation of vitamin and mineral supplements, natural therapies and pharmacological agents in practice.

Please be assured that your personal details as well as the information, which you furnish, will be treated confidentially. No personal details will appear on the questionnaire. Personal details will however appear on the informed consent form but will be separated from the questionnaire by a neutral third party on its return, thus ensuring anonymity.

With the exception of a few open ended questions, where a short written answer is necessary, all the questions can be answered by marking the appropriate box or boxes with a tick or cross. Please return the completed questionnaire and informed consent form by post or fax to the DUT research co-ordinator (neutral third party). Fax 031 202 3632 or Chiropractic Department, Durban University of Technology, 11 Ritson Rd Berea, 4000

You will be required to return the informed consent form in order for your questionnaire to be used in the studies analysis.

Benefits:

The results will be published in an article in a journal and be available in the Durban University of Technology library.

Remuneration: None. Participation in this study is entirely voluntary.

Persons to contact for problems or questions:

Researcher: Natalie De Gouveia (0828061503 or 031-373 2205 (D.U.T)
Supervisor: Dr L Wilson (031 373 2094)

Thank you for participating in this survey. Your time and assistance are greatly appreciated.

Appendix E

QUESTIONAIRE

PART 1: DEMOGRAPHICS

1. Gender: Male ☐ Female ☐

2. State your age?

<25 ☐ 26-35 ☐ 36-45 ☐ 46-55 ☐ 56-65 ☐ >65 ☐

3. Ethnic group? (statistical purposes only)

White ☐ Black ☐ Indian ☐ Other ☐

4. **Which institution did you graduate from?**

please specify ……

5. How many years have you been qualified as a chiropractor?

<5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ 21-30 ☐ 31-40 ☐ >40 ☐

6. Have you taken any postgraduate courses since you qualified?

Yes ☐ please specify …….

No ☐

7. Do you have any additional qualifications?

Yes ☐ please specify ……..……..

No ☐

8. Are you in practice?

Part time? ☐ Full time? ☐

9. Which type of practice do you work in?

Private ☐ Multidisciplinary ☐ Hospital inpatients ☐ Outpatients ☐

If multidisciplinary, which other disciplines are involved in the practice? Please specify:

……

10. In what type of area is the practice situated?

Urban (>50,000) ☐ Suburban (25,000-50,000) ☐ Rural (<25,000) ☐

11. Do you use any of the following in your practice?

Manipulation of (i) the spine	☐	Traction	☐
(ii) the extremities	☐	Exercise therapy	☐
Mobilisation	☐	Massage	☐
Ultrasound	☐	Low frequency electrotherapy	☐
Interferential electrotherapy	☐	TENS	☐
Ultra shortwave	☐	Cold therapy/ice therapy	☐
Hot packs	☐	Acupuncture	☐
Laser	☐	Dietary advice	☐
Ergonomic advice	☐		

12. Do you have inter-professional relationships with mutual referrals with any of the following practitioners?

General Practitioners	
Neurologists	
Physiotherapists	
Orthopaedic surgeons	
Nutritionist	
Homeopath	

Other ……..

PART 2: Vitamins and Minerals

1. The Act (Act 63 1982, as amended) states that chiropractors are allowed to advise patients on vitamins and minerals, do you feel that you are adequately qualified to do so?

Yes ☐ No ☐

2. Do you ever give advice to patients on vitamins and minerals?

Yes ☐ No ☐

3. What is your view on the use of vitamins and minerals in practice?

please specify ……

4. Do you think using vitamins and minerals in your practice has improved the following:

Patient management? Yes ☐ No ☐

Patient referral? Yes ☐ No ☐

Patient retention? Yes ☐ No ☐

Other ……..

5. **Do you feel that there should be more information supplied on vitamins and minerals in the chiropractic course?**

   Yes ☐ No ☐

6. **Would you be interested in doing a post graduate course on vitamins and minerals?**

   Yes ☐ No ☐

7. **How often do you recommend vitamins and minerals to your patients?**

Daily	(3 to 5) ☐	(6 to 10) ☐	(11 or more) ☐
Weekly	(3 to 5) ☐	(6 to 10) ☐	(11 or more) ☐
Monthly	(3 to 5) ☐	(6 to 10) ☐	(11 or more) ☐

8. **For what conditions do you recommend vitamins and minerals?**

Musculoskeletal system	
Cardiovascular system	
Respiratory system	
Gastrointestinal system	
Neurological system	
Genitourinary system	

Other ……...

PART 3: Natural Remedies

1. **The Act (Act 63 1982, as amended) states that chiropractors are allowed to advise patients on remedies, do you feel that you are adequately qualified to do so?**

   Yes ☐ No ☐

2. **What is your view on the use of natural remedies in practice?**

   please specify ……

3. **Do you ever give advice to patients on homeopathic/natural remedies?**

   Yes ☐ No ☐

4. Do you think using natural remedies in your practice has improved the following:

Patient management? Yes ☐ No ☐

Patient referral? Yes ☐ No ☐

Patient retention? Yes ☐ No ☐

Other ……..

5. Do you feel that there should be more information supplied on natural remedies in the chiropractic course?

Yes ☐ No ☐

6. Would you be interested in doing a post graduate course on natural remedies?

Yes ☐ No ☐

7. How often do you recommend natural remedies to your patients?

Daily (3 to 5) ☐ (6 to 10) ☐ (11 or more) ☐

Weekly (3 to 5) ☐ (6 to 10) ☐ (11 or more) ☐

Monthly (3 to 5) ☐ (6 to 10) ☐ (11 or more) ☐

8. For what conditions do you recommend natural remedies?

Musculoskeletal system	
Cardiovascular system	
Respiratory system	
Gastrointestinal system	
Neurological system	
Genitourinary system	

Other ……

PART 3: Biopuncture

1. Are you aware of the biopuncture course?

Yes ☐ No ☐ (If No please go to question 12)

Please state your opinion for the following statements:

2. Chiropractors should have access to the Biopuncture course.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

3. The use of Biopuncture by chiropractors is necessary for good patient management.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4. The use of Biopuncture by chiropractors is needed in South Africa.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

5. The use of Biopuncture by chiropractors conflicts with the traditional philosophy of chiropractic.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

6. Biopuncture administration is part of the chiropractic scope of practice.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

7. What is your view of the biopuncture course?

please specify ……

8. Have you completed the Biopuncture course?

Yes ☐ No ☐

9. How often do you administer Biopuncture in practice?

Daily	(3 to 5) ☐	(6 to 10) ☐	(11 or more) ☐
Weekly	(3 to 5) ☐	(6 to 10) ☐	(11 or more) ☐
Monthly	(3 to 5) ☐	(6 to 10) ☐	(11 or more) ☐

10. What conditions do you commonly administer the biopuncture for?

Musculoskeletal system	
Cardiovascular system	
Respiratory system	
Gastrointestinal system	
Neurological system	
Genitourinary system	

Other ……

11. Do you think using Biopuncture in your practice has improved the following:

Patient management? Yes ☐ No ☐

Patient referral? Yes ☐ No ☐

Patient retention? Yes ☐ No ☐

Other ……..

12. If you have not completed the Biopuncture course would you consider doing so?

Yes ☐ No ☐

please explain ……

PART 4: Natural Therapies

1. If you could, would you administer any other natural therapies in practice?

Yes ☐ No ☐

2. Please list the natural therapies you would use?

Homeopathic	
Naturopathy	
Herbology	
Reiki	
Accupuncture	
Aromatherapy	
Reflxology	
Ayurvedic	
Unani Tib	

Other ……..

3. Would you be interested in more post graduate courses in order to be able to administer additional natural therapies in practice?

Yes ☐ No ☐

please specify ……

PART 5: Non Steroidal Anti-inflammatory Drugs (NSAIDs)

1. Are you aware of the NSAIDs course?

Yes ☐ No ☐ (If No please go to question 12)

Please state your opinion for the following statements:

2. Chiropractors should have access to the NSAIDs course.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

3. The use of Nsaids by chiropractors is necessary for good patient management.

Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree

4. The use of NSAIDs by chiropractors is needed in South Africa.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

5. The use of NSAIDs by chiropractors conflicts with the traditional philosophy of chiropractic.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

6. NSAIDs administration is part of the chiropractic scope of practice.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

7. What is your view of the NSAIDs course?

please explain ……

8. Have you completed the NSAIDs course?

Yes ☐ No ☐

9. How often do you administer NSAIDs in practice?

Daily (3 to 5) ☐ (6 to 10) ☐ (11 or more) ☐

Weekly (3 to 5) ☐ (6 to 10) ☐ (11 or more) ☐

Monthly (3 to 5) ☐ (6 to 10) ☐ (11 or more) ☐

10. What conditions do you commonly administer NSAIDs for?

Musculoskeletal system	
Cardiovascular system	
Respiratory system	
Gastrointestinal system	
Neurological system	
Genitourinary system	

Other ……..

11. Do you think using NSAIDs in your practice has improved the following:

Patient management? Yes ☐ No ☐

Patient referral? Yes ☐ No ☐

Patient retention? Yes ☐ No ☐

Other ……..

12. If you have not completed the NSAIDs course would you consider doing so?

Yes ☐ No ☐

please explain ……..

PART 6: Pharmacological agents

1. If you could, would you administer any other pharmacological agents in practice?

Yes ☐ No ☐

2. Please list the pharmacological agents you would use?

Corticosteroids	
Local anaesthetics	
Muscle relaxants	
Anti-depressants	

Other ……

3. Would you be interested in more post graduate courses in order to be able to administer additional pharmacological agents in practice?

Yes ☐ No ☐

please specify ……

……...

Appendix F

Focus Group changes

Formatting Changes (including answer format options):

Part One - Q2 was changed to say “yrs” and the age blocks were removed.

Part One - Q5 changed to Q6 and the blocks were removed.

Part One - Q10 changed to Q9 and the numbers were removed.

Part One - Q11 changed to 14 and was put in table form.

Part Two - Q8 was changed and “(please provide an example)” and example line was added.

Part Three and Five were combined to become Part Five.

Part Five - Q10 was changed and “(please provide an example)” and example line was added.

Grammatical and spelling changes:

Part One - Q2 the question mark was remove

Questions omitted or added; or combined, omitted or added in modification:

Part One - Q5 was added.

Part One - Q10 was added.

Part One - Q12 was added.

Part One - Q15 was added.

Part Three - Natural medicines Q1-8 were omitted.

Part Three - Topical substances Q1,2 and 3 were added.

Part Four - Natural therapies Q1,2 and 3 were omitted.

Part Four - Natural medicines Q1 and 2 were added.

Part Five - Q5 was added.

Part Five- Q13-17 were added.

Part Five- Q19-21 were added.

Questions or answer options modified:

Part One- Q4 “(or are you currently studying at)” added.

Part One- Q 6 changed to Q 11 and now says “(health related short courses)”.

Part One- Q 7 changed to Q 13 and “(apart from your chiropractic qualification was added)”.

Part One- Q8 changed to Q 7 and now says “(Do you practice)” and the options “(not practicing)” and “(other)” were added.

Part One- Q12 changed to 15 “(yes/no)” and “(other)” was added and the options were put in alphabetical order.

Part Two- Q1 “(please provide reasons)” added.

Part Two- Q2 “(as part of chiropractic management)” added.

Part Two- Q3 “(as part of chiropractic management)” and extra lines added.

Part Two- Q4 “(as part of chiropractic patient clinical outcome)” added and put in block form with “(yes/no)”.

Part Two- Q5 changed to “(in chiropractic training)”.

Part Two- Q7 changed to “(On average what percentage of your patients do you recommend vitamins and minerals and natural remedies per week)”.

Part Five- Q2 changed to “(useful)”

Part Five- Q9 changed to “(On average what percentage of your patients do you administer emergency NSAIDs to per week)”

Part Five- Q11 changed to “(Do you think that being able to use NSAIDs in emergency situations has enhanced your patient clinical outcomes in terms of the following)”

Part Six- Q1 changed to “(If you were allowed, would you consider administering any other pharmacological agents in practice?)”.

Part Six- Q3 changed to “(Would you be interested in post graduate courses In order to be able to administer additional pharmacological agents in practice?)”

Heading changes:

Part Three- changed to topical substances.

Part Four- changed to natural medicines.

Part Five- changed to non steroidal anti inflammatory drugs (NSAIDs) and Biopuncture.

Questions completely unchanged:

Part One- Q1 and 3

Part Two- Q6

Part Six- Q2

Questions completely unchanged except for numbering:

Part One- Q9 becomes Q8.

Part Five- Q4 becomes Q3.

Part Five- Q5 becomes Q4.

Part Five- (NSAIDs) Q1 becomes Part five Q7.

Part Five- (NSAIDs) Q7 becomes Part five Q12.

Part Five- Q12 becomes Q18.

Appendix G

QUESTIONNAIRE

Please complete the Questionnaire by marking the appropriate block or printing on the lines provided.
Confidentiality will be strictly maintained and Questionnaires will remain anonymous.

PART 1: DEMOGRAPHICS

1. **Gender:** Male ☐ Female ☐

2. **State your age.** …….. **yrs**.

3. **Ethnic group? (statistical purposes only)**

White ☐ Black ☐ Indian ☐ Other ☐

4. **Which institution did you graduate from, or are you currently studying at?**

Please specify …….

(Students please skip to Part 2)

5. **What qualification have you obtained? (not applicable to students)**

……

6. **How many years have you been practicing as a chiropractor?** ……..….. **yrs**.

7. **Are you in practice?**

Part time? ☐ Full time? ☐

Other ……..

8. **Which type of practice do you work in?**

Private ☐ Multidisciplinary ☐ Hospital inpatients ☐ Outpatients ☐

If multidisciplinary, which other disciplines are involved in the practice? Please specify:

……...

9. **In what type of area is the practice situated?**

Urban ☐ Suburban ☐ Rural ☐

10. **Have you ever practiced outside of South Africa?**

Yes ☐ please specify …….

No ☐

11. **Have you taken any short courses since you qualified?**

Yes ☐ please specify …….

No ☐

12. Please specify the nature of your short course?

……

13. Do you have any additional qualifications apart from your chiropractic qualification?

Yes ☐ please specify ……..……..

No ☐

14. Do you use any of the following in your practice?

Manipulation of (i) the spine	☐	Traction	☐
(ii) the extremities	☐	Exercise therapy	☐
Mobilization	☐	Massage	☐
Ultrasound	☐	Low frequency electrotherapy	☐
Interferential electrotherapy	☐	TENS	☐
Ultra shortwave	☐	Cold therapy/ice therapy	☐
Hot therapy	☐	Acupuncture	☐
Laser	☐	Dietary advice	☐
Ergonomic advice	☐	Dry needling	☐

15. What type/s of chiropractic technique do you utilize in your practice? (eg. Best, SOT, Diversified)

Please specify ……..……..

16. Do you have inter-professional relationships (where there is mutual referral) with any of the following medical practitioners?

General Practitioners	YES	NO
Homeopaths	YES	NO
Neurologists	YES	NO
Nutritionists	YES	NO
Orthopaedic	YES	NO
Physiotherapists	YES	NO

Other ……..

<u>PART 2: Vitamins and Minerals & Natural Remedies</u>

1. Although the Act (Act 63 1982, as amended) states that chiropractors are allowed to advise patients on vitamins and minerals and natural remedies, do you feel that you are adequately qualified to do so?

Vitamins & Minerals		Natural Remedies	
YES	NO	YES	NO

Please provide reasons ……..

……

2. Do you give advice to patients on vitamins and minerals and natural remedies as part of chiropractic management?

Vitamins & Minerals		Natural Remedies	
YES	NO	YES	NO

3. What is your view of the use of vitamins and minerals and natural remedies as part of chiropractic management?

Vitamins and minerals ……

……

……

Natural remedies ……..

……..

……..

4. Do you think using vitamins and minerals and natural remedies as part of chiropractic management has improved the following:

	Vitamins & Minerals		Natural Remedies	
Patient Management?	Yes	No	Yes	No
Patient referral?	Yes	No	Yes	No
Patient retention	Yes	No	Yes	No

Other ……

5. Do you feel that there should be more information supplied on vitamins and minerals and natural remedies in chiropractic training?

Vitamins & Minerals		Natural Remedies	
YES	NO	YES	NO

6. Would you be interested in doing a post graduate course on vitamins and minerals and/or natural remedies?

Vitamins & Minerals		Natural Remedies	
YES	NO	YES	NO

7. On average how often do you administer vitamins and minerals and natural remedies per week:

Vitamins and minerals _____ % of patients.

Natural remedies _____ % of patients.

8. For what conditions do you recommend vitamins and minerals and natural remedies and please provide an example?

	Vitamins & Minerals		**Natural Remedies**	
Musculoskeletal system	YES	NO	YES	NO

Example ……

	Vitamins & Minerals		Natural Remedies	
Cardiovascular system	YES	NO	YES	NO

Example …….

	Vitamins & Minerals		Natural Remedies	
Respiratory system	YES	NO	YES	NO

Example …….

	Vitamins & Minerals		Natural Remedies	
Gastrointestinal system	YES	NO	YES	NO

Example …….

	Vitamins & Minerals		Natural Remedies	
Neurological system	YES	NO	YES	NO

Example ……..

	Vitamins & Minerals		Natural Remedies	
Genitourinary system	YES	NO	YES	NO

Example ……..

Other ……... …….

……

PART 3: Natural Therapies

1. Given the proper training would you administer any other natural therapies in practice?

YES	NO

2. Please indicate the natural therapies you would use?

Acupuncture	YES	NO
Aromatherapy	YES	NO
Ayurvedic	YES	NO
Herbology	YES	NO
Homeopathy	YES	NO
Reflexology	YES	NO
Reiki	YES	NO
Naturopathy	YES	NO
Unani Tab	YES	NO

Other ……..……

Part 4: Non Steroidal Anti-inflammatory Drugs (NSAIDs) & Biopuncture

1. Do you know what Biopuncture is? (If NO please answer the following questions on NSAIDs only)

YES	NO

2. Are you aware of the NSAIDs & Biopuncture courses?

Nsaids	YES	NO
Biopuncture	YES	NO

Please state your opinion for the following statements:

3. Chiropractors should have access to the NSAIDs and Biopuncture courses.

Nsaids	Strongly Disagree	Disagree	Agree	Strongly Agree
Biopuncture	Strongly Disagree	Disagree	Agree	Strongly Agree

4. The use of Nsaids and Biopuncture by chiropractors is useful for good patient management.

Nsaids	Strongly Disagree	Disagree	Agree	Strongly Agree
Biopuncture	Strongly Disagree	Disagree	Agree	Strongly Agree

5. The use of NSAIDs and Biopuncture by chiropractors is needed in South Africa.

Nsaids	Strongly Disagree	Disagree	Agree	Strongly Agree
Biopuncture	Strongly Disagree	Disagree	Agree	Strongly Agree

6. The use of NSAIDs and Biopuncture by chiropractors conflicts with the traditional philosophy of chiropractic.

Nsaids	Strongly Disagree	Disagree	Agree	Strongly Agree
Biopuncture	Strongly Disagree	Disagree	Agree	Strongly Agree

7. NSAIDs administration and Biopuncture is part of the chiropractic scope of practice.

Nsaids	Strongly Disagree	Disagree	Agree	Strongly Agree
Biopuncture	Strongly Disagree	Disagree	Agree	Strongly Agree

8. What is your view of the use of NSAIDs and Biopuncture in practice?

Nsaids ……

……

……

Biopuncture ……

……

……..

9. Have you completed a NSAIDs or Biopuncture course?

Nsaids	YES	NO
Biopuncture	YES	NO

10. On average how often do you administer NSAIDs and Biopuncture per week:

NSAIDs _____% of patients

Biopuncture _____% of patients

11. What conditions do you commonly administer NSAIDs and Biopuncture for and please provide an example?

	NSAIDs		Biopuncture	
Musculoskeletal system	YES	NO	YES	NO

Example ……

	NSAIDs		Biopuncture	
Cardiovascular system	YES	NO	YES	NO

Example …….

	NSAIDs		Biopuncture	
Respiratory system	YES	NO	YES	NO

Example …….

	NSAIDs		Biopuncture	
Gastrointestinal system	YES	NO	YES	NO

Example …….

	NSAIDs		Biopuncture	
Neurological system	YES	NO	YES	NO

Example ……..

	NSAIDs		Biopuncture	
Genitourinary system	YES	NO	YES	NO

Example ……..

Other ……..

……...

12. Do you think using NSAIDs and Biopuncture as part of chiropractic management has improved the following:

	NSAIDs		Biopuncture	
Patient management?	YES	NO	YES	NO
Patient referral?	YES	NO	YES	NO
Patient retention?	YES	NO	YES	NO

Other ……

13. If you have not completed the NSAIDs and Biopuncture courses would you consider doing so?

Nsaids	YES	NO
Biopuncture	YES	NO

Please explain ……

……

PART 5: Pharmacological agents

1. If you were allowed, would you consider administering any other pharmacological agents in practice?

YES	NO

2. Please list the pharmacological agents you would use?

Anti-depressants	YES	NO
Corticosteroids	YES	NO
Local anaesthetics	YES	NO
Muscle relaxants	YES	NO

Other ……..

……

3. Would you be interested in post graduate courses in order to be able to administer additional pharmacological agents in practice?

YES	NO

Please specify …….

……...

Dear Participant
Welcome to my research study. Thank you for your interest.

Title: The knowledge, perception and utilisation of vitamin and mineral supplements, natural medicine and pharmacological agents as adjuncts to chiropractic practice in South Africa.

Name of researcher: Natalie De Gouveia (082 806 1503)
Name of supervisor: Dr L Wilson, M.Tech: Chiropractic (031 373 2094)
Name of Institution: Durban University of Technology

Introduction:

Perception is the process by which people select, organise and interpret information to form a meaningful picture of the world (Chaffe, 1997). In the chiropractic profession a practitioner's perception of the concepts of holism and conservative management, may strongly influence the way the practitioner practices and how they utilise adjunctive therapies as taught in undergraduate and postgraduate education.

Chiropractors traditionally use non-invasive drug and surgery-free techniques with a large percentage of chiropractors using vitamins and mineral therapy such as B-complex for musculoskeletal conditions and glycosamine for osteoarthritis. Remedies for topical application such as arnica may also be used and recommended by chiropractors.

Chiropractors like other health care practitioners may obtain other qualifications in disciplines like homeopathy, naturopathy, acupuncture, Chinese medicine, reflexology and other natural medicines. There are also post-graduate certifications to specialise or enhance their service delivery like courses on paediatrics, extremity and NSAIDs etc. To date no study has been undertaken to assess qualified chiropractors' knowledge, perception and utilisation of vitamin and mineral supplements, natural medicine and pharmacological agents as adjuncts to chiropractic practice in South Africa.

Procedure:

This study consists of a questionnaire that is accompanied by a letter of information and informed consent form explaining what is expected in terms of the completion of the questionnaire. Each participant will need to complete the questionnaire and sign the informed consent form.

Please be assured that your personal details as well as the information, which you furnish, will be treated **confidentially**. There are no personal details on the questionnaire and please refrain from making any markings which may identify you. This will ensure anonymity.
With the exception of a few open ended questions, where a short written answer is necessary, all the questions can be answered by marking the appropriate box or boxes with a tick or cross.

The return questionnaires will be sent to an independent person (Mrs S. Naidoo) who is the subject librarian at the Alan Pittendright Library, Steve Biko Campus, DUT. She will separate the informed consent forms from the questionnaires prior to giving the questionnaires to the researcher this will be done to ensure that the researcher **will not be able** to identify the respondents.

The return address is as follows:
Faculty of Health Sciences Subject Librarian,
Mrs S Naidoo,
Alan Pittendright Library,
Steve Biko Campus,
P.O. Box 1334,
Durban,
4001

e-mail address:
naidoose@dut.ac.za.

Benefits:
The results will be published in an article in a journal and be available in the Durban University of Technology library.

Remuneration:
None. Participation in this study is entirely voluntary.

Persons to contact for problems or questions:
Researcher: Natalie De Gouveia (0828061503 or 031 373 2205)
Supervisor: Dr L Wilson (031 373 2923)
Should the above not be able to assist you please contact the Faculty of Health Sciences Research Co-ordinator, Mr V. Singh on 031 373 2701.

Statement of Agreement to Participate in the Research Study:

(I,……subject's full name,

ID number……., have read this document in its entirety and understand its contents. Where I have had any questions or queries, these have been explained to me by Natalie De Gouveia to my satisfaction. Furthermore, I fully understand that I may withdraw from this study at any stage without any adverse consequences and my future health care will not be compromised. I, therefore, voluntarily agree to participate in this study.

Subject's name (print) ……

Subjects signature:……Date:……..

Researcher's name (print): Natalie De Gouveia

Researcher's signature:……Date:.....

Supervisor's name (print): Dr. Laura Wilson, M.Tech Chiropractic

Supervisor's signature: ……Date:…….

Thank you for participating in this survey. Your time and assistance are greatly appreciated.

QUESTIONNAIRE

N. De Gouveia
Durban University of Technology

QUESTIONNAIRE

Please note: This questionnaire is anonymous, please do not write your name or make any other markings that may identify you.

Please complete the questionnaire by marking the appropriate block or printing on the lines provided. For the purpose of this study "chiropractic practice" will refer to your practice as a chiropractor, so in the case of the Master's students this will be your practice in the Chiropractic clinic at either DUT or UJ.

PART 1: DEMOGRAPHICS

1. Gender: Male ☐ Female ☐

2. State your age. _____**yrs**.

3. Ethnic group? (statistical purposes only)

White ☐ Black ☐ Indian ☐ Other ☐ _____

4. Which institution did you graduate from, or are you currently studying at?

Please specify:_____

(Students please skip to Part 2)

5. What qualification have you obtained? (not applicable to students)

_____

6. How many months/years have you been practicing as a chiropractor?

_____

7. Do you practice? (You may tick more than one box).

Part time ☐ Full time? ☐ Academic ☐ Not practicing ☐

Other:_____

8. Which type of practice do you work in?

Private ☐ Multidisciplinary ☐ Hospital inpatients ☐ Hospital Outpatients ☐

If multidisciplinary, which other disciplines are involved in the practice? Please specify:

_____

9. In what type of area is the practice situated?

Urban ☐ Suburban ☐ Rural ☐

10. Have you ever practiced outside of South Africa?

Yes ☐ please specify:_____

No ☐

11. Have you taken any health related short courses since you qualified?

Yes ☐ please specify:_____

No ☐

12. Please specify the nature of your short course?

_____

13. Do you have any additional qualifications apart from your chiropractic qualification?

Yes ☐ please specify:_____

No ☐

14. Do you use any of the following in your practice?

Manipulation of the spine		Traction	
Manipulation of extremities		Exercise therapy	
Mobilization		Massage	
Ultrasound		Low frequency electrotherapy	
Interferential electrotherapy		TENS	
Ultra shortwave		Cold therapy/ice therapy	
Hot therapy		Acupuncture	
Laser		Dietary advice	
Ergonomic advice		Dry needling	

15. What type/s of chiropractic technique do you utilize in your practice?

Best	YES	NO
Diversified	YES	NO
SOT	YES	NO

Other:_____

16. Do you have inter-professional relationships (where there is mutual referral) with any of the following medical practitioners?

General Practitioners	YES	NO
Homeopaths	YES	NO
Neurologists	YES	NO
Nutritionists	YES	NO
Orthopaedic	YES	NO
Physiotherapists	YES	NO

Other:_____

PART 2 : Vitamins and Minerals

1. The Act (Act 63 1982, as amended) states that chiropractors are allowed to advise patients on vitamins and minerals, do you feel that you are adequately qualified to do so?

YES	NO

Please provide reasons:_____

_____

2. Do you give advice to patients on vitamins and minerals as part of chiropractic management?

YES	NO

3. What is your view of the use of vitamins and minerals as part of chiropractic management?:

_____

_____

_____

4. Do you think using vitamins and minerals as part of chiropractic patient clinical outcome has improved the following:

Patient management?	Yes	No
Patient referral?	Yes	No
Patient retention	Yes	No

Other :_____

5. Do you feel that there should be more information supplied on vitamins and minerals in chiropractic training?

YES	NO

6. Would you be interested in doing a post graduate course on vitamins and minerals?

YES	NO

7. On average what percentage of your patients do you recommend vitamins and minerals and natural remedies per week:

_____ % of patients.

8. For what conditions do you recommend vitamins and minerals and please provide an example?

Musculoskeletal system	YES	NO

eg:_____

Cardiovascular system	YES	NO

eg:_____

Respiratory system	YES	NO

eg:_____

Gastrointestinal system	YES	NO

eg:_____

Neurological system	YES	NO

eg:_____

Genitourinary system	YES	NO

eg:_____

Other:_____

_____

Part 3 Topical Substances

1. Do you know that the 2001 regulation of Act 63, 1982 allows chiropractors to use the following:

Orthodox Medicinal topical substances	YES	NO
Natural topical Substances	YES	NO

2. Do you use Orthodox Medicinal topical substances in practice?

YES	NO

eg:_____

3. Do you use Natural topical substances in practice?

YES	NO

eg:_____

PART 4: Natural Medicines

1. Do you use any of the following natural medicines in your chiropractic practice?
(You may tick more than one)

Acupuncture	
Aromatherapy	
Ayurvedic	
Chinese Medicine	
Dry Needling	
Herbology	
Homeopathy	
Reflexology	
Reiki	
Naturopathy	
Unani Tab	

Other:_____

2. Do you have post graduate qualification(s) in any of the above mentioned natural medicines?

YES	NO

Please specify:_____

Part 5: Non Steroidal Anti-inflammatory Drugs (NSAIDs) & Biopuncture

Please state your opinion for the following statements:

1 Chiropractors should have access to the NSAIDs and Biopuncture courses.

NSAIDs	Strongly Disagree	Disagree	Agree	Strongly Agree
Biopuncture	Strongly Disagree	Disagree	Agree	Strongly Agree

2. The use of NSAIDs and Biopuncture by chiropractors is useful for good patient management.

NSAIDs	Strongly Disagree	Disagree	Agree	Strongly Agree
Biopuncture	Strongly Disagree	Disagree	Agree	Strongly Agree

3. The use of NSAIDs and Biopuncture by chiropractors is needed in South Africa.

NSAIDs	Strongly Disagree	Disagree	Agree	Strongly Agree
Biopuncture	Strongly Disagree	Disagree	Agree	Strongly Agree

4. The use of NSAIDs and Biopuncture by chiropractors conflicts with the traditional philosophy of chiropractic.

NSAIDs	Strongly Disagree	Disagree	Agree	Strongly Agree
Biopuncture	Strongly Disagree	Disagree	Agree	Strongly Agree

5. The use of NSAIDs and Biopuncture by chiropractors is encroaching on the scope of practice of another profession.

NSAIDs	Strongly Disagree	Disagree	Agree	Strongly Agree
Biopuncture	Strongly Disagree	Disagree	Agree	Strongly Agree

6. The use of NSAID's and Biopuncture is part of the chiropractic scope of practice.

NSAIDs	Strongly Disagree	Disagree	Agree	Strongly Agree
Biopuncture	Strongly Disagree	Disagree	Agree	Strongly Agree

7. Are you aware of the NSAIDs course?

YES	NO

If <u>no</u> please proceed to question 10

8. Have you completed the NSAIDs course?

YES	NO

If <u>no</u> please proceed to question 10

9. On average what percentage of your patients do you administer emergency NSAIDs to per week:

_____ % patients per week

10. What conditions have you commonly administered emergency NSAIDs for and please provide an example?

Musculoskeletal system	YES	NO

eg:_____

Cardiovascular system	YES	NO

eg:_____

Respiratory system	YES	NO

eg:_____

Gastrointestinal system	YES	NO

eg:_____

Neurological system	YES	NO

eg:_____

Genitourinary system	YES	NO

eg:_____

Emergencies	YES	NO

eg:_____

Other:_____

11. Do you think that being able to use NSAIDs in emergency situations has enhanced your patient clinical outcomes in terms of the following:

Patient management?	YES	NO
Patient referral?	YES	NO
Patient retention?	YES	NO

Other:_____

12. What is your view of the use of emergency NSAIDs in practice?

_____

_____

_____

13. Do you think that chiropractors should be allowed to recommend the following:

NSAID tablets?	YES	NO	N/A
NSAID cream?	YES	NO	N/A

14. Do you think that chiropractors should be allowed to dispense the following :

NSAID tablets?	YES	NO	N/A
NSAID cream?	YES	NO	N/A

15. In your opinion do you think that NSAIDs should be made available for use by chiropractors in non-emergency situations?

YES	NO

If <u>no</u> please proceed to question 15.

16. Under what conditions would you like to use non-emergency NSAID's for in your practice?

Patient in severe acute pain	YES	NO
Patient in mild pain	YES	NO
Patient who is reluctant to go to the GP	YES	NO
Facet syndrome	YES	NO
Nerve root entrapment	YES	NO
Headaches	YES	NO
Myofascial pain dysfunction	YES	NO
Discogenic pain	YES	NO
Tendonitis	YES	NO
Bursitis	YES	NO
Sprains	YES	NO
Strains	YES	NO

Other: _____

17. Do you think that by being able to use NSAIDs in non-emergency situations would enhance your patient clinical outcomes in terms of the following:

Patient management?	YES	NO
Patient referral?	YES	NO
Patient retention?	YES	NO

Other:_____

18. If you have not completed the NSAIDs course would you consider doing so?

YES	NO

Please explain: _____

_____

19. Do you know what Biopuncture is?

YES	NO

If yes please provide your definition: _____

_____

20. Do you think that biopuncture is a modality that should be available to chiropractors?

YES	NO

If yes, why?:_____

_____

_____

21. Do you think that chiropractors should challenge the legislation to incorporate biopuncture?

YES	NO

If yes, why?:_____

_____

_____

PART 6: Pharmacological agents

1. If you were allowed, would you consider administering any other pharmacological agents in practice?

YES	NO

2. Please list the pharmacological agents you would use?

Anti-depressants	YES	NO
Corticosteroids	YES	NO
Local anaesthetics	YES	NO
Muscle relaxants	YES	NO

Other: _____

_____

3. Would you be interested in post graduate courses in order to be able to administer additional pharmacological agents in practice?

YES	NO

Please specify;_____

_____

Thank you for your time and participation in this study.

Appendix J

Conditions for which Vitamins and Minerals are recommended

Musculo-skeletal conditions for which vitamins and minerals are recommended

Anaemia	1	Fatigue	2
Avascular Necrosis	1	Joint support	2
Facet / Sacro-iliac syndrome	1	Spasm	3
Gout	1	Degenerative joint disease	4
Muscle strain	1	Osteoporosis	6
Reduced bone mineralisation	1	Myofascial trigger points	7
Rehabilitation	1	Cramp	8
Sprains and strains	1	Arthritis	18

Cardiovascular conditions for which vitamins and minerals are recommended

Arteriosclerosis	1	Anaemia	2
Deep Vein Thrombosis	1	Hypercholesteremia	3
Cardiovascular disease	1	Hypertension	5

Respiratory conditions for which vitamins and minerals are recommended

Cystic fibrosis	1	Upper Respiratory Tract Infection	1
Emphysema	1	Asthma	2
Flu / influenza	1	Bronchitis	2
Sinusitis	1		

Gastrointestinal conditions for which vitamins and minerals are recommended

Candidiasis	1	Ulcer diet	1
Constipation /diarrhea	1	Ulcerative Colitis	1
Cramps	1	Gastritis	2
GIT indications	1	Irritable Bowel Syndrome	10
Gastric reflux	1		

Neurological conditions for which vitamins are recommended

Carpel tunnel syndrome	1	Alzheimers	2
Nervousness	1	Multiple Sclerosis	2
Neuritis	1	Peripheral neuropathies	3
Neuropathic pain	1		
Neuropathy, metatarsalgia	1		
Pins and needles	1		
Sciatica	1		
Stress	1		

Example of Genitourinary conditions for which vitamins and minerals are recommended

Menstrual problems	1	Cystitis	3
Sexual dysfunction	1	Urinary Tract Infection	5
Thrush	1		

Example of other conditions for which vitamins and minerals are recommended

Fatigue, anemia	1
Iron deficiency anemia	1

Appendix K

Conditions for which emergency NSAIDS are recommended

Conditions of emergency NSAID use in the musculoskeletal system

Acute MS injuries	1	Acute injury	3
Acute muscle trauma	1	Arthritis	2
Acute pain	1	Knee injuries	2
Acute strain	1	Muscle tear	2
Disc prolapsed	1	Whiplash	2
Injury, inflammation	1	Acute disc	4
Lumbar herniation	1	Acute low back pain	4
Myofascial trigger points	1	Muscle spasm	4
Spasm	1	Sprain /strain	4
		Acute facet	5

Conditions of emergency NSAID use in the neurological system

Acute discs	1
Acute pain	1
Degenerative Disc Disease	1
Migraine	2
Nerve Root Entrapment	2

Conditions of emergency NSAID use in the emergency situation

Accident	1
Acute disc	1
Acute low back pain	1
Migraine	1
Motor vehicle accident	1
Whiplash	1
Acute musculoskeletal injuries	2
Acute strain of facet	2
Sport injury	2

ETHICS CLEARANCE CERTIFICATE

Student Name	**Natalie De Gouveia**	**Student No**	**20402644**
Ethics Reference Number	FHSEC 037/08	**Date of FRC Approval**	17/10/2008
Research Title:	The knowledge, perception and utilisation of vitamin and mineral supplements, natural medicine and pharmacological agents as adjuncts to chiropractic practice in South Africa.		

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 obligations:

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 186 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	x		
❖ Potential psychological and physical risks have been considered and minimised	x		
❖ Provision has been made to avoid undue intrusion with regard to participants and community	x		
❖ Rights of participants will be safe-guarded in relation to: - Measures for the protection of anonymity and the maintenance of Confidentiality.	x		
- Access to research information and findings.	x		
- Termination of involvement without compromise	x		
- Misleading promises regarding benefits of the research	x		

SIGNATURE OF STUDENT/RESEARCHER — DATE: 13/10/08

SIGNATURE OF SUPERVISOR/S — DATE: 13/10/08

SIGNATURE OF HEAD OF DEPARTMENT — DATE: 14/10/08

SIGNATURE: CHAIRPERSON OF RESEARCH ETHICS COMMITTEE — DATE: 14/10/08