

**A STUDY TO DETERMINE THE PERCEPTIONS,
ATTITUDES AND KNOWLEDGE OF SELECTED
SOUTH AFRICAN PHARMACISTS ON THE
CHIROPRACTIC PROFESSION**

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DEDICATION

To my awesome parents, Colin and Elaine Palmer, for your endless love patience and support. Without it, none of this would have been possible.

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ABSTRACT

Pharmacists are seen as a trustworthy source of advice and information to many people. Their accessibility, approachability and availability enable them numerous opportunities to offer health education and advice in an informal environment. Patient use of and demand for complementary and alternative practitioners including chiropractors, continues to increase, however there have been no studies to determine the extent of the pharmacists knowledge and perceptions/attitudes towards these alternative practitioners.

Thus the purpose of this study was to determine the current perceptions, attitudes and knowledge of selected South African pharmacists with respect to the chiropractic profession. This will provide a basis for future studies, as well as a knowledge base to facilitate greater understanding and co-operation between pharmacists and chiropractors.

This was done by means of a questionnaire, which was adapted to the South African context by means of a focus group. The questionnaire was distributed to a random, proportional sample of 1350 pharmacists within the metropolitan areas of Johannesburg, Cape Town, East London and Durban, for completion and return along with a covering letter, and business reply envelope. SPSS version 15.0 was used for data analysis (SPSS Inc., Chicago, Illinois, USA). Descriptive objectives were analysed with frequency tables and bar charts in the case of categorical variables, and using summary statistics such as median, range and inter quartile range in the case of skewed quantitative or ordinal variables.

Of the 136 questionnaires that were returned, in the allotted 7-week period, only 116 were completed and met the inclusion criteria. Thus, a low response rate of 8.72% was achieved. Only 66% of the respondents reported having any knowledge of chiropractic. The median knowledge score was 46.3%, thus the general level of knowledge was quite poor. There was a significant difference in

mean knowledge score between those pharmacists who had referred patients to chiropractors and those who had not ($p=0.011$), with the knowledge being higher in those who had referred patients to chiropractors. The general level of perceptions/attitudes towards chiropractic was positive. 11.8% of respondents felt they were not informed enough to comment and relatively few respondents had negative perceptions of chiropractic. The only factor that was significantly associated with attitudes towards chiropractic was whether the participant had been treated by a chiropractor ($p=0.019$). Those who had been treated had significantly higher perceptions scores than those who had not been treated.

The majority (99%) of respondents believed that communication with other health care providers was essential, however only 16.4% had communicated with chiropractors previously. All respondents thought it was important to be able to inform patients on the other treatment options available to them, but only 19% knew enough about chiropractic to adequately inform them. Just under half of the respondents (48%) had recommended their patients see a chiropractor. The majority (89%) did not feel adequately informed about chiropractic and 88% said they would like to know more about chiropractic. This indicates that some changes will need to be made in the future to improve communication and cooperation between these two professions. It was apparent from this study that in order for the interprofessional ties between these two professions to grow, education leading to an accurate awareness of what chiropractic is will be necessary.

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GLOSSARY

Knowledge: information and skills acquired through experience or education, the sum of what is known, awareness or familiarity gained by experience of a fact or situation. (Oxford online dictionary)

Attitudes: A way of thinking, which governs one's behaviour towards something. (Oxford Advanced Learner's Dictionary 1997)

Perceptions: the ability to see, hear, or become aware of something through the senses, a way of understanding or interpreting something, intuitive understanding and insight. (Oxford online dictionary)

For the purpose of this research, perceptions and attitudes will be used interchangeably.

CHAPTER ONE: INTRODUCTION

Studies have shown that the number of patient visits to chiropractors has increased greatly over the last number of years, and in certain countries (i.e.: Netherlands) it has more than doubled in the last five years, and there has also been an increased public and political interest in chiropractic treatments, (Brussee, Assendelft, and Breen, 2001). In some countries (for e.g. United States), the use of alternative medical practices and treatments has dramatically increased over the last few years (Eisenberg, Davis, Ettner, Appel, Wilkey, Rompay and Kessler, 1998) however these alternative medicine or therapies are not widely taught in medical schools or available at hospitals/health care facilities (Eisenberg, Kessler, Foster, Norlock, Calkins and Delbanco, 1993).

Chiropractic is the largest, most regulated, and best recognised of the professions that have traditionally functioned outside of mainstream medical institutions and have fallen in to the category of “complementary and alternative medicine” (CAM)(Meeker and Haldeman, 2002). Many patients receive their information regarding a range of CAM therapeutic options, including chiropractic, from pharmacists and the quality and accuracy of the information used by the patient from this source varies considerably, this can be problematic because opportunities can be missed to integrate CAM therapies into the overall plan of care in instances when these therapies may be beneficial (Hamilton, Monaghan and Turner, 2002)

“It has been well publicized in recent years that there is a definite need for inter-professional relationships to develop between the different health care professions. This development, it is thought, could lead to the production of a symbiosis among health professionals which is beneficial not only to the health care professionals themselves but, more importantly, to the patients they treat.” (Hunter, 2004)

The popularity of alternative forms of health care continues to rise, and coverage of them in the lay literature increases. (Graham, 1998) It is therefore important that careful studies to investigate each profession's current attitudes and perceptions of another similar or a different profession are undertaken.

Langworthy and Birkelid's (2001) study concluded that with increasing emphasis on multidisciplinary health care, greater understanding and better communication is needed in order for the patient to obtain optimum results. The chiropractic profession is attempting to improve co-operation with the medical profession via the scientific validation of its theories and practice through research (Rubens, 1996). Thus a study into the current perceptions, attitudes and knowledge of selected South African pharmacists on the chiropractic profession, may prove beneficial in furthering inter-professional relationships and improving patient care. In addition, it may trigger further studies into this vast field, and establish a knowledge base to facilitate greater understanding and co-operation between pharmacists and chiropractors.

The aim of this study is to:

1. Establish the present perceptions/attitudes of a sample of South African pharmacists toward the chiropractic profession.
- Hypothesis 1
A negative perception/attitude exists about the chiropractic profession amongst pharmacists in South Africa.
2. To establish the level of knowledge about chiropractic amongst a sample of South African pharmacists.

- Hypothesis 2

A low level of knowledge exists about the chiropractic profession amongst pharmacist in South Africa.

Once the perceptions/attitudes and knowledge of pharmacists in South Africa has been established, then the following areas might be addressed in the future:

- Future collaboration in terms of patient inter-referral / benefit.
- Future collaboration in terms of research.
- How the relationship between these two professions can be bettered, explored and improved upon.

CHAPTER TWO: REVIEW OF THE RELATED LITERATURE

In this review, four variables were identified that in one way or another influenced the perceptions, attitudes and knowledge of other health care professionals on the chiropractic profession. These variables include; knowledge of the chiropractic profession, the role of chiropractic in the health care system, scope of practice of chiropractors and communication between chiropractors and other health care professionals. In this chapter an attempt is made to integrate the literature with the identified variables.

2.1 Introduction

The World Federation of Chiropractic (2001) defines the chiropractic profession as: "a health care profession concerned with the diagnosis, treatment and prevention of disorders of the musculoskeletal system and the effects of these disorders on the function of the nervous system and general health". This is in congruence with the definition as available from the Chiropractic Association of South Africa (<http://www.chiropractic.co.za>). Chiropractic is the largest, most regulated, and best recognized of the professions that have traditionally functioned outside of mainstream medical institutions and have fallen into the category of "complementary and alternative medicine" (CAM) (Meeker and Haldeman, 2002).

CAM has been defined as a broad domain of healing resources that encompasses all health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health system of a particular society or culture in a given historical period. CAM includes all such practices and ideas self-defined by their users as preventing or treating illness or promoting health and well-being. Boundaries within CAM and between the CAM domain and that of the dominant system are not always sharp or fixed (Zollman and Vickers, 1999).

"Chiropractic has gained widespread social acceptance, and it is viewed as an alternative form of health care, or in some cases as a specialty" (Coulter, 1992). Chiropractic care was found to be one of the most frequently sought after form of alternative care, and evinced a high level of patient satisfaction and continuous utilization (Greene, Smith, Allareddy and Haas, 2006). In some countries (for e.g. United States), the use of alternative medical practices and treatments has dramatically increased (Eisenberg et al, 1998) however these alternative medicine or therapies are not widely taught in medical schools or available at hospitals/health care facilities (Eisenberg et al, 1993). In addition these alternative practices can be used in place of, or in concert with, conventional Western therapies. With increasing recognition by insurance companies and managed care plans, chiropractic medicine has evolved from a marginal position on the health care landscape in the United States to become one of a number of options for health care consumers in an expanding health care marketplace, both in the United States and in other countries. In the United States visit rates for the public to chiropractic physicians have doubled over a recent 15-year period (Konrad, Fletcher and Carey, 2003).

The popularity of alternative forms of health care continues to rise, and coverage of them in the lay literature increases (Graham, 1998). Patient use of and demand for complementary practitioners including chiropractors, has continued to increase over the last decade or so. Many patients are drawn towards complimentary medicine because of its focus on holistic care together with patient's responsibility for health and well being, and in part to disenchantment with conventional medicine (Verhoef and Page, 1996).

Traditionally General Practitioners (G.P's) and pharmacists have maintained a close relationship, pharmacists provide various services to promote health to the community, most of these services are in direct response to written directions from the G.P. The G.P and the community pharmacist are both major deliverers of health care and the services that they provide overlap. Both depend greatly on

the activities of the other, and the effectiveness of each may be increased through appropriate cooperation between them (Gallagher and Zander, 1983). Louw's (2005) study showed that South African G.P's, perceptions and knowledge of chiropractic is not ideal, and it is assumed that similar results can be expected from South African pharmacists. Everyday roughly half a million people in the United Kingdom receive a prescription from their G.P before going to a pharmacy to have it dispensed, as well as patients with prescriptions, pharmacies are visited daily by over six million other people, offering numerous opportunities for health education and advice in an informal environment (Spencer and Edwards, 1992).

In South Africa the pharmacy profession has been defined as a dynamic, information driven, patient-orientated profession whereby the pharmacist, through his competence and skills is committed to meeting the health care needs of the people of South Africa by being the:

- custodian of medicines;
- formulator, manufacturer, distributor and controller of safe, effective and quality medicine;
- advisor on the safe, rational and appropriate use of medicine;
- provider of essential clinical services including screening and referral services;
- provider of health care education and information;
- provider of pharmaceutical care by taking responsibility for the outcome of therapy and by being actively involved in the design, implementation and monitoring of pharmaceutical plans;
- provider of cost-effective and efficient pharmaceutical services.

The profession is committed to high standards of competence, professionalism and co-operation with other health care personnel in order to serve the interests of the patient and the community (The South African Pharmacy Council).

Many people make rational decisions about their use of different primary care services and for the most part do appear to use pharmacies as a first port of call when treating minor ailments (Hassell, Noyce, Rogers, Harris and Wilkinson, 1997). The accessibility, approachability, and availability of the community pharmacist for some make the community pharmaceutical services a preferred source of advice on minor ailments, while for others the pharmacist is seen as a facilitator, either in confirming their choice of self-care, or in acting as an agent of referral to a G.P (Hassell et al, 1997).

“The overwhelming increase in the demand for CAM therapies adds a new dimension to the traditional role of a pharmacist” (Dutta, Miederhoff and Pyles, 2003). Since pharmacists are frequently cited as both accessible to patients and one of the most trusted healthcare professionals, patients routinely ask them for advice about a variety of CAM-related practices (Harris, Kingston, Rodriguez and Choudary, 2006). It is important for pharmacists to be aware of patients’ use of CAM therapies as many patients do not routinely tell their physicians about alternative medicine use nor do physicians routinely ask about it. This makes the pharmacist’s involvement in CAM use by consumers even more critical (Dutta, 2003). The pharmacist is unique among the health professions in that he/she is expected to be a source of objective health information. Pharmacists are clearly assuming a leadership position in health care today, with unconventional therapies rising in popularity each year, pharmacists must be further educated in other health care modalities in order to responsibly fulfill the demands of modern day patient care (Rowell and Kroll, 1998).

While consumer interest in CAM has continued to rise, mainstream schools of pharmacy have been slow to embrace curriculum changes aimed at educating practitioners about alternative forms of healing. A number of factors may have contributed to the reluctance on the part of mainstream practitioners and academicians to either include CAM approaches in their practice or educate new practitioners about various CAM approaches that are gaining wide acceptance by

consumers. Many practitioners cite “lack of scientific evidence” as a concern, while others simply admit that they are unfamiliar with many of the CAM approaches that their patients are using (Harris, 2006). If pharmacists were to acquire a sound knowledge in this area, they could constructively contribute to impartially informing their customers about the evidence for and against CAM (Ernst, 2004). As more studies indicate high patient interest in and use of CAM, it has become important to understand health professionals’ attitudes with respect to CAM (Baugniet, Boon and Ostbye, 2000).

2.2 Knowledge and understanding of the chiropractic profession.

Sanchez (1991) suggests that studies should explore the inter-professional relationships between chiropractic and other relevant health care practitioners because the legitimacy and status of chiropractic is greatly dependent upon its acceptance by, and collaboration with, other health professions. When professionals are attempting to work together and communicate, they should be knowledgeable about one another’s principles, formation, attitudes, qualifications and basic skills and they should try to discover the differences between individuals and groups of professionals (Brussee et al, 2001). To date no studies have been conducted in South Africa on the pharmacists’ knowledge of chiropractic.

Historically, conventional health care providers have received limited or no formal education in CAM and have been perceived by patients as being biased against CAM (Kreitzer, Mitten, Harris and Shandeling, 2002). Rowell and Kroll (1998) states that, “with the increased involvement of pharmacy in objective patient education and the emergence of our role as pharmaceutical care providers, it is incumbent upon pharmacy education to provide both current and future practitioners with rational information on CAM to enable frank discussion of alternative therapies with patients who are also using conventional medicines”.

Pharmacists should be educated enough to give a scientific-based explanation to their patient as to whether the use of conventional and unconventional therapies, when used simultaneously, is appropriate for the patient's state or goal. Proper training on alternative health care modalities will equip pharmacists to communicate objectively and intelligently with their patients, providing a much higher level of care (Rowell and Kroll, 1998).

A study conducted on pharmacy students in an American university, indicated that the majority of students felt that a course on CAM should be required in the curriculum and that knowledge about CAM was important to their future practice as a pharmacist (Dutta, 2003). Another study comparing the views of Medical students and other Health care professional students, showed that only 28.7% felt they knew a lot about chiropractic, and only 66.6% perceived it as a useful therapy (Baugniet et al, 2000). In America, attempts have already been made to encourage pharmacists to advance their knowledge in CAM through continuing education, and providing support for this education (Dutta, 2003).

There is also an obvious need for quality continuing education on these subjects for practicing pharmacists to properly equip them for the task, especially with regard to selecting suitable alternative medicine information sources.

Rowell and Kroll (1998) states that “the profession of pharmacy is currently at a crossroads where subjective biases, either positive or negative, toward CAM could damage our long-held position of public trust. Pharmacists must possess the knowledge and ethics to provide accurate patient counseling information on CAM products and practices”

2.3 The role of Chiropractic in the health care system

Doctors of chiropractic are highly trained practitioners, qualified and licensed to diagnose disease entities and to refer patients when the treatment necessary is out of their scope of practice, however, allopathic medicine, in particular has

viewed chiropractic with deep suspicion and concern (Curtis and Bove, 1992). Medical practitioners were forbidden to have anything to do with this “false system of teaching” (Hupkes, 1990). Chiropractic was condemned, particularly because it lacked the scientific evidence to substantiate its claims (Sanchez, 1991).

“Even though chiropractic is a popular health care option in many countries, organised medicine remains skeptical of this health profession” (Jamison, 1994). “Chiropractic theories, right from their creation, were in direct opposition to mainstream medicine. The claim to “cure all by spinal manipulation” immediately created skepticism about its validity among those practicing within the biomedical paradigm” (Haldeman, 2000). Coulter (1992) in agreement stated that although chiropractic is an established part of the health care system, there is still opposition from powerful groups, including mainstream medicine, based on the philosophical grounds underpinning the respective fields. “Overall, it appears that chiropractic is still not recognised as an integral, needed and legitimate part of health care by many members of the conventional health care system” (Verhoef and Page, 1996).

Over approximately the last 30 years, however, chiropractic has become more accepted, and as a result, all aspects of the profession are under continuous evaluation (Wardwell, 1994). According to Coulter (1992), chiropractic has gained widespread social acceptance, and it is viewed as an alternative form of health care, or in some cases as a specialty.

Chiropractic is an evolving health profession, with functions, values, traditions, and training institutions similar to those of other professions. Modern chiropractic theory and practice have moved away from the original mono-causal theory, and research is gradually redefining the nature of the discipline and its education (Meeker and Haldeman, 2002). During the past two decades, there has been a marked change in the manner in which chiropractic is viewed, not only by

mainstream medical practitioners and institutions but also by members of the profession itself (Meeker and Haldeman, 2002).

Relative to other complementary therapies, chiropractic seems to enjoy the widest acceptance among the medical community in Canada (Verhoef and Page, 1996). Chiropractors themselves are divided about how to define the profession; many do not want to be termed CAM practitioners, and often describe themselves as primary care providers (Meeker and Haldeman, 2002).

If chiropractors are to serve as primary care practitioners and if they are to alter the existing care-seeking behaviors of consumers, chiropractors must overcome impressions that they primarily treat lower back pain (Gaumer, Koren and Gemmen, 2002). The development of evidence-based guidelines in chiropractic practice, may improve relations between chiropractic and the health care system and better enable the chiropractic profession achieve its foremost goal of serving as a portal of entry into the health care system with chiropractors functioning as primary contact practitioners (Jamison, 2005).

Therefore Meeker and Haldeman (2002) refers to the chiropractic profession as having now come to a crossroads between alternative and mainstream medicine. Although the biomedical paradigm, including pharmacy, has not yet fully accepted chiropractic as a mainstream form of health care, the next decade should determine whether chiropractic maintains the trappings of an alternative health care profession or becomes fully integrated into all health care systems (Meeker and Haldeman, 2002).

2.4 Scope of practice of Chiropractors.

Most public consumers (in the United States of America) and other potential consumers view chiropractors as back specialists (Gaumer et al, 2002). Chiropractors tend to be regarded by the public as specialists within a narrow range of clinical practice related to musculoskeletal disorders (principally low

back pain) (Jamison, 1995), however some chiropractors consider themselves to be primary care physicians and commonly treat a variety of non-neuromusculoskeletal conditions (e.g., respiratory conditions, ear infections and menstrual problems) as well (Mainous, Gill, Zoller and Wolman, 2000).

Back pain is the most commonly reported physical symptom, after headache and tiredness. It results in a great deal of disability and distress especially in industrialized countries (Silcock, Moffett, Edmondson, Waddell and Burton, 2007). According to Brussee, et al, (2001), the number of chiropractors in the Netherlands has more than doubled in the past five years and there has been an increased public and political interest in chiropractic treatment. This increased interest was possibly caused by the large number of patients with low back pain, the increased economic burden placed on society by low back pain, patient satisfaction with chiropractic treatment and reports of the cost-effectiveness of such chiropractic treatment.

A significant segment of the general public prefers chiropractic care to medical care for low back pain. The usefulness of manipulation in the management of low back pain is well established and the cost-effectiveness of chiropractic care in cases of mechanical low back pain is achieving substantial scientific credibility (Jamison, 1995). To maximize the chances of successful treatment and minimize variation in care, it is important that all healthcare professionals understand the basic principles of back pain management (Silcock, 2007).

Community pharmacists can be consulted without appointment in a large number of convenient locations, and they are in an ideal position to give timely advice to patients at the onset of low back pain and also reinforce advice given by other healthcare professionals, however there is little specific information about the quality of care provided in the pharmacy for people with back pain. The quality of this care will be determined by factors that are professional, patient related and

environmental. The main professional factors are the knowledge, skills and attitudes of individual practitioners (Silcock, 2007).

Pasternak, Lehman, Smith and Piland, (1999) evaluated G.P's attitudes towards chiropractic care in a large health maintenance organization in the American South West. According to this study, chiropractic services functioned within a scope of practice that was limited to the diagnosis and treatment of neuromusculoskeletal conditions. It was also found that especially family practitioners were receptive to chiropractic treatment. The conditions most commonly referred to chiropractors by G.P's were: low back pain, whiplash, neck pain, headaches, cervicobrachial neuralgia, sciatic neuralgia, degenerative joint disease, spinal subluxations, discopathy of the spine, scoliosis, spinal stenosis and myofascial pain syndromes.

2.5 Communication between health care professionals.

Good communication between various health care professionals has proved to be important in ensuring high standards of care. However, previous studies have shown that communication between primary and secondary health care professionals as far from ideal. Consequently one can assume that good communication between primary health care professionals and complementary medical practitioners may be even harder to achieve (Brussee, et al, 2001). Bad experiences, the use of confusing terminology, stereotyping, and lack of knowledge seemed to be the major factors influencing the communication process (Brussee, et al, 2001).

“The education and training of chiropractors is grounded in orthodox medicine and they share a common language with their medical colleagues, allowing for close dialogue, however levels of communication, knowledge, and collaborative working arrangements between these professions are often found to be poor. Given patient acceptance of alternative therapies, western medical practitioners may be more effective if they are knowledgeable of these therapies and are able

to address patients' questions, concerns, and beliefs” (Langworthy and Birkelid, 2001).

With the growing trend toward multidisciplinary health care and public demand for greater integration of orthodox and unorthodox medicine has made it clear that more frequent and meaningful inter-professional collaboration at the local level must occur (Langworthy and Birkelid, 2001). The fragmentation of a patient’s health care across providers may lead to a greater chance of missed information about the patient’s history, treatments and co-morbid conditions, in some cases a patient will need to see a variety of health care providers. Unfortunately, little coordination of care seems to be taking place between alternative practitioners and allopathic practitioners, this lack of communication and coordination of care may be detrimental to the quality of care provided to the patient (Mainous et al, 2000). Patients receive their information regarding a range of CAM therapeutic options from pharmacists and the quality and accuracy of the information used by the patient from this source varies considerably, this can be problematic because opportunities can be missed to integrate CAM therapies into the overall plan of care in instances when these therapies may be beneficial (Hamilton et al, 2002).

It is clear that more frequent and meaningful inter-professional collaboration is necessary between allopathic practitioners and chiropractors. This relationship will not only benefit the health care professionals themselves, but more importantly the patients they treat. “Good professional communication between the practitioners will increase the quality of patient care” (Brussee et al, 2001).

Manga, Angus and Swan, (1993) concluded in their study that it is apparent that greater collaboration amongst key health care providers is required to ensure that the "right people are doing the right thing at the right time" and thus ensuring the patient is receiving optimum care at all times. This emphasizes the need for development of inter-professional relationships and communication between the

professions. The only manner, in which this can be achieved, is to determine what the current inter-professional attitudes and perceptions are.

2.6 Conclusion

With the persistent interest of the local and international community in alternative health care and the continuing discourse about “unconventional” medicine in medical journals, increased referral from medical to chiropractic practitioners would seem likely (Jamison, 1994).

It would therefore appear that in order for inter-professional relations to develop between the chiropractic and pharmacy professions in South Africa, there needs to be an investigation to ascertain the current perceptions/attitudes and knowledge of South African pharmacists towards the chiropractic profession. Thus the aim of this research was to establish the present perceptions/attitudes and knowledge of a sample of South African pharmacists towards the chiropractic profession.

"It is important to repeat this type of study in as many different contexts as possible, as each country will vary considerably in its culture, health care delivery system, education of health care professionals, and inter-professional relations" (Hupkes, 1990). The results of this study would give an indication as to whether chiropractors are being accepted by South African pharmacists and whether their knowledge of chiropractic is enough to adequately inform the growing number of public consumers seeking “alternative” health care.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

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

3.2 Study Design

The study was of a quantitative nature and the information was collected by means of a questionnaire, based upon the questionnaire format used in previous research studies (Rubens (1996), Louw (2005), Van As (2005) and Hunter (2004)

3.3 Sampling

Stratified sampling was used in this study. The sample was proportional to the size of the population of the pharmacists in the respective metropolitan areas. One thousand three hundred and fifty (1350) pharmacists were identified in 4 major metropolitan areas in South Africa, the number per metropolitan area being according to population size. The metropolitan areas involved were Johannesburg, Cape Town, East London and Durban.

A total of 1350 pharmacists were sampled. A list of addresses of registered pharmacists was obtained from the South African Pharmacy Council. The entire register of pharmacists within Gauteng, Kwa-Zulu Natal, Eastern Cape and Western Cape, registered with the South African Pharmacy Council was purchased. It was then sorted into the four different metropolitan areas using postal codes, resulting in a total of 4694 pharmacists as follows: Johannesburg, 1611 (34.32%); Cape Town, 1673 (35.64%); East London, 210 (4.47%) and Durban, 1200 (25.56%). This list was then sent to the statistician (Tonya Esterhuizen) who generated a random proportional sample of 1350 pharmacists from the list of 4694 pharmacists. To generate the random sample, the names of all the pharmacists were added to an Excel document (Microsoft Excel version 9,

2000) and then sorted into the four metropolitan areas. The Excel random function (=RAND()) was then applied to each metropolitan area to produce a random sample. The appropriate number of names was then taken from each of these lists. The number of pharmacists to be targeted in each metropolitan area was calculated according to the percentage of the overall pharmacist population in South Africa present in the respective metropolitan area. The final number of questionnaires sent to each metropolitan area was as follows: Johannesburg, 463 (34.32%); Cape Town, 482 (35.64%); East London, 60 (4.47%) and Durban, 345 (25.56%).

The questionnaires were mailed to randomly selected pharmacists via the Durban University of Technology mailing system. Accompanying the questionnaire was a covering letter that introduced the reader to the questionnaire, explained the study and assured anonymity and confidentiality (Appendix A), and an informed consent form (Appendix E). The sampling was done in such a way that proper representation of the population of pharmacists in each metropolitan area, relevant to the total population, was sampled.

3.4 Delimitation

It is assumed that the respondents to this study will have answered the questionnaire openly and honestly therefore allowing the researcher the best approximation of the knowledge and perceptions/attitudes held by the pharmacists in the sample.

This type of recruitment for observation may not fully represent the population group and may lead to error in results. It is inevitable that any sampling process, no matter how carefully carried out, will always result in a sample that is less than perfectly representative of the population (Dyer, 1997)

Since only pharmacists working in the major urban areas of South Africa were eligible for inclusion into the study, results of the study can only be generalised to

this population. There may exist fundamental differences between pharmacists working in rural areas and those in urban areas, but this is beyond the scope of this study. The four major South African metropolitan areas viz Johannesburg, Cape Town, Durban and East London were selected. This was done to get a broader geographical representation within the South African context. These metropolitan areas were picked because it was assumed that pharmacists practicing within these cities would have had a greater chance of contact with chiropractic.

3.5 Inclusion criteria

In order to be accepted for participation in the study, the pharmacist had to comply with the following criteria

1. All subjects had to be qualified and registered pharmacists in South Africa
2. All subjects had to be working within the four selected metropolitan region
3. All subjects had to be residents of the Republic of South Africa
4. All subjects had to sign the informed consent form
5. All subjects had to speak English as the questionnaire was in English only
6. All questionnaires had to be returned with the relevant information completed

3.6 Exclusion Criteria

Participants were excluded from the study if they:

1. Did not comply with the above inclusion criteria
2. Any questionnaire returned incomplete was excluded from the sample and regarded as a non respondent

3.7 Data Collection Tool

Langworthy developed and piloted a questionnaire, which was used in studies in the Netherlands and Norway respectively (Langworthy and Smink, 2000; Langworthy and Birkelid, 2001). Hunter (2004), Louw (2005) and Van As (2005)

received permission to use this questionnaire and modify it accordingly to the South African context. A questionnaire was then developed specifically for this study by modifying and adapting the questionnaires used by Rubens (1996), Hunter (2004), Louw (2005), and Van As (2005). (Appendix B)

The questionnaire comprised of forty questions in five sections, covering personal information, knowledge about chiropractic, the role of chiropractic in the health care system in South Africa, the scope of practice of chiropractic and communication. It was developed using a focus group.

In general, questionnaires are a good source of information, provided that the questionnaire has been proven reliable and valid (Mouton, 1996). Questionnaires are the tool of choice for a project such as this, as it ensures that bias, on the side of the researcher, is kept to a minimum, and there is also less chance of misinterpretation of the results (Mouton, 1996).

This is especially pertinent in this study, where the researcher is a chiropractic student. This may lead to an inherent bias in terms of the interpretation of the results in the study. Therefore the objectivity as offered by a questionnaire is essential in ensuring that researcher bias is kept to a minimum

3.8 Focus Group

The focus group consisted of 2 chiropractors, 2 pharmacists, 2 students and 1 teacher. Each member was given a letter of information (Appendix D), an informed consent form (Appendix E), a confidentiality statement (Appendix F) and a code of conduct form (Appendix G) to read and sign. This group gathered and discussed the questionnaire and the factors that it covered, to rule out any ambiguity and syntax difficulties. Relevant questions were included while some irrelevant questions were omitted. (Appendix I)

3.9 Pilot study

After the focus group was held, the changes suggested to the questionnaire were implemented. Five pharmacists in Durban were approached to fill out the new questionnaire. This was done to see how long it took to complete the questionnaire and also to identify problem areas. Whilst completing the questionnaire, these pharmacists had no difficulties concerning ambiguity or syntax within the questionnaire. The pilot subjects were excluded from the main study. (Appendix C)

Questionnaires were mailed to 1350 pharmacists with an included business reply service envelope. These pharmacists were randomly selected from the list of pharmacists registered with the South African Pharmacy Council. Three weeks were allowed for the returning of completed questionnaires, after this time an email was sent to the non respondents, requesting them to please return the questionnaire, a further 4 weeks were given, to receive these questionnaires.

3.10 Confidentiality

Confidentiality was ensured through the following methods: Confidentiality was maintained as no names were revealed in the publication of the results. A coding system was used, where each questionnaire was numbered, and the identity of the pharmacist was not revealed to the researcher. A neutral party (Faculty officer) received the returned questionnaires.

3.11 Statistical methodology

SPSS version 15.0 was used for data analysis (SPSS Inc., Chicago, Illinois, USA). A p value of <0.05 was considered as statistically significant.

Descriptive objectives were shown with frequency tables and bar charts in the case of categorical variables, and using summary statistics such as median,

range and inter quartile range in the case of skewed quantitative or ordinal variables.

Correct answers to the 41 questions testing knowledge of chiropractic were summed together and expressed as a percentage out of 41.

Perceptions/attitudes were scored out of a maximum possible score of 27 to the 12 questions assessing perception of chiropractic, and expressed as a percentage, with the higher the score the more positive the perceptions/attitudes.

Relationships between knowledge and perception were assessed using Spearman's rank correlation coefficient. Comparison of knowledge and perceptions scores between categorical demographics were done with Mann-Whitney tests (for 2 group comparisons) or Kruskal – Wallis tests (for more than two group comparisons) as appropriate.

CHAPTER FOUR: RESULTS

Chapter 4 contains only the results found in this study; a discussion of these findings is presented in chapter 5. Please refer to chapter 5 accordingly.

4.1 Response rate

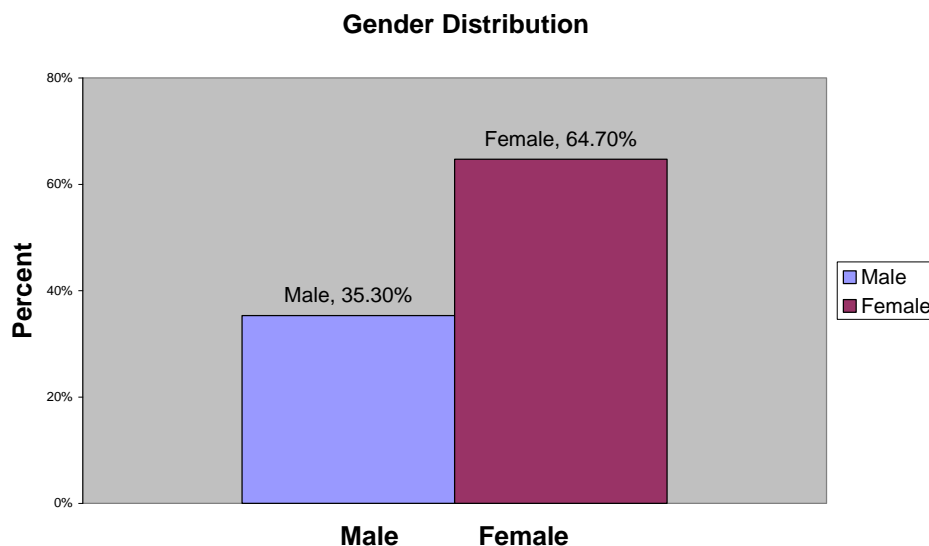
1350 questionnaires were mailed to pharmacists, out of a total population of 4694 within the four metropolitan areas. Of these, 20 questionnaires were returned unopened because the recipients had: Changed address (n=9), Closed their P.O Box (n=8), were deceased (n=2) or had emigrated (n=1). Thus out of a possible 1330 participants in the study, one hundred and sixteen questionnaires were returned for analysis. This gives a response rate of 8.72% 95%CI [7.29% to 10.40%]

4.2 Descriptive Analysis

4.2.1 Demographics

The majority of respondents were female (64.7% - Figure 1) and only 35.3 % were male, however this was to be expected as there were fewer males in the sample.

Figure 1: Graph of gender distribution of participants.



The median age of the sample was 46 years, with a range from 24 to 86 years and an inter quartile range from 37 to 60 years. This is displayed in Table 1.

Table 1: Summary statistics for age of participants

N	Valid	115
	Missing	1
Median		46.00
Minimum		24
Maximum		86
Percentiles	25	37.00
	50	46.00
	75	60.00

The median time in practice was 23.5 years (range 1 year to 67 years). The inter quartile range was from 15 years to 35 years. This is shown in Table 2.

Table 2: Summary statistics for number of years practicing

N	Valid	116
	Missing	0
Median		23.50
Minimum		1
Maximum		67
Percentiles	25	15.00
	50	23.50
	75	35.00

Type of pharmacy practice is shown in Figure 2. The percentages add up to more than 100% since some respondent reported working in more than one type of pharmacy. More than half of the respondents were in a retail pharmacy practice (n=57), while 20 worked in a hospital pharmacy. Fifteen respondents reported working in another type of pharmacy practice. These included industry, research, medical aid and teaching.

Figure 2: Type of pharmacy practice in study participants (n=116)

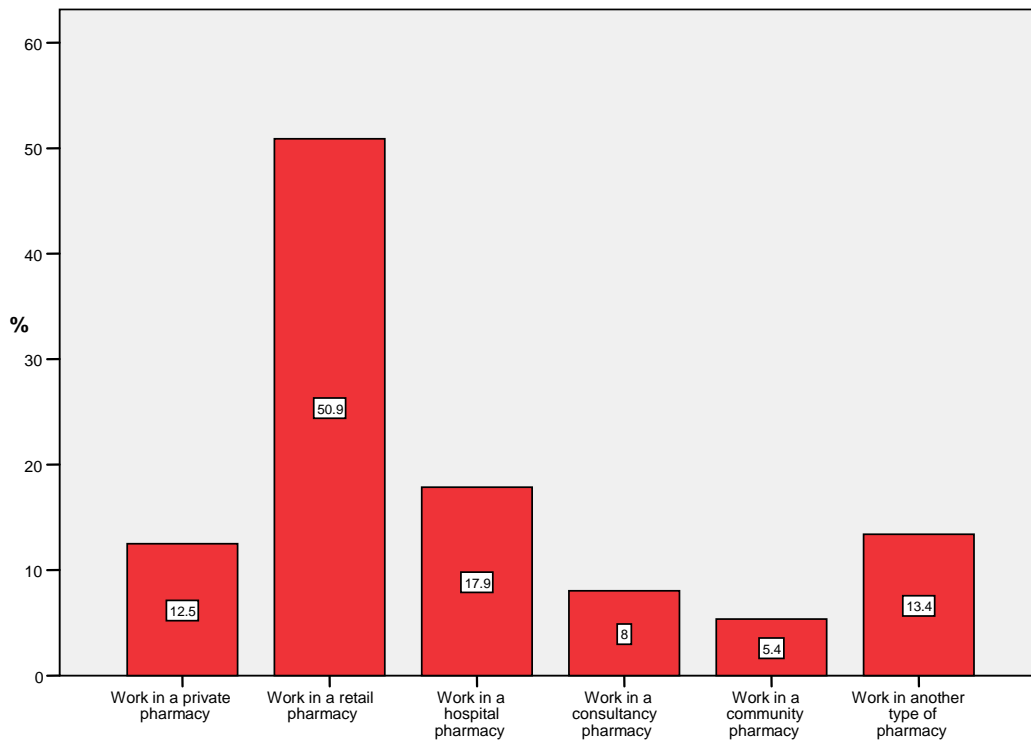


Figure 3 shows that the majority of responses were from Cape Town and Durban (34.5% each) while 28.3% were from Johannesburg and only 2.7% from East London. Three participants did not state which city they were from. In order to achieve a true representation of the different areas, the researcher aimed to receive a similar returning percentage compared to the percentage of mailed questionnaires to each of the different areas, the mailed questionnaires were returned in a more or less representative fashion. The highest number of questionnaires were sent to Cape Town (35.64%), followed closely by Johannesburg (34.32%), and then Durban (25.56%) and lastly to East London (4.47%).

Figure 3: Metropolitan area of Respondents

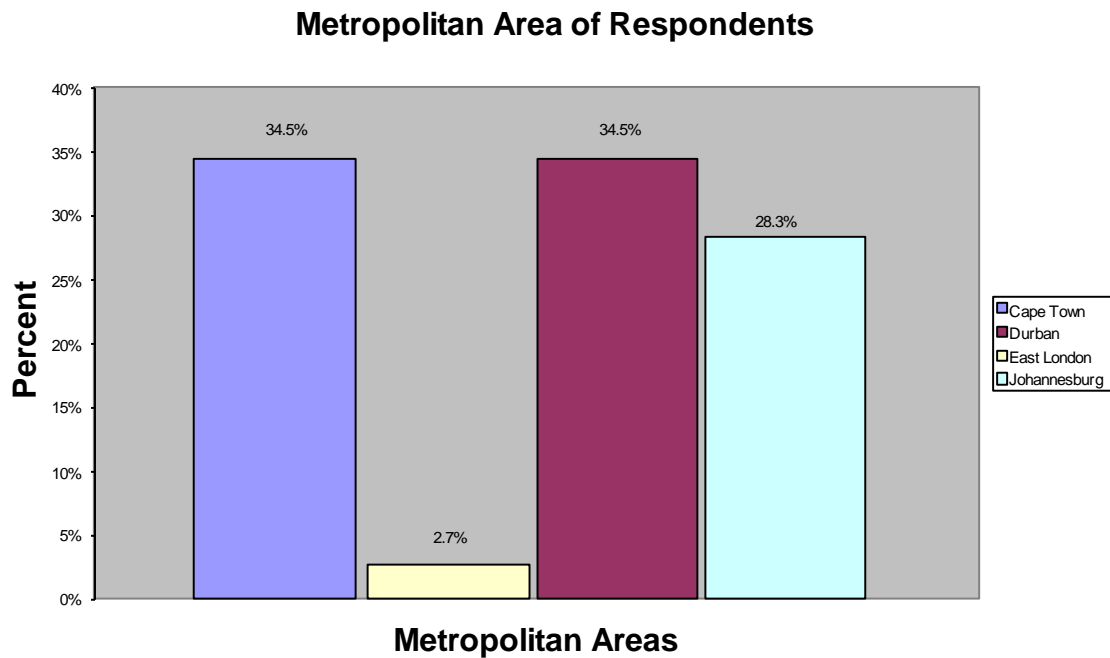


Figure 4 shows the qualifications of the respondents before they started their pharmacy degrees. The majority of respondents (89.7%) had a matric, but 4.3% had another degree and 1.7% had a diploma. The qualifications under “other” included A levels and other matric equivalent qualifications.

Figure 4: Qualification of the respondents prior to starting their pharmacy training

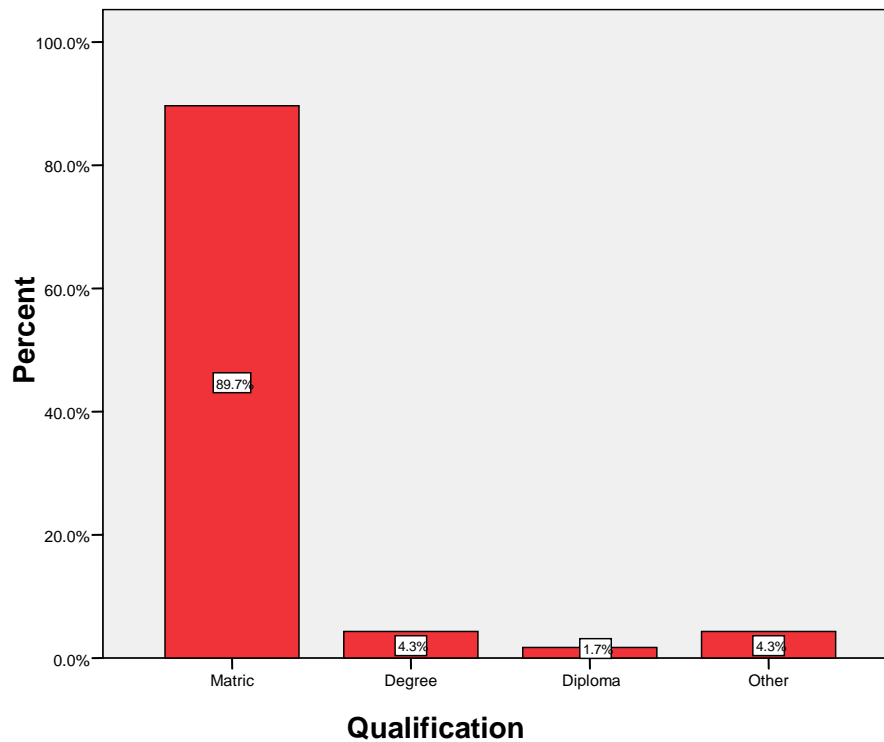


Table 3 shows that 43 % of the total respondents had been treated by a chiropractor, while 57% had not.

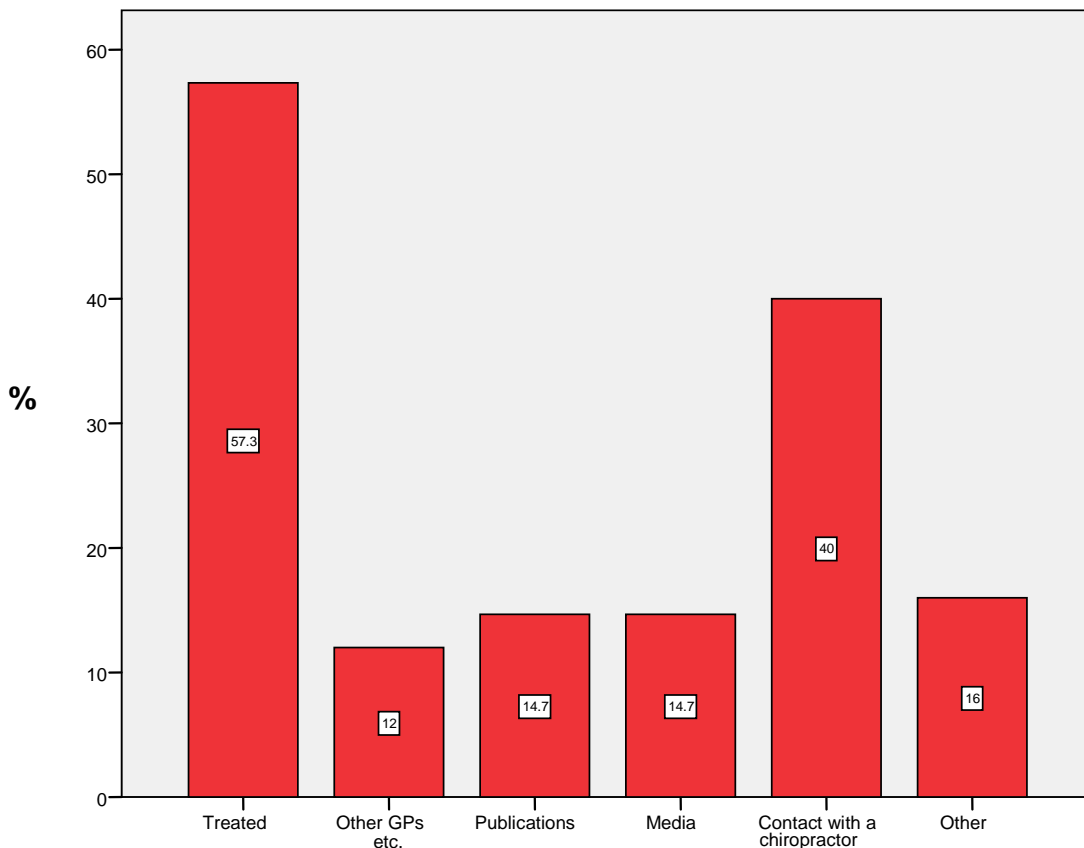
Table 3: Treated by a Chiropractor

	Frequency	Percent
Yes	50	43.1
No	66	56.9
Total	116	100.0

4.2.2 Knowledge and understanding of Chiropractic

Only those participants who reported to have any knowledge of chiropractic were asked to complete the knowledge and perception/attitude questions. A sub-sample of only 76 respondents (66%), reported having any knowledge of chiropractic. Figure 5 shows how these respondents gained their knowledge of chiropractic. The majority received their information through being treated by a chiropractor (57.3%), or through personal contact with a chiropractor (40%) and the least received their information from other G.P's, specialists, physiotherapists etc (12%). The percentages add up to more than 100% since a number of pharmacists received their information from multiple sources. (Figure 5)

Figure 5: Sources of information on chiropractic



The responses, along with a brief description to all the individual knowledge questions can be found in APPENDIX H.

Table 4 shows the summary statistics for the knowledge score for the sample. The median score was 46.3% this meant that out of a total score of 100, the average pharmacist scored 46.3 out of 100 for his/her knowledge about chiropractic. The scores ranged from 17% to 93%. The inter quartile range was from 36.6% to 58.5%. Thus the general level of knowledge was quite poor.

Table 4: Knowledge score percentage in the sample

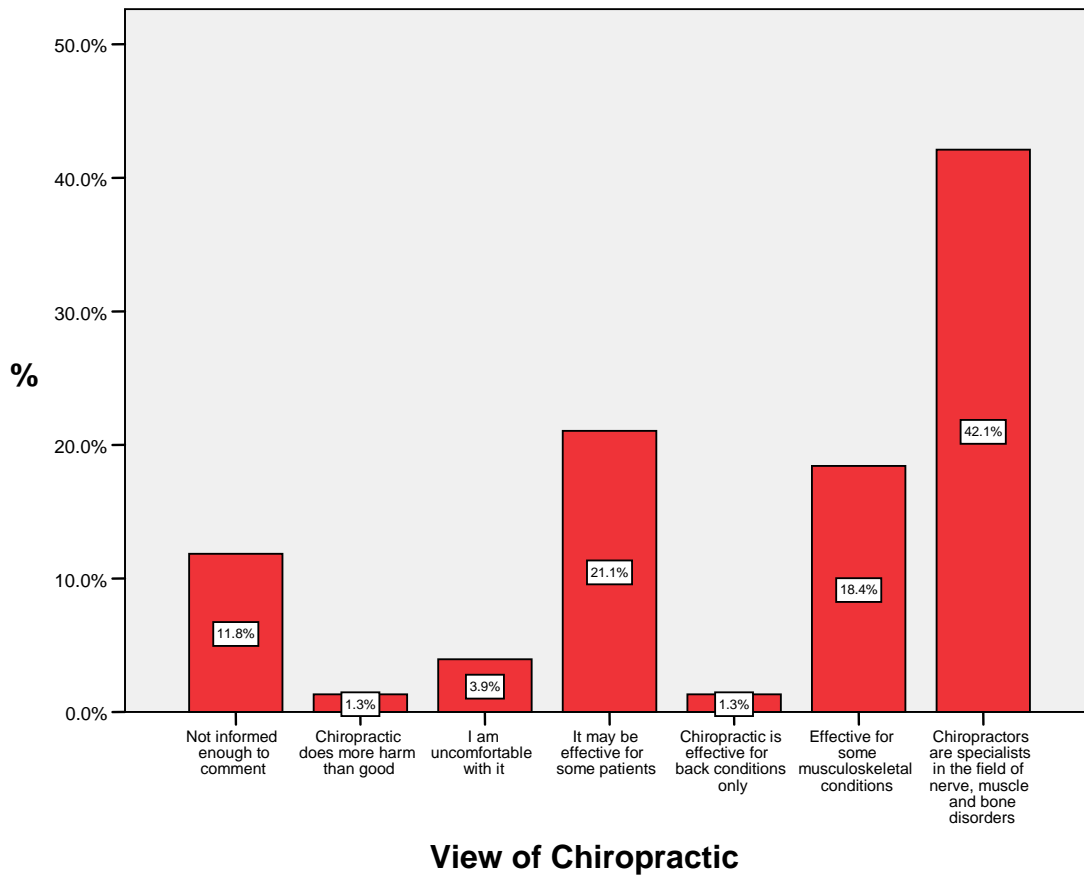
N	Valid	76
	Missing	40
Median		46.34
Minimum		17
Maximum		93
Percentiles	25	36.59
	50	46.34
	75	58.54

4.2.3 Perceptions and attitudes of the Chiropractic profession among South African pharmacists

The Role of Chiropractic in the South African Health Care System

Figure 6 shows that the views of chiropractic in the sample were mostly positive. 42.1% of respondents perceived chiropractors to be specialists in the field of nerve, muscle and bone disorders, including the treatment of the spine and extremities. 11.8% felt they were not informed enough to comment and relatively few respondents (5.2%) had negative perceptions/attitudes of chiropractic.

Figure 6: Participants' view of chiropractic



Tables 5 – 12 show responses to the individual perception/attitude questions.

Most participants felt that chiropractic should be integrated to a moderate extent (56.0%) or a great extent (37.3%). Few (1.3%) thought that there was no active role for chiropractic in the South African health care system (Table 5).

Table 5 Respondents views on the extent to which chiropractic should be integrated into SA health care system

	Count	%
Great extent	28	37.3%
Moderate extent	42	56.0%
Slight extent	4	5.3%
No active role	1	1.3%

Pharmacists were asked to rate, on a scale of 1 to 5, twelve professions in terms of their importance in serving in a primary health care capacity in South Africa. Medicine, nursing, pharmacy, optometry, dentistry and physiotherapy were rated as most important with a rating of five. Chiropractic scored a median of three along with other complementary therapies, homeopathy, acupuncture and traditional healing. Ayurvedic medicine and Chinese medicine scored the lowest with a median rating of one (Table 6).

Table 6: Rating of various professions in terms of their importance in serving in a primary health care capacity

	1		2		3		4		5	
	Count	%	Count	%	Count	%	Count	%	Count	%
Acupuncture	15	20.3%	23	31.1%	24	32.4%	6	8.1%	6	8.1%
Ayurvedic	28	41.8%	15	22.4%	16	23.9%	3	4.5%	5	7.5%
Chinese	27	38.6%	19	27.1%	16	22.9%	3	4.3%	5	7.1%
Chiropractic	3	4.0%	3	4.0%	28	37.3%	22	29.3%	19	25.3%
Homeopathy	10	13.7%	15	20.5%	20	27.4%	17	23.3%	11	15.1%
Dentistry	1	1.3%	0	.0%	3	3.9%	19	25.0%	53	69.7%
Medicine	0	.0%	0	.0%	1	1.3%	10	13.2%	65	85.5%
Nursing	0	.0%	1	1.3%	2	2.6%	8	10.5%	65	85.5%
Optometry	0	.0%	2	2.7%	9	12.2%	19	25.7%	44	59.5%
Pharmacy	0	.0%	0	.0%	3	4.0%	15	20.0%	57	76.0%
Physiotherapy	0	.0%	4	5.4%	11	14.9%	23	31.1%	36	48.6%
Traditional	18	24.7%	21	28.8%	23	31.5%	6	8.2%	5	6.8%

Most participants (86.1%) felt that there was a great enough difference between, chiropractic and physiotherapy to warrant two separate professions (Table 7).

Table 7 View on whether there is sufficient difference between chiropractic and physiotherapy to warrant two separate professions.

	Count	%
Yes	62	86.1%
No	10	13.9%

Most participants (68.0%) felt that chiropractic was not promoted enough in South Africa, and only a very small percent (1.3%) felt that it was promoted too much. (Table 8)

Table 8 Respondents views on the extent to which Chiropractic is promoted in South Africa

	Count	%
Not at all	5	6.7%
Too much	1	1.3%
Not Enough	51	68.0%
Don't Know	13	17.3%
Enough	5	6.7%

Scope of Practice of Chiropractors

Respondents rated the competency of chiropractors in neuromuscular examination and diagnosis. More than half rated chiropractors as competent and only a small portion rated them as incompetent or very incompetent. (Table 9)

Table 9 Perceptions on the extent to which chiropractors are competent in neuromuscular examination

	Count	%
Very competent	13	18.1%
Moderately competent	20	27.8%
Competent	37	51.4%
Incompetent	1	1.4%
Very incompetent	1	1.4%

Respondents rated the competency of chiropractors in the general medical management of patients. More than half rated chiropractors as competent and only 5.4% and 1.4% rated them as either incompetent or very incompetent respectively. (Table 10)

Table 10 Perceptions on the extent to which chiropractors are competent in general medical management

	Count	%
Very competent	5	6.8%
Moderately competent	25	33.8%
Competent	39	52.7%
Incompetent	4	5.4%
Very incompetent	1	1.4%

The majority of respondents felt that chiropractic was an alternative health care service (39.5%) and only 27.6% felt that chiropractic was a primary health care service. A large proportion of respondents had positive perceptions and felt that chiropractic should be part of medical aid (94.7%), should be accessible to everyone (55.3%), is affordable (54.1%) and should be recognised by law (82.8%). Only the small minority felt that chiropractic should not be part of a medical aid (1.3%), is not needed in South Africa (1.4%) or should not be recognised by law (2.6%). (Table 11)

Table 11 General perceptions of chiropractic

		Count	%
Health care service	A primary health care service	21	27.6%
	A secondary health care service	25	32.9%
	An alternative health care service	30	39.5%
Medical Aid	Should be part of medical aid	71	94.7%
	Should not be part of medical aid	1	1.3%
Accessibility	Is accessible to every one	18	23.7%
	Is not accessible to everyone	16	21.1%
	Should be accessible to everyone	42	55.3%
Affordable	Affordable	40	54.1%
	The right cost	20	27.0%
	Too expensive	14	18.9%
Scientific	Lacking scientific background	9	12.2%
	Not needed in SA	1	1.4%
	None of the above	64	86.5%
Recognised by Law	Should be recognised by law	63	82.9%
	Should not be recognised by law	2	2.6%
	No opinion	11	14.5%

Table 12 shows the summary statistics for the attitude score for the sample. The median score was 66.7% and the scores ranged from 25.9% to 100%. The inter quartile range was from 51.8% to 77.8%. Thus the general level of perceptions/attitudes towards chiropractic was positive.

Table 12: Attitudes score percentage in the sample

N	Valid	75
	Missing	41
Median		66.6667
Minimum		25.93
Maximum		100.00
Percentiles	25	51.8519
	50	66.6667
	75	77.7778

4.2.4 Communication between pharmacists and chiropractors.

Table 13 shows that the vast majority of respondents believed that communication with health care providers was essential and 95% had at some stage communicated with other health care providers to ensure maximum benefit to the patients.

Table 13: Communication between pharmacists and health care providers

	Yes		No	
	Count	%	Count	%
Good Communication	115	99.1%	1	.9%
Have Communicated	109	94.8%	6	5.2%

The types of health care providers with which they had communicated is shown in Figure 7. The most common health care provider was a GP (91.4%), followed by dentists (57.8%). Only 16.4% had communicated with chiropractors previously.

Figure 7: Bar chart of type of health care provider responding pharmacists have communicated with

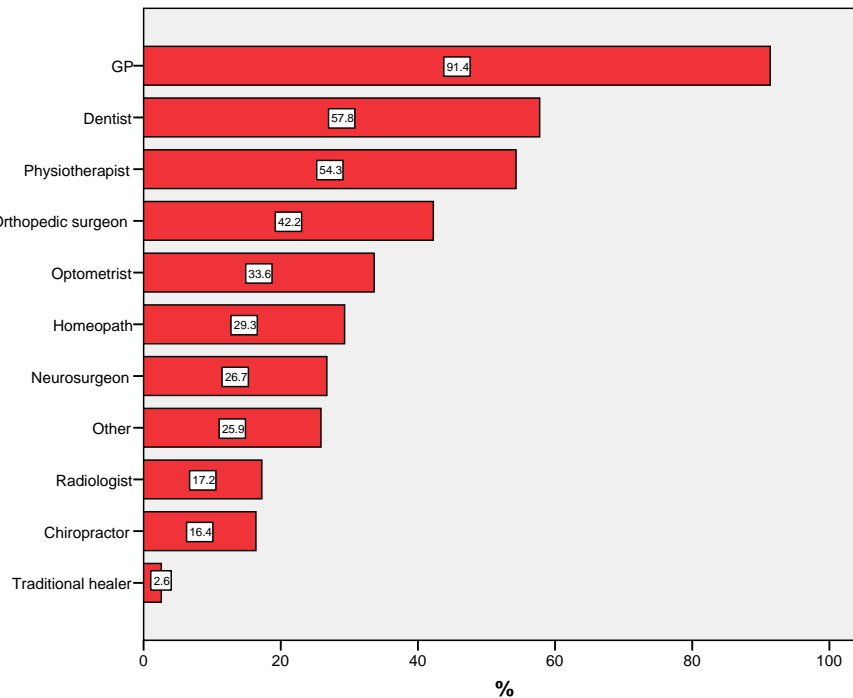


Figure 8 shows that pharmacists would mostly refer patients with musculo-skeletal conditions to physiotherapists (56%), followed by GPs (47%) and chiropractors (34%).

Figure 8: Bar chart of type of health care provider responding pharmacists would refer patients with musculo-skeletal conditions to

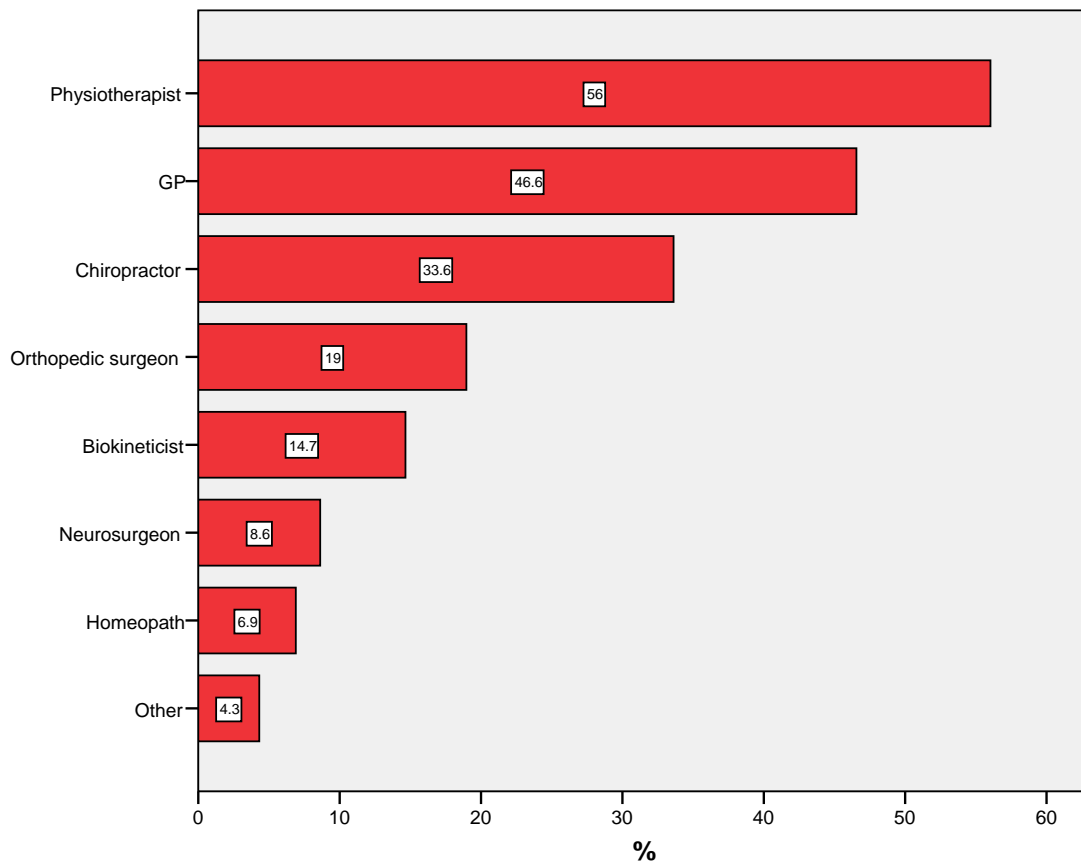


Table 14 shows that responding pharmacists thought that orthopedic surgeons were the specialists that chiropractors mostly referred to (89%). This was followed by neurologists (71%) and radiologists (52%). Very few respondents thought that chiropractors also refer to gynecologists (13.8%), Obstetricians (10.3%), Urologists (9.5%) and Proctologist (6.9%), should the need arise.

Table 14: Specialists that responding pharmacists thought that chiropractors refer to

	No		Yes	
	Count	%	Count	%
Neurologist	34	29.3%	82	70.7%
Neurosurgeon	67	57.8%	49	42.2%
Orthopedic surgeon	13	11.2%	103	88.8%
Radiologist	56	48.3%	60	51.7%
Gynecologist	100	86.2%	16	13.8%
Obstetrician	104	89.7%	12	10.3%
Proctologist	108	93.1%	8	6.9%
Urologist	105	90.5%	11	9.5%

Table 15 shows that the majority of pharmacists get asked occasionally for advice on treatment options other than medication (41%), while 33% get asked often. This shows the need for pharmacists to have the knowledge to be able to adequately inform the public, should they ask for it.

Table 15: Frequency that responding pharmacists get asked for advice on treatment options other than medication

		Count	%
How often do patients ask you for advice on the treatment options available to them other than medication?	Never	2	1.9%
	Seldom	15	14.0%
	Occasionally	44	41.1%
	Often	35	32.7%
	All the time	11	10.3%

Table 16 shows that all respondents thought it was important to be able to inform patients on the other treatment options available to them, but only 19% knew enough to adequately inform them. Only 48% of pharmacists had recommended their patients see a chiropractor. 89% did not feel adequately informed about chiropractic and 88% said they would like to know more about chiropractic.

Table 16: Responses on issues of information and referral

	yes		no	
	Count	%	Count	%
Do you believe it is important to be able to inform patients on the other treatment options available to them?	113	100.0%	0	.0%
Do you feel you know enough to adequately inform them on the subject?	21	18.6%	92	81.4%
Have you ever referred a patient to a chiropractor?	54	47.8%	59	52.2%
Do you feel adequately informed about chiropractic?	13	11.4%	101	88.6%
Would you like to know more about chiropractic?	100	87.7%	14	12.3%

Figure 9 shows that LBP was the most common condition for which pharmacists would refer patients to chiropractors (46%) followed by neck problems (42%).

Figure 9: Percentage of respondents that would refer patients to chiropractors for each listed condition

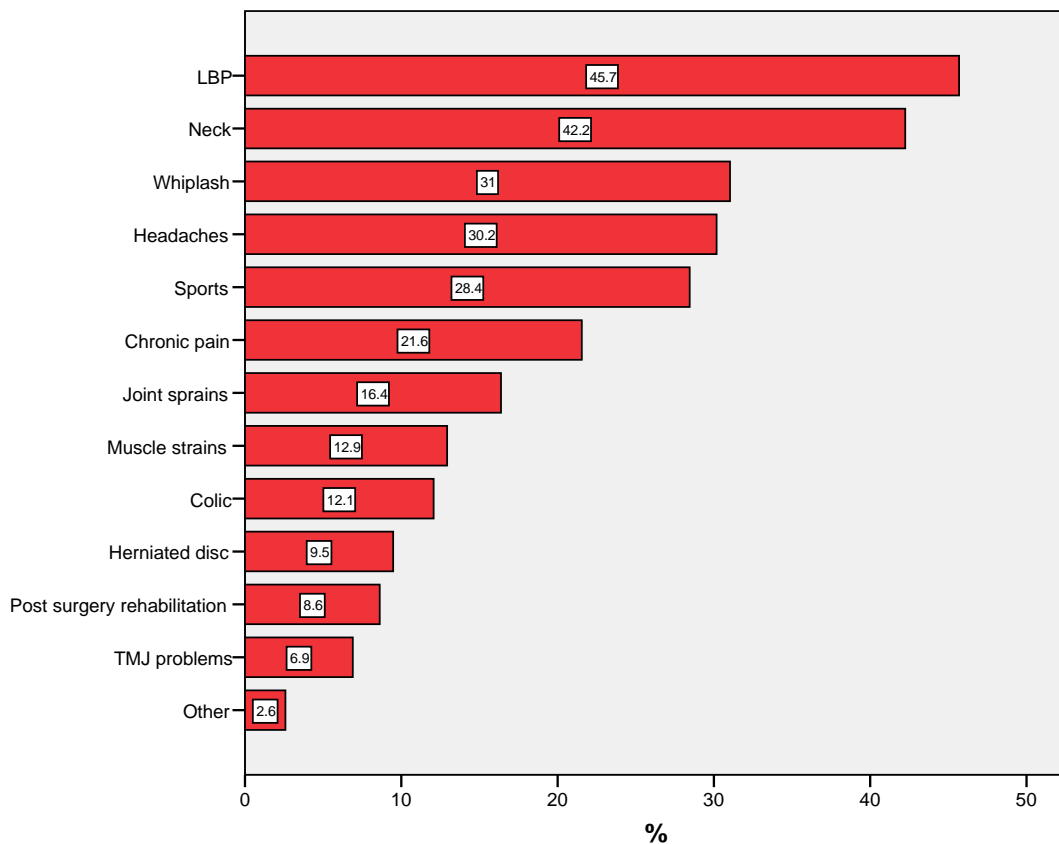


Table 17 shows that scope of practice (81%) and treatment options (75%) were most commonly referred to by pharmacists, as the aspects of chiropractic that they wanted to know more about.

Table 17: Responses to aspects of chiropractic that pharmacists would like to know more about.

	no		yes	
	Count	%	Count	%
Scope of practice	22	19.0%	94	81.0%
Prescribing medicine	71	61.2%	45	38.8%
Treatment options	29	25.0%	87	75.0%
Malpractice insurance	101	87.1%	15	12.9%
Years studied	90	77.6%	26	22.4%
Subjects studied	84	72.4%	32	27.6%
Terminology	67	57.8%	49	42.2%
Education	90	77.6%	26	22.4%
Understanding and application of pharmacology	70	60.3%	46	39.7%
Other	111	95.7%	5	4.3%

4.2.5 Knowledge and perceptions/attitudes, and referral to chiropractors

There was a significant difference in mean knowledge score between those pharmacists who had referred patients to chiropractors and those who had not ($p=0.011$), with the knowledge being higher in those who had referred patients to chiropractors. There was a highly significant difference in perception/attitude score between the two groups ($p<0.001$) with perceptions/attitudes being more positive in those who had referred patients to chiropractors. (Table 18)

Table 18: Comparison of median knowledge and perceptions/attitude scores between pharmacists who have referred patients to chiropractors and those who have not

	Have you ever referred a patient to a chiropractor?		p value
	Yes	No	
	Median	Median	
Knowledge	54	41	0.011
Attitude	74.07	59.26	<0.001

4.2.6 Knowledge, perceptions/attitudes and demographics.

Knowledge and perceptions (attitudes)

There was a statistically significant although weak positive correlation between knowledge score and perception/attitudes score ($\rho = 0.338$, $p=0.003$). This meant that in general as one score increased so did the other. (Table 19)

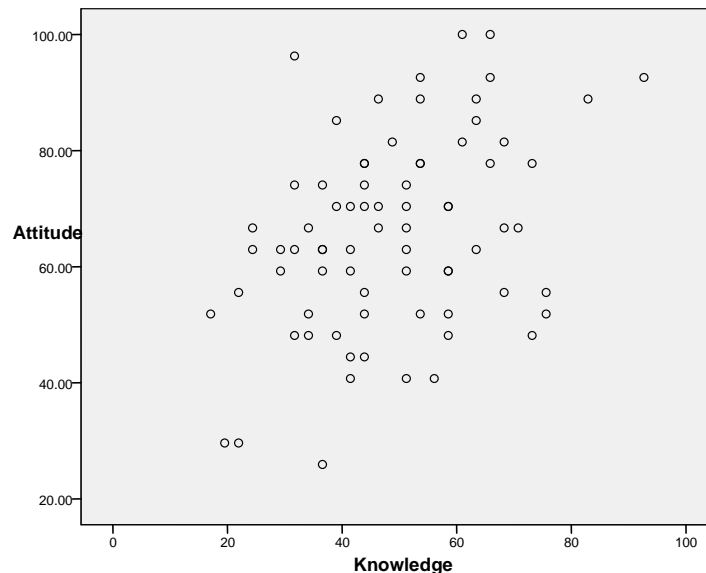
Table 19: Spearman's correlation between knowledge and perceptions scores

			attitude
Spearman's rho	knowledge	Correlation Coefficient	0.338(**)
		Sig. (2-tailed)	0.003
		N	75

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

However, a correlation coefficient this weak would not usually imply statistical importance, as Figure 10 indicates that there is a slight trend towards a straight line relationship between the two variables.

Figure 10: Scatter plot of the relationship between knowledge and perceptions/attitudes scores.



Knowledge and demographics

There was no correlation between age and knowledge ($\rho = -0.010$, $p=0.932$), or between length of time qualified and knowledge ($\rho = 0.070$, $p=0.550$). This is shown in Table 20.

Table 20: Correlation between knowledge, and age and years practicing

			1.2 age	1.3 qualified
Spearman's rho	knowledge	Correlation Coefficient	-0.010	0.070
		Sig. (2-tailed)	0.932	0.550
		N	75	76

There was also no difference in median knowledge score between any of the demographic groups except for those working at a hospital pharmacy who scored lower in terms of knowledge of chiropractic than those who did not work in a hospital pharmacy ($p=0.001$) (Table 21).

Table 21: Comparison of knowledge by demographic group

		knowledge	p
		Median	values
Gender	Male	45	0.392
	Female	50	
City	Cape Town	41	0.229
	Durban	49	
	East London	61	
	Johannesburg	54	
Work in a private pharmacy	no	46	0.161
	yes	60	
Work in a retail pharmacy	no	49	0.470
	yes	46	
Work in a hospital pharmacy	no	51	0.001
	yes	39	
Work in a consultancy pharmacy	no	44	0.063
	yes	59	
Work in a community pharmacy	no	49	0.196
	yes	37	
Work in a other pharmacy	no	45	0.714
	yes	51	
Qualification	Matric	50	0.058
	Degree	34	
	Diploma	28	
	Other	48	
Treated by a chiropractor	yes	49	0.675
	no	46	

Perceptions/attitudes and demographics

There was no correlation between age and perceptions/attitudes ($\rho = 0.100$, $p=0.395$), or between length of time in practice and perceptions/attitudes ($\rho = 0.138$, $p=0.239$). This is shown in Table 22.

Table 22: Correlation between perceptions, and age and years qualified

			1.2 age	1.3 qualified
Spearman's rho	attitude	Correlation Coefficient	0.100	0.138
		Sig. (2-tailed)	0.395	0.239
		N	74	75

The only factor that was significantly associated with perceptions/attitudes towards chiropractic was whether the participant had been treated by a chiropractor ($p=0.019$). Those who had been treated had significantly higher perception/attitude scores than those who had not been treated. (Table 23)

Table 23: Comparison of perceptions/attitude scores by demographic group

		attitude	p value
		Median	
Gender	Male	62.96	0.749
	Female	66.67	
City	Cape Town	62.96	0.857
	Durban	62.96	
	East London	70.37	
	Johannesburg	62.96	
Work in a private pharmacy	no	62.96	0.389
	yes	66.67	
Work in a retail pharmacy	no	66.67	0.278
	yes	62.96	
Work in a hospital pharmacy	no	66.67	0.124
	yes	62.96	
Work in a consultancy pharmacy	no	64.81	0.802
	yes	59.26	
Work in a community pharmacy	no	62.96	0.486
	yes	88.89	
Work in a other pharmacy	no	62.96	0.199
	yes	70.37	
Qualification	Matric	66.67	0.455
	Degree	62.96	
	Diploma	51.85	
	Other	72.22	
Treated	yes	70.37	0.019
	no	61.11	

4.3 Conclusion

Therefore, with respect to the hypotheses made in chapter one the following is applicable:

Hypothesis 1

A negative perception or attitude exists about the chiropractic profession amongst South African pharmacists.

Hypothesis one must be rejected as this study showed that the general level of perceptions/attitudes towards chiropractic was positive amongst pharmacists in South Africa. However, this must be taken with caution due to the low response rate of the study and lack of statistical significance of the results.

Hypothesis 2

A low level of knowledge exists about the chiropractic profession amongst pharmacists in South Africa.

Hypothesis two can be accepted based on evidence presented in the study. However this must be taken with caution due to the low response rate of the study and lack of statistical significance of the results.

CHAPTER FIVE: DISCUSSION OF RESULTS

Chapter 5 is a discussion of the findings presented in chapter 4. Please refer to chapter 4 accordingly.

5.1 Demographics

The majority of respondents were female, similar results were found In Dutta's (2003) study on American pharmacy students. The greatest population of pharmacists worked in retail and the next most common setting was in a hospital. Very similar results were found in Rowell and Krolls, (1998) study on recently qualified pharmacists.

5.2 Pharmacists knowledge and understanding of chiropractic

The majority of the respondents received their information through being treated by a chiropractor or through personal contact with a chiropractor and thus had the opportunity of gaining first hand experience of what chiropractic treatment is about. We can assume that many of the non-responders had never been treated by a chiropractor or had no contact with a chiropractor. The results of this study suggests that reponsesents who have been treated by a chiropractor, have significantly better perceptions/attitudes towards chiropractic then those who have not.

A small group of participants gained their knowledge about chiropractic by reading scientific journals. Langworthy and Smink (2000) suggested that one way to increase awareness between professions would be through the use of journals. Chiropractic research is more often being published in multidisciplinary publications, resulting in a possible gain in knowledge by pharmacists who read more broadly.

The majority of pharmacists were not well informed about chiropractic in SA.

Similar results were found in Louw's (2005) study where G.Ps were also found to have a low knowledge about chiropractic. It can be assumed that the general public who have minimal contact with health professionals, may have even lower knowledge scores, it is imperative that the chiropractic profession holds awareness and educational drives to properly inform the public.

It was found that pharmacists working within a hospital had lower knowledge scores. This could be due to the fact that chiropractic has not been widely accepted in South African hospitals. It would therefore be beneficial for chiropractors in South Africa, to strive to become more recognised and accepted by hospitals.

South African pharmacists do not feel adequately informed about chiropractic and the vast majority would like to know more about the profession. Scope of practice and treatment options were most commonly referred to by pharmacists as the aspects of chiropractic that they wanted to know more about. This gives some idea of what issues need to be addressed, which may enhance further ties between the professions.

5.3 Perceptions and attitudes of pharmacists towards the chiropractic profession

The median perception/attitude score was 66.7%, thus the majority of pharmacists perceptions/attitudes towards chiropractic were positive.

5.3.1 The role of chiropractic in the South African Health Care System

The views of chiropractic in the sample were positive and relatively few respondents had negative perceptions/attitudes towards chiropractic, however there still remains a low level of knowledge amongst these respondents.

Pharmacists with a positive perception/attitude towards chiropractic may be more

willing to increase their education and awareness about it. However there is still some confusion as to the exact role of chiropractic in the Health Care system.

The precise role of chiropractic in health care continues to be disputed (Jamison, 1995). In recent years, it has largely been the impression of government, private industry policymakers, many health care professions, the general public, and some within the chiropractic profession itself that chiropractic practice is not primary care and should be utilized for the treatment of neuro-musculoskeletal or musculoskeletal conditions only (Duenas, Carucci, Funk and Gurney, 2003). Further studies should be conducted to ascertain how chiropractors in South Africa perceive themselves and what role in the health care system they feel they should be filling.

This trend was demonstrated by asking pharmacists to rate, on a scale of 1 to 5, twelve professions in terms of their importance in serving in a primary health care capacity in South Africa. The median rating of chiropractic by pharmacists in SA in the health care system is similar to that of G.P's (Louw, 2005) and neurologists, neurosurgeons and orthopaedic surgeons (Rubens, 1996) who all placed chiropractic higher than, Ayurvedic medicine and Chinese medicine, but lower than physiotherapy and the more traditional medical professions. It is important that South African chiropractors ensure that the role they perceive themselves to be playing in the health care system is the same as that which other professions view them to be filling.

“Physiotherapy and chiropractic are both health care professions that specialize in the treatment of disorders pertaining to the neuro-musculo-skeletal system” (Hunter 2004). The majority of respondents (86.1%) thought that there was sufficient difference between chiropractic and physiotherapy to warrant separate professions. GP's were more comfortable referring to physiotherapists because they had a greater understanding of the treatment involved (Breen, Carrington, Collier and Vogel, 2000). Physiotherapists seem to enjoy more favour than

chiropractors for the treatment of musculoskeletal conditions. One of the reasons may be the fact that GP's are aware of their scope of practice and not sufficiently informed about chiropractic (Louw, 2005).

5.3.2 The scope of practice of chiropractors

South African pharmacists thought that chiropractors were competent in the general medical management of patients. However Louw (2005) found the majority of GP's considered chiropractors incompetent in general medical management of patients. The small majority of respondents felt that chiropractic was an alternative health care service which was quite different to Hunters (2004) results in which the large majority of South African physiotherapists believed chiropractic to be an alternative health care service. The large majority of respondents felt that chiropractic should be recognized by law which is in contrast to Hunter's (2004) study in which only a small percentage of South African physiotherapists felt the same. These results tend to show a large inconsistency in the way the various health professions view chiropractic or alternatively that the views of chiropractic have become more positive over the last few years as it has become more accepted by the public and other health professions. Follow up studies should be done to determine whether the views of certain health professionals are in fact changing over time.

5.4 Communication between pharmacist's and chiropractors

Almost all the participants believed that communication with health care providers was essential; GP's were the most common health care provider with which pharmacists communicate with, followed by dentists and physiotherapists. Only a small percentage of pharmacists had communicated with chiropractors previously. When dealing with patients with musculo- skeletal conditions, pharmacists were most likely to refer them to physiotherapists, then GP's and then chiropractors. This shows that there may be a barrier in communication between the professions in South Africa at present. Emphasizing that greater co-operation and communication seems to be occurring between GP's, pharmacists

and physiotherapists. One of the reasons may be the fact that pharmacists are aware of their scope of practice and not sufficiently informed about chiropractic. This indicates that there is a need for other professions (especially pharmacists) to be more educated about chiropractic. Further research should be conducted on why communication is better between certain professionals, as this may provide suggestions on how chiropractors can improve communication with other health professionals.

The majority of pharmacists get asked occasionally or often for advice on treatment options other than medication. This shows the need for pharmacists to have the knowledge to be able to adequately inform the public, should they ask for it. There is a large discrepancy here, as over 80% of the respondents believe that it is important to inform patients on the other treatment options available to them, but do not have enough knowledge to inform them adequately. With so many sources of information available, it may be assumed that the respondents do not know where to obtain adequate, trustworthy and reliable information. Chiropractors should accept the responsibility of making this information readily available to anyone who requires it.

Less than half the respondents had ever referred a patient to a chiropractor this result was very similar to that found by G.Ps (Louw 2005). LBP followed closely be neck problems were the most common condition for which pharmacists would refer patients to chiropractors, emphasizing the fact, that a large proportion of respondents perceive chiropractors to be back specialists. "Chiropractic would be wise to improve public awareness by expounding upon what conditions it can treat. Gaps in the public knowledge have translated into non-utilization. This follows that the more unclear the respondents' understanding of the professions' scope of treatment, the more likely they are not to identify a condition as one that can be treated by chiropractic" (Sanchez, 1991).

5.5 Limitations of the study

The number of pharmacists sampled in this study was 28.8% of the population in the four metropolitan areas (1350 out of 4694 pharmacists). These results cannot be assumed to be representative and should not be extrapolated to the whole population of pharmacists in South Africa. A study of non-responders to the questionnaire was not performed. We can assume that many of the non-responders had no working relationship with a chiropractor. It is equally possible that a great number of non-responders were not interested in working with chiropractors. Possible sampling bias cannot be ruled out.

The questionnaire was of medium length in order to obtain greater insight into the pharmacist's perceptions. However, pharmacists are busy professionals with limited time, and a slightly shorter questionnaire might have yielded a better response.

The response rate of 8.72% to the mailed questionnaires is quite low. According to Russel, et al. (2004), response rates to mail surveys vary depending on the nature of the population studied and there is evidence that response rates to surveys have declined over time.

A recent review found that response rates were lower in surveys if the surveys were anonymous (Russel, et al. 2004). However, due to ethical reasons the respondents in this study remained anonymous. If the topic and questions were sensitive, the survey could have been associated with a lower response rate. Surveys that used advance notices had higher response rates than those that did not use advance notices. According to Russel, et al. (2004), the key to obtaining good response rates is sound methodology including: the use of personalized questionnaires and letters, advance notices, follow-up contact and the sending of additional questionnaires to non-respondents.

In the design of this study, one mailed contact between the researcher and the population was allowed and a reminder email. The reminder email was sent to all those pharmacists on the register who had supplied an email address, however this was not effective, as only 796 respondents had email addresses and a large proportion of the emails were not delivered due to various reasons.

If an advance notice was sent to the sample group, followed by the questionnaire, the response rate would have been higher according to the study by Russel, et al. (2004). Follow-up sending of additional questionnaires would have increased the response rate even further. A telephonic reminder was another option used in previous studies to remind non-responders (Brussee, et al. 2001); however the telephone numbers were not available for this study. Due to the anonymity of this study, there was no opportunity to follow-up on non-respondents.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusions

The main conclusions that can be drawn from this study are as follows:

1. In general, respondents felt inadequately informed about chiropractic. South African pharmacists do not feel as if they know enough about chiropractic and the vast majority of them would like to know more about the profession.
2. The respondent's views of chiropractic were mostly positive. With the majority of respondents perceiving chiropractors to be specialists in the field of nerve, muscle and bone disorders, including the treatment of the spine and extremities.
3. The majority of respondents viewed chiropractic as an alternative health care profession and not a primary health care profession, which chiropractors tend to see themselves as. This again emphasizes a non-congruence of what chiropractors perceive themselves to be and what pharmacists perceive chiropractors to be.
4. Less than half the respondents had ever referred a patient to a chiropractor, those who had, most often referred for low back pain followed by neck problems. Emphasizing the fact, that there is a lack of awareness amongst a large proportion of respondents who perceive chiropractors to be back specialists.
5. Almost all the respondents felt that communication with other health care providers was essential, however only a very small proportion of the respondents had ever communicated with a chiropractor. Indicating that

there may be barriers to communication, between these professions at present.

6. The majority of respondents revealed that patients occasionally (41.1%) or often (32.7%), asked for their advice on treatment options available to them other than medication. All respondents thought it was important to be able to inform these patients on the other available treatment options, but only 18.6% knew enough to adequately inform them about chiropractic.
7. There was a significant difference in mean knowledge score between those pharmacists who had referred patients to chiropractors and those who had not. With the knowledge being higher in those who had referred patients to chiropractors. There was a highly significant difference in perception/attitude score between the two groups, with perceptions/attitudes being more positive in those who had referred patients to chiropractors. This study suggests that pharmacists who communicate or refer patients to chiropractors tend to have a higher degree of knowledge, and a better attitude towards chiropractic. This indicates that a pharmacist who understands chiropractic treatment and the usefulness thereof for selected conditions, would be more likely to refer patients to chiropractors than a pharmacist whose knowledge or perceptions/attitudes are low.
8. Participants who had been treated by chiropractors had significantly higher perception/attitude scores than those who had not been treated.
9. There was also no difference in median knowledge score or attitude score between any of the demographic groups except for those working at a hospital pharmacy who scored lower in terms of knowledge of chiropractic than those who did not work in a hospital pharmacy.

This study provides useful information which could influence future referral and communication between pharmacists and chiropractors in the South African health care system. This study has shed light on interprofessional knowledge and perceptions/attitudes being very important in interprofessional communication.

6.2 The following recommendations can be made from the study:

1. Pharmacists in South Africa need to be informed about the chiropractic profession, especially that pertaining to scope of practice and treatment techniques commonly used by chiropractors, as well as many other areas, if there is to be a better understanding, co-operation and communication between the two professions. Although chiropractic is considered to be a viable means of treating certain disorders, there is still much confusion about the exact role of chiropractic in the health care system.
2. Further studies need to be conducted, into how better communication and co-operation between chiropractors and pharmacists can be reached, now that it has been discovered that it is poor and that improvement in this area will be beneficial to both professions as well as their patients.
3. The small sample size was a limitation to showing statistical significance in the hypotheses tested. The demonstration of trends suggests that this study should be repeated in a larger more representative sample. There are always other factors that must be considered in studies such as this that can skew the data collected, for example respondents who took the time to respond, all may have done so because of a personal interest in the topic at hand, and the fact that they had already formulated an opinion on the topic. This may have led to a respondent bias and therefore a truer

reflection would have been achieved if the response rate had been greater.

4. The response rate to the mailed survey was low. It may be useful to change the design slightly, in order to get an improved response rate. Mailed questionnaires should focus on pertinent questions and be as short as possible. These questionnaires should not be anonymous, as this decreases the response rate. Sensitive or controversial issues should be avoided if possible.
5. If at all possible, numerous contacts between the researcher and the participants must take place. This can be done by sending an advance letter introducing the study. After an initial 2-3 week period, reminder questionnaires should be sent to the non-respondents. Another set of reminders can be sent 3 weeks later. A telephone call can be made to the non-responders as a final ploy to increase the response rate.
6. Intervention programmes to educate and increase awareness of chiropractic amongst pharmacists should take place. This could include incorporating introductory courses on alternative health care into the current pharmacy curricula in South African pharmacy schools, to expose students to viable referral options. Other options include exposing pharmacists to lectures and presentations by chiropractors and by publishing chiropractic related articles, in pharmacy journals. More articles should also be published in magazines, newspapers and medical journals, as these are sources of information to a wide variety of people.

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Appendix A
COVER LETTER

Dear Participant

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

A Study to determine the perceptions, attitudes and knowledge of selected South African pharmacists on the chiropractic profession.

Name of researcher: David Palmer (083 6579345 or 031-572 6189)

Name of supervisor: Dr Brian Kruger M.Tech Chiro, C.C.S.P

Home (031-564 9091) Cell (082 5300 695)

Name of Institution: Durban University of Technology

Introduction:

The health care delivery system in South Africa is constantly undergoing change, and one of the important issues to be addressed, is the seeming lack of inter professional co-operation. The inter-professional relationships between chiropractic and other relevant health care practitioners should be explored because the legitimacy and status of chiropractic is greatly dependent upon its acceptance by, and collaboration with, other health professions.

The chiropractic profession is attempting to improve co-operation with the medical professions via the scientific validation of its theories and practice through research. However, at present very little quantifiable information on the pharmacists perceptions and attitude towards Chiropractic exists.

Procedure:

You are requested to complete a questionnaire. The questions will be concerned with your views of chiropractic utilisation as well as its therapeutic efficacy and inter-professional relations.

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 possible, all the questions can be answered by marking the appropriate box or boxes with a cross, or circling a number. Please return the questionnaire in the stamped envelope included for your convenience.

You would 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 Institute of Technology library.

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

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

Appendix B
QUESTIONNAIRE

Dear Sir/Madam
This should not take more than 10 minutes
Please answer all questions honestly and to the best of your ability
You will remain anonymous throughout
Thank you for your time!

Please cross the relevant box, or fill in the necessary information.

1. Personal Information

1.1 Gender:

- Male Female

1.2 Age: _____ years

1.3 How many years have you been qualified as a Pharmacist? _____ years

1.4 In which city do you work as a pharmacist?

- Cape Town Durban
 East London JHB

1.5 In which type of pharmacy do you work?

- Private Retail
 Hospital Consultancy
 Community

1.6 What qualifications did you have before starting your course in pharmacy?

- Matric Degree
 Diploma Medical Degree
 Other: Please Specify

1.7 Have you ever been treated by a chiropractor?

- Yes No

2. General Knowledge about Chiropractic

2.1 Have you any knowledge of chiropractic?

- Yes No (If no continue to question 5.1)

2.2 If you answered "YES" to 2.1 above, how did you get this information? (More than one answer possible)

- I have been treated by a chiropractor
 From other G.P's, specialists, physiotherapists etc
 Through scientific publications
 Media (radio, television, newspapers)
 Personal contact with a chiropractor
 Other: (Please specify).....

2.3 Is chiropractic recognised by law in South Africa?

- Yes No
 Don't know

2.4 Is chiropractic covered by medical aid in South Africa?

- Totally Partially
 No Don't know

2.5 Is the chiropractic profession, in South Africa, regulated by a statutory body?

- Yes No
 Don't know

2.6 How long has chiropractic existed as a profession in South Africa?

- <10 years >100 years
 11-50 years Don't know
 51-100 years

2.7 How long do you think it takes to train as a chiropractor in South Africa?

- <1 year 4 years
 2 years 5 years
 3 years Don't know

2.8 Which of the following subjects do you think are included in the chiropractic curriculum? (Please cross the appropriate boxes)

- | | |
|--------------------------------------|---------------------------------------|
| <input type="checkbox"/> Anatomy | <input type="checkbox"/> Chemistry |
| <input type="checkbox"/> Diagnostics | <input type="checkbox"/> Microbiology |
| <input type="checkbox"/> Pathology | <input type="checkbox"/> Pharmacology |
| <input type="checkbox"/> Physics | <input type="checkbox"/> Physiology |
| <input type="checkbox"/> Psychiatry | <input type="checkbox"/> Radiology |

2.9 What qualification does the chiropractic course in South Africa lead to?

- Diploma
- Masters degree
- Other: (please specify).....
- Bachelor's degree
- PhD

2.10 Do you know what a chiropractic adjustment/manipulation is?

- Yes
- No
- Not sure

3. The role of chiropractic in the health care system of South Africa

3.1 Which of the following statements best reflects your view of Chiropractic? (Please cross one box only)

- Not informed enough to comment
- Chiropractic does more harm than good
- I am uncomfortable with it
- It may be effective for some patients
- Chiropractic is effective for back conditions only
- Chiropractic is effective for some neuromusculoskeletal conditions
- Chiropractors are specialists in the field of nerve, muscle and bone disorders, including treatment of the spine and extremities (e.g. Wrist, knee, etc)

3.2 To what extent should chiropractic be integrated into the South African health care system?

- Great extent
- Slight extent
- Moderate extent
- No active role

3.3 Please rate each of the following professions in terms of their importance in serving a primary health care capacity. (Please cross a number for each profession, with (1) indicating least important and (5) indicating most important)

<input type="checkbox"/> Acupuncture	1	2	3	4	5
<input type="checkbox"/> Ayurvedic Medicine	1	2	3	4	5
<input type="checkbox"/> Chinese medicine	1	2	3	4	5
<input type="checkbox"/> Chiropractic	1	2	3	4	5
<input type="checkbox"/> Dentistry	1	2	3	4	5
<input type="checkbox"/> Homeopathy	1	2	3	4	5
<input type="checkbox"/> Medicine	1	2	3	4	5
<input type="checkbox"/> Nursing	1	2	3	4	5
<input type="checkbox"/> Optometry	1	2	3	4	5
<input type="checkbox"/> Physiotherapy	1	2	3	4	5
<input type="checkbox"/> Pharmacy	1	2	3	4	5
<input type="checkbox"/> Traditional Healing	1	2	3	4	5

3.4 Do you believe that there is sufficient difference between chiropractic and Physiotherapy to warrant two separate professions?

- Yes No

3.5 How well do you think the chiropractic profession is promoted in South Africa?

- Not at all Too much
 Not enough Don't know
 Enough

4. Scope of practice of chiropractic

4.1 To what extent do you believe chiropractors to be competent in neuromuscular examination and diagnosis? (Please cross one box only)

- Very competent Moderately competent
 Competent Incompetent
 Very incompetent

4.2 To what extent do you believe chiropractors to be competent in general medical management of patients? (Definition of general medical management: The ability to diagnose, treat or refer the patient for optimum patient benefit.)

- Very competent Moderately competent
 Competent Incompetent
 Very incompetent

4.3 What kind of procedures would you expect a chiropractor to perform in his/her assessment of a patient? (more than one answer possible)

- Vital signs (Heart rate, blood pressure, respiratory rate, temperature)
 Cardiovascular examination Respiratory examination
 Abdominal examination Neurological examination
 Orthopaedic examination Genito–Urinary examination
 Radiological Examination Medical history

4.4 Which techniques/modalities do you expect a chiropractor to be able to use in his/her treatment of a patient? (more than one answer possible)

- Manipulation/Adjustment of the spine Ultraviolet light therapy
 Manipulation/Adjustment of the extremities Traction
 Mobilisation Massage
 Stretching Ultrasound
 Electrotherapy (IFC, TENS) Cold therapy/ ice packs
 Heat therapy/ heat packs Dry needling
 Acupuncture Laser
 Dietary advice Ergonomic advice

4.5 How do you perceive the chiropractic profession?

I think chiropractic is:

- 4.5.1 A primary health care service A secondary health care service
 An alternative health care service
- 4.5.2 Should be part of the medical aid
 Should not be part of the medical aid
- 4.5.3 Is accessible to everyone Is not accessible to everyone
 Should be accessible to everyone
- 4.5.4 Affordable The right cost
 Too expensive
- 4.5.5 Lacking scientific background Not needed in South Africa
 None of the above
- 4.5.6 Should be recognised by law Should not be recognised by law
 No opinion

5. Communication

5.1 Do you believe that good communication between pharmacists and other health care providers is important?

- Yes No

5.2 Have you ever communicated with other health care providers to ensure maximum benefit for a patient?

- Yes No

5.3 If you answered yes to question 5.2 above, which of the following health care providers have you communicated with? (Please cross appropriate boxes)

- | | |
|--|--|
| <input type="checkbox"/> G.P | <input type="checkbox"/> Homeopath |
| <input type="checkbox"/> Physiotherapist | <input type="checkbox"/> Orthopaedic surgeon |
| <input type="checkbox"/> Neurosurgeon | <input type="checkbox"/> Optometrist |
| <input type="checkbox"/> Radiologist | <input type="checkbox"/> Dentist |
| <input type="checkbox"/> Chiropractor | <input type="checkbox"/> Traditional Healers |
| <input type="checkbox"/> Other (Please specify)..... | |

5.4 Should a patient present to you with a musculoskeletal condition who has contra – indications to required medication, who would you refer him/her to?

- | | |
|---|--|
| <input type="checkbox"/> G.P | <input type="checkbox"/> Homeopath |
| <input type="checkbox"/> Physiotherapist | <input type="checkbox"/> Orthopaedic surgeon |
| <input type="checkbox"/> Neurosurgeon | <input type="checkbox"/> Chiropractor |
| <input type="checkbox"/> Bio – kineticist | |
| <input type="checkbox"/> Other (Please specify) | |

5.5 Which of the following specialists do you think chiropractors refer to? (Please cross appropriate boxes)

- | | |
|--|--|
| <input type="checkbox"/> Neurologist | <input type="checkbox"/> Neurosurgeon |
| <input type="checkbox"/> Orthopaedic surgeon | <input type="checkbox"/> Gynaecologist |
| <input type="checkbox"/> Radiologist | <input type="checkbox"/> Obstetrician |
| <input type="checkbox"/> Proctologist | <input type="checkbox"/> Urologist |

5.6 How often do patients ask you for advice on the treatment options available to them, other than medication?

- | | |
|---------------------------------------|---------------------------------|
| <input type="checkbox"/> Never | <input type="checkbox"/> Seldom |
| <input type="checkbox"/> Occasionally | <input type="checkbox"/> Often |
| <input type="checkbox"/> All the time | |

5.7 Do you believe it is important to be able to inform these patients on the other treatment options available to them?

- | | |
|------------------------------|-----------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|------------------------------|-----------------------------|

5.8 Should a patient ask you for advice regarding chiropractic, do you feel you know enough to adequately inform them on the subject?

- | | |
|------------------------------|-----------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|------------------------------|-----------------------------|

5.9 Have you ever recommended/referred a patient to a chiropractor?

- | | |
|------------------------------|-----------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|------------------------------|-----------------------------|

5.10 If you answered yes for question 5.9 above, for which of the following conditions would you recommended/refer a patient to a chiropractor? (Please cross the appropriate boxes)

- | | |
|--|--|
| <input type="checkbox"/> Low back pain | <input type="checkbox"/> Neck and shoulder pain |
| <input type="checkbox"/> Headaches | <input type="checkbox"/> Sports Injury |
| <input type="checkbox"/> Whiplash | <input type="checkbox"/> Muscle strains |
| <input type="checkbox"/> Temporomandibular joint problems | <input type="checkbox"/> Joint/ligament sprains |
| <input type="checkbox"/> Chronic pain problems | <input type="checkbox"/> Herniated disc |
| <input type="checkbox"/> Post orthopaedic surgery rehabilitation | <input type="checkbox"/> Colic (paediatric patients) |
| <input type="checkbox"/> Other (please specify)..... | |

5.11 Do you feel adequately informed about chiropractic?

- Yes No

5.12 Would you like to know more about the chiropractic profession?

- Yes No

5.13 If you answered yes to 5.12 above, what would you like to know about chiropractic in order to gain a better understanding of the profession?

- | | |
|--|--|
| <input type="checkbox"/> Scope of practice | <input type="checkbox"/> Prescribing medicine |
| <input type="checkbox"/> Treatment options | <input type="checkbox"/> Malpractice Insurance |
| <input type="checkbox"/> Years studied | <input type="checkbox"/> Subjects studied |
| <input type="checkbox"/> Chiropractic terminology | <input type="checkbox"/> Education |
| <input type="checkbox"/> Understanding and application of pharmacology | |
| <input type="checkbox"/> Other (Please specify)..... | |

**Thank you so much for taking the time to complete this questionnaire!
Please return this questionnaire in the enclosed stamped envelope**

Appendix C
POST FOCUS GROUP PILOT STUDY

- 1 What is your opinion of the subject presented in this questionnaire?
(Please mark the most appropriate box)
- | | | |
|-----|-----------------------|--------------------------|
| 1.1 | Extremely interesting | <input type="checkbox"/> |
| 1.2 | Interesting | <input type="checkbox"/> |
| 1.3 | Average | <input type="checkbox"/> |
| 1.4 | Boring | <input type="checkbox"/> |
| 1.5 | Very boring | <input type="checkbox"/> |
- 2 Do you think the topics raised in this questionnaire were adequately covered?
- | | | |
|-----|-----|--------------------------|
| 2.1 | Yes | <input type="checkbox"/> |
| 2.2 | No | <input type="checkbox"/> |
- 3 What is your opinion about the covering letter?
(Please mark one box only)
- | | | |
|-----|----------------|--------------------------|
| 3.1 | Very clear | <input type="checkbox"/> |
| 3.2 | Clear | <input type="checkbox"/> |
| 3.3 | Adequate | <input type="checkbox"/> |
| 3.4 | Unclear | <input type="checkbox"/> |
| 3.5 | Needs revising | <input type="checkbox"/> |
- 4 How would you describe the instructions accompanying each of the questions?
(Please mark one box only)
- | | | |
|-----|----------------|--------------------------|
| 4.1 | Very clear | <input type="checkbox"/> |
| 4.2 | Clear | <input type="checkbox"/> |
| 4.3 | Adequate | <input type="checkbox"/> |
| 4.4 | Unclear | <input type="checkbox"/> |
| 4.5 | Needs revising | <input type="checkbox"/> |
- 5 Do you think the questionnaire is too long?
- | | | |
|-----|-----|--------------------------|
| 5.1 | Yes | <input type="checkbox"/> |
| 5.2 | No | <input type="checkbox"/> |
- 6 What is your opinion of the wording of the questionnaire?
(Please mark the appropriate box/es)
- | | | |
|-----|---|--------------------------|
| 6.1 | The meaning of all questions is absolutely clear | <input type="checkbox"/> |
| 6.2 | The meaning of most questions is clear | <input type="checkbox"/> |
| 6.3 | There is too much chiropractic/ medical jargon | <input type="checkbox"/> |
| 6.4 | The questions will not be understood by lay persons | <input type="checkbox"/> |
| 6.5 | The questionnaire needs to be revised because it is unclear | <input type="checkbox"/> |

If you had any difficulty answering any question/s, please write the number/s of the question/s in the space below with a suggestion on how the question/s can be improved?

Thank you for your most valuable time in helping me with my research project. Please be reminded that the topics discussed above are strictly confidential.

Appendix D
LETTER OF INFORMATION (Focus Group)

Dear Sir/Madam,

I am a student currently pursuing a qualification at the Durban University of Technology. I would like to welcome you into the focus group of my study

Study Title:

A Study to determine the perceptions, attitudes and knowledge of selected South African pharmacists on the chiropractic profession.

Background to study:

The health care system in South Africa is undergoing changes at present. Some of the important issues under the spotlight at the moment include a shortage of resources, the high costs of health care, and a lack of interprofessional cooperation.

At present, very little quantifiable evidence on the pharmacist's perceptions of and attitudes towards the chiropractic profession exists, and as yet, no studies have been done in South Africa.

It is therefore my intention to determine the current perceptions and attitudes of South African pharmacists on the chiropractic profession.

Objective of Study:

This research aims to establish the pharmacist's knowledge of chiropractic, their views on the role of chiropractic within the health care system, as well as their perceptions of, and attitudes towards chiropractic. The data obtained from the questionnaire will also assess the interprofessional relationship between chiropractors and pharmacists in the South African health care system. The questionnaire will only take a few minutes to complete, as most of the questions require you to tick or cross the appropriate answer. There are only a few short written responses that are required.

Confidentiality:

As with all surveys, the information you furnish will be treated in the utmost confidence. Please return the questionnaire in the stamped addressed envelope included for your convenience. As with all surveys, the information, which you furnish, will be treated in the utmost confidence. A neutral party (Faculty of Health Officer) at the Durban University of Technology will receive the questionnaire and code them before returning them to the researcher. Thus the researcher will never have access to the identities of the recipients. You are free to withdraw from the study at any stage.

Your time, opinion, and assistance with this project is invaluable and greatly appreciated.

Yours sincerely,

.....
David Palmer
Research Student

.....
Dr. Brian Kruger
Supervisor

Appendix E
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 to determine the perceptions, attitudes and knowledge of selected South African pharmacists on the chiropractic profession.

NAME OF SUPERVISOR:

Dr Brian Kruger M.Tech Chiro, C.C.S.P (082 5300 695)

NAME OF RESEARCH STUDENT:

David Palmer (0836579345 / 031 5726189)

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: _____

CONFIDENTIALITY STATEMENT – FOCUS GROUP

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.

DECLARATION

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 organization 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.

Please print in block letters:

Focus Group Member: _____ Signature: _____

Witness Name: _____ Signature: _____

Researchers Name: _____ Signature: _____

Supervisors Name: _____ Signature: _____

Appendix G

CODE OF CONDUCT

This form needs to be completed by every member of the Focus Group before 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 organization outside of this specific focus group as to the decisions of this focus group.
3. The information from this focus group will be made public in terms of a journal publication, which will in no way identify any participants of this research.

Member represents	Member's Name	Signature	Contact Details

Appendix H
RESPONSES TO INDIVIDUAL KNOWLEDGE QUESTIONS

2.3 Is chiropractic recognised by law in South Africa?

	Count	%
Yes	64	84.2%
No	1	1.3%
Don't know	11	14.5%

The majority of respondents knew that Chiropractic was recognized by law in South Africa (84.2%)

2.4 Is chiropractic covered by medical aid in South Africa?

	Count	%
Totally	10	13.2%
Partially	45	59.2%
No	2	2.6%
Don't know	19	25.0%

More than half the respondents (59.2%) thought that chiropractic was partially covered by medical aid in South Africa, and only 2.6% thought that it was not covered at all.

2.5 Is the chiropractic profession, in South Africa, regulated by a statutory body?

	Count	%
Yes	58	76.3%
No	1	1.3%
Don't know	17	22.4%

The majority of pharmacists were well informed that chiropractic is regulated by a statutory body in South Africa (76.3%) and only (1.3%) thought it was not.

2.6 How long has chiropractic existed as a profession in South Africa?

	Count	%
<10 years	2	2.6%
11-50 years	27	35.5%
51-100 years	10	13.2%
>100 years	4	5.3%
Don't know	33	43.4%

Just under half of the respondents did not know how long the chiropractic profession has existed in South Africa, (43.4%) and (35.5%) thought that it has existed between 11-50 years

2.7 How long do you think it takes to train as a chiropractor in South Africa?

	Count	%
<1 year	0	.0%
2 years	0	.0%
3 years	5	6.6%
4 years	24	31.6%
5 years	34	44.7%
Don't know	13	17.1%

The majority of respondents thought the chiropractic course was 5 years in duration (44.7%) and only a small minority thought it was 3 years or less (6.6%)

2.8 Which of the following subjects do you think are included in the chiropractic curriculum? (Please cross the appropriate boxes)

	NO		YES	
	Count	%	Count	%
2.8 Anatomy	41	35.3%	75	64.7%
2.8 Chemistry	88	75.9%	28	24.1%
2.8 Diagnostics	65	56.0%	51	44.0%
2.8 Microbiology	96	82.8%	20	17.2%
2.8 Pathology	74	63.8%	42	36.2%
2.8 Pharmacology	85	73.3%	31	26.7%
2.8 Physics	72	62.1%	44	37.9%
2.8 Physiology	44	37.9%	72	62.1%
2.8 Psychiatry	107	92.2%	9	7.8%
2.8 Radiology	72	62.1%	44	37.9%

The majority of respondents knew that anatomy and physiology were part of the chiropractic curriculum, 64.7% and 62.1% respectively. However the majority of respondents thought that microbiology (82.8%), chemistry (75.9%) and pharmacology (73.3%) were not part of the curriculum.

2.9 What qualification does the chiropractic course in South Africa lead to?

	Count	%
Diploma	28	40.6%
Bachelor's degree	20	29.0%
Masters degree	11	15.9%
PhD	10	14.5%
Other	0	.0%

Only 15.9% of respondents knew that a Master degree was the qualification with which a chiropractor qualifies. Most thought it was a diploma 40.6%

2.10 Do you know what a chiropractic adjustment/manipulation is?

	Count	%
Yes	48	64.0%
No	5	6.7%
Not Sure	22	29.3%

The majority of respondents knew what a chiropractic adjustment/manipulation was (64%), this could be due to the fact that the majority of pharmacists received their information about chiropractic, by being treated by a chiropractor. 29.3% were unsure, and only 6.7% did not know what a chiropractic adjustment/manipulation was.

4.3 What kind of procedures would you expect a chiropractor to perform in his/her assessment of a patient? (more than one answer possible)

	NO		YES	
	Count	Row N %	Count	Row N %
4.3 Vital Signs	80	69.0%	36	31.0%
4.3 Cardiovascular	109	94.0%	7	6.0%
4.3 Respiratory	105	90.5%	11	9.5%
4.3 Abdominal	108	93.1%	8	6.9%
4.3 Neurological	77	66.4%	39	33.6%
4.3 Orthopedic	50	43.1%	66	56.9%
4.3 Genitourinary	113	97.4%	3	2.6%
4.3 Radiological	70	60.3%	46	39.7%
4.3 Medical History	55	47.4%	61	52.6%

A small majority of pharmacists knew that chiropractors perform orthopaedic examinations in practice (56.9%) and also take medical histories (52.6%). The vast majority of pharmacists however, did not know that chiropractors perform genitor-urinary (2.6%), cardiovascular (6.0%), abdominal (6.9%) and respiratory (9.5%) examinations in practice.

4.4 Which techniques/modalities do you expect a chiropractor to be able to use in his/her treatment of a patient? (more than one answer possible)

	NO		YES	
	Count	Row N %	Count	Row N %
4.4 Manipulation Spine	44	37.9%	72	62.1%
4.4 U.V	96	82.8%	20	17.2%
4.4 Manipulation Extremity	49	42.2%	67	57.8%
4.4 Traction	72	62.1%	44	37.9%
4.4 Mobilization	55	47.4%	61	52.6%
4.4 Massage	68	58.6%	48	41.4%
4.4 Stretching	54	46.6%	62	53.4%
4.4 Ultrasound	90	77.6%	26	22.4%
4.4 Electrotherapy	93	80.2%	23	19.8%
4.4 Cold Therapy	81	69.8%	35	30.2%
4.4 Heat Therapy	80	69.0%	36	31.0%
4.4 Dry Needling	103	88.8%	13	11.2%
4.4 Acupuncture	96	82.8%	20	17.2%
4.4 Laser	109	94.0%	7	6.0%
4.4 Dietary	92	79.3%	24	20.7%
4.4 Ergonomic	82	70.7%	34	29.3%

The small majority of pharmacists knew that chiropractors use manipulation of the spine (62.1%), manipulation of the extremities (57.8%) stretching (53.4%) and mobilisation (52.6%) as common techniques/modalities for treatment of patients. The vast majority of pharmacists did not know that chiropractors commonly use LASER (6%), dry needling (11.2%) and UV (17.2%) in the treatment of their patients.

Appendix I

CHANGES TO QUESTIONNAIRE POST FOCUS GROUP

The format and wording of some questions was changed, so that they would be easier to understand and less ambiguous.

The format of question 1.2 was changed from:

1.2 Age:

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

To:

1.2 Age: _____ years

The format of question 1.3 was changed from:

1.3 How many years have you been qualified as a Pharmacist?

<10 11-20 21-30 31-40 41-50 >50

To:

1.3 How many years have you been qualified as a Pharmacist? _____ years

Question 1.5 was added:

1.5 In which type of pharmacy do you work?

Private Retail
 Hospital Consultancy
 Community

The format of question 2.1 was changed from:

2.1 Do you know something about chiropractic?

Yes
 No
 Not sure

To:

2.1 Have you any knowledge of chiropractic?

Yes No (If no continue to question 5.1)

The wording of question 2.4 was changed from:

2.4 Is chiropractic funded by health care insurers in South Africa?

To:

2.4 Is chiropractic covered by medical aid in South Africa?

The wording of question 2.8 was changed from:

2.8 The chiropractic course includes grounding in the following subjects?

To:

2.8 Which of the following subjects do you think are included in the chiropractic curriculum?

Question 2.10 was found to be confusing and omitted from the questionnaire

2.10 Which areas can Chiropractors specialize in?

- Neuromusculoskeletal system
- Paediatrics
- Rehabilitation
- Sports injuries
- Extremities (eg. Knee, elbow, wrist)

Question 2.12 was found to be too technical and omitted from the questionnaire

2.12 Do you know what a joint fixation/subluxation is?

- Yes
- No
- Not sure

The wording of question 2.13 was changed from:

2.13 How well do you think chiropractors promote their profession?

To:

3.5 How well do you think the chiropractic profession is promoted in South Africa?

Question 2.16 was changed from:

2.16 If you answered yes to 2.15 above, what would you like to know about chiropractic in order to gain a better understanding of the profession?

.....

.....

.....

.....

to:

5.13 If you answered yes to 5.12 above, what would you like to know about chiropractic in order to gain a better understanding of the profession?

- | | |
|--|--|
| <input type="checkbox"/> Scope of practice | <input type="checkbox"/> Prescribing medicine |
| <input type="checkbox"/> Treatment options | <input type="checkbox"/> Malpractice Insurance |
| <input type="checkbox"/> Years studied | <input type="checkbox"/> Subjects studied |
| <input type="checkbox"/> Chiropractic terminology | <input type="checkbox"/> Education |
| <input type="checkbox"/> Understanding and application of pharmacology | |
| <input type="checkbox"/> Other (Please specify)..... | |

Question 3.4 was found to be confusing and was omitted from the questionnaire

3.4 To what extent should chiropractic occupy the following roles in Health care? (Please cross one number, for each role, with (1) indicating no role at all and (5) the greatest role.)

- | | | | | | | |
|--|---|---|---|---|---|---|
| <input type="checkbox"/> Primary contact | | 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> Preventative | 1 | 2 | 3 | 4 | 5 | |
| <input type="checkbox"/> Supportive | | 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> Rehabilitative | 1 | 2 | 3 | 4 | 5 | |

Question 4.5 was originally laid out as follows.

4.5 How do you perceive the chiropractic profession (more than one answer possible?)

I think chiropractic is:

- A primary health care service
- A secondary health care service
- An alternative health care profession
- Is accessible to everybody
- Should be accessible to everybody
- Cheap
- The right cost
- Too expensive
- Should not be part of the medical aid
- Should be part of the standard medical aid
- Should be recognised by law
- Should not be recognised by law
- Lacking scientific background
- Not needed in South Africa
- No opinion/ do not know enough about it

It was decided that it would be easier to follow if it was laid out as follows

4.5 How do you perceive the chiropractic profession?

I think chiropractic is:

- | | | |
|-------|---|--|
| 4.5.1 | <input type="checkbox"/> A primary health care service | <input type="checkbox"/> A secondary health care service |
| | <input type="checkbox"/> An alternative health care service | |
| 4.5.2 | <input type="checkbox"/> Should be part of the medical aid | <input type="checkbox"/> Should not be part of the medical aid |
| 4.5.3 | <input type="checkbox"/> Is accessible to everyone | <input type="checkbox"/> Is not accessible to everyone |
| | <input type="checkbox"/> Should be accessible to everyone | |
| 4.5.4 | <input type="checkbox"/> Affordable | <input type="checkbox"/> The right cost |
| | <input type="checkbox"/> Too expensive | |
| 4.5.5 | <input type="checkbox"/> Lacking scientific background | <input type="checkbox"/> Not needed in South Africa |
| | <input type="checkbox"/> None of the above | |
| 4.5.6 | <input type="checkbox"/> Should be recognised by law | <input type="checkbox"/> Should not be recognised by law |
| | <input type="checkbox"/> No opinion | |

The following 2 questions were added to the questionnaire

5.4 Should a patient present to you with a musculoskeletal condition who has contra – indications to required medication, who would you refer him/her to?

- | | |
|---|--|
| <input type="checkbox"/> G.P | <input type="checkbox"/> Homeopath |
| <input type="checkbox"/> Physiotherapist | <input type="checkbox"/> Orthopaedic surgeon |
| <input type="checkbox"/> Neurosurgeon | <input type="checkbox"/> Chiropractor |
| <input type="checkbox"/> Bio – kineticist | |
| <input type="checkbox"/> Other (Please specify) | |

**5.5 Which of the following specialists do you think chiropractors refer to?
(Please cross appropriate boxes)**

- | | |
|--|--|
| <input type="checkbox"/> Neurologist | <input type="checkbox"/> Neurosurgeon |
| <input type="checkbox"/> Orthopaedic surgeon | <input type="checkbox"/> Gynaecologist |
| <input type="checkbox"/> Radiologist | <input type="checkbox"/> Obstetrician |
| <input type="checkbox"/> Proctologist | <input type="checkbox"/> Urologist |

Journal Article

A STUDY TO DETERMINE THE PERCEPTIONS, ATTITUDES AND KNOWLEDGE OF SELECTED SOUTH AFRICAN PHARMACISTS ON THE CHIROPRACTIC PROFESSION

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A Study to determine the perceptions, attitudes and knowledge of selected South African pharmacists on the chiropractic profession.

ABSTRACT

INTRODUCTION

Pharmacists are seen as a trustworthy source of advice and information to many people. It is imperative that they are knowledgeable about complementary and alternative practitioners, including Chiropractors, if they are to adequately inform the public interested in these alternative forms of health care.

OBJECTIVE

The purpose of this study was to determine the current perceptions, attitudes and knowledge of selected South African pharmacists with respect to the chiropractic profession. This will provide a basis for future studies, as well as a knowledge base to facilitate greater understanding and co-operation between pharmacists and chiropractors.

DESIGN

The study was of a quantitative nature and the information was collected by means of a questionnaire, based upon the questionnaire format used in previous research studies.

PARTICIPANTS

A postal survey was distributed to a random, proportional sample of 1350 pharmacists out of a total of 4694. A low response rate of 8.72% was achieved.

RESULTS

Only 66% of the respondents reported having any knowledge of chiropractic. Just less than half the respondents (42.1%) perceived chiropractors to be specialists in the field of nerve, muscle and bone disorders, including the treatment of the

spine and extremities and only a few respondents had negative perceptions / attitudes of chiropractic. Most participants (56%) felt that chiropractic should be incorporated to a moderate extent into the health care system, and that it functions as an alternative health care service (39.5%). Almost all participants, (99%) felt that good communication with other health care providers is essential, however only 16.4% had ever communicated with a chiropractor. It was found that pharmacists are often (32.7%) asked for advice on other treatment options, however only 18.6% felt adequately informed about chiropractic.

CONCLUSIONS

This study showed, that the pharmacists who responded, had a limited knowledge of chiropractic, but a positive perception / attitude towards chiropractic. Those respondents who had referred patients to chiropractors had higher knowledge and perception / attitude scores.

INTRODUCTION

Studies have shown that the number of patient visits to chiropractors has increased greatly over the last number of years, and in certain countries (i.e.: Netherlands) it has more than doubled in the last five years, and there has also been an increased public and political interest in chiropractic treatments.¹ In some countries (for e.g. United States), the use of alternative medical practices and treatments has dramatically increased over the last few years² however these alternative medicines or therapies are not widely taught in medical schools or available at hospitals/health care facilities.³

Chiropractic is the largest, most regulated, and best recognised of the professions that have traditionally functioned outside of mainstream medical institutions and has fallen into the category of “complementary and alternative medicine” (CAM).⁴ Many patients receive their information regarding a range of CAM therapeutic options, including chiropractic, from pharmacists and the quality and accuracy of the information used by the patient from this source varies

considerably, this can be problematic because opportunities can be missed to integrate CAM therapies into the overall plan of care in instances when these therapies may be beneficial.⁵

It has been well publicized in recent years that there may be a need for inter-professional relationships to develop between the different health care professions.⁶ This development, it is thought, could lead to the production of a symbiosis among health professionals which is beneficial not only to the health care professionals themselves but, more importantly, to the patients they treat.⁶

The popularity of alternative forms of health care continues to rise, and coverage of them in the lay literature increases.⁷ It is therefore important that careful studies to investigate each profession's current attitudes and perceptions of another similar or a different profession are undertaken.

With increasing emphasis on multidisciplinary health care, greater understanding and better communication is needed in order for the patient to obtain optimum results.⁸ The chiropractic profession is attempting to improve co-operation with the medical profession via the scientific validation of its theories and practice through research.⁹ Thus a study into the current perceptions, attitudes and knowledge of selected South African pharmacists towards the chiropractic profession, may prove beneficial in furthering inter-professional relationships and improving patient care. In addition, it may encourage further studies into this vast field, and establish a knowledge base to facilitate greater understanding and co-operation between pharmacists and chiropractors.

METHODOLOGY

The objective of this study was to determine the current perceptions, attitudes and levels of knowledge about the chiropractic profession, amongst South African pharmacists. It was hypothesised that a low level of knowledge and negative perceptions / attitudes exists amongst the pharmacists.

This study was of a quantitative nature and the information was collected by means of a questionnaire.

Questionnaire development

A questionnaire was developed specifically for this study by modifying and adapting existing questionnaires.^{6, 9, 10, 11} The questionnaire comprised of forty questions in five sections, covering personal information, knowledge about chiropractic, the role of chiropractic in the health care system in South Africa, the scope of practice of chiropractic and communication.

It was developed using a focus group. The focus group consisted of 2 chiropractors, 2 pharmacists, 2 students and 1 teacher. This group gathered and discussed the questionnaire and the factors that it covered, to rule out any ambiguity and syntax difficulties. Relevant questions were included while some irrelevant questions were omitted. After the focus group was held, the changes suggested to the questionnaire were implemented. Five pharmacists in Durban were approached to fill out the new questionnaire. This was done to see how long it took to complete the questionnaire and also to identify problem areas. Whilst completing the questionnaire, these pharmacists had no difficulties concerning ambiguity or syntax within the questionnaire. The pilot subjects and the pharmacists involved in the focus group were excluded from the main study.

Data collection procedure

One thousand three hundred and fifty (1350) pharmacists were randomly identified in 4 major metropolitan areas in South Africa. The metropolitan areas involved were, Cape Town, Durban, East London and Johannesburg. These metropolitan areas were chosen to get a broader geographical representation within the South African context. It was also assumed that pharmacists working within these regions would have had a greater chance of contact with chiropractic. According to the South African Pharmacy Council, there were 4694

registered pharmacists in these 4 metropolitan areas; of these pharmacists 1350 were sampled. The amount of pharmacists to be targeted in each metropolitan area was calculated according to the percentage of the overall pharmacist population in South Africa present in the respective metropolitan area. The final number of questionnaires sent to each metropolitan area was as follows: Cape Town (482), Durban (345), East London (60) and Johannesburg (463).

Inclusion and exclusion criteria

For the subjects to be included in the study, they had to be qualified and registered pharmacists in South Africa and working within the 4 major metropolitan areas. All subjects had to be residents of the Republic of South Africa, had to sign the informed consent form and had to speak English as the questionnaire was in English only. All the relevant information had to be completed for the questionnaire to be accepted for analysis. Participants were excluded from the study if they did not comply with the above criteria.

Confidentiality was maintained as no names were revealed in the publication of the results. A coding system was used, where each questionnaire was numbered, and the identity of the pharmacist was not revealed to the researcher. A neutral party received the returned questionnaires. SPSS version 15.0 was used for data analysis (SPSS Inc., Chicago, Illinois, USA). Descriptive objectives were shown with frequency tables and bar charts in the case of categorical variables, and using summary statistics such as median, range and inter quartile range in the case of skewed quantitative or ordinal variables. Relationships between knowledge and perception were assessed using Spearman's rank correlation coefficient. Comparison of knowledge and perceptions scores between categorical demographics were done with Mann-Whitney tests (for 2 group comparisons) or Kruskal – Wallis tests (for more than two group comparisons) as appropriate.

RESULTS AND DISCUSSION

1350 questionnaires were mailed to pharmacists, out of a total population of 4694 within the four metropolitan areas. Of these, 20 questionnaires were returned unopened because the recipients had: Changed address (n=9), Closed their P.O Box (n=8), were deceased (n=2) or had emigrated (n=1). Thus out of a possible 1330 participants in the study, one hundred and sixteen questionnaires were returned for analysis. This gives a response rate of 8.72%

Table 1: Demographic Information of Respondents

		Amount
Gender	Male	35.3%
	Female	64.7%
Age (mean)		46 years
Years Qualified (mean)		23.5 years
Metropolitan Region	Cape Town	34.5%
	Durban	34.5%
	East London	28.3%
	Johannesburg	2.7%
Type of Pharmacy	Private	12.5%
	Retail	50.9%
	Hospital	17.9%
	Consultancy	8%
	Community	5.4%
	Other	13.5%
Qualifications	Matric	89.7%
	Degree	4.3%
	Diploma	1.7%
	Medical Degree	0%
	Other	4.3%

Table 1 summarises the demographic information of the respondents. A larger portion of the respondents were female (64.7%), however this was to be expected as there were more females in the sample, the average age of the respondents was 46 years, and the average respondent had been qualified for 23.5 years. The biggest population of pharmacists worked in retail (51%) and the next most common setting was in a hospital (18%). An American study found that 56% of recently qualified pharmacists worked in retail and 17% worked in the hospital setting.¹²

Only 66% of respondents reported having any knowledge of chiropractic, of these respondents the majority received their information through being treated by a chiropractor (57.3%), or through personal contact with a chiropractor (40%) and thus had the opportunity of gaining first hand experience of what chiropractic treatment is about. This was less than the 80.5% of South African G.P's, who reported having some knowledge of chiropractic.¹⁰

Another 14.7% of the participants gained their knowledge about chiropractic by reading scientific journals. It has been suggested that one way to increase awareness between professions would be through the use of journals.¹³ It was found that a similar proportion of G.P's had also received their information through scientific journals.¹⁰

The majority of pharmacists were not well informed about chiropractic in SA. The mean composite knowledge score of the sampled pharmacists's was 46.3%. This meant that out of a total score of 100, the average pharmacist scored 46.3 out of 100 for his/her knowledge about chiropractic. A similar study showed that South African G.Ps had very similar knowledge scores about chiropractic.¹⁰

There was no difference in median knowledge score between any of the demographic groups except for those working at a hospital, who scored lower in terms of knowledge of chiropractic than those who did not work in a hospital. This

could be due to the fact that chiropractic has not been widely accepted in South African hospitals.¹⁴ It would therefore be beneficial for chiropractors in South Africa, to strive to become more recognised and accepted by hospitals.

South African pharmacists do not feel adequately informed about chiropractic (88.6%) and the vast majority (87.7%) would like to know more about the profession. This is an encouraging statistic as this indicates that although the majority of the pharmacists who responded admitted that they were inadequately informed about the chiropractic profession, they had an interest in knowing more about it and thereby possibly being able to enhance further ties between the professions. Scope of practice (81%) and treatment options (75%) were most commonly referred to by pharmacists as the aspects of chiropractic that they wanted to know more about.

The median perception / attitude score was 66.7%, thus the general level of perceptions / attitudes towards chiropractic was positive. Just less than half the respondents (42.1%) perceived chiropractors to be specialists in the field of nerve, muscle and bone disorders, including the treatment of the spine and extremities. Almost a quarter of respondents (21.1%) felt it might be effective for some patients, 18.4% felt that it is effective for some neuro-musculoskeletal conditions, and 11.8% felt they were not informed enough to comment, thus relatively few respondents had negative perceptions / attitudes towards chiropractic. This is positive as pharmacists with a positive perception / attitude towards chiropractic, may be more willing to increase their education and awareness about it.

Most participants felt that chiropractic should be integrated to a moderate extent (56.0%) or a great extent (37.3%) and very few (1.3%) thought that there was no active role for chiropractic in the South African health care system.

“The precise role of chiropractic in health care continues to be disputed”.¹⁵ In recent years, it has largely been the impression of government, private industry policymakers, many health care professions, the general public, and some within the chiropractic profession itself that chiropractic practice is not primary care and should be utilized for the treatment of neuro-musculoskeletal or musculoskeletal conditions only.¹⁶

This trend was demonstrated by asking pharmacists to rate, on a scale of 1 to 5, twelve professions in terms of their importance in serving in a primary health care capacity in South Africa. Medicine, nursing, pharmacy, optometry, physiotherapy and dentistry were rated as most important with a rating of five. Chiropractic scored a median of three along with other complementary therapies, homeopathy, acupuncture and traditional healing. Ayurvedic medicine and Chinese medicine scored the lowest with a median rating of one. The median rating of chiropractic by pharmacists in SA in the health care system is similar to that of GP's¹⁰ and neurologists, neurosurgeons and orthopaedic surgeons⁹ who also placed chiropractic higher than, Ayurvedic medicine and Chinese medicine, but lower than physiotherapy and the more traditional medical professions. It is important that South African chiropractors ensure that the role they perceive themselves to be playing in the health care system is the same as that which other professions view them to be filling.

A large proportion of respondents (86.1%) thought that there was sufficient difference between chiropractic and physiotherapy to warrant separate professions. GP's were more comfortable referring to physiotherapists because they had a greater understanding of the treatment involved.¹⁷ Physiotherapists seem to enjoy more favour than chiropractors for the treatment of musculoskeletal conditions. One of the reasons may be the fact that GP's are aware of their scope of practice and not sufficiently informed about chiropractic.¹⁰

South African pharmacists thought that chiropractors were competent in examining and diagnosing neuro-musculoskeletal conditions (51.4%). A very similar proportion of pharmacists (52.7%) felt that chiropractors were also competent in the general medical management of patients (i.e. the ability to diagnose, treat and refer the patient for optimum patient benefit). Very few respondents felt that chiropractors were incompetent in either area, 1.4% and 5.4% respectively. However the majority of GP's (40.3%) considered chiropractors incompetent in general medical management of patients.¹⁰

The majority of respondents felt that chiropractic was an alternative health care service (39.5%) and only 27.6% felt that chiropractic was a primary health care service. A large proportion of respondents had positive perceptions and felt that chiropractic should be part of medical aid (94.7%), should be accessible to everyone (55.3%), is affordable (54.1%) and should be recognised by law (82.8%). Only the small minority felt that chiropractic should not be part of a medical aid (1.3%), is not needed in South Africa (1.4%) or should not be recognised by law (2.6%) (Table 2)

Table 2 General perceptions of chiropractic

		Count	%
Health care service	A primary health care service	21	27.6%
	A secondary health care service	25	32.9%
	An alternative health care service	30	39.5%
Medical Aid	Should be part of medical aid	71	94.7%
	Should not be part of medical aid	1	1.3%
Accessibility	Is accessible to every one	18	23.7%
	Is not accessible to everyone	16	21.1%
	Should be accessible to everyone	42	55.3%
Affordable	Affordable	40	54.1%
	The right cost	20	27.0%

	Too expensive	14	18.9%
Scientific	Lacking scientific background	9	12.2%
	Not needed in SA	1	1.4%
	None of the above	64	86.5%
Recognised by Law	Should be recognised by law	63	82.9%
	Should not be recognised by law	2	2.6%
	No opinion	11	14.5%

Almost all the participants (99.1%) believed that communication with other health care providers was essential and 95% had at some stage communicated with other health care providers to ensure maximum benefit to the patients.

GP's (91.4%) were the most common health care provider with which pharmacists communicate with, followed by dentists (57.8%) and then physiotherapists (54.3%). Only 16.4% had communicated with chiropractors previously. This shows that there is a definite barrier in communication between the professions in South Africa at present and could be due to the fact that chiropractors view their profession as a "drug-free" profession. This is quite different from the 43% of South African GP's¹⁰ and the 34% of South African physiotherapists⁶ who communicate with chiropractors. The results show that referral of patients to chiropractors was higher in those pharmacists whose knowledge, and perception / attitude scores were higher.

When dealing with patients with musculo-skeletal conditions, pharmacists were most likely to refer them to physiotherapists (56%), then GP's (47%) and then chiropractors (34%). Emphasizing that greater co-operation and communication seems to be occurring between GP's, pharmacists and physiotherapists. One of the reasons may be the fact that pharmacists are aware of their scope of practice and not sufficiently informed about chiropractic. This indicates that there is a

need for other professions (especially pharmacists) to be more educated about chiropractic.

The majority of pharmacists are asked occasionally for advice on treatment options other than medication (41%), while 33% get asked often. This shows the need for pharmacists to have the knowledge to be able to adequately inform the public, should they ask for it. All the respondents believed that it was important to be able to inform patients on the other treatment options available to them, but only 18.6% felt that they knew enough about chiropractic to inform patients adequately. There is a large discrepancy here, as over 80% of the respondents believe that it is important to inform patients on the other treatment options available to them, but do not have enough knowledge to inform them adequately. (Table 3)

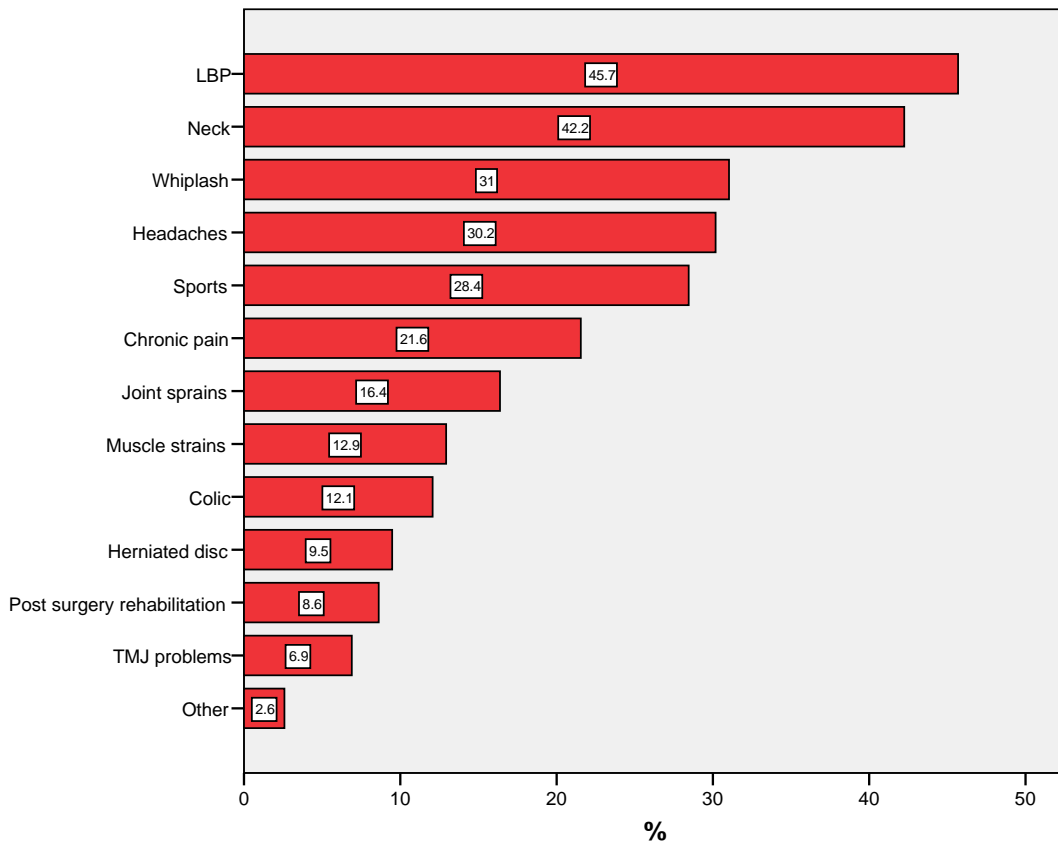
Table 3: Responses on issues of information and referral

	Yes		No	
	Count	%	Count	%
Do you believe it is important to be able to inform patients on the other treatment options available to them?	113	100.0%	0	.0%
Do you feel you know enough to adequately inform them on the subject?	21	18.6%	92	81.4%
Have you ever referred a patient to a chiropractor?	54	47.8%	59	52.2%
Do you feel adequately informed about chiropractic?	13	11.4%	101	88.6%
Would you like to know more about chiropractic?	100	87.7%	14	12.3%

Less than half the respondents had ever referred a patient to a chiropractor (47.8%) a very similar proportion of South African GP's (46.8%) had referred

patients to a chiropractor.¹⁰ Low Back Pain was the most common condition for which pharmacists would refer patients to chiropractors (46%) followed by neck problems (42%). (Figure 1) Emphasizing the fact, that a large proportion of respondents perceive chiropractors to be back specialists. Chiropractic would be wise to improve public awareness by expounding upon what conditions it can treat. Gaps in the public knowledge have translated into non-utilization.¹⁸ This follows that the more unclear the respondents' understanding of the professions' scope of treatment, the more likely they are not to identify a condition as one that can be treated by chiropractic.¹⁸

Figure 1: Percentage of respondents that would refer patients to chiropractors for each listed condition



It was found that the mean knowledge score of the respondents was significantly higher in those who had referred patients to chiropractors, and there was a highly significant difference in perception / attitude score between the two groups ($p < 0.001$) with perceptions / attitudes being more positive in those who had referred patients to chiropractors.

There was a statistically significant although weak positive correlation between knowledge score and perception / attitudes score ($\rho = 0.338$, $p = 0.003$) this indicates that in general as one score increased so did the other.

There was no difference in median knowledge score between any of the demographic groups except for those working at a hospital pharmacy that scored lower in terms of knowledge of chiropractic than those who did not work in a hospital pharmacy. ($p = 0.001$)

The only factor that was significantly associated with perceptions / attitudes towards chiropractic was whether the participant had been treated by a chiropractor ($p = 0.019$). Those who had been treated had significantly higher perception / attitude scores than those who had not been treated.

CONCLUSION

The perception, attitudes and knowledge of selected South African pharmacists on the chiropractic profession, has been described in this study.

The number of pharmacists sampled in this study was 28.8% of the population in the four metropolitan areas (1350 out of 4694 pharmacists). These results cannot be assumed to be representative and should not be extrapolated to the whole population of pharmacists in South Africa. A study of non-responders was not performed. We can assume that many of the non-responders had no working relationship with a chiropractor. It is equally possible that a great number of non-

responders were not interested in working with chiropractors. In addition possible sampling bias cannot be ruled out.

Nonetheless, this study has shed light on limitation of knowledge and perception/ attitude amongst pharmacists about the chiropractic profession in South Africa. Although chiropractic is considered to be a viable means of treating certain disorders, there is still much confusion about the exact role of chiropractic in the health care system. This study provides useful information which could influence future referral and communication between pharmacists and chiropractors in the South African health care system. This study has shed light on interprofessional knowledge and perceptions / attitudes being very important in interprofessional communication.

Therefore, with respect to the hypotheses made, the following is applicable:

Hypothesis 1

A negative perception or attitude exists about the chiropractic profession amongst South African pharmacists.

Hypothesis one must be rejected as this study showed that the general level of perceptions / attitudes towards chiropractic was positive amongst pharmacists in South Africa. However, this must be taken with caution due to the low response rate of the study and lack of statistical significance of the results.

Hypothesis 2

A low level of knowledge exists about the chiropractic profession amongst pharmacists in South Africa.

Hypothesis two can be accepted based on evidence presented in the study. However this must be taken with caution due to the low response rate of the study and lack of statistical significance of the results.

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