A demographic and descriptive survey of chiropractic Patients at the Chiropractic Clinic at Kimberly Public Hospital Complex.

By

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I, **Madelaine Higgs**, do declare that this dissertation is representative of my own work in both conception and execution (except where acknowledgements indicate to the contrary).

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DEDICATION

This Master's thesis is not only a representation of my work over the years, but it is a result of the love, support and encouragement from my family and friends.

This study is dedicated to my father, Freddy Higgs (1941-2001) and my mother Yvonne Higgs. Their hard work and sacrifices to provide me with the life that I have today can never be measured.

A special thank you goes to my dedicated mom, for all her love and support over the years away from home. For all the weekly phone calls to encourage me to pull through the tough times, I will be forever grateful. The most motivating quote from her being; "If you think you can, you can. If you think you can't, you can't. Either way you will prove yourself right." And now I have proved that I can.

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ABSTRACT

Objective: The majority of information available on chiropractic patients originates from private practices in developed countries. However, recently reports describing chiropractic patients in South Africa have emerged, reporting on private practices and teaching clinics. Therefore, the overall purpose of this study was to determine the characteristics of patients presenting to a public chiropractic facility at the Kimberley Hospital Complex (KHC) in South Africa; and compare to the local and international private practices and teaching clinics.

Methods: The period prevalence was three months in which information was extrapolated from patient files of the patients that presented to the KHC Chiropractic Clinic (KHCCC). Information that was collected included demographic data, common presenting complaints, patient history and common management protocols.

Results: Data for 157 patients were recorded. The mean age of patients was 47.5 years, majority of the patients were female (70%), comprised of coloured and black patients (85%), where the greater part had a primary education level. Less than half the patients were employed in manual type of occupation, whilst almost one quarter of the patients were pensioners. By far, the greatest reason that patients visited chiropractors within the public health care sector at the KHCCC in South Africa was for chronic musculoskeletal complaints (68%). Majority presented with spinal complaints of the lower back (n=144), the most common diagnosis made was sacroiliac syndrome (48%). X-rays were the most common special investigation requested by KHCCC. The most common co-morbidities reported were hypertension, followed by diabetes and allergies. More than half the sample had undergone previous surgery. Thirty seven percent of patients received treatment for fewer than six visits. Contraindications to chiropractic treatment were indicated in only three patients. The treatment protocols that were predominantly used at the KHCCC were joint manipulation, followed by dry needling, kinesiotape and soft tissue therapy. Two thirds of all patients that were referred to the KHCCC were referred from within the medical profession.

With regards to the chiropractic patients globally, similarities respect to patients in the public sector in South Africa to all sectors both locally and internationally, include factors such as majority female patients, top five anatomical locations of complaint, common usage of x-rays as a special investigation, similarities with co-morbidities including cardiovascular and endocrine, the repeated number of visits for the same complaint and manipulation remained treatment of choice.

Conclusion: Although this was purely a demographic and descriptive study in nature, it gave a better understanding of patients that presented to a public hospital in a developing country like South Africa. With this demographic and descriptive information obtained in this study, it confirmed that although there is a unique population utilising chiropractic services within the public sector of South Africa, meaningful similarities have been found between patients in the different sectors in South Africa and internationally.

Key Indexing terms:
Demography, prevalence, epidemiology, chiropractic, public sector and private sector.

TABLE OF CONTENTS

CHAPTER FIVE

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

Definitions

- **Acute:** Referring to a disease of sudden onset and of a brief duration. With respect to this study, it was considered as duration of 0 – 3 months**.** Literature does not always consistently distinguish these durations (Stedman, 2003).

- **Chronic:** Term used to describe persistent disease or a long term illness. With respect to this study, it was considered as a time period of more than 6 months. (Stedman, 2003)

- **Combination labour:** Combination labour consists of an amalgamation of manual and non-manual labour throughout a working day. In this study, combination labour consisted of nursing staff, seamstresses, draftsman and military personnel.

- **Content Validity:** A test or survey is said to have content validity if the items or content of which it is made up constitute a representative sample or verification that the method of measurement actually measures what it is expected to measure (www.assessnet.org.uk/mod/glossary/view.php)

- **Co-morbidities:** A concomitant but unrelated pathologic or disease process (Stedman, 2003).

- **Coloured:** In the South African, Namibian, Zambian, Botswana and Zimbabwean context, the term Coloured (also known as *Bruinmense*, *Kleurlinge* or *Bruin Afrikaners* in Afrikaans) refers or referred to an ethnic group of mixed-race people who possess some sub-Saharan African ancestry, but not enough to be considered Black under the law of South Africa (http://dictionary.reference.com/browse/coloured)

- **Contraindication**: "Any condition, especially any condition of disease, that renders one particular line of treatment improper or undesirable" (Gatterman, 1990)

- **Demographic:** Is a term for 'population characteristics', which are used primarily for statistical research. Demographics include race, age, income, educational attainment, home ownership, employment status, and even location. Demographics pertaining to this study included that of age, gender, ethnicity, occupation, area of residence and level of education.(Popenoe, Cunningham and Bolt, 1997)

- **Descriptive:** Involving or characterized by a description of information pertaining to a topic (http://dictionary.reference.com/browse/descriptive).

- **Ethnic Group:** "A social group characterised by a distinctive social and cultural tradition maintained from generation to generation and a sense of identification within a group" (Stedman, 2003).

- **Grant:** In South Africa grants are defined as alimony, compensation for injuries, and state pensions (South African Demographic and Health Survey (SADHS), 2003).

- **High Blood pressure/ Hypertension:** "Persisting high arterial blood pressure, exceeding values of 140mmHg systolic or exceeding 90mmHg diastolic blood pressure" (Stedman, 2003)

- **Low Blood pressure/ Hypotension:** "Subnormal arterial blood pressure. Reduced pressure or tension" (Stedman, 2003).

- **Manual Labour:** Physical work done with the hands, especially in an unskilled job such as fruit and vegetable picking, road building, or any other field where the work may be considered physically arduous. The objective is profitable objective, such as in the production of goods. In this study mine workers, domestic workers, laundry staff, mechanical engineers, builders and any other labour which consisted of regular physical activities i.e. bending, lifting, twisting was considered to be manual labour (http://dictionary.reference.com/browse/manual labour).

- **Non-manual labour:** Non-manual labour usually comprises of skilled labour, no hard physical work is done. In this study non-manual labour consisted of lawyers, sales personnel, clerical occupations and managerial positions (http://dictionary.reference.com/browse/manual labour).

- **Non-traumatic aetiology : "**Science and study of cause of disease and their mode of operation when it does not involve any traumatic origin" (Stedman, 2003)

- **Perception:** Is the process by which people select, organise and interpret information to form a meaningful picture of the world (Chaffe, Weiers and Stengel, 1995).

- **Prevalence:** Is the number of people in a defined population who have a specified disease or condition at a point in time. Prevalence is usually measured by surveying a particular population containing individuals with and without the condition of interest. Thus, prevalence equals the number of people with a health problem at a point in time divided by the total defined population alive at that point in time (Waddell, 2004).

- **Period prevalence:** Is a measure over a specified time period. Period prevalence is the proportion of the population with a given disease or condition over a specific period of time. It could describe how many people in a population had a cold over the cold season in 2006, for example (Waddell, 2004).

- **Profile:** A set of characteristics or qualities that identify a type or category of person or object (http://dictionary.reference.com/browse/profile).

- **Socioeconomics**: Is the study of the relationship between economic activity and social life. The field is often considered multidisciplinary, using theories and methods from sociology, economics, history and psychology. The term refers to studies/indicators looking at both social and economic conditions relevant to well-being (www.bcstats.gov.bc.ca/glossary.asp.) Socioeconomic factors include: income, occupation, place of residence and lifestyle (Popenoe *et al.,* 1997).

- **Soft tissue manipulation**: Are physical procedures using the application of force to improve health. This category includes techniques that manipulate and stimulate directly to muscles, ligaments and fascial layers (Bergman *et al.,* 1993).

- **Soft tissue mobilisation**: The use of specific, graded and progressive application of force by the use of physiological, accessory or combined techniques to promote collagen synthesis, orientation and bonding (Becton, 2003).

- **Soft tissue therapy**: The systematic therapeutic application of friction, stroking, percussion or kneading to the body (Bergman *et al.,* 1993)

- **Sub-acute:** Denoting the course of a disease of moderate severity and duration of between three to six months. (Steadman, 2003)

- **Self referral:** Patient in a managed care plan that refers himself or herself to a specialist. “Self-referrals”, with regards to this study consisted of those patients whom presented to the KHCCC on their own accord and those that may have been referred from friends and family (http://dictionary.reference.com/browse/self-referral).

- **Subluxation:** The meaning of subluxation has evolved from a simple static concept, i.e. a bone-out-of-place, to a complex biomechanical entity of many components, and in simple terms, is a loss of proper movement (Gatterman, 1990)

- **Survey:** The collection of information from a common group through interviews or the application of questionnaires to a representative sample of that group. (ojp.usdoj.gov/BJA/evaluation/glossary/glossary_s.htm)

- **Teaching Clinics**: A teaching clinic provides health care for ambulatory patients. Teaching clinics are operated by educational facilities and provide free or low-cost services to patients. Teaching clinics differ from standard health clinics in that treatment is performed by graduate students under the supervision of licensed health care providers. Teaching clinics serve the dual purpose of providing a setting for students in the health care profession to learn and practice skills, while simultaneously offering lower cost treatments to patients (http://dictionary.reference.com/browse/teaching_clinic).

- **Traumatic Aetiology:** “The science and study of the cause of disease and their mode of operation when it involves any traumatic origin” (Stedman, 2003). With regards to this study, traumatic aetiologies included that of: Motor vehicle accidents, traumatic falls, and manual work related injuries

- **Unknown Aetiology:** “The science and study of the cause of disease and their mode of operation” (Stedman, 2003), when the aetiology of the origin was unknown or forgotten in the case.

CHAPTER ONE

Introduction

Chiropractic was founded at the close of the nineteenth century (1895) and is regarded as a relatively young profession worldwide (Gatterman, 1990 and Haldeman, 1992). The evolution of the chiropractic profession began as a marginalised group of practitioners, but has now progressed to an accepted health-care profession. This evolutionary process has been the focus of intense studies by sociologists (Haldeman, 1992). At the end of the twentieth century, with chiropractic reaching its centenary, many descriptive and demographic surveys had begun to emerge. These studies were pertaining to the chiropractors in the profession (Pedersen, 1994, Lee, 2005 and Kopansky-Giles) and their chiropractic patients (Nyiendo, 1990, Pedersen, 1990, Walsh and Jamenson, 1992, Leboeuf-Yde, Hennius, Rudberg, Leufvenmark, Thuman, 1997 and Hurwitz, Coulter, Adams, Genovese, Shekelle, 1998) in an attempt to understand the development of the profession and how it had grown in each country in terms of chiropractic practice and its role in health care (Pedersen, 1990).

According to Rubinstein, Pfeifle, van Tulder and Assendelft, (2000), the addition of a patient profile into a study gives a better perspective of chiropractic patients in that particular country. Surveys on chiropractic patients had been compiled by the turn of the twentieth century (Rubinstein *et al*., 2000) but these were mainly in English speaking countries (Hartvigsen, Sorensen, Graesborg and Grunnet-Nillssson*,* 2002). Their study, combined with research by Hartvigsen *et al.,* (2002) found that there was still relatively little known about chiropractic patients in many non-English European speaking countries.

Rubinstein *et al*., (2000) therefore attempted a similar survey on chiropractic patients in the Netherlands in an attempt to identify the profile of chiropractic patients. Similar studies were carried out in Europe, USA and Canada, New Zealand and Australia (Nyiendo and Halderman, 1987, Nyiendo, 1990, Pedersen, 1990, Walsh and Jamenson, 1992, Leboeuf-Yde *et al*., 1997, Hurwitz *et al.*, 1998, Hartvigsen, 2002, Coulter and Shekelle, 2005, Mootz, Cherkin, Odegard, Eisenberg, Barassi and Deyo*,* 2005, Rubinstein *et al.,* 2000, Sorensen, Stochkendahl, Hatvigsen and Nisson*,* 2002). It is important to note at this point, that most of these studies mentioned above were performed in the private sector. There is a paucity of studies that have been compiled in the public sector (Suleman, 2001, Giles, Millar and Winter, 2002, Kopansky-Giles, Vernon, Tibbles, Decina, Goldin and Kelly, 2007 and Stevens, 2007).

Although Rubinstein *et al*., (2000) were referring to the Netherlands and other European countries, when referring to the limited knowledge available about chiropractic patients, the same criticism could be applied to South Africa, where only two studies had been compiled about chiropractic patients in both the public and the private sector (Drews, 1995 and Till and Till, 2000) by the end of the twentieth century. In 2007 however, detailed descriptive and demographic studies on chiropractic patients were compiled (Mahomed, 2007, Benjamin, 2007, Jaman, 2007, Kandhai, 2007 and Venketsamy, 2007) in the South African private sector.

Till and Till (2000) conducted the only public sector study in Kimberley at the Kimberley Hospital Complex (KHC), a public hospital situated in the Northern Cape Province of South Africa. The focus of this study was to assess the potential for integration of chiropractic education into a hospital setting. Some data regarding prevalence of conditions and the demographics of patients were recorded at that time. This data has been useful as it has provided some insight, as to the identity of the chiropractic patient that presented to a South African public hospital, over a decade ago. However, this study did not include capturing of data pertaining to clinical characteristics of patients, special investigations, referral patterns and common management protocols used as highlighted in other such studies world wide.

Therefore, the purpose of this study was to conduct a demographic and descriptive survey of chiropractic patients at the KHCCC (the only South African public hospital that currently employs a chiropractor) as to identify the chiropractic patients in terms of demographics, common presenting conditions, common aetiologies, special investigations, referral patterns and to document common chiropractic management protocols used on these chiropractic patients. This was done in an attempt to establish an updated and more comprehensive case profile of patients presenting to the public sector in South Africa, which may contribute to the knowledge of the profession in determining the role of chiropractors in the public health care system. Where possible an attempt was made to compare and contrast this data against published data from a previous study at the KHC, as well as to compare unpublished data obtained at private clinics and a teaching institution in South Africa.

1.2 Aims and Objectives of the Study

The aim of the research was to conduct a descriptive study of case profiles that presented to the Kimberley Hospital Complex Chiropractic Clinic (KHCCC) over a three month period.

Objective One: To identify selected demographics of patients that presented to the KHCCC (Age, gender, ethnicity, occupation, area of residence and level of education).

Objective Two: To document the common presenting conditions (Anatomical location of pain, diagnosis), chronicity, common aetiologies of complaint, special investigations used and referral patterns where possible.

Objective Three: To determine the prevalence of musculoskeletal and non-musculoskeletal conditions in patients that presented to the KHCCC (History of co-morbidities as reported by the patient, history of smoking, blood pressure readings taken at KHCCC, history of spinal conditions, history of surgery and history of previous chiropractic treatment for the same condition).

Objective Four: To document the chiropractic management protocol/s that has been used for patients at the KHCCC.

Objective Five: To compare the data obtained in this study to local and international studies.

1.3 Rationale for the Study

1. A patient profile study aids in giving a better perspective of chiropractic practice in that particular country (Rubinstein *et al.,* 2000). Some of the criteria required to provide adequate descriptive data about chiropractic practice include objective data regarding patient demographics, patient health status and clinical characteristics of patients in search of chiropractic care (Coulter and Shekelle, 2005). Therefore this study aimed at giving a better perspective of chiropractic practice in a public hospital in South Africa by conducting a demographic and descriptive survey of chiropractic patients at the KHCCC to identify the profile of the chiropractic patients in the public sector.

2. There is a paucity of information available in the South African public hospital regarding selected patient demographics and prevalence of common clinical

conditions of patients seeking chiropractic care (Till and Till, 2000). No published and unpublished data that was reviewed for this study was available concerning the identity of the chiropractic patient in terms of clinical characteristics, special investigations, referral patterns, common chiropractic management protocols applied to chiropractic patients. Certain patient demographics were not included in this study (Till and Till, 2000). The present study therefore aimed to build on the study of Till and Till (2000) with more recent data, captured over a three month period, and to fulfil the above mentioned objectives and to compare the findings of this study to that of Till and Till, (2000).

3. Although studies of this nature have been conducted internationally, less information is available on chiropractic practice and patients in the public sector (Suleman, 2001, Giles *et al*., 2002, Kopansky-Giles *et al*., 2007, Stevens, 2007), when as compared to private clinics and teaching institutions (Nyiendo and Haldeman, 1987, Nyiendo, 1990, Pedersen, 1990, Walsh and Jamenson, 1992, Leboeuf-Yde *et al*., 1997, Hurwitz *et al.*, 1998, Hartvigsen, 2002, Bryant, Atkins and Bull, 2003, Coulter and Shekelle, 2005, Holt and Beck, 2005, Mootz *et al.,* 2005, Rubinstein *et al.,* 2000, Sorensen *et al.,* 2002 and Garner, Aker, Balon, Brimingham, Moher, Keenan and Manga, 2007).

4. Comparisons between demographics and outcomes of patients in different countries are useful to identify similarities and differences between chiropractic patients in different countries (Hartvigsen *et al*., 2002). Therefore, data obtained in the present study, was used to compare data pertaining to patients seeking chiropractic care internationally (Rubinstein *et al*., 2000, Sorensen *et al*., 2002, Giles *et al*., 2002, Stevens, 2007 and Kopansky-Giles *et al*., 2007). Where possible data was also compared with unpublished studies conducted in South African private practices and a teaching institution, in an attempt to ascertain if patients presenting to the KHC public facility are different or similar to those patients presenting to private clinics and teaching institutions in this country, so to determine if the patients being treated in a teaching clinic (before qualification of the chiropractic student) is similar in profile to those that would be treated in practice (whether private or public) once qualified.

1.4 Benefits and Limitations of this study

1.4.1 General benefits of a demographic and descriptive epidemiological study.

The primary use of epidemiological descriptive studies in the health sciences comprises the investigation of the causes and natural history of disease with the intention of prevention and health promotion. Secondly, it is to develop the risk screening techniques and diagnostic instruments. Thirdly, (and in the case of this study) the measurement of health care needs and the evaluation of clinical management with the aim of improving the efficacy and efficiency of health care (Brink, 2007).

1.4.2 Specific benefits of this study

The chiropractic profession primarily indorses a patient centred care approach in its management plan (CASA, 2008), and in order for this to be achieved successfully, it is imperative that the profession understands the types of patients utilizing chiropractic care (Rubinstein, 2000, Mootz, *et al.* 2005, Holt and Beck, 2005 and Mahomed, 2007). This study is designed to assist the chiropractic profession gain insight into the identity/profile of chiropractic patients with regards to demographics, common presenting conditions, common aetiologies, special investigations, referral patterns and common management protocols used at the only public hospital that has a post for a chiropractor in South Africa. The answers of a descriptive study of this nature have implications both for the understanding of the chiropractic profession and its role in health care (Pedersen, 1994). This would be valuable to the growing chiropractic profession in South Africa, as it may assist in facilitating the role of chiropractic as a profession in a public setting, as well as the insight into the workings of a primary health care system. Wyatt (2005) states that the knowledge of how a multidisciplinary setting runs and knowledge as to the identity of the patients in a public institutional setting may allow for rapid integration into the hospital settings in the future. This statement supports the observations made in Menka (2003), where rapid integration of complementary and alternative medicine into the health care delivery system was already occurring in the United States. The benefits noted for this type of integrative approach for chiropractic care include the following: sharing of information with medical physicians, access to better resources and equipment, and a broader base of patients who could benefit from chiropractic treatment (Menka, 2003). Thus future studies in South Africa can possibly utilise this study to give insight into the profile of the patient seeking chiropractic care in a public hospital, in an attempt to further integrate into other public hospitals in South Africa.

Comparison of data at this public facility to patients at other facilities is expected to reveal whether these chiropractic patients are comparable / generalisable to chiropractic patients in teaching clinics and private practices in South Africa, as well as, different sectors internationally.

1.4.3 Limitations to this study

The cross sectional survey necessitated a reliance on the accuracy and completeness of the notes in the patient file. This study assumes that the data in the patient file was both accurate and complete. It is assumed that the patient was open and honest during the consultation and had understood the doctors' questions in order to answer the questions adequately. It is also assumed that there were no language barriers between the patient and doctor and that inaccurate transcription of data recording did not occur.

1.5 In Summary

Based on the foregoing discussion, it is hoped that establishing the case profile of patients presenting to the public sector, will contribute to the profession in determining the role of chiropractors in the public health care system. In order to achieve this a demographic and descriptive survey of chiropractic patients at the KHCCC was conducted, the results of which will provide insight into the social, diagnostic and therapeutic identity of chiropractic in this setting (Pederson, 1994).

This will be validated by a comparison of demographic and descriptive information obtained in this study, to that of other local and international studies (private, public and teaching clinics). Thus the profession will be able to determine similarities and/or differences that may exist between the chiropractic patients that present to chiropractors in different parts of the world or in different health care sectors.

Therefore Chapter One has introduced the present study by incorporating a discussion and highlighting a gap in the research literature. The aims and objectives, the rationale, benefits and limitations to the study were also highlighted.

Chapter Two will introduce the location of the study, the background and history of the KHC and the South African public setting. A comprehensive literature review discussing international and local chiropractic patients, with the results of these studies have been summarised on tables. Trends within the tables were highlighted and further discussions on the limitations of this type of study were addressed.

Chapter Three will discuss the methodology behind the study. Chapter four documents the results of this study by the utilisation of the SPSS version 15.0 program. The results of Chapter Four will be critically discussed in Chapter Five, and comparisons will be made to international and local studies, and conclusions of critical points and future recommendations to conducting this type of research will also be made. Finally, Chapter Six will conclude the study and provide recommendations for future studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter will introduce the background to the present study at KHC and the running of this multidisciplinary establishment. Secondly, the history of the chiropractic profession in South Africa will be addressed. Thirdly, demographic and descriptive studies that have been performed in various countries in recent years, documenting factors such as patient demographics and common complaints will be discussed. These studies will be critically evaluated and results will be summarised into table format, under the four main objectives of this study. Fourthly, trends within the results of the tables will be highlighted to review the fifth objective and lastly, limitations of the studies will be stated.

2.2 Background to the KHC and the organization of this multidisciplinary setting.

The KHC is situated in Kimberley, which is the capital of the Northern Cape Province of South Africa. Kimberley has a population of 211,000 people representing approximately 46,000 households (Kimberley South Africa, 2008). Historically, the first diamond discovered in 1867 led to the great influx of diamond miners into Kimberley. Before long problems pertaining to overcrowding, flies and bad sanitation had developed. By 1871 two small tent hospitals were developed to service these diamond miners. From these tents a raw brick building was established in Kimberley in 1882. Over the century the hospital grew from strength to strength. Kimberley Hospital was rebuilt in the 1970's and reopened in October 1980. It consisted of medical, orthopaedic and surgical wards and provided physiotherapy, occupational therapy and radiology. (Diamond Fields Advertiser, 1980).

The chiropractic program at Durban University of Technology (DUT) was invited by the Department of Health of the Northern Cape Province in June 1996, to join the Kimberley Hospital by including a chiropractic department into the facility. This was done with the following goals in mind (Till and Till, 2000):

- To reduce barriers by exposing the public and affording them the opportunity to experience the services and benefits of this care.
- To expand the experience of the chiropractic students by adding the option of community service at the KHC to the experience gained at the teaching clinic.
- To change the attitudes of medical staff and supporting staff and
- To create positive public relations.

As a result of this trial, a permanent position for a doctor of chiropractic has been included at Kimberley Hospital since 1998; and Kimberley Hospital is to date the only public hospital in South Africa that offers a post for a chiropractor. The KHCCC consists of one resident chiropractor and an assisting nursing sister. This forms part of the hospital's multidisciplinary professional setting in which treatment is provided to the public of Kimberley and surrounding rural areas of the Northern Cape and Western Free State. The KHCCC falls under the auspices of the KHC main hospital. Referrals occur mainly from the rural clinics, KHC satellite clinics, casualty and the out patients department, if chiropractic is considered to be the treatment of choice by the medical attendant (Jacobs, 2008). "Self-referrals" are also accepted at the KHCCC. Due to the high number of pathologies that are seen at the public hospital facility, patients are also referred from the KHCCC to other specialists, other departments and other clinics in the KHC when required. This is done in order to perform special investigations, or for appropriate treatment of musculoskeletal and non-musculoskeletal conditions that patients may present with to the KHCCC, which are out of the scope of chiropractic practice (Jacobs, 2008).

By 2001, Kimberley hospital had evolved and was now known as the KHC. It had expanded to include the following sixteen specialist clinics: Chiropractic (as discussed above), Dermatology, Dental, Ear Nose and Throat specialist (ENT), Gynaecology, Medical, Maxillo-Facial, Neurosurgery, Obstetrics, Ophthalmology, Orthopaedic, Paediatric, Plastic Surgery, Surgical Specialist Clinic and Urology (Diamond Fields Advertiser, 2001, Olivier, 2008). The KHC also comprises of three satellite clinics located in the vicinity namely, Harmony Home (Kimberley hospital rehabilitation centre), West End Psychiatric hospital and Galeshewe day hospital (Strebel, 2004). Interrelations and inter-referrals occur regularly between the hospitals and the sixteen specialist clinics allowing a multidisciplinary approach in this public setting (Olivier, 2008).

The annual reports of the specialist clinics from April 2007 to March 2008 have reported that 100 234 patients have utilised the specialist clinics over that time period (Olivier, 2008). This is excluding the amount of patients that are attended to daily at the casualty department on a 24 hour basis. According to these reports, the KHCCC independently averages 600 patients quarterly (Olivier, 2008).

It was difficult to find a hospital that compares to KHC and the KHCCC because it is one of the few public hospitals in the world that offers chiropractic services. However, if comparison was sought, St Michaels Hospital and its chiropractic department may be the

most comparable because of the similarities in historical backgrounds, and the similar goals noted with respect to the inclusion of chiropractic services into the hospital facility as discussed below:

1. St Michael's Hospital was founded in 1892 to care for the sick and the poor of Toronto's inner city public (St Michaels Hospital, 2008).
2. In 2004, St Michael's Hospital in collaboration with the Canadian Memorial Chiropractic College integrated chiropractic services into this primary care hospital based setting as a project grant. This was conducted over a two year period where a new model of health service delivery had to be established to integrate the chiropractic staff as practitioners into a teaching hospital (Kopansky-Giles *et al.,* 2007).
3. With the positive results, the chiropractic services are now also a permanent programme (Kopansky-Giles *et al.,* 2007).
4. According to Kopansky-Giles *et al.,* (2007) the integrated chiropractic services at the hospital have distinct benefits to the community:
    - Reduces barriers to patient access to chiropractic care for the community
    - It provides a multidisciplinary practice model which improves quality of health care
    - Promotes collaboration with the health care fraternity
    - Decreases the hospital load on other medical and health care professionals
    - Provides education in prevention and promotion and
    - Improves quality of life for the poor who would otherwise not be exposed to it.

    The benefits listed above highlight the similarities in the goals between the two hospitals, with respect to initially increasing the accessibility of chiropractic care to the public, by decreasing barriers and enabling the public to benefit from chiropractic care.
5. In terms of the structure of the hospitals:
    - St Michael's Hospital also consists of a variety of specialists clinics. These include departments related to allergy and allergy testing, dermatology, general surgery, gastro-intestinal, head injury, hematology, hepatology, immunology, infectious diseases, internal medicine, neurosurgery, pain, peripheral vascular and podiatry. All patients requiring an appointment in these clinics must be referred by a family physician or referring doctor.
    - Chiropractic forms part of the hospitals multidisciplinary approach, this to ensure collaboration and integration, a clinical working group composed of chiropractors, physiotherapists, physicians and other medical staff meet regularly to plan and discuss issues or clinical scenarios that may have come to light (Kopansky-Giles, 2007; St Michaels Hospital, 2008).

- The chiropractors at St Michael's Hospital are considered as primary contact healthcare providers who see patients referred by the hospital's network of family physicians, the positive care clinic and the employee health unit (St Michaels Hospital, 2008).

The infra-structure within the two hospitals in terms of patient accessibility to chiropractic services for the economically disadvantaged communities was also similar, as well as, the variety of departments available to the public and the inter-referrals among the medical staff.

2.3 History of Chiropractic in South Africa

In the early 1900's, there were only four or five chiropractors from the United States and Canada who had set up chiropractic services in South Africa (Hupkes, 1990). By 1960 the chiropractic profession had grown considerably and it became apparent that legislation should be sought to govern and control the profession. Act 76 of 1971, (better known as the Chiropractors Act), had granted recognition to qualified chiropractors already in South Africa, but at the same time not allowing any further chiropractors to register and practise in this country (Hupkes, 1990 and Chiropractic Association of South Africa, 2008). Despite rejections from the South African Medical and Dental council, the act was consistently appealed by the Chiropractic Association of South Africa. This resulted in an amendment to Act 63 of 1982 being implemented in 1985 to form a new body called the Allied Health Professions Council of South Africa to house both chiropractic and homeopathy. Thus the register for chiropractors and homeopaths was re-opened allowing new practitioners into these two professions (Hupkes, 1990 and CASA, 2008). The first teaching institution opened at Technikon Natal (now known as the Durban University of Technology). Thirty two applicants started the academic year in 1989 (Hupkes, 1990) and the first graduates qualified in 1994. A second chiropractic teaching institution opened at the Technikon Witwatersrand (now know as the University of Johannesburg) soon there after in 1994 (CASA, 2008).

Being a relatively young profession in South Africa, access to the chiropractic profession is very limited in this country, with the service being primarily available in the private sector. This is one of the main factors contributing to the fact that research of this nature on chiropractic patients has not been conducted in the public sector. According to Till and Till (2000), South Africa is largely a developing country with scattered developed communities. Therefore, its requirements and opportunities as they relate to chiropractic may differ significantly from those in other developed countries. Within South Africa, there is a wide gap in the living standards and conditions between the wealthy and the poor, thus the patterns of disease affecting them are different as well (Popenoe, Cunningham

and Boult, 1997). With this in mind, it is important to ascertain any differences between the patients that present to the private sector of South Africa, and those that present to the public sector of South Africa. Despite representing a smaller proportion of chiropractic patients in South Africa, it is important that the public sector should not be excluded so as to obtain a true reflection of the patients seeking chiropractic care in a public hospital.

2.4 Introduction to demographic and descriptive studies

Although descriptive studies of this nature have been performed on chiropractic patients internationally, many of these have been performed in the private sector (Nyiendo, 1990, Pedersen, 1990, Walsh and Jaminson, 1992, Leboeuf-Yde *et al*., 1997, Hurwitz *et al.*, 1998, Rubinstein *et al.,* 2000, Sorensen *et al.,* 2002, Hartvigsen, 2002, Coulter and Shekelle, 2005 and Mootz *et al.,* 2005). The same applies to the descriptive studies of this nature in South Africa where majority are also in the private sector (Drews, 1995, Mahomed, 2007, Benjamin, 2007, Jaman, 2007, Kandhai, 2007 and Venketsamy, 2007). Therefore relatively little information was available on chiropractic patients in the public sector. The studies that have been found on patients in the public sector internationally were conducted at a multidisciplinary spinal pain unit in Australia (Giles *et al*., 2002), St Michael's Hospital and satellite clinics in Canada which are affiliated with other satellite teaching clinics in the vicinity (Kopansky-Giles *et al*., 2007). Other studies have also been carried out at a free public clinic in Buffalo, New York USA (Stevens, 2007), and the Calgary Urban Project in Alberta (Suleman, 2001). The only published literature on chiropractic patients in the public sector in South Africa was data on chiropractic patients gathered by Till and Till (2000) at KHC in 1997.

2.4.1 The Demographics of a South African Public Hospital

The primary aim of the South African study conducted by Till and Till (2000), was to determine the potential for integration of chiropractic education into a hospital setting. However, this study documented to a lesser extent on some patient demographics and prevalence of common conditions that presented. Although providing this data was not the main focus of the study, this information has provided some insight as to the identity of the chiropractic patient that presented to a South African public hospital slightly over a decade ago.

A summary of some demographic results documented by Till and Till (2000) revealed that females constituted 79% of the patients seen, with the mean age of 53.3 years. Coloured and Black African ethnic groups constituted 83% of the total number of patients. Pensioners and unemployed comprised 42.4% of the patients. Clinically, 19.4% of the complaints that presented were related to the lumbar spine, 14.4% to the cervical spine,

13.9% to the sacroiliac joint, 12.5% to the thoracic spine and 29.8% to extremity disorders. Non-musculoskeletal complaints were documented in 8.6% of the patients. However, this data was collected in 1997 before the appointment of a full time chiropractor at KHC and has not been updated in the last decade. The study aimed to describe the integration of chiropractic education into a hospital setting, and did not include capturing of data pertaining to clinical characteristics of patients or common management protocols used. Therefore, in order obtain more comprehensive data on the chiropractic patients at the KHCCC, the present study aimed to ascertain more recent data; and to focus on capturing data on all of the following factors: to identify demographics of patients, to document the common presenting conditions, common aetiologies, special investigations, referral patterns, to determine the prevalence of musculoskeletal conditions and non-musculoskeletal conditions and lastly to document common management protocols used in this multidisciplinary primary health care facility in South Africa. (Refer to the summary Tables 1.1 to 4.2 that follow, for the results of this study).

2.4.2 Demographic and descriptive studies conducted in international hospitals and free clinics.

The Canadian Memorial Chiropractic Collage (CMCC) has three community based teaching clinics located in the inner city region of Toronto, namely in Sherbourne Health Centre, Anishnawbe Health Toronto and St. Michael's Hospital, (Kopansky-Giles *et al*., 2007). The focus of the research conducted by Kopansky-Giles *et al.,* (2007) was to describe the experiences of the community based teaching clinics of the CMCC, who offered chiropractic services to the poor patients. Minimal demographic information was documented, however this was not the main objective of this study. It was concluded, that these clinics offer the students' experience in the field, enhancing the student's awareness to problems commonly occurring within the marginalised communities (Kopansky-Giles *et al*., 2007) (Results of this study can be found on summary Tables 1.1 to Table 4.2 which follows after the discussion page). A similar study was conducted by Garner *et al.,* (2007) who investigated the effectiveness of chiropractic care for patients of low socioeconomic status within the Canadian community health centres. This study suggested that chiropractic care at these centres, improved the patients general health status by reducing pain and disability (Garner *et al.,* 2007).

A study performed in a public health care system in Queensland, Australia (Giles *et al*., 2002) prospectively documented patients that presented to the clinic from July 5, 1995 to January 31, 2002. Data was documented on patient characteristics, radiological findings, treatment modalities used and any significant complications as a result of treatment.

Patient data was recorded from 1775 patient records who presented with spinal pain syndromes. In addition patient satisfaction questionnaires were then posted to a random sample of patients (n = 779, 44%) to asses their level of satisfaction with the specialised multidisciplinary spinal pain unit. This multidisciplinary spinal pain unit consisted of chiropractors, acupuncturists and medical practitioners (Giles *et al.,* 2002). (Refer to summary Tables 1.1 to Tables 4.2 that follow, for results of this study).

Research was conducted in Buffalo, New York (Stevens, 2007) at the Lighthouse Free Chiropractic Clinic. This free chiropractic clinic is part of a multidisciplinary setting, which includes other medical professions namely dental, medical and psychology department that attended to the needs for the poor population that presents to the clinic. The objective of this study was to determine the demographics of patients presenting to a free clinic in an ethnic low-income neighbourhood and how they became aware of this clinic (Stevens, 2007). A spreadsheet was created in which interns entered the patient names, addresses, ethnicity, gender, chief complaint, co-morbidities, stages of care, and referral source. The demographic information was obtained from existing clinic intake forms of 256 patients. Limitations to this study included a limited true mean age as patients younger than 18 years of age were not included in the study. However, Stevens, (2007) recommended the inclusion of patients 18 years and younger and more detail on their smoking history be included in future studies in an attempt to strengthen this type of study. (Stevens, 2007). (Refer to summary Tables 1.1 to 4.2 to follow, for results of this study).

A retrospective study was conducted at the Calgary Urban Project Health Clinic (CUPS) in Alberta by Suleman (2001). CUPS is a non-educational, non-hospital institutional setting which aims at providing chiropractic and dentistry services to the lower socioeconomic patients on a voluntary basis. However, services were also provided by medical doctors, nurses and councillors who are paid either by salary or at an hourly rate. This one year retrospective study aimed to gain insight into chiropractic service utilization within this low-income bracket population. This may have indicated that observing trends in a setting like CUPS may provide insight into the chiropractic utilisation that would not be apparent in private practice because of the unique segments of society that are serviced through CUPS. The demographics of users of chiropractic care were examined at this multidisciplinary setting. A limitation to this study was that workers compensation and motor vehicle accident cases were not included into this study. (Refer to summary Tables 1.1 to 4.2 to follow, for results of this study).

Although not the focus of the above-mentioned studies, important demographic and descriptive information about chiropractic patients in the relevant hospitals and public clinical settings were provided.

2.4.3 Demographic and descriptive studies at South African chiropractic private clinics and international private chiropractic clinics

A demographic and descriptive profile of chiropractic patients in private clinics in South Africa was conducted by Mahomed (2007), in which the patient and practitioner profile and demographic data was captured and statistically analysed. Twenty percent of participating chiropractors from all nine provinces of South Africa were sampled in this study. All chiropractors involved in the study were members of the Allied Health Professions Council of South Africa. It is important to note that a limitation to this study was that the response rates were very low, with a zero response rate from Mpumalanga, Limpopo, Northern Cape and the Free State provinces. This low response rate that was documented within these provinces may be due to the minimal number of chiropractors which have set up practice in these above mentioned provinces (n= 15). The overall practitioner and patient response rate was 22.47% and 18.63% respectively. Therefore, this may not have given a true sample group of the private clinics in all provinces of South Africa (Refer to summary Tables 1.1 to 4.2 to follow, for results of this study).

Similar descriptive studies were conducted in the Netherlands (Rubinstein *et al*., 2000) and in Sweden (Leboeuf-Yde *et al*., 1997) to describe the population of patients that present to chiropractors in these countries. In both studies, questionnaires were sent out to the participating chiropractors. Each chiropractor had to complete the data on ten consecutive patients. The patient questionnaire included demographic information, history of the chief complaint and treatment expectations and the number of working days lost due to the chief complaint was also included (Rubinstein *et al*., 2000). The sample included 833 patients from 94 practices. Due to the high response rate of this study (89% and 78% respectively), the results produced were regarded as representative of the chiropractic population (Rubinstein *et al*., 2000) (Refer to the summary Tables 1.1 to 4.2 to follow, for the results of this study).

Similarly in a Swedish study (Leboeuf-Yde *et al*., 1997), each participating chiropractor interviewed ten consecutive patients (new patients or patients with new complaints) using a standardized questionnaire. Where possible, patients were followed for a maximum of six follow-up visits. The sample included 625 patients and 1858 consultations from 66 chiropractic practices (response rate of 78%) (Leboeuf-Yde *et al.,* 1997). The only

difference between the two studies was that the Netherlands study used a retrospective-type questionnaire on ten consecutive new patients.

Danish descriptive studies (Hartvigsen *et al*., 2002 and Sorensen *et al*., 2002) were conducted to provide patient characteristics of chiropractic patients. In the study conducted by Hartvigsen *et al.,* (2002) chiropractic clinics in Denmark were asked to collect data on new patients that presented over a randomly assigned week in 1999 with a basic questionnaire which included patient age, gender, location, duration and intensity of the pain, limitation of activities of daily living, absence from work, previous treatment and mode of referral. The sample included 1887 patients (response rate of 94%) from a total of 176 chiropractic clinics (response rate of 88%). A limitation noted in this study was that the use of open-ended questions and a pain drawing diagram which resulted in a fairly large percentage of misleading answers e.g. patients filled out the whole pain drawing diagram which made it impossible to determine the chief complaint (Hartvigsen *et al*., 2002).

As a follow-up, in 2002, the descriptive study conducted by Sorensen *et al*., (2002) with an expanded questionnaire which included age, gender, occupation, education, location and description of chief complaint, pain intensity, limitations of activities in daily living, mode of referral, duration of sick leave, previous treatments , co morbidity, smoking habits and use of x-rays. Eighty-five percent of all chiropractic clinics in Denmark participated in this study and 1595 patients (response rate of 81%) of the patients filled out the self-administered questionnaire. Limitations to this study were the written answers which didn't always make sense and secondly participants getting confused about their chief complaint as they may have multiple complaints with overlapping symptoms. The combination of the data collected in 1999 and 2002 provided a comprehensive picture of Danish chiropractic patients (Sorensen *et al.,* 2002). (Refer to the summary Tables 1.1 to Table 4.2 to follow, for the results of this study).

Mootz *et al.,* (2005) randomly conducted telephonic surveys of sampled chiropractors who were licensed in Arizona and Massachusetts. The objective of this study was to describe chiropractic care using data collected at the time of each patient visit. The chiropractors were then recruited to document data on 20 consecutive patient visits. Data was collected directly after the consultation with the use of questionnaires. These questionnaires were based upon the National Ambulatory Medical Care Survey (NAMCS). A total amount of 2550 chiropractic patient visits were recorded. A limitation noted in this study was that it was possible for the same patient to be documented twice, as no exclusion was made for

the patient who was seen more than once within the consecutive 20 patient visits (Refer to the summary Tables 1.1 to Table 4.2 to follow, for the results of this study).

Coulter and Shekelle (2005), conducted a descriptive analysis of chiropractic patients and practitioners in five states of the United States of America and one in Canada. Chiropractic practitioners and ten of their patients were selected at random and interviewed. Data was obtained from the interviews and patient files. The sample consisted of 131 practitioners, with 1275 patients interviewed (with an overall response rate of 71%). The results of this study suggested that chiropractic had firmly established themselves within the health care system in the United States and Canada. (Refer to the summary Tables 1.1 to Table 4.2 to follow, for the results of this study).

A few demographic and descriptive studies included data pertaining to whether the patients presented with musculoskeletal and/or non-musculoskeletal conditions and documented the proportion of musculoskeletal conditions as compared to non-musculoskeletal conditions (Rubinstein *et al*., 2000, Hawk *et al.,* 2001, Sorensen *et al*., 2002, Coulter and Shekelle, 2005 and Leboeuf-Yde *et al.,* 2005). The multination survey by Leboeuf-Yde *et al*., (2005) which included South Africa also documented self-reported improvement to non-musculoskeletal features such as allergies, asthma and breathing as a result of chiropractic intervention .

Research conducted by Hawk *et al*., (2001) reported on the demographics and prevalence of non-musculoskeletal complaints in chiropractic practices in 32 states in the United States of America, 2 Canadian provinces, and 2 states in Australia utilising a practice based research programme (PBR). A total of 7651 patients completed forms from 110 practices. The purpose of this study was to identify characteristics of patients seeking chiropractic care for non-musculoskeletal complaints and of the practitioners associated with such patients. Non-musculoskeletal complaints accounted for 10.3% of the chief complaints. Particular characteristics were identified which included factors such as: being under the age of 14, located in a rural or small town, reporting more than one complaint and having received chiropractic treatment before 1960. Limitations implicated in this study, included volunteer practices and only their consenting patients were included, which may not have been generalisable to the general public. Secondly, quality assurance was questioned in terms of the patients understanding and responding to the questions truthfully and correctly. (Hawk *et al.,* 2001).

2.4.4 Demographic and descriptive studies of teaching institutions in South Africa and abroad

One unpublished study was conducted by Drews (1995), where data was collected on chiropractic patients in a teaching institution in Durban and compared to the private sector. This study (like that of Till and Till, 2000), was conducted over a decade ago, and as a result the data obtained is outdated. In addition, Drews (1995) conducted the study shortly after the teaching clinic was opened in Durban, therefore this may not have given a good indication of the patients that present to teaching clinics presently. In view of this, various studies were conducted in 2007 where updated demographic and descriptive information on chiropractic patients was collected in order to establish a demographic and descriptive profile of patients that presented to a teaching institution, at Durban University of Technology (DUT), Chiropractic Clinic (Benjamin, 2007; Jaman 2007; Kandhai, 2007 and Venketsamy, 2007). The surveys consisted of cervical, thoracic, lumbo-sacral and extremity cases respectively that presented to the learning institute from 1995 to 2005. A 30% sample was randomly selected for review (Refer to the summary Tables 1.1 to Table 4.2 to follow, for the results of this study). The results of these studies were needed for comparison in this study because the data was more current, and because considerably more patient files were documented in the recent studies than the study conducted by Drews (1995). Therefore these studies provide a better reflection of chiropractic patients that present to the DUT teaching clinc in South Africa.

Similarly, a number of comparable studies (Nyiendo *et al*., 1989, Walsh, 1992, Walsh and Jamison, 1992, Morschhauser *et al*., 2003 and Holt and Beck, 2005) were conducted to make comparisons between chiropractic teaching clinics and between private clinics that were located in similar areas to that of teaching clinics. However, questions as to whether these findings may be generalized to other chiropractic teaching clinics or to patients attending chiropractors in the field was inconclusive. This may be due to the fact that noticeable differences between the clinics were noted on the standard demographics which included that of age, education, employment and income in some studies (Nyiendo *et al*., 1989, Morschhauser *et al*., 2003, Walsh and Jaminson, 1992) but were not found in other studies conducted (Walsh, 1992 and Holt and Beck, 2005). It was noted that these differences may be accounted for by the different neighbourhoods in which the clinics were located. It was also concluded that there were no significant differences in the types of health complaints for which patients sought treatment and the characteristics of the complaints were very similar (Nyiendo *et al*., 1989, Walsh and Jaminson, 1992). Thus it was concluded by Walsh (1992), that it was possible to conduct studies across the clinics which have similar demographics and pool the data, or to use the data from one clinic to

draw conclusions about the other clinics. (Refer to the summary Tables 1.1 to Table 4.2 to follow, for the results of this study).

Walsh and Jamison (1992), conducted a retrospective analysis of all new patients at private clinics that were located in similar areas to that of teaching clinics and compared such information to the data derived from the three teaching clinics, described as above in the study done by Walsh (1992). The marked overlap between the patient profiles of student and practitioner clinics suggests that both of these venues may provide useful research data. It was possible to conclude that private clinic patients showed a similar sample to the teaching clinics in most of the categories studied (Walsh and Jamison. 1992).

2.4.5 Summary tables colour coding

Green: Private international chiropractic practices

Blue: Public international chiropractic practices

Purple: International Chiropractic teaching clinics

Orange: Public local chiropractic clinic

Grey: Local chiropractic teaching clinic

Sea Green: Private local chiropractic clinics

2.4.6 Index of Summary tables

	Authors	Countries/Areas	Female	Male	Age	Employment and Occupation
1	Pedersen (1994)	Europe	53.80%	46.20%	mean age was 40.8	44.5% Employed full-time, 14.1% Self-Employed, 11.6% Housewives, 7.5% Retired & 5.2% Students
2	Leboeuf-Yde *et al*., (1997)	Sweden	50.00%	50.00%	between 25-64	67% employed, 11% homemaker, 9% retired, 4% student, 2% unemployed
3	Rubinstein *et al*., (2000)	Netherlands	60.00%	40.00%	mean age 41	30% Skilled Labourers or Lower-Class Personnel, 23% Middle-Class Personnel, 10% Higher-Class Personnel & 18% Housewives.
4	Hartvigsen *et al*., (2002)	Denmark	51.50%	48.50%	average age was 42	Not investigated
5	Sorensen *et a*l., (2002)	Denmark	50.50%	49.50%	mean age 42	Documented only absence from work
6	Coulter & Shekelle (2005)	USA and Canada	61.00%	38.00%	average age was 42	Not investigated
7	Mootz *et al*., (2005)	Arizona	58.00%	42.00%	mean age was 46	Not investigated
8	Mootz *et al*., (2005)	Massachusetts	57.00%	43.00%	mean age 44	Not investigated
9	Stevens (2007)	Buffalo New York	65.00%	35.00%	between 18-60	Not investigated
10	Suleman (2001)	Calgary Urban Project	33.00%	67.00%	average age was 37.8	14% Labourers, 4% Students, 3% Unemployed & 66% not reported, 10% other
11	Gaumer & Gemmen (2006)	Chiropractic users USA	65.00%	35.00%	37% were aged 35-50	18.8% Retired, 8% Manufacturing, 8.5% Retail/Wholesale & 8.8% Healthcare
12	Till and Till (2002)	KHCCC	79.00%	21.00%	mean age 53.3	42.4% Unemployed or Pensioner
13	Giles *et al*., (2002)	Queensland Australia	47.00%	53.00%	between 10-91, average 43	33% Unemployed, 18.3% Manual worker, 13% Self employed, 2.3% Pensioner, 23.4% Other.
14	**Kopansky-Giles et al., (2007)**	CMCC Toronto Hospitals	no	no	no	Not investigated
15	Morschhauser *et al*., (2003)	Outreach (Free to pts with financial need)	44.20%	55.80%	56.4% between 18-24	Not investigated
		Inner City	59.10%	40.90%	43.6% between 45-65	Not investigated
		Main (On Campus)	50.60%	49.40%	49.2% between 18-24	Not investigated
		Satellite (For Free)	60.30%	39.70%	42.8% between 18-24	Not investigated

16	Nyiendo *et al*., (1989)	USA - LACC	51.00%	49.00%	mean age 36.4	24% Unemployed, 75% Employed, 42% Manual, 58% Non-manual
		Palmer-West	51.00%	49.00%	mean age 36.0	24% Unemployed, 75% Employed, 25% Manual, 75% Non-manual
		WSCC	51.00%	49.00%	mean age 37.1	24% Unemployed, 75% Employed, 42% Manual, 58% Non-manual
		Pasadena	52.00%	48.00%	mean age 42.7	47% Unemployed, 54% Employed, 37% Manual, 63% Non-manual
		Cleveland	47.00%	54.00%	mean age 37.6	44% Unemployed, 57% Employed, 37% Manual, 62% Non-manual
		Life-West	58.00%	42.00%	mean age 34.5	31% Unemployed, 69% Employed, 36% Manual, 64%Nonmanual
17	Walsh (1992) Abbotsford	Australia Abbotsford	52.40%	47.60%	mean age 34.2	4.7%Heavy Manual, 30.2% Light manual, 57.2% Non-manual, 7.9% Unemployed
	Bulleen	Australia Bulleen	53.30%	46.70%	mean age 34.3	3.3% Heavy Manual, 25.5% Light manual, 66.2% Non-manual, 5% Unemployed
	Summerhill	Australia Summerhill	52.30%	47.70%	mean age 34.7	7.9% Heavy Manual, 39.8% Light Manual, 42.1% Non-manual, 10.2% Unemployed
18	Walsh and Jamison (1992)	Private clinic Australia	47.80%	52.20%	mean age 34.1	12.6% Heavy Manual, 33% Light Manual, 31% Non-manual, 23.3% Non-employed
		Teaching clinic Australia	52.60%	47.40%	mean age 34.4	5.55 Heavy Manual, 32.2% Light Manual, 54.4% Non-manual, 8% Non-employed
19	Holt and Beck (2005)	New Zealand	51.90%	48.10%	mean age 32.3	Not investigated
20	Venketsamy (2007)	South Africa DUT cervical	59.60%	40.40%	mean age 36.89	33.1% Active occupation,45.7% Sedentary,31.7% NA, 57.9% Employed,5.3%Retired
21	Benjamin (2007)	South Africa DUT thoracic	54.80%	45.20%	mean age 33.3	21.6% Active occupation, 51.9% Sedentary,26.6 NA, 58.1% Employment, 2.9% Unemployed, 2.1 % Retired
22	Jaman (2007)	South Africa DUT lumbar	44.70%	55.30%	mean age 39.47	22.4% Active occupation,61.4% Sedentary,16.2 NA,65.3% Employed, 8.6% Retired, 2.9% Unemployed
23	Kandhai (2007)	South Africa DUT extremities	37.90%	62.10%	mean age 39.6	19.7% Active occupation,42.2% Sedentary,38.2% N/A, 42.2% Employed, 22.2% Scholar,9.6% Retired,2.9% Unemployed
24	Mahomed (2007)	South Africa Private clinics	62.60%	37.40%	mean age 41.81	24% Liberal professions, 16% managerial professions, 10% skilled worker/artisan, 10% housewife

Summary Table 1.1: Demographics table

****** Data has been taken and is to be published. Presently unavailable.

	Authors	Ethnicity	Education
1	Pedersen (1994)	Not Investigated by authors	Not Investigated
2	Leboeuf-Yde *et al*., (1997)	Not Investigated by authors	Not Investigated
3	Rubinstein *et al*., (2000)	Not Investigated by authors	37 % of patients completed secondary (vocational) training
4	Hartvigsen *et al*., (2002)	Not Investigated by authors	Not Investigated
5	Sorensen *et al*., 2002	Not Investigated by authors	13% primary school, 29% Vocational, 18% Bachelor, 9%Masters, 22% Other
6	Coulter & Shekelle (2005)	82.5% White, 3.9% Black, 6.4% Hispanic & 7.1% Other.	54% Americans had a degree,38% In Canada had a degree,
7	Mootz *et al*., (2005)	93% White, 4% Native American, 2% African American, 11% Hispanic.	Not Investigated
8	Mootz *et al*., (2005)	95% White, 3% African American, 5% Hispanic & 2% Asian/Pacific Islander	Not Investigated
9	Stevens (2007)	63 %African American, 32% White, 4% Hispanic	Not Investigated
10	Suleman (2001)	Not Investigated	Not Investigated
11	Gaumer & Gemmen (2006)	93.5 % White, 2.3% African American, 1.8% Hispanic, 0.8% Asian & 0.8%	36% of patients were High School Graduates
12	Till and Till (2002)	83% Coloured and Black	Not Investigated
13	Giles *et al.,* (2002)	Not Investigated	Not Investigated
14	Kopansky-Giles *et al*., (2007)	Not Investigated	Not Investigated
15	Morschhauser *et al.,* (2003)	65% White, 25% African American	Not Investigated
		35% White, 44% African American	Not Investigated
		65% White, 5% African American	Not Investigated
		90% White, 5% African American	Not Investigated
16	Nyiendo *et al*., (1989)	Not Investigated by researchers	5%<high school, 24% High school, 72% College
		Not Investigated by researchers	2%<high school, 14% High school, 83% college
		Not Investigated by researchers	5%<high school, 19% High school, 76% College
		Not Investigated by researchers	11%<high school, 25% High school, 63% College
		Not Investigated by researchers	13%<high school, 21%High school, 66% College
		Not Investigated by researchers	8%<high school, 16% High school, 76% College
17	Walsh (1992) Abbotsford	Not Investigated by researchers	Not investigated
	Bulleen	Not Investigated by researchers	Not investigated
	Summerhill	Not Investigated by researchers	Not Investigated
18	Walsh and Jamison (1992)	Not Investigated by researchers	Not Investigated
		Not Investigated by researchers	Not Investigated
19	Holt and Beck (2005)	Not Investigated by researchers	Not Investigated
20	Venketsamy (2007)	Not Investigated by researchers	Not Investigated
21	Benjamin (2007)	Not Investigated by researchers	Not Investigated
22	Jaman (2007)	Not Investigated by researchers	Not Investigated
23	Kandhai (2007)	Not Investigated by researchers	Not Investigated
24	Mahomed (2007)	75.66% White, 15.93% Indian, 3.54% Black, 3.98% Coloured	40.97% Tertiary, 25.99% Post grad, 25.11% Matric, 6.17% High school

Summary Table 1.2: Demographics Table

	Authors	Anatomical Location
1	Pedersen (1994)	51.8% Low Back-Leg, 28.5% Headaches/Neck-Arm, 7.3% Thoracic/Chest, 4.4% Lower Extremity & 3.8% Upper Extremity
2	Leboeuf-Yde *et al*., (1997)	56% Back/Neck, 20% Spine & Radiating, 14% Several Areas & 7% Only Peripherally Radiating Pain
3	Rubinstein *et al.,* (2000)	47% Low Back, 19% Neck, 7% Headache, 3% Thoracic, 3% Neck & Headache, 2% Lower Extremities, 1% Upper Extremities & 15% Multiple Areas of Complaint
4	Hartvigsen *et al.,* (2002)	50% low back pain, 15% Neck,
5	Sorensen *et al*., 2002	49% Lower Back or Pelvis Pain
6	Coulter & Shekelle (2005)	27% Neck/Cervical problems, 22% Low Back problems, 21% Back/Spine problems and 13% Extremities
7	Mootz et al., (2005) Arizona	41% Low Back Pain, 26% Neck/Face pain/injury, 9% Extremity, 6% Headache & 4% Wellness
8	Mootz et al., (2005) Massac	44% Low Back Pain, 23% Neck/Face pain/injury, 4% Extremity, 5% Headache & 10% Wellness
9	Stevens (2007)	57% lumbopelvic, 18% Neck, 7% Thoracic, 1% Headaches, 9% Lower Extremity, 4% Shoulder, 2% Maintainence, 1% Other
10	Suleman (2001)	All patients presented with a neuromusculoskeletal complaint
12	Till and Till 2002	19.4% Lumber spine, 14.4% Cervical spine, 13.9% Sacroiliac, 12.5% Thoracic spine, 29.8% Extremity disorders
13	Giles *et al*., (2002)	17% had soft tissue nonspecific spinal pain syndromes, 83% had radiologically identifiable pathology
14	Kopansky-Giles *et al*., (2007)	40% Low back, 8% Neck, 1% Upper back, 3% Headaches, 19% Multiple sites, 11% Nonspinal
15	Morschhauser *et al*., (2003)	44% Back, 20% Extremity, 20% Multiple Areas
	inner City	40% Extremity, 38% Back, 20% Neck
	Main	40% Back, 22% Extremity, 20% Neck
	Satellite	35% Back, 25% Extremity, 20% Neck
16	Nyiendo *et al.,* (1989) LACC	41% Low Back, 27% Neck, 17% Extremity, 10% Upper back, 5% other, 0% Head
	Palmer-West	34% Low Back, 24% Neck, 19% Extremity, 15% Upper back, 5% Head, 4% Other
	WSCC	37% Low Back, 20% Neck, 19% Extremity, 14% Upper back, 6% Other, 4% Head
	Pasadena	39% Low Back, 19% Neck, 19% Extremity, 14% Other, 11% Upper back, 0% Head
	Cleveland	31% Low Back, 25% Neck, 22% Extremity, 12% Upper back, 5% Other, 5% Head
	Life-West	34% Low Back, 26% Neck, 17% Extremity, 14% Upper back, 8% Other, 2 % Head
17	Walsh (1992) Abbotsford	70.5% Spinal, 18.7% Extremity, 10.8% Visceral
	Bulleen	77.3% Spinal, 13.3% Extremity, 9.3% Visceral
	Summer	73.9% Spinal, 15.8% Extremity, 11.3% Visceral
18	Walsh and Jaminson (1992)	42.4% Low Back, 25% Cervical, 9.5% Thoracic, 6.1% Shoulder, 5.7% Headache, 5% Other extremity, 4.6% Other visceral
		33.2% Low Back, 23.6% Cervical, 16.5% Thoracic, 9% Other extremity, 8.1% Headache, 6.4% Shoulder, 3.2% Other visceral
19	Holt and Beck (2005)	31.7% Low back (no referral), 6.4% Low back with referral, 13.4% Cervical (no referral), 12.6% Headache, 11.6% No complaint, 9.5% Thoracic,6.2% Upper extremity2.6% Lower extremity
20	Venketsamy (2007)	91.18% Neck pain, 37.5% Headaches,11.69% Arm Pain, 1.13% Jaw pain, 0.83% Chest pain
21	Benjamin (2007)	41.4% Midback, 26.5% Thoracic, 7.2% Shoulder Blade, 6% Upper Back, 3.2% Mid Thoracic.
22	Jaman (2007)	89.8% Low Back pain, 4.8% Buttock, 4% Leg pain, 3.6% Sacroiliac pain, 3.1% Thigh pain, 2% Hip pain
23	Kandhai (2007)	28.6% Knee, 25.8% Shoulder, 2.2% Foot, 8.7% Hand and wrist, 6.7% Elbow, 6.6% Hip, 1.4% TMJ
24	Mahomed (2007)	25.6% Headache and neck pain, 18.5% low back pain, 11.9%Neck pain only, 11.5% Low back and leg, 7% Mid Back, 4.4% Maintenance, 3.5% Headaches, 3.1% Shoulder

	Primary Diagnosis	Duration
1	As discussed in main area of complaints	46.8% Acute (less than 4 weeks), 25.1% Sub-acute (4 weeks to 6 months) & 28.1% Chronic (more than 6 months)
2	As discussed in main area of complaints	For almost half of the participants, duration was less than 1 month
3	Only Main areas of complaint	Greater than 77% of all neuro-musculoskeletal complaints were over 3 months duration, where 58% greater than a year
4	Only Main areas of complaint	Majority between 1 and 6 months, Sub-acute and Chronic
5	Not Investigated	64% Acute conditions of less then four weeks
6	Not Investigated	45% less than 3 weeks & 21% more than 6 months
7	Not Investigated	Not Investigated
8	Not Investigated	Not Investigated
9	Not Investigated	21% Acute, 9% Sub-acute, 68% Chronic, 2% Maintenance
10	Not Investigated	Not Investigated
12	Not Investigated	Not Investigated
13	17% nonspecific spinal pain syndromes, 83% radiological abnormalities	92.7% Chronic, 7.3% Sub-acute, 2.2% Acute
14	Not Investigated as yet	Not investigated as yet
15	Not Investigated	40% > 1 year, 20% < 1 week, 18% 1-6 weeks
		55% > 1 year, 5% < 1 week, 17% 1-6 weeks
		53% > 1 year, 10% < 1 week, 15% 1-6 weeks
		53% > 1 year, 10% < 1 week, 15% 1-6 weeks
16	Not Investigated	36% Acute, 64% Chronic
		23% Acute, 77% Chronic
		36% Acute, 64% Chronic
		20% Acute, 80% Chronic
		32% Acute, 68% Chronic
		21% Acute, 79% Chronic
17	Not Investigated	52-53% two months or more, 25.6% only one week or less, 4.2% last 24 hours
	Not Investigated	
	Not Investigated	
18	Not Investigated	46.3% 60+days, 5.6% 29-59 days, 48.1% 1-28 days
		52.6% 60+days, 7.4% 29-59 days, 21.1%
19	Not Investigated	Not Investigated
20	67.4% Cervical Facet Syndrome,14.2 Myofascial Syndrome,3.5% Cervicogenic Headache	Not Investigated
21	74.7% Thoracic Facet Syndrome, 8.8% Myofasciitis, 2% Costrotransverse Syndrome	Not Investigated
22	39.7% Sacroiliac Syndrome, 37.8% Lumbar Facet Syndrome, 6.6% Myofasciitis	Not Investigated
23	12.9% Myofaciitis,7.8% Supraspinatus tendinitis,7.1% Lateral Epicondylitis,6.8% Bicipital Tendinitis, 5.4% Adhesive Capsulitis, 12.2% PFP Syndrome, 8.2% Inversion Ankle Sprain.	Not Investigated
24	7.05% Cervical Facet Syndrome, 5.73% Sacroiliac Syndrome,4.85% Whilash,3.96% Lumbar Facet Syndrome	57.9% Chronic, 28.77% Acute, 13.24% Sub-acute

	Aetiology	Special Investigations	Source of Patient referred from
1	Not Investigated	25.6% use of X-rays, 5.6% Laboratory tests	Not Investigated
3	Not Investigated	Not Investigated	71% Family and friends,17% Referred by GP, 10% other therapist
4	Not Investigated	Not Investigated	31% referred from friends or family, 49% of referred patients from GP
5	Not Investigated	27% X-rayed on initial visit	17% from GP, 2% Physiotherapist, 1%Reflexologist, 24% Friends and Family
6	53% Reported Injury, 43% Non-work related Injuries, 16% Work related Injuries	Not Investigated	Not Investigated
7	Not Investigated	17 %Plain Film x-ray, 1% MRI	85% Self referrals, 6% medical referral
8	Not Investigated	6% Plain Film x-ray, 1% MRI	85% Self referrals, 6% medical referral
9	Not Investigated	Not Investigated	14% Medical Doctor, 5% Chiropractic, 27% Patients, 25% Walk-ins
10	Not Investigated	X-ray requisition	Walk in patients
12	Not Investigated	Not Investigated	Not Investigated
13	Not Investigated	CT, MRI, Laboratory test, 83% had radiological identifiable pathology	40% medical referral, 2% Chiropractic, 1% Osteopathy, 40.3% self referred of referred patients
14	Not Investigated as yet	Not Investigated as yet	Not Investigated
15	Not Investigated	Not Investigated	Not Investigated
16	Not Investigated	Not Investigated	44% DC student, 6% health professional, 37% Friend/relative, 8% ads,4% Self
	Not Investigated		78% DC student, 1% Health professional, 17% Friend/relative, 2% Ads, 2% Self
	Not Investigated		49% DC student, 5% Health professional, 31% Friend/relative, 10% Ads, 6% Self
	Not Investigated		49% DC student, 5% Health professional, 31% Friend/relative, 10% Ads, 6% Self
	Not Investigated		35% DC student, 9% Health professional, 36% Friend/relative, 10% Ads, 10% Self
	Not Investigated		55% DC student, 6% Health professional, 29% Friend/relative, 8% Ads, 3% Self
17	45.2%Unknown, 13.5% Stress, 10.3% Trauma, 9.5% Lifting	Not Investigated	Not Investigated
	33.3% Unknown, 15% Sports injury, 15% Trauma, 13.3% Movement	Not Investigated	Not Investigated
	47.3% Unknown, 14.8% Trauma, 9.1% Sports Injury, 9.1% Lifting	Not Investigated	Not Investigated
18	40% Unknown, 16.5% Movt, 12% Trauma, 11% Sporting, 9% Lifting, 7.5% MVA, 4% Stress	Not Investigated	Not Investigated
	44.9% Unknown, 12% Trauma, 10.2% Lifting, 10.2% Sporting,8.8% Stress, 5.8% MVA	Not Investigated	Not Investigated
19	Not Investigated	Not Investigated	Not Investigated
20	61.8% unknown, 9.9% Accident, 7.6% Depression, 5.6% poor posture,4.6% sport	8.7% X-rays, 0.4% Other	Not Investigated
21	61.4% unknown, 8.4% Sport, 5.6% Carrying, 5.2% Accident, 5.2 Ergonomics	5.6% X-rays	Not Investigated
22	57.2% unknown, 12.3% Carrying, 11.5% Sport, 2% medical	8.5% X-rays	Not Investigated
23	53.9% unknown, 25.4% Sport (LL),4.4% Carrying (UL),14.9% Accident,	5.1% X-rays (UL), 4.7% X-rays (LL)	Not Investigated
24	Not Investigated	37.4% X-rays,3.2% Ultrasound,2.4% Blood Tests	45% Relative/Friend,25.7% Self referral,5.3% GP, 1.8% Physiotherapist

	Authors	History of illness	Smoker	Blood Pressure
1	Pedersen (1994)	Not Investigated	Not Investigated	Not Investigated
2	Leboeuf-Yde *et al*., (1997)	***	***	***
3	Rubinstein *et al*., (2000)	Not Investigated	Not Investigated	Not Investigated
4	Hartvigsen *et al*., (2002)	Not Investigated	Not Investigated	Not Investigated
5	Sorensen et al. 2002	19% Male 25% female Lung problems, 12% Male-16% Female Asthma/Allergy, 13%Female Reproductive, 5% Cardiovascular, 2% Male-1%Female Diabetes	32% Smokers	
6	Coulter & Shekelle (2005)	Not Investigated	Not Investigated	Not Investigated
7	Mootz *et al*., (2005)	Not Investigated	Not Investigated	
8	Mootz *et al*., (2005)	Not Investigated	Not Investigated	
9	Stevens (2007)	27% Hypertension, 13% Cholesterol, 4% Heart Disease, 22% Depression, 12% Diabetes	30% Smokers	27% Hypertension
10	Suleman (2001)	Not Investigated	Not Investigated	Not Investigated
11	Gaumer & Gemmen (2006)			
12	Till and Till (2002)	Not Investigated	Not Investigated	Not Investigated
13	Giles *et al*., (2002)	Not Investigated	Not Investigated	
14	Kopansky-Giles *et al*., 2007	Not Investigated as yet	Not Investigated as yet	Not Investigated
15	Morschhauser *et al*., 2003	Not Investigated	Not Investigated	Not Investigated
16	Nyiendo *et al.,* (1989)	Not Investigated	Not Investigated	Not Investigated
17	Walsh (1992) Abbotsford	Not Investigated	Not Investigated	Not Investigated
	Bulleen	Not Investigated	Not Investigated	Not Investigated
	Summerhill	Not Investigated	Not Investigated	Not Investigated
18	Walsh and Jamison (1992)	Not Investigated	Not Investigated	Not Investigated
19	Holt and Beck (2005)	Not Investigated	Not Investigated	Not Investigated
20	Venketsamy (2007)	24% Respiratory,20.5% Cardiac, 14% Endocrine, 4.2% High Blood Pressure	Not Investigated	13.6% abnormalities, of these 63.9% high BP, 35% Low BP
21	Benjamin (2007)	Not Investigated	Not Investigated	Not Investigated
22	Jaman (2007)	5.9% Cardiac, 4.8% Abdominal, 4.4% Respiratory	Not Investigated	12.3% abnormalities, Of these 81.5% high,18.5% low
23	Kandhai (2007)	9.2% Cardiac (LL),7.5% Endocrine (LL),7.5% Respiratory	Not Investigated	13.6% abnormalities (UP), 9.2% abnormalities (LL)
24	Mahomed (2007)	Not Investigated	Not Investigated	Not Investigated

Summary Table 3.1: History of illness, smoking and blood pressure

	Authors	History of pre-existing spinal conditions	History of surgery	Previous treatment for same complaint at the chiropractor
1	Pedersen (1994)	Not investigated	Not Investigated	Not Investigated
2	Leboeuf-Yde *et al*., (1997)	***	***	***
3	Rubinstein *et al.,* (2000)	Not investigated	Not Investigated	14% previous chiropractic treatment
4	Hartvigsen *et al.,* (2002)	Not investigated	Not Investigated	15% previous treatment for same complaint
5	Sorensen *et al.,* (2002)	Not investigated	Not Investigated	53% previous treatment for same complaint
6	Coulter & Shekelle (2005)	SF-36 General Health Status	Not Investigated	58% no care for current episode before chiropractic, Previous tx not investigated
7	Mootz *et al.,* (2005)	Not investigated	Not Investigated	81% seen previously, of which 90% same complaint
8	Mootz *et al*., (2005)	Not investigated	Not Investigated	89% seen previously, of which 90% same complaint
9	Stevens (2007)	Not investigated	Not Investigated	Not Investigated
10	Suleman (2001)	Not investigated	Not Investigated	Not Investigated
11	Gaumer & Gemmen (2006)	***	***	***
12	Till and Till, (2002)	Not investigated	Not Investigated	Not Investigated
13	Giles *et al.,* (2002)	1.9% Inflammatory arthritic conditions, 0.6% malignancies, 2.2% other e.g. osteoporosis	Failed spinal surgery 6.76%	Not Investigated
14	Kopansky-Giles *et al*., (2007)	Not investigated as yet	Not Investigated as yet	Not Investigated as yet
15	Morschhauser *et al.,* (2003)	Not investigated	Not Investigated	
16	Nyiendo *et al.,* (1989)	Not investigated	Not Investigated	Not Investigated
17	Walsh, (1992) Abbotsford	Not investigated	Not Investigated	Not Investigated, (Number of previous
	Bulleen	Not investigated	Not Investigated	Episodes were investigated)
	Summerhill	Not investigated	Not Investigated	
18	Walsh and Jamison, (1992)	Not investigated	Not Investigated	Not Investigated (Number of previous episodes were investigated)
19	Holt and Beck, (2005)	Not investigated	Not Investigated	Not Investigated
20	Venketsamy, (2007)	Not investigated	Not Investigated	Not Investigated
21	Benjamin, (2007)	N=6 Scoliosis, N=4 Hyperkyphosis	Not Investigated	Not Investigated
22	Jaman, (2007)	Not investigated	Not Investigated	Not Investigated
23	Kandhai, (2007)	Not investigated	Not Investigated	Not Investigated
24	Mahomed, (2007)	Not investigated	Not Investigated	70% treated by chiropractor of which 89% was the same complaint

Summary Table 3.2: History of spinal conditions, surgery and previous treatment

	Authors	Referrals	Contraindications for treatment
1	Pedersen (1994)	Not Investigated	Not Investigated
2	Leboeuf-Yde *et al*., (1997)	***	***
3	Rubinstein *et al*., (2000)	Not Investigated	Not Investigated
4	Hartvigsen *et al*., (2002)	Not Investigated	Not Investigated
5	Sorensen *et al*., 2002	Not Investigated	Not Investigated
6	Coulter & Shekelle (2005)	Not Investigated	Not Investigated
7	Mootz *et al*., (2005)	Not Investigated	Not Investigated
8	Mootz *et al.,* (2005)	Not Investigated	Not Investigated
9	Stevens (2007)	Not Investigated	Not Investigated
10	Suleman (2001)	Not Investigated	Not Investigated
11	Gaumer & Gemmen (2006)		
12	Till and Till (2002)	Not Investigated	Not Investigated
13	Giles *et al.,* (2002)	12.6% Referred to various disciplines, Orthopaedics, Neurosurgery, Physiotherapy	Pneumothorax complication from acupuncture
14	Kopansky-Giles *et al*., 2007	Not Investigated as yet	Not Investigated as yet
15	Morschhauser *et al*., 2003	Not Investigated	Not Investigated
16	Nyiendo *et al.,* (1989)	Not Investigated	Not Investigated
17	Walsh (1992) Abbotsford	Not Investigated	Not Investigated
	Bulleen	Not Investigated	Not Investigated
	Summerhill	Not Investigated	Not Investigated
18	Walsh and Jamison (1992)	Not Investigated	Not Investigated
19	Holt and Beck (2005)	Not Investigated	Not Investigated
20	Venketsamy (2007)	2.1% referral to other practitioners	6.3% to manipulation and electrotherapy
21	Benjamin (2007)	2 Referred to gynaecologist and orthopaedic surgeon	2.8% Cancer, Hepatomegaly
22	Jaman (2007)	1.6% Referred to other practitioners	3.7% contraindicated for manipulation
23	Kandhai (2007)	2.9% Referred to other practitioners, 30% GP,15% Orthopaedic Surgeon	13patients Contraindications to treatment
24	Mahomed (2007)	Not Investigated	Not Investigated

Summary Table 4.1: Management protocol

	Authors	Treatment Protocol
1	Pedersen (1994)	91.3% Manipulative therapy, 94.8% Non-manipulative therapy, 3.2% non-prescription medication.
2	Leboeuf-Yde *et al.,* (1997)	***
3	Rubinstein *et al*., (2000)	Not Investigated
4	Hartvigsen *et al.,* (2002)	Not Investigated
5	Sorensen *et al.,* 2002	Not Investigated
6	Coulter & Shekelle (2005)	Not Investigated
7	Mootz *et al*., (2005)	82% Spinal Adjustments,9% Extremity adjustment, Soft tissue techniques
8	Mootz *et al.,* (2005)	85% Spinal Adjustment, 11% Extremity adjustment, Soft tissue techniques
9	Stevens (2007)	Not Investigated
10	Suleman (2001)	92% Chiropractic Adjustment, Diversified technique
11	Gaumer & Gemmen (2006)	
12	Till and Till 2002	Not Investigated
13	Giles *et al.,* (2002)	28.6% acupuncture, 11.7% Chiropractic manipulation,7.6% Medication, 0.6% Shoe Lift.
14	Kopansky-Giles *et al*., 2007	Not Investigated as yet
15	Morschhauser *et al.,* 2003	Not Investigated
16	Nyiendo *et al.,* (1989)	Not Investigated
17	Walsh (1992) Abbotsford	Not Investigated
	Bulleen	Not Investigated
	Summerhill	Not Investigated
18	Walsh and Jamison (1992)	Not Investigated
19	Holt and Beck (2005)	Not Investigated
20	Venketsamy (2007)	84.3% Soft Tissue Therapy, 74.7% Manipulation, 73.9% Other
21	Benjamin (2007)	82.6% Joint Manipulation, 79.4% Soft Tissue Therapy, 44.9% Stretches
22	Jaman (2007)	74.5% Joint Manipulation, 72.7% Soft Tissue, 31.8% IFC
23	Kandhai (2007)	49.6% Electro modalities, 42.2% Soft Tissue, 37.4% Cryotherapy
24	Mahomed (2007)	Not Investigated

Summary Table 4.2: Management protocol

2.5 Discussion of the four main objectives in this study and the trends analysed in the tables documented above.

2.5.1 Introduction

Leboeuf-Yde, *et al.* (1997), states that factors such as political differences between countries and their diverse cultures could result in variations in both the chiropractic practice and patient profiles. This may be true for a multicultural and multiracial country like South Africa, with its diverse population structure and different lifestyles led by different populations (Popenoe *et al*. 1997). Due to this diverse population of South Africa, the need for statistical and descriptive information pertaining to chiropractic patients in South African public hospitals was warranted to detect if this variation in practice and patient profiles exists.

2.5.2 Discussion of the demographic tables (Summary Tables 1.1 and 1.2)

In this study, demographic factors of patients were primarily investigated to determine what subgroups exist in the overall population in Kimberley, who utilize chiropractic services in a public health care facility at KHCCC; and to create a clear and complete picture of the characteristics of a typical member of these subgroups. Popenoe *et al.,* (1997) suggested that it is important to include ethnicity and socioeconomic indicators (such as income level, occupation, place of residence and lifestyle) in addition to all other factors documented. This may be especially important in a country like South Africa where a unique demographic profile, marked by multiple ethnic groups and social issues brought on by the history of this country, which includes that of the apartheid era, divisions within ethnic groups, the HIV/AIDS epidemic and the high emigration rates from the neighboring countries (SADHS, 2003). Therefore the demographic factors of patients included gender, age, ethnicity, employment, occupation, level of education and patient residence. These factors were assessed:

- In order to give a better picture of the typical patient that presented to the KHCCC,
- Certain factors which were based on recommendations made in other studies and
- To allow for comparisons to be made within this study to other local and international studies.

Data regarding gender was represented in summary table 1.1. In majority of the studies analysed, it was noted that there was a higher proportion of female patients compared to male patients, with the exception of particular studies (Suleman, 2001, Giles *et al.,* 2002, Morschhauser *et al., 2003,* Nyiendo *et* al., 1989, Walsh and Jamenson, 1992, Jaman, 2007 and Kandhai, 2007). Of the studies with a higher male proportion of patients, three studies

(Suleman, 2001, Giles *et al.,* 2002 and Morschhauser *et al.,* 2003) were located in public clinics in under privileged populations, three were teaching clinics (Nyiendo *et* al., 1989, Jaman, 2007 and Kandhai, 2007), and only one was a private clinic (Walsh and Jamenson, 1992). Of these, the largest proportion of men utilising chiropractic care was from the CUPS public facility in Alberta (Suleman, 2001). This may be due to the fact that fewer men had health care coverage in provinces other than Alberta, causing more men from other provinces to come across to utilise the CUPS facility.

Data regarding age was represented in summary table 1.1. The mean age varied in all 24 studies that were documented in this study. The mean age ranged between 33.3 and 53.3 years of age. It was noted that the highest mean age of all the studies documented in the tables was that of Till and Till, (2000), where the mean age was 53.3 years of age. It was noted locally and internationally, that the mean ages of the patients at private clinics were between 42 and 43 years of age, whereas as in the teaching clinics the patients were predominantly younger with a mean age between 32.3 and 41.81 locally and internationally. The observation made in the teaching clinics, was supported by Nyiendo *et al*., (1989) who stated that the proportion of patients referred by the chiropractic interns or students to the teaching clinic was most prominent. In view of this, it was stated that the average patient referred by the chiropractic interns and students ranged from between two to ten years younger than patients referred to the clinics by another source. This tendency was also evident in the mean age of patients seeking care at the teaching clinic in South Africa (Benjamin, 2007, Jaman, 2007, Kandhai, 2007 and Venketsamy, 2007).

With regards to ethnicity of the patient, represented in summary table 1.2, it was noted that the patients that presented to the majority of the private clinics in USA, Canada and South Africa, were predominantly White. However in two studies (9 and 15) conducted in Buffalo New York and only one clinic in the Inner City regions of Iowa, the greatest proportions of African Americans were documented. This was also prominent in the study by Till and Till, (2000), who documented that up to 83% of the patients that presented to the Kimberley hospital, almost a decade ago, were Coloured and Black. The results of these studies are in accordance with the views of Nyiendo *et al*., (1989) and Hurwitz *et al*., (1998) who have suggested that similarities and/or differences that present among patients that present to chiropractic clinics are reflective of the characteristics of the neighbourhoods in which the clinics are located, and from which they are likely to source most of their patients.

Of the 24 studies used for comparison, only five studies (Rubinstein *et al.,* 2000, Sorensen *et al., 2002,* Coulter and Shekelle, 2005, Gaumer and Gemmen, 2006, Jaman, 2007) investigated the level of education, represented in the summary table 1.2. The education level indicated that up to 40.97% of South Africans attending private chiropractors had a tertiary education. This was comparable to patients seeking private chiropractic care in Canada and United States where 38% and 54% respectively had reported to have a tertiary education. This may be suggestive of greater health awareness among the higher educated population (Sorensen, 2007). It can also be seen as a good socio-demographic indicator that is suggestive to the fact that middle and higher income levels can afford to utilise chiropractic services in the private sector (Sorensen, 2007; Mohamed, 2007) as it is not as readily available in the public sector.

Employment and occupation details were not investigated in most of the studies that were documented in the summary table 1.1, although it was extrapolated from the studies (Pedersen, 1993, Leboeuf-Yde *et al.,* 1997, Rubinstein *et* al., 2000, Suleman, 2001, Gaumer and Gemmen, 2006, Till and Till, 2000, Giles *et al.,* 2002, Nyiendo *et al.,* 1989, Walsh, 1992, Walsh and Jamison, 1992, Holt and Beck, 2005, Venketsamy, 2007, Benjamin, 2007, Jaman, 2007, Kandhai, 2007 and Mahomed, 2007) that did collect this data that a higher proportion of patients investigated were employed. The higher levels of unemployment occurred mostly at government funded hospitals of Kimberley (Till and Till, 2000) and the multidisciplinary spinal pain unit at Townsville General Hospital, Australia (Giles, *et al.* 2002) (Till and Till, 2000 and Giles *et al.,* 2002).

It was noted, that of the majority of studies tabulated, there was a higher level of non-manual/sedentary work, as compared to the manual type of occupation. The majority of the studies that documented level of education, did not document employment profile or occupation type (Sorensen, *et al.* 2002, Coulter and Shekelle, 2005 and Gaumer and Gemmen, 2006). However, in the two studies (Nyiendo *et al.,* 1989 and Mahomed, 2007), who did document these factors, an positive association was made between a higher level of education and a relatively higher percentage of managerial positions.

2.5.3 Main Complaint (Summary Tables 2.1 to 2.3)

In this descriptive study, the main complaints that were documented at the KHCCC included the anatomical location of pain as reported by the patient. The primary, secondary and tertiary diagnoses as documented by the resident chiropractor, the chronicity of complaint before receiving chiropractic intervention and aetiology of complaint in terms of 'traumatic' and 'non-traumatic' and 'unknown' were also documented. Special investigations that were requested by the resident chiropractor were documented and the source of patients in terms of who referred them to the KHCCC was investigated. These factors were assessed for the following reasons:

- The main complaints indicated the common problems that occur among the patients that present to the KHCCC, therefore representing the typical complaints of patients seeking chiropractic care in South Africa, particularly in this public facility.
- If differences are found in the public sector in terms of the above mentioned factors, then problem areas need to be highlighted.
- If similarities are found, this may suggest that the current syllabus at the teaching institution, and the level of clinical experience obtained by the students prepares them to manage chiropractic patients that present to a public setting like KHCCC.
- Added prospective benefits of this data were to determine whether any specific complaints were common amongst the residents of Kimberley and surrounding rural areas.
- The main complaint and chronicity of the complaint, gave a good indication to the level of awareness and perception of the patients that utilised the facility.
- To establish the relationship between the chiropractic profession and the other health care professionals, at the KHC. This indicated that the source of the patients showed a high level of awareness of the patients and the acceptance and integration of the chiropractic profession within the medical profession.
- These factors were assessed in other studies, therefore inclusion into the present study allowed meaningful comparisons to be made to other local and international studies.

Main complaints were documented on the summary Table 2.1 which depicted the reported anatomic locations of patients' main complaints. The location of the patient's main complaint was investigated in all studies reviewed within the tables. It was therefore possible to analyse this data for the most common area of complaint in all studies, except for the studies that were designed to focus on specific parts of the human anatomy (Benjamin, 2007; Jaman, 2007; Kandhai, 2007 and Venketsamy, 2007). With regards to area of main complaint, most

patients at all types of clinics gave similar responses reporting that the low back was the most common area of primary complaint. There were only two exceptions to this; the first was a study by Coulter and Shekelle (2005) and the second was a study by Mahomed (2007) where complaints in the neck region were more common than that of low back complaints. The high proportion of neck pain may be attributed to the high percentage of liberal and managerial professions in this population sub-group that was documented by Mahomed (2007). Coulter and Shekelle, (2005) did not investigate occupation type. However, if one extrapolates from the previous studies (Mahomed, 2007 and Nyiendo, 1989) that indicate a link between a higher level of education and managerial/sedentary type of occupations, this study may indirectly support the same observation if the high percentage of patients who had a high level of tertiary education is taken into account.

With regards to the main complaint, the primary diagnosis and duration of complaint before receiving chiropractic intervention is documented on the summary Table 2.2. Primary diagnoses were not documented in most cases, as the anatomical regions of pain reported by the patient were documented. The studies conducted at DUT were location specific and only documented the specific diagnosis for that particular area of interest. Although it was interesting to note that the most common diagnosis made at private South African clinics were that of cervical facet syndrome (7.05%), followed by sacroiliac syndrome (5.73%).

Chronicity of chief complaint varied considerably between all the literatures documented on the summary Table 2.2. The trend regarding the chronicity of the complaint when first seeking care, may implicate that in many developed countries [Europe, Sweden, Denmark, USA and Canada] (Pedersen, 1994, Leboeuf-Yde *et al.,* 1997, Sorensen *et al.,* 2002 and Coulter and Shekelle, 2005) patients presented mostly in the acute stage, whereas in clinics that have been set up in areas of lower socioeconomic status such as in Buffalo New York and Queensland and developing countries like South Africa, patients presented in the sub-acute to chronic stage (Rubinstein *et al.,* 2000, Hartvigsen *et al.,* 2002*,* Stevens, 2007, Giles *et al.,* 2002*,* Morschhauser *et al.,* 2003 and Jaman, 2007). In South Africa this delay in seeking chiropractic care may be related to many different factors discussed below:

- **Accessibility barriers** (Gaumer, Koren, and Gemmen, 2002).

  Limited access to chiropractic in South Africa may be due to the vast areas of rural communities, comprising majority of the public sector that do not have easy geographical access to chiropractic. However, chiropractic is readily available in the

private sector in urban areas. This can be seen in terms of the distribution of chiropractic private practices in South Africa where private practices are well clustered in the greater areas of Durban, Johannesburg and Cape Town. (This may be related to the fact that the only two teaching institutions that offer chiropractic in South Africa are located in two of these cosmopolitan cities); and the rest of South Africa has a limited number of chiropractors. For example, only four chiropractors at present practise in the Free State Province and only one in the Northern Cape Province. (CASA, 2008 and Mohamed, 2007).

- **Financial barriers** (About South Africa > Health, 2004; Hupkes, 1990).
  The low socio-economic status prevalent in South Africa, with respect to the general population, also contributes as a limiting factor (About South Africa>Health, 2004, Hupkes, 1990). Chiropractic is covered by 98% of medical aid schemes and since most chiropractors in South Africa work in the private sector (CASA, 2005), chiropractic seems to cater for middle and high income earners who tend to be members of medical aid schemes (18% of the total South African population) (About South Africa>Health, 2004).

- **Legal barriers** (Gaumer *et al*., 2002).
  It is of concern that the awareness of chiropractic cannot be increased in South Africa by means of advertising as there are strict legal limitations imposed when advertising the chiropractic practice (Allied Health Professions Council of South Africa, 2008).

Of the investigated studies documented on summary Table 2.3, only seven studies investigated the aetiology of the conditions as reported by the patients (Coulter and Shekelle, 2005, Walsh, 1992, Walsh and Jamison, 1992, Venketsamy, 2007, Benjamin, 2007, Jaman, 2007 and Kandhai, 2007). This was investigated in this study to establish the main causative factors that present in the public sector, and to assess the level of awareness of common causative factors. Of these studies investigated, four out of the seven studies (Venketsamy, 2007, Benjamin, 2007, Jaman, 2007 and Kandhai, 2007) were conducted at a teaching institution in South Africa. The aetiology cannot be compared to the public sector (Till and Till, 2000), nor the private sector (Mohamed, 2007) of South Africa as this factor was not investigated in these studies. Precise comparisons were difficult to formulate in this

component of the data as different terminology was used in the studies to report on the aetiology of the complaint.

With regards to special investigations performed and as documented on summary Table 2.3, x-rays were the most common investigation conducted (Pedersen, 1994, Sorensen *et al.,* 2002, Mootz *et al., 2005,* Walsh and Jamison, 1992, Holt and Beck, 2005, Venketsamy, 2007, Benjamin, 2007, Jaman, 2007, Kandhai, 2007 and Mahomed, 2007) This may be due to the lower cost factor of the x-ray as compared to Magnetic resonance imaging and computed tomography scans and the shorter time taken to perform these specific investigations. With respect to common use of x-rays by chiropractors, and instances when these investigations were most commonly used Sorensen *et al*., (2002), found that significantly more x-rays were taken of patients at their first consultation. They also found that more x-rays were taken with increasing patients' age and in the case of patients with chronic problems (Sorensen *et al*., 2002).

Summary Table 2.3 reveals that "self referral" and "referral from friends and family" still remained the highest source of patient referral in most countries. The highest being that of "self referral" (85%) from the private sector in Arizona and Massachusetts and "referral from friends and family" (71%) in the Netherlands, while the average ranged between 24% to 45%. The private sector in Denmark and the public sector in Australia had the highest level of referral from general practitioners at 49% and 40% respectively. This was substantially higher than what was documented in the private sector of South Africa, with a considerably low referral rate from the general practitioners (5.3%). This low level of referral from general practitioners in South Africa may be explained by Louw (2005), who investigated the knowledge and perception of general practitioners in South Africa. It was revealed in this study that up to a quarter of the general practitioners thought that chiropractic could not help neuro-musculoskeletal conditions. Louw (2005) also stated, that chiropractors were thought to primarily be involved with rehabilitation. This leads to the discussion below on the medical barriers and patient barriers that exist in South Africa in term of chiropractic:

Medical Barriers

- **Knowledge and perception of the medical profession**.

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 benefits. However, literature has revealed a number of

studies exploring the relationship between chiropractic, the public and other health care professions in South Africa (Reubens, 1996; Hunter, 2004, Jamison, 1995, Langworthy and Smink, 2000, Louw, 2005, Sanchez, 1991 and Van As, 2005) which indicated that there was a poor level of knowledge and perception of chiropractic within these researched populations.

- **Integration of chiropractic in the health care profession**.

The limited integration of chiropractic care in the health care profession may be due to the fact that chiropractic is registered under the Allied Health Professions Council of South Africa. Therefore the acceptance from the medical professions is not yet established, because chiropractic is not registered under the same governing body (Hupkes, 1990). This may be playing a role in creating a barrier for the integrative approach of complementary and alternative medicine into the health care system in the country.

Patient Barriers

- **Public awareness:**

It has been estimated that in South Africa only a fraction of the country's population are aware of what chiropractic is, and therefore, the largest challenge lies with educating the public about chiropractic (www.chiroweb.com, 2008).

- **Patient perception:**

It cannot be assumed that the perception of a profession is the same in every country. This may be due to the fact that perception is primarily governed by cultural or social development of the perceiver (Robbins, 1996 and Bergh and Theron, 1999). This may be true for South Africa with its diverse population structure and different lifestyles led by different populations (Popenoe, *et al*. 1997).

- **Consumer preference and demand barriers:**

According to Gaumer, Koren, and Gemmen, (2002), most chiropractic clients and other potential clients view chiropractors as back specialists. If chiropractors are to serve as primary care practitioners as per the Allied Health Professions Act 63 of 1982 and if they are to alter the existing care-seeking behaviours of clients, chiropractors must overcome impressions that they only treat low back pain.

The result of the barriers and issues discussed above was observed in the recent study conducted in South Africa on private chiropractic practices and patients (Mahomed, 2007). This study indicated that many patients present to chiropractors only after having received the standard forms of conservative care and thus presented to chiropractors only when their complaint had progressed into the chronic stage. Therefore, the results of the study conducted by Mahomed (2007) on South African private practice and patients, has shown that chiropractic is not the primary choice of healthcare for patients with musculoskeletal disorders in South Africa, and that chiropractors are not an established part of the healthcare referral system in South Africa at present.

2.5.4 Patient History (Summary Tables 3.1 and 3.2)

According to Gatterman (1990) patient history is vital to the path of exclusion and formulation of differential diagnosis and the steps leading to a decision about the area to treat and the treatment management protocol, is an important part of any interaction between a doctor and a patient. These factors were assessed for the following reasons:

- The knowledge of the patients pre-existing co-morbidities and their blood pressure readings adds to the chiropractors' knowledge about any contraindications to manipulative therapy that may exist before a physical examination is conducted.
- In addition the knowledge of the patients' history of smoking, pre-existing spinal conditions, surgical history and history of previous treatment, all contributes to the decisions made by the doctor in terms of patient management.
- The knowledge available on the common conditions that present to a public facility and the knowledge of the patients history with respect to the above mentioned factors, jointly gives a better indication of the general health status of the patients.
- These factors can also assist in determining the prevalence of musculoskeletal and non-musculoskeletal conditions of patients that presented to the KHCCC in terms of objective three. [To determine the prevalence of musculoskeletal and non-musculoskeletal conditions in patients that presented to the KHCCC (History of co-morbidities as reported by the patient, history of smoking, blood pressure readings taken at KHCCC, history of spinal conditions, history of surgery and history of previous chiropractic treatment for the same condition)].
- This data can be compared to local and international studies in terms of the proportion of non-musculoskeletal conditions presenting to the chiropractic clinic.

- These factors were assessed in other studies, therefore inclusion into the present study allowed meaningful comparisons to be made to other local and international studies.

Two different aspects have been documented in the following paragraph, the first is related to co-morbidities as reported by the patient, and the second refers to blood pressure taken at the KHCCC on the day of consultation. With respect to reported co-morbidities, cardiac and respiratory diseases accounted for the majority co-morbidities that were documented on the summary Table 3.1. Conditions included that of hypertension and hypercholesterolemia, which was followed by that of depression and diabetes (Sorensen *et al.,* 2002, Stevens, 2007, Venketsamy, 2007, Jaman, 2007 and Kandhai, 2007). Of the studies that were listed on the summary tables, Venketsamy (2007) documented that hypertension was represented as a co-morbidity by 4.2% of the patients. With respect to blood pressure taken on the day of consultation it can be seen on the summary Table 3.1 that only three studies documented blood pressure abnormalities that were taken at the consultations (Walsh and Jamison, 1992, Venketsamy, 2007 and Benjamin, 2007). A range from 12.3% to 13.6% of the patients that presented to the teaching clinics in South Africa, had blood pressure abnormalities, with high blood pressure accounting for the majority of this total.

Histories of pre-existing spinal conditions were documented on the summary Table 3.2. Only two studies investigated the history of pre-existing spinal conditions (Giles, 2002 and Benjamin, 2007). These studies documented conditions including that of inflammatory arthritic conditions, malignancies, osteoporosis and spinal malalignments (scoliosis and hyperkyphosis). History of surgery was not documented in any of the studies, although Giles (2002) did document the number of failed spinal surgeries (6.76%). Only two of the studies documented on the summary Table 2.1 investigated whether the patients were smokers (Sorensen, 2002 and Stevens, 2007). The percentages of smokers documented in these studies were 30% and 32% respectively (5 and 9).

History of previous treatment for the same complaint by the chiropractor was documented on summary Table 3.2. This was documented in order to determine the proportion of patients that received follow-up treatments for their main complaint. It was documented by Rubenstein *et al*., (2000) and Hartvigsen *et al.*, (2002), that 14% and 15% respectively in the international private sector had previous treatment for the same complaint. However, it was documented by Mootz *et al.,* (2005), that 81% of the patients that had previously been seen, 90% of them

where treated for the same complaint. This was also noted within the local private sector, where 70% of the patients had previously been seen, of which 89% were treated for the same complaint (Mahomed, 2007).

2.5.5 Patient Management (Summary Tables 4.1 and 4.2)

The importance of the study of the aetiology, pathogenesis and pathophysiology of back pain, helps the doctor to understand the natural process of the condition, to weigh it up with the clinical picture and to decide on the management protocol (Kirkaldy-Willis, 1992). The knowledge gained from a good history and patient assessment, make for an accurate and complete diagnosis possible and facilitates the formulation of a logical plan of treatment (Kirkaldy-Willis, 1992). The patient management in terms of referral of patients to other medical professions, the common contraindications for chiropractic treatment and lastly the common treatment protocols are all documented in this study to identify what the common contraindications are, what the common treatments are, and the proportion of patients that were referred out the KHCCC. If documented in other studies, these factors were compared to the local and international, private, public and teaching clinics to establish similarities and/or differences that may exist.

It is important to document the referral pattern at a multidisciplinary hospital like KHCCC, where the degree of inter-professional integration may be observed between the resident chiropractor and the other health care professionals. This information is essential in terms of determining the relationship of chiropractic and how it fits into this public health care facility. Of the documented studies on the summary Table 4.1, only five studies (Giles *et al.,* 2002, Venketsamy, 2007, Benjamin, 2007, Jaman, 2007 and Kandhai, 2007) documented data regarding patient referrals from the chiropractor. Four of these were conducted at the DUT teaching clinic. The percentage of referrals made by chiropractors to other disciplines and professionals varied from as little as 1.6% to 2.9% at the teaching institution in South Africa, to as much as 12.6% at the multidisciplinary spinal pain unit in Australia. However, a comparatively lower percentage of referrals were made from the teaching clinic (Benjamin, 2007, Jaman, 2007, Kandhai, 2007 and Venketsamy, 2007).

As defined by Gatterman (1990) “Chiropractic is considered to specialise in the correction of biomechanical disorders of the spinal column and extremities by the use of spinal manipulative therapy/manipulation. Manipulation is characterised by the implementation of the

traditional specific short-lever, high-velocity, low amplitude thrusts directed at specific joints in the body". It is considered by Anrig and Plaugher (1998) that "the corner stone of the chiropractic profession is to enhance the motion of a segment by the reduction of the subluxation".

According to Gatterman (1990) a contraindication is considered to be any condition, that renders the choice of treatment improper or undesirable in that particular case (Gatterman, 1990). Contraindications to spinal manipulative therapy include the following broad categories but not limited to: aneurysms, bone infections, tumors, vascular complications, arthritides, psychosocial considerations and neurological complications. Contraindications to treatment, once again were only documented by the retrospective studies conducted at DUT represented on summary Table 4.1. The most common treatment protocols that were contraindicated in certain patients were that of manipulation and electrotherapy (Benjamin, 2007, Jaman, 2007, Kandhai, 2007 and Venketsamy, 2007).

Treatment protocols were documented in nine of the studies (Pedersen, 1994, Mootz *et al.,* 2005, Suleman, 2001, Giles *et al.,* 2002, Benjamin, 2007, Jaman, 2007, Kandhai, 2007 and Venketsamy, 2007). Manipulation was the most commonly used treatment of choice in six of those nine studies documented on the summary Table 4.2. The high percentage of manipulation documented in these studies was an expected result and can be explained by the fact that the cornerstone of the chiropractic philosophy is the reduction of a joint fixation which is achieved by means of the chiropractic manipulation (Gatterman, 1990).

Most of the treatment regimes consisted of manipulation and adjunctive non-manipulative procedures such as soft tissue techniques, massage and physiotherapy modalities (Pedersen, 1994, Mootz *et al.,* 2005, Suleman, 2001, Benjamin, 2007 and Jaman, 2007). It was interesting to note that soft tissue techniques, acupuncture and electrotherapy were the most common treatment protocols of choice in the other studies (Giles *et al.,* 2002, Venketsamy, 2007 and Kandhai, 2007). One such example was the study by Giles *et al.,* (2002), which demonstrated that chiropractic spinal manipulation only accounted 11.7%, where majority of the treatment consisted of acupuncture (28.6%). This was perhaps due to the large number of patients that presented with failed spinal surgery, large disc herniations, advanced osteoarthritis and osteoporosis that were included for acupuncture treatment. It was protocol, that at this spinal pain unit, patients that were sent to the chiropractic clinic did not have pathology other than mild to moderate osteoarthritis or a spondylolisthesis of greater

than grade one (Giles *et al.,* 2002). This may also be the reason for the high referral rates of patients within this study. It was also documented in the local studies at the teaching clinic, that manipulation was not the most common treatment modalities for extremities (Kandhai, 2007) and for the cervical spine (Venketsamy, 2007). This may be explained by the high number of contraindications to manipulation in the cervical spine due to the high number of patients that presented with high blood pressure and in many of the cases, manipulation did not occur at the first treatment as an x-ray was firstly required.

2.6 Limitations addressed in this study based on limitations found in the literature

Due to the fact that this study was demographic and descriptive in nature, the design of this study had to be taken into consideration, with some known limitations to this type of study documented in the literature discussed above. These limitations in other studies were addressed as follows:

Based on limitations in Stevens (2007) study and recommendations made, all age groups were recorded in the study and a detailed history of smoking was recorded.

Based on limitations in Suleman's (2001) study, and recommendations made, the present study included all patients on workers compensation, patients with disability grants and patients that claim from the road accident fund in South Africa. This information would give us a good indication of how many patients that presents to the KHCCC claim from grants and compensations.

Based on limitations noted in Mohamed's (2007) study pertaining to the low response rates for the study, a three month period prevalence study was developed for this study, whereby the researcher personally went to the KHCCC for three months. This was done in an attempt to get a true sample of the chiropractic patient population that presented to the KHCCC.

Based on the limitation noted in Hartvigsen *et al., (*2002) study, pertaining to the use of open-ended questions and a misleading pain drawing diagram filled out by the patient, patients did not fill in any questionnaires in this study. Instead the researcher personally filled in the data sheets from the patient files.

Based on the limitation noted in Mootz *et al*., (2005) study, pertaining to possible duplicating of data on the same patient, this limitation was addressed in this three month period

prevalence study, in which each patient was documented once in this time period. This was controlled by a registry of patients that was taken daily, and if the patient returned for follow-up visits, the researcher could check that the patients name and corresponding date of previous visit was documented. Therefore, no patients that presented to the clinic, that fell into the inclusion criteria would be missed in the documenting process or documented twice.

Limitations implicated in the study conducted by Hawk *et al.,* (2001), included only volunteer practices and their consenting patients were included, which may not have been generalisable to the general public. There is only one public hospital in South Africa which offers chiropractic to the public, therefore this study does give a good indication of what is occurring in this public scenario. The second limitation pertaining to the quality assurance on answering questions accurately in the Hawk's *et al.,* (2001) study was addressed, by documenting data from the patient files and therefore patients were not under the stress of an interview to answer questions correctly.

A major limitation addressed in the present study, was related to signing of informed consent/assent forms by the patient. KHCCC had no system in place for the patients to sign any form of insurance and therefore there was no legal document in place to allow this study to be conducted so that the researcher was able to use the information from the patient files in a retrospective design. Thus the limitation was addressed by proceeding with a three month period prevalence design in which patients that were included into the study were given an informed consent/asset form. Once the patient was satisfied that they understood what the study was about, they were requested to sign if they were willing to participate in the study and data was only then collected after the consultation.

Limitations were addressed with regards to multiple researcher dependent errors discussed previously in chapter one. Due to their only being one researcher present during the transcription of the information from the patient files, marginal errors could occur in this process. Minimal errors could occur from the researcher with regards to the interpretation of the information documented in the files, as all the patients that were documented would have initially consulted with the resident chiropractor, and all these inconsistencies or queries could be addressed immediately in the research process. This was possible because the researcher had the advantage of been able to clear up any queries/inconsistencies by asking the resident chiropractor.

2.7 Conclusion

Chapter two discussed the documented literature found that relates to this study. A review of the workings of KHC was detailed and a comparison was made to St Michaels Hospital in Toronto. Twenty four studies were documented on Tables according to the four main objectives of this study. Discussion of Tables followed whereby trends were highlighted. Lastly the limitations that were addressed in this study based on limitations found in the literature were discussed. Chapter three will follow, which will discuss the methodology of this study.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

Chapter three will address the methodology of this study, including study design, development of the research tool, a step by step explanation of the sampling procedure and data collection at the KHCCC. The chapter concludes with a description of the statistical methodology utilised in the study.

3.2 Study Design

The study involved a three month period cross sectional survey and file review of chiropractic clinical files at KHCCC utilising a data collection tool that was developed and validated by the researcher.

3.3 Primary and Secondary data

Primary data obtained from the data collection sheet includes:

- Selected demographics of patients including age, gender, ethnicity, occupation, area of residence and level of education
- Common presenting conditions including anatomical location of pain, primary diagnosis made and duration of complaint before treatment was sought.
- Common aetiologies for main complaint.
- Special investigations ordered.
- Referral patterns to the KHCCC.
- Prevalence of musculoskeletal and non-musculoskeletal conditions including; the history of co-morbidities, smoking, blood pressure, history of spinal conditions, history of surgery and previous chiropractic treatment.
- Common chiropractic management protocols such as the referrals made by the chiropractor, the contraindications to treatment and the treatment protocols commonly used.

Secondary data obtained from the study includes:

- comparative data with South African studies conducted in the private sector.
- comparative data with South African studies conducted in the teaching institution.
- comparative data with international studies.

3.4 Research Tool.

The data collection tool was based upon related literature and similar studies conducted internationally and validated local retrospective studies conducted at the Durban University of Technology Chiropractic Day Clinic. This was done to allow for comparisons to be drawn between the data obtained in the present study and from those studies conducted previously. The data collection tool was designed with the aid of the research supervisor, considering all the information required to meet the objectives of the study and the information recorded in the hospital files so as to resourcefully combine and eliminate unnecessary information.

A questionnaire that is well thought-out as a tool in the research process, can be considered to have content validity when the content of a questionnaire is considered effective and has the ability to assess a particular concept of that particular research (Bernard, 2000). The data collection tool was developed following a literature review of previous studies of a similar nature to enhance its content validity. The purpose of the focus group was to ensure content validity of the data collection tool used in the present study.

A focus group consisting of five chiropractors, (who have worked as full time staff at the KHCCC), were invited to participate in the focus group. The initial contact was made telephonically to the participants. A Letter of Information (Appendix A), an Informed Consent Form (Appendix B), a Confidentiality Statement (Appendix C) and the data collection template (Appendix D) was mailed to each member of the focus group by email and postal services. No focus group meeting could be established due to the wide distribution of the participants, namely two in Cape Town, one in Kimberley and two in Durban. The focus group had appropriate time to complete the necessary documentation and could contact the researcher and supervisor if the need arose. The participants commented on clarity and understanding of the data tool and suggestions were made for improvements to the data collection tool. The appropriate documentation had to be completed and mailed back to the researcher at the DUT Chiropractic Department. After the assessment was completed, suggestions were reviewed, and appropriate changes were made to produce the final data collection sheet (Appendix E). This research was approved by the DUT ethics committee, clearance number: FHSEC C27/08 (Appendix H).

Main aspects of the data collection sheet (with the aim of meeting objectives one to four) comprised of information pertaining to:

- Demographic factors
- Main complaint
- Patient history
- Patient management

3.5 Inclusion/Exclusion Criteria

3.5.1 Inclusion criteria for the patients were as follows:

- Only patients that presented to the KHCCC within the allocated timeframe were surveyed.
- All age groups were included in the survey. Minors were accepted if the accompanying parent or guardian approved the inclusion into the study.
- Male and female gender and all ethnic groups that presented to the KHCCC were included into the study
- Only patients that signed the research informed consent form, and minors whose parent or legal guardian consented to sign the assent form, were included into the study.
- Only patients whom have been a new patient of the current resident chiropractor (since November 2005) were included into the study. This was to ensure that the majority of data required to complete the data collection sheets was available in patient files and to allow comparisons to be made, between current data and data obtained in 1997 in the Till and Till (2000) study.

3.5.2 Exclusion criteria for the patients were as follows:

- Minors unaccompanied by an adult were not considered for inclusion into the study.

3.6 Sampling Procedure

In this descriptive survey, patients presenting to the KHCCC, during the three month period that met with the inclusion criteria listed above were included into the study. The sampling method of choice for this study was purposive sampling (Bernard, 2000).

The procedure at the KHCCC was as follows:

1. The assisting nurse ensured that the patient's initial consultation was conducted after November 2005 by looking at the date in the patient files. If so, the patient was approached by the researcher in the reception room and given a short explanation of the research, which included the patient giving permission to the researcher to extract the necessary information from the patient files once the consultation by the resident chiropractor was complete. No further interview was done by the researcher.
2. The patient was then given an opportunity to participate in the study. The patient was given an Afrikaans or English letter of information and consent (Appendix F and G) to read and an opportunity to ask any questions pertaining to the study. Once the patient was satisfied that they understood what the study was about, they were requested to sign if they were willing to participate in the study. In the case of a minor an assent was signed by the guardian/parent (Appendix F and G).
3. The consultation (including the history, physical and regional examination) and/or treatment procedure conducted by the resident chiropractor at KHCCC continued as normal without any time delays or interruptions from the researcher.
4. After the consultation and/or treatment was completed by the resident chiropractor, patient files were handed over to the researcher so that the relevant patient details were captured by the researcher from the patient files onto the data collection sheets (Appendix E). The files were then handed back to the assisting nurse for filing.
5. All patients were documented in a registry book, which helped ensure that the patients were not documented twice, even if they revisited the KHCCC for a follow up treatment.
6. The same procedure was followed on a daily basis, for each eligible patient throughout the three month period.
7. At the end of the three months, all captured data was sent to the statistician to be statistically analysed.
8. A breakdown of all patients presenting to the KHCCC was done by the researcher on a monthly basis. In doing so, the number of new patients and the number of follow-up patients that presented to the KHCCC on a monthly basis were documented.

3.7 Confidentiality

All completed data collection sheets were regarded as confidential documents. Files were not removed from the KHCCC, and all data was extracted from the hospital files on the premises. No names appeared on the data collection sheet. Only a file number was recorded. The informed consent form was not attached to the data collection sheet and kept separate thereby keeping the information confidential. Only the researcher, supervisor, co-supervisor and statistician had access to the data collection sheets and related documents. No names were revealed in the publication of the results.

3.8 Statistical Methods

The information from the data collection sheets were transferred onto an excel spreadsheet. The spreadsheet was then sent to the statistician to be statistically analysed. SPSS version 15.0 program (SPSS Inc., Chicago, Illinois, USA) was used to analyse the data. A p value <0.05 was considered as statistically significant. Descriptive statistics involved frequency tabulations and bar charts reporting percentages of responses in categories. Quantitative data was summarized using mean, standard deviation and range.

Associations between categorical variables were assessed using Pearson's chi square tests. Means of quantitative variables were compared between two independent groups using student's t-tests. (Esterhuizen, 2009).

3.9 Conclusions

Chapter three addressed the methodology of this study, including study design, development of the research tool and a step by step explanation of the sampling procedure. This study involved a three month period prevalence descriptive survey at KHCCC utilising a data collection tool that was developed and validated by the researcher, the results of which will be discussed in chapter four.

CHAPTER FOUR
RESULTS CHAPTER

4.1 Introduction

Chapter four documents the results of this study by the utilisation of the SPSS version 15.0 program (SPSS Inc., Chicago, Illinois, USA). A p value <0.05 was considered as statistically significant. Descriptive statistics involved bar charts and frequency tabulations reporting percentages of responses in categories. Quantitative data was summarized using standard deviation, mean and range. Means of quantitative variables were compared between two independent groups using student's t-tests. Associations between categorical variables were assessed using Pearson's chi square tests.

4.2 Data

4.2.1 Primary data

Primary data obtained from the data collection sheet included:

- Selected demographics of patients such as: age, gender, ethnicity, occupation, area of residence and level of education.
- Selected complaint descriptions included: prevalence of musculoskeletal and non-musculoskeletal conditions, common presenting conditions, common aetiologies, special investigations, referral patterns and common chiropractic management protocols.

4.2.2 Secondary data

Secondary data obtained from the study includes:

- Comparative data with international studies within the private sector, the public sector And teaching clinics.
- Comparative data with South African studies conducted in the private sector.
- Comparative data with South African studies conducted in a teaching institution.

4.3 Abbreviations and key terms for this chapter

- Refer to Definitions list (page xvii)
- # This symbol indicates a sample size of less than 157, due to missing data in patient files

4.4 Records analysed over the study period

The aim of this research was to conduct a descriptive study of case profiles that presented at the KHCCC over a three month period. One hundred and fifty-seven patient records were analysed. Although this study is purely demographic and descriptive in nature, it gives a better understanding of the chiropractic patients in the KHCCC and their complaints and thereby defines the contribution of chiropractic in that health arena.

4.5 Results per objective:

4.5.1 Objective 1: To identify selected demographics of patients that present to the KHCCC (Gender, age, ethnicity, grant status, area of residence, level of education, employment profile and occupation type).

4.5.1.1 Gender

The sample consisted of 46 (29.3%) males and 111 (70.7%) females (Table 1).

		Frequency	Percent
Valid	Male	46	29.3
	Female	111	70.7
	Total	157	100.0

Table 1: Gender of the sample

4.5.1.2 Age

The sample consisted of a mean age of 47.5 years with a standard deviation of 16 years and a range from 3 to 87 years (Table 2).

N	Valid	157
	Missing	0
Mean		47.45
Std. Deviation		15.978
Minimum		3
Maximum		87

Table 2: Summary statistics for age of sample

The following (4.5.1.3 – 4.5.1.8) represent the socioeconomic indicators documented in this study: ethnicity, education, grant status, occupation and residence. The level of income was not documented due the sensitivity of the question to an underprivileged community.

Ethnicity

Of the sample of patients documented it was shown that 53.2% of the sample were Black, 31.4% Coloured, 14.1% White and only 1.3% Indian.

	Frequency	Percent
Black	83	53.2
Coloured	49	31.4
White	22	14.1
Indian	2	1.3
Total	#156	100.0

Table 3: Ethnicity of sample

4.5.1.4 Schooling and Education

A greater part of the sample group had completed primary school education (51.6%), with a smaller proportion having completed high school education (23.9%). There were 9% who had some primary schooling and 7.7% with no education. Of this sample group only 7.7% had received a tertiary education.

	Frequency	Percent
None	12	7.7
Some Primary Schooling	14	9.0
Completed Primary School	80	51.6
Completed High School	37	23.9
Completed Tertiary Education	12	7.7
Total	#155	100.0

Table 4: Education of sample

4.5.1.5 Residence

Majority of patients that presented to the KHCCC were from the city of Kimberley (71.7%). A smaller percentage of the patients presented from surrounding rural areas and smaller rural town communities (28.2%).

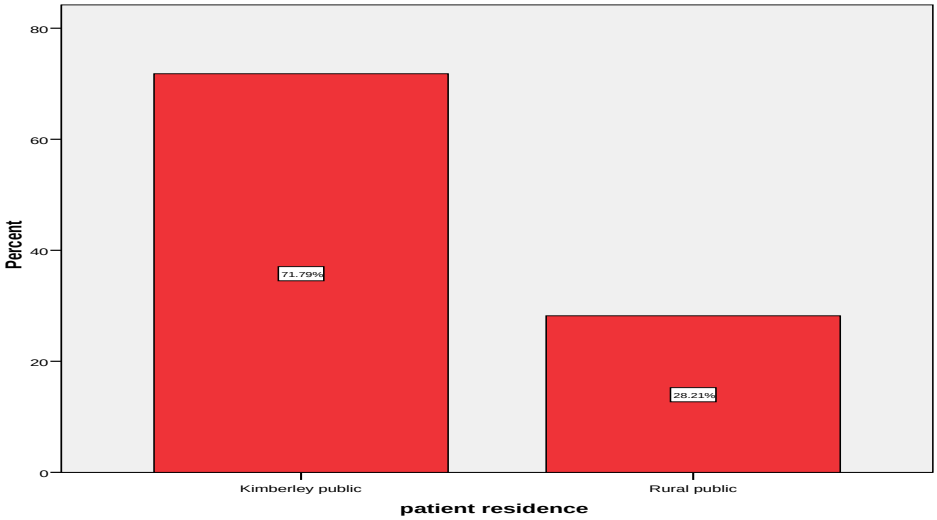

Figure 1: Residence of the patients in the sample

4.5.1.6 Grant status

Table 5 indicates those who had information available on grant status. It was observed that 81.3% had held no grant, while 14.8% had disability grants, and 2.6% claimed from Workman's compensation. Only 1.3% claimed from the Road Accident Fund (RAF).

	Frequency	Percent
No grant	126	81.3
Disability	23	14.8
Workmen's compensation	4	2.6
Road Accident Fund	2	1.3
Total	#155	100.0

Table 5: Grant status of the sample

4.5.1.7 Employment profile

It was documented that 42.9% of the sample group was employed, 30.5% were unemployed and 22.7% were pensioners, whereas only 3.9% students sought chiropractic care. This is demonstrated in Figure 2.

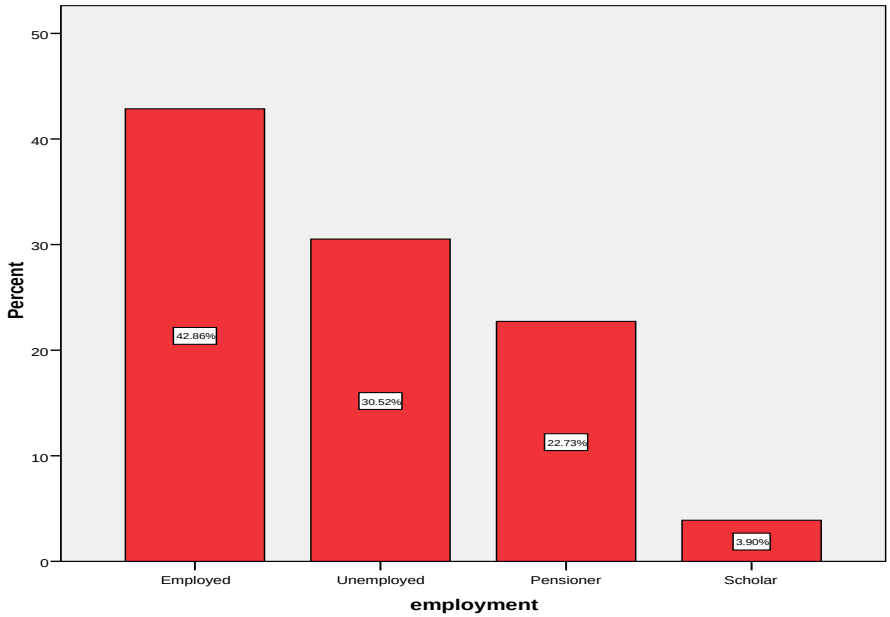

Figure 2: Employment profile of sample

4.5.1.8 Occupation

This question was not applicable to a large proportion of the sample group as they were either unemployed, pensioners or scholars (58.3%). Of those that were employed, 15.4% were manual labourers, 14.7% did a combination of manual and non manual work, and 11.5% were non manual workers.

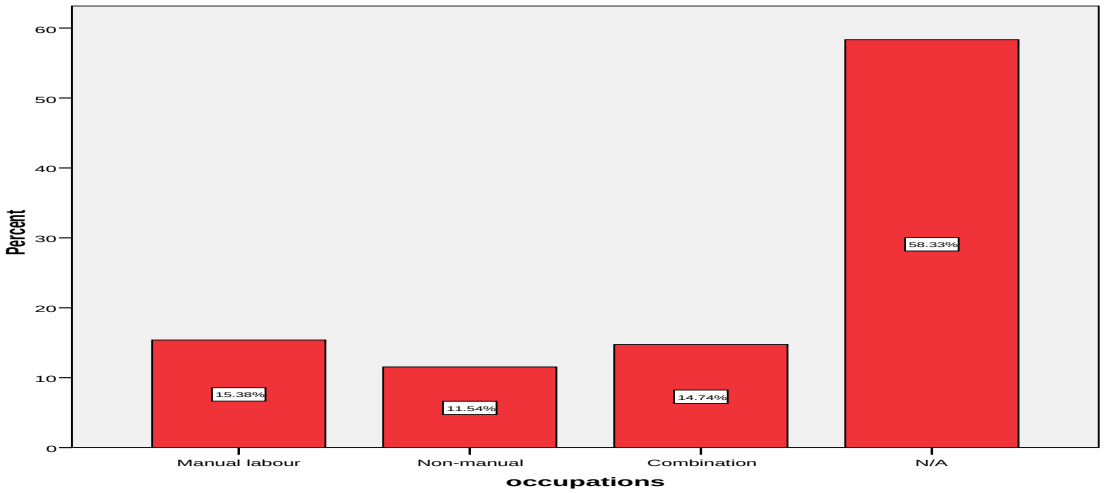

Figure 3: Occupation of the sample

4.5.2 Objective 2: To document the common presenting conditions at the KHCCC, such as anatomical location of complaint, diagnosis made and duration of complaint, common aetiologies of complaint, special investigations used, source of patient and referral patterns where possible.

4.5.2.1 Anatomical location of complaint

The recorded anatomical locations are ranked in Table 6. The number of anatomical locations totalled more than 157, since many patients had more than one area of complaint. However, the percentage shown is of the total of 157 patients.

In terms of the anatomical location of complaint the specific areas of complaint were categorized (for a concise overview) into five main areas from the highest to the lowest number of reports, namely spinal complaints (n=144, 91.7%), lower extremity complaints (n= 87, 55.4%), upper extremity complaints (n= 68, 43.3%) and headache (n= 21, 13.3%). An "other category" was included for those complaints that reflected anatomical locations of pain that did not fall into any of the above mentioned categories. These included chest pain, iliac crest pain, general body pains, insomnia, facial pain, oedema (n= 10, 6.3%).

The most common specific location of complaint was lumbar pain (n= 55, 35%) followed by sacroiliac pain (n= 49, 31.2%), shoulder pain (n= 42, 26.8%), leg pain (n= 35, 22.4%), neck pain (n= 29, 18.5%), hip pain (n= 17, 10.9%), knee pain (n= 17, 10.8%), thoracic pain (n = 11, 7.0%), elbow pain (n= 10, 6.4%), headache associated with neck pain (n= 8, 5.1%). The remainders of the specific locations are listed in Table 6 below.

Anatomical Locations of complaint					
Complaint	Count	%		Count	%
Lumbar pain	55	35.0%	Shoulder blade pain	2	1.3%
Sacroiliac pain	49	31.2%	Calf pain	2	1.3%
Shoulder pain	42	26.8%	Ankle pain	2	1.3%
Leg pain	35	22.4%	Tension type headache	2	1.3%
Neck pain	29	18.5%	Generalised headache	2	1.3%
Hip pain, of these: Hip pain associated with Low back pain: Hip pain associated with extremity pain:	17 10 7	10.9%	Buttock pain	2	1.3%
Knee pain	17	10.8%	Groin Pain	2	1.3%
Thoracic pain	11	7.0%	General Body pains	2	1.3%
Elbow pain	10	6.4%	Chest pain	1	.6%
Neck pain associated with headache	8	5.1%	Insomnia	1	.6%
Cervicogenic headache	8	5.1%	Facial pain	1	.6%
Lower hip pain	7	4.5%	Coccyx pain	1	.6%
Forearm pain	6	3.8%	Oedema	1	.6%
Wrist pain	4	2.5%	Cramps	1	.6%
Arm pain	3	1.9%	Shin pain	1	.6%
Iliac crest pain	3	1.9%	Cluster headaches	1	.6%
Hand pain	3	1.9%	No complaint	1	.6%
Upper leg pain	3	1.9%			
Foot pain	3	1.9%			

Table 6: Presenting Anatomical locations

4.5.2.2. Diagnosis made by resident chiropractor

The following diagnosis table was drawn up, irrespective of whether the diagnosis was the primary, secondary or tertiary diagnosis made by the resident chiropractor. The list represents all the diagnoses made, where some patients may have had more than one diagnosis. Therefore, the number of patients does not add up to 157, but the percentages add up to 100%.

Sacroiliac syndrome accounted for the most common diagnosis (47.8%). This was followed by followed by cervical facet syndrome (23.6%) and general lumbar myofasciitis (22.3%).

Diagnosis	Count	%	Diagnosis	Count	%
Sacroiliac Syndrome	75	47.8%	Tendinitis	1	.6%
Cervical Facet Syndrome	37	23.6%	Arthritis	1	.6%
General lumbar Myofasciitis	35	22.3%	Centerolisthesis at L5	1	.6%
Thoracic Facet Syndrome	25	15.9%	Cramps	1	.6%
Lumbar Facet Syndrome	22	14.0%	Rheumatoid arthritis knee	1	.6%
General thoracic myofasciitis	12	7.6%	Oedema in left arm	1	.6%
General Cervical Myofasciitis	10	6.4%	Joint fixation- Shoulder	1	.6%
Rotator cuff syndrome	9	5.7%	Facial neuralgia	1	.6%
Osteoarthritis of the extremities	9	5.7%	Spondylolisthesis	1	.6%
Nerve Root Entrapment	8	5.1%	Insomnia	1	.6%
Headache- cervicogenic	7	4.5%	Knee ligamentous overuse	1	.6%
Medial collateral ligament strain	2	1.3%	Lateral epicondylitis	1	.6%
General Rheumatoid Arthritis	2	1.3%	Medial and lateral collateral ligament sprain	1	.6%
Pectoral major and deltoid muscle strain	2	1.3%	Dislocation- Shoulder	1	.6%
Planter fasciitis	1	.6%	Dislocation- Knee	1	.6%
Headache- cluster	1	.6%			
Headache- Tension	1	.6%			
Epicondylitis- Lateral	1	.6%			

Table 7: Diagnoses of patients ranked

4.5.2.3 Link between Primary, Secondary and Tertiary diagnoses

The above diagnoses list was further split into primary, secondary and tertiary diagnoses as seen on the Tables 8, 9 and 10. This was done to establish if a corresponding link could be observed between the secondary and tertiary diagnoses made, and the common primary diagnosis. These primary diagnoses are documented in Table 8, and the secondary and tertiary diagnoses are in Tables 9 and 10 below. In terms of primary diagnoses, it was noted that sacroiliac syndrome was the most common primary diagnosis (n = 58), followed by cervical facet syndrome (n = 25) and lumbar facet syndrome (n = 20). For easy viewing, diagnoses in the three tables that may be related to each other, a colour coding system has been used below. Because sacroiliac syndrome and lumbar facet syndrome are closely linked in terms of anatomical location, both have been colour coded in orange. Cervical facet

syndrome is represented in green on Table 8. The secondary and tertiary diagnoses tables 9 and 10 that may correspond to sacroiliac syndrome and lumbar facet syndrome are also coded in orange, and those that may correspond to cervical facet syndrome are also coded in green, for the link to be easily observed when screening the three Tables.

	Frequency	Percent
Sacroiliac Syndrome	58	36.9
Cervical Facet Syndrome	25	15.9
Lumbar Facet Syndrome	20	12.7
Thoracic Facet Syndrome	8	5.1
Rotator Cuff Syndrome	7	4.5
Cervicogenic Headache	6	3.8
Lumbar Nerve root entrapment	4	2.5
Lumbar myofasciitis	3	1.9
Cervical Nerve Root entrapment	1	.6
Cervical Arthritis	1	.6

	Frequency	Percent
Lumbar Myofasciitis	10	6.3
Sacroiliac Syndrome	3	1.9
Cervical Facet Syndrome	2	1.3
Thoracic Facet Syndrome	2	1.3
Cervical Myofasciitis	1	.6
Spondylolisthesis	1	.6
Rotator Cuff Syndrome	1	.6
Infraspinatus myofasciitis	1	.6
Knee ligamentous overuse	1	.6

Table 8. Top 10 Primary Diagnosis
Table 10:Top 10 Tertiary

	Frequency	Percent
Lumbar myofasciitis	33	21.0
Thoracic facet Syndrome	15	9.6
Sacroiliac Syndrome	14	8.9
Cervical Facet Syndrome	11	7.0
Cervical myofasciitis	9	5.7
Lumbar facet Syndrome	3	1.9
Lumbar Nerve Root Entrapment	3	1.9
Osteoarthritis of the knee	2	1.3
Cervicogenic Headache	1	.6

Table 9: Top 10 Secondary

4.5.2.4 Chronicity of main complaint before receiving treatment

A high proportion of complaints were chronic in presentation (68.2%), followed by a smaller proportion of complaints that were acute (21.7%) and sub-acute (10.2%).

	Frequency	Percent
Acute	34	21.6
Sub-acute	16	10.2
Chronic	107	68.2
Total	157	100.0

Table 11: Chronicity of main complaint before receiving treatment

4.5.2.5 Most common aetiology of complaint presented irrespective of diagnosis

The aetiology of complaint was almost equally divided between unknown, non-traumatic and traumatic (Table 12).

	Frequency	Percent
Unknown	52	33.1
Non-traumatic	53	33.8
Traumatic	52	33.1
Total	157	100.0

Table 12: Aetiology of complaint

4.5.2.6 Most common investigations ordered irrespective of diagnosis

A very low percentage of special investigations were ordered at the KHCCC. Of those ordered: x-rays were the most common (7.6%), followed by blood tests (1.9%). The remaining investigations stated on Table 13 were never ordered at the KHCCC during the three month period prevalence of this study.

	Count	%
X-ray	12	7.6%
Blood tests	3	1.9%
Magnetic Resonance Imaging	0	.0%
Colonoscopy	0	.0%
Bone density	0	.0%
Computed Tomography scans	0	.0%
Ultrasound	0	.0%
Bone scan	0	.0%
Electrocardiogram	0	.0%
Urine analysis	0	.0%
Glucometer	0	.0%

Table 13: Special investigations ordered

4.5.2.7 Source of patients

The results from this study indicate that 66.3% of the patients that received chiropractic treatment at the KHCCC were referred within the medical profession. The highest percentage was from the physiotherapy department (15.25%), followed by rural clinics (14.6%) and the general medical clinic (8.9%). “Self-referral” constituted 22.9% of the total and KHC staff constituted 10.8% of the 157 patients.

	Frequency	Percent
Walk-in/Self referral	36	22.9
Physiotherapy	24	15.2
Rural clinic	23	14.6
KHC Staff	17	10.8

General Medical Clinic	14	8.9
Private	7	4.5
Urban clinic	6	3.8
Casualty	6	3.8
Military Hospital	6	3.8
Orthopeadics	5	3.2
Out patients department	4	2.5
Oncology	4	2.5
Paediatrics	3	1.8
ENT	1	0.6
Urology	1	0.6
Total	157	100.0

Table 14: Source of patients in the sample

A further breakdown highlighted that 59.6% were referred from within KHC and 40.3% from outside the KHC either from the rural and urban clinics or the military hospital.

	Frequency	Percent
Referred from within the KHC	62	59.6
Referred from outside KHC	42	40.4
Total	104	100.0

Table 15: Referral of patients

4.5.3 Objective 3: To determine the prevalence of musculoskeletal and non-musculoskeletal conditions in patients that present to the KHCCC. (Includes history of co-morbidities as reported by the patients, history of smoking, blood pressure as taken at the KHCCC on day of consultation, history of pre-existing spinal conditions and history of surgery)

4.5.3.1 History of co-morbidities

Of the 157 patients that presented to KHCCC, 68 patients (at some point) reported on an co-existent morbidity (43.3%). The most common co-morbidity was hypertension (28.2%), followed by diabetes (12.8%), allergies (5.8%), heart conditions (5.1%) and asthma (4.5%). Therefore, cardiovascular, respiratory and endocrine disorders were among the highest. It

must be noted that some patients may have reported on more than one co-morbidity. All co-morbidities as reported by the patients are illustrated on figure 4.

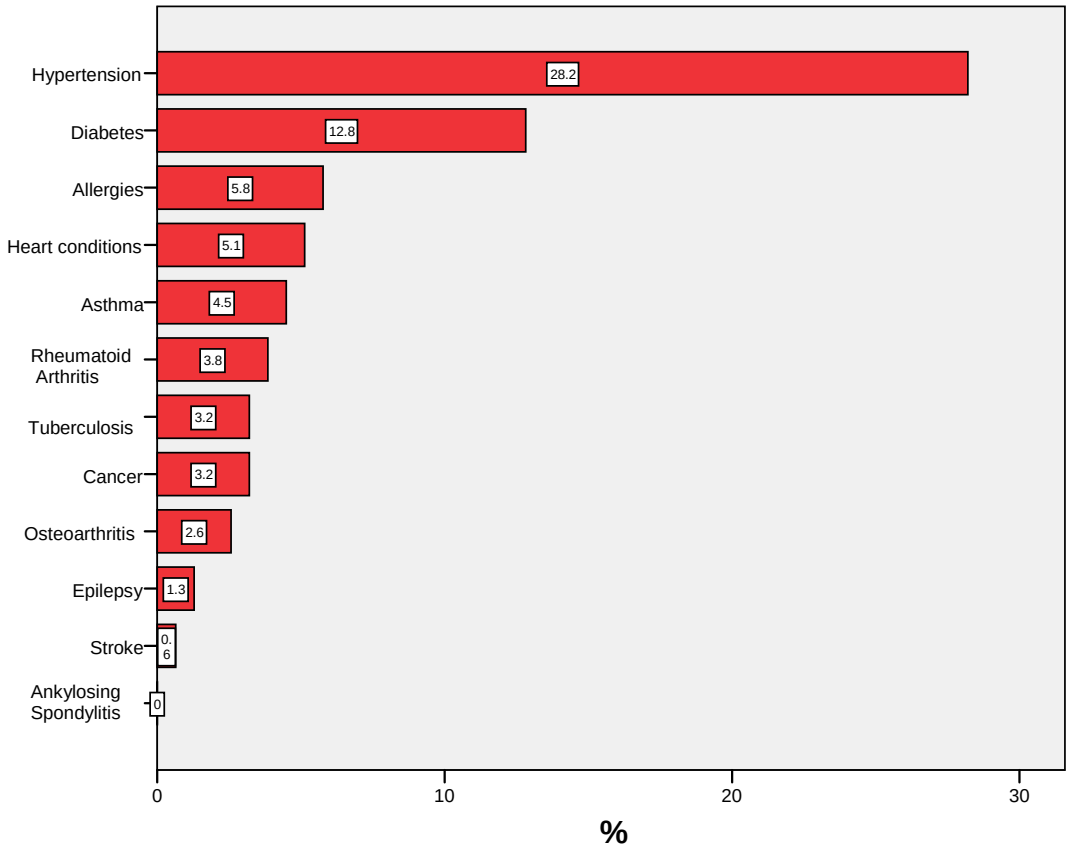

Figure 4: History of co-morbidities

4.5.3.2 History of smoking

Of the 157 patients documented, 25 patients were current smokers and 19 patients were previous smokers. A high proportion of the sample (113 patients) were non smokers.

	Frequency	Percent
No	113	72.0
Yes	25	15.9
Previous smoker	19	12.1
Total	157	100.0

Table 16: History of smoking

4.5.3.3. Blood pressure

Of the 136 patients that had their blood pressure taken at KHCCC, 12 patients (8.8%) were diagnosed with high blood pressure, (systolic reading of greater than 140mmHg), which classified as high blood pressure. No patients were diagnosed by the resident chiropractor as having low blood pressure (readings lower then 110mmHg systolic). However, it was interesting to note that 28.2% of the 157 patients reported hypertension as a co-morbidity in this study, which was being medically managed at the time. (Of the 12 patients diagnosed with high blood pressure, 7 had reported hypertension as a co-morbidity).

		Systolic BP	Diastolic BP
N	Valid	136	136
	Missing BP not taken at KHCCC	21	21
Mean		130.40	81.02
Std. Deviation		14.332	11.283
Minimum		100	60
Maximum		190	122

Table 17: Blood pressure summary statistics

4.5.3.4 History of pre-existing spinal conditions before receiving chiropractic treatment

It was documented that only 7.7% (n=12) had a previous history of spinal conditions. Scoliosis was the most common spinal condition. Other pre-existing spinal conditions included that of unspecified spinal conditions in which surgery was performed, osteoporosis of the spine, rheumatoid arthritis, fibromyalgia and neurofibroma. (One patient with fibromyalgia and one patient with neurofibroma were included in this section as they reported complaints in and around the spine that required chiropractic treatment).

Pre-existing Spinal Conditions	Frequency	Percent
No	144	92.3
Yes	12	7.7
Total	#156	100.0

Table 18: History of pre-existing spinal conditions

4.5.3.5 History of surgery

More than half the sample had reported on a previous surgery (50.3%, n=79). Surgery comprised mostly of hysterectomies, cesareans, tonsillectomies, gall stones, cysts, and back operations.

Previous Surgery	Frequency	Percent
No	78	49.7
Yes	79	50.3
Total	157	100.0

Table 19: History of surgery

4.5.3.6 History of previous treatment for same complaint by chiropractor

Table 20 illustrates that the greater percentage of patients that presented to KHCCC were existing patients whom had received treatment for less than 6 visits (n= 56, 35.7%). Almost 20% (n= 31) of the patients had received 18 treatments and more, in the time period from November 2005, that the present resident chiropractor has been working there, and the remainder (n= 35, 22.3%) had received between 6 and 17 treatments. However, new patients represented 22.3 % (n= 35) of the total sample.

Frequency of visits		Frequency	Percent
Valid	< 6 visits	56	35.7
	6-11 visits	24	15.3
	12-17 visits	11	7.0
	=/>18 visits	31	19.7
	new	35	22.3
	Total	157	100.0

Table 20: History of previous treatment for same complaint by chiropractor

It can be concluded, taking into account objective two and three, that majority of the patients that presented to the KHCCC, presented with a musculoskeletal conditions (n = 152, 96.8%), with 2.5% (n = 4) accounting for non-musculoskeletal conditions and one patient presented with no complaint (0.6%). In terms of the general health status of the patient pertaining to the non-musculoskeletal conditions that the patients presented with, it was noted that a high proportion of patients (43.3%) presented to the KHCCC with co-morbidities (cardiovascular and endocrine being the most common).

4.5.4 Objective four: To document the chiropractic management protocol/s that has been used for patients at the KHCCC

4.5.4.1 Referral patterns

Six patients (3.8%) who were consulted by the chiropractor were referred to other departments within the KHC. The reasons for referral consisted of a variety of conditions, namely for high blood pressure, a swollen face, muscle strengthening program, physiotherapy treatment and night sweats.

Referral Patterns	Frequency	Percent
No	151	96.2
Yes	6	3.8
Total	157	100.0

Table 21: Referral from chiropractic clinic

4.5.4.2 Contraindications to treatment

It was documented in the present study that 15 patients that presented to the KHCCC did not have joint manipulation included into the patient's treatment regime. Firstly, of these patients n = 3 (20%) had contra-indications to manipulation (Table 22). Of the remaining 12, n = 6 (40%) of them did not receive joint manipulation but did receive joint mobilization technique instead (Table 23). The last six patients (40%), did not require joint manipulation or joint mobilisation techniques. Of the 15 patients documented, the highest number of patients (n = 7, 46.7%) were in the age group of 60 years of age and older, followed by the age group of 50 – 59 years of age (n = 3) (Table 25).

Contraindications		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	12	80.0	80.0	80.0
	yes	3	20.0	20.0	100.0
	Total	15	100.0	100.0	

Table 22: Contraindications for manipulation in patients who did not receive manipulation

Contraindications		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	9	60.0	60.0	60.0
	yes	6	40.0	40.0	100.0
	Total	15	100.0	100.0	

Table 23: Joint mobilisation

Primary Diagnosis		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sacroiliac Syndrome	3	20.0	20.0	40.0
	Thoracic Facet Syndrome	2	13.3	13.3	20.0
	Cervical Facet Syndrome	1	6.7	6.7	6.7
	Lumbar Myofasciitis	1	6.7	6.7	46.7
	0steoarthritis of extremities	1	6.7	6.7	53.3
	Shoulder dislocation	1	6.7	6.7	60.0
	Meniscul Injury	1	6.7	6.7	66.7
	Groin strain	1	6.7	6.7	73.3
	No diagnosis	1	6.7	6.7	80.0
	General check up	1	6.7	6.7	86.7
	Oedema in left arm	1	6.7	6.7	93.3
	SLE remission, left hand muscle contracture	1	6.7	6.7	100.0
	Total	15	100.0	100.0	

Table 24: Primary Diagnosis

Age Group		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<20	1	6.7	6.7	6.7
	20-29	1	6.7	6.7	13.3
	30-39	2	13.3	13.3	26.7
	40-49	1	6.7	6.7	33.3
	50-59	3	20.0	20.0	53.3
	>=60	7	46.7	46.7	100.0
	Total	15	100.0	100.0	

Table 25: Age group

4.5.4.3 Treatment protocols

The treatment protocol most commonly used at the KHCCC was joint manipulation (90.4%). This was followed by dry needling (76.4%), kinesiotape (42%) and soft tissue therapy (38.9%). Other treatment protocols that were seldom used included that of joint mobilisation (7.0%), traction (0.6%), soft tissue mobilisation (0.6%), strapping (1.3%), nutritional advice (0.6%) and Non-Steroidal Anti-Inflammatory Drugs (0.6%). The remaining treatments listed on the Table 26 were not used at the KHCCC.

Treatment	Count	%	Treatment	Count	%
Joint manipulation	142	90.4%	Nutritional advice/vitamins	1	.6%
Dry needling	120	76.4%	Proriceptive	0	.0%
Kinesiotape	66	42.0%	Heat therapy	0	.0%
Soft tissue therapy[1]	61	38.9%	Electro dry needling	0	.0%
Joint mobilization	11	7.0%	Cryotherapy	0	.0%
Strapping	2	1.3%	Crossfriction	0	.0%
Traction	1	.6%	Orthotics	0	.0%
Non steroid anti-inflammatory drugs	1	.6%	Electrotherapy	0	.0%
Soft tissue mobilisation[2]	1	.6%	Soft tissue manipulation[3]	0	.0%
Home exercise	1	.6%			

[1] Soft tissue therapy, [2] Soft tissue mobilisation, [3] Soft tissue manipulation refer to Definitions list xvii

Table 26: Treatment protocols

4.6 Tendency analysis of Age

4.6.1 Age versus diagnosis

Table 27 demonstrates the most common age groups within the top ten diagnosis that may likely present in this sample group. The results indicated that patients in age group of less than 20, comprised of the highest percentage of cervical myofasciitis (33.3%) and cervicogenic headache (11.1%). Patients that presented in the age group between 20 and 29, presented with the highest percentage of cervical facet syndrome (40.0%), general myofasciitis (30.0%) and lumbar myofasciitis (10.0%). Patients that presented in the age group between 30 and 39, presented with the highest percentage of thoracic facet syndrome (28.0%), rotator cuff syndrome (12.0%) and nerve root entrapment (8.0%). Patients that presented in the age group between 40 and 49, presented with sacroiliac syndrome (52.6%)

and lumbar facet syndrome (21.1%). Patients over the age of 50 did not present with the highest percentage in any diagnosis but did have a high percentage of sacroiliac syndrome, cervical myofasciitis, lumbar myofasciitis and rotator cuff syndrome (Column percentages are illustrated in tables 27a, 27b and 27c).

		Sacroiliac syndrome			Cervical Facet syndrome		Cervical myofasciitis	
		Total count	Count	%	Count	%	Count	%
Age group	<20	9	4	44.4%	2	22.2%	3	33.3%
	20-29	10	2	20.0%	4	40.0%	0	.0%
	30-39	25	12	48.0%	8	32.0%	6	24.0%
	40-49	38	20	52.6%	10	26.3%	6	15.8%
	50-59	42	20	47.6%	7	16.7%	13	31.0%
	>=60	33	17	51.5%	6	18.2%	7	21.2%

Table 27a

		Thoracic facet syndrome			Lumbar facet syndrome		Lumbar myofasciitis	
		Total count	Count	%	Count	%	Count	%
Age group	<20	9	1	11.1%	2	22.2%	0	.0%
	20-29	10	1	10.0%	1	10.0%	1	10.0%
	30-39	25	7	28.0%	3	12.0%	1	4.0%
	40-49	38	3	7.9%	8	21.1%	2	5.3%
	50-59	42	8	19.0%	5	11.9%	4	9.5%
	>=60	33	5	15.2%	3	9.1%	3	9.1%

Table 27b

		General myofasciitis			Rotator cuff syndrome		Cervicogenic Headache		Nerve Root Entrapment	
		Total Count	Count	%	Count	%	Count	%	Count	%
Age group	<20	9	0	.0%	0	.0%	1	11.1%	0	.0%
	20-29	10	3	30.0%	1	10.0%	1	10.0%	0	.0%
	30-39	25	2	8.0%	3	12.0%	1	4.0%	2	8.0%
	40-49	38	3	7.9%	1	2.6%	3	7.9%	2	5.3%
	50-59	42	2	4.8%	1	2.4%	1	2.4%	1	2.4%
	>=60	33	0	.0%	3	9.1%	0	.0%	2	6.1%

Table 27c: Age vs. diagnosis for top 10 diagnoses

4.6.2 Age versus aetiology of complaint

The aetiology of the complaint was reported as unknown in the highest percentage of patients (55.6%) who were younger than 20 years of age. The highest percentage of non-traumatic

causes were reported in patients older then 60 years of age was 45.5%. The highest percentage of traumatic cases (50%) was reported in patients between 20 and 29 years of age (row percentages are illustrated in Table 28).

		Total Count	Aetiology					
			Unknown		Non-traumatic		Traumatic	
			Count	%	Count	%	Count	%
Age group	<20	9	5	55.6%	4	44.4%	0	.0%
	20-29	10	3	30.0%	2	20.0%	5	50.0%
	30-39	25	11	44.0%	8	32.0%	6	24.0%
	40-49	38	14	36.8%	10	26.3%	14	36.8%
	50-59	42	11	26.2%	14	33.3%	17	40.5%
	>=60	33	8	24.2%	15	45.5%	10	30.3%

Table 28: Age vs. aetiology

4.6.3 Age versus chronicity of complaint

The total number of the patients (107 out of 157) at the KHCCC were in a chronic stage of presentation. Of these, the lowest percentage (52%) of the patients were between 30 and 39 years of age, whilst the highest percentage (78.8%) presented in patients older then 60 years of age. Only a small number of patients presented in an acute stage (34 out of 157), and sub-acute stage of presentation (16 out of 157). Of these, the highest percentage of patients in the acute state (32.0%) and sub-acute stage (16.0%) were between 30 to 39 years of age (row percentages are illustrated in Table 29).

		Total Count	Duration					
			Acute (<3months)		Sub-acute (3-6 months		Chronic (> 6 month)	
			Count	%	Count	%	Count	%
Age group	<20	9	2	22.2%	1	11.1%	6	66.7%
	20-29	10	3	30.0%	0	.0%	7	70.0%
	30-39	25	8	32.0%	4	16.0%	13	52.0%
	40-49	38	10	26.3%	5	13.2%	23	60.5%
	50-59	42	8	19.0%	2	4.8%	32	76.2%
	>=60	33	3	9.1%	4	12.1%	26	78.8%

Table 29: Age vs. Chronicity

4.6.4 Age versus top three co-morbidities

The highest number of patients that presented with co-morbidities had hypertension (n= 44), with the highest number of patients (n=19 out of 25) who had hypertension being in the 50-59 year age category. Diabetes was the second highest co-morbidity reported (n= 20), with the

highest number of patients (n=11 out of 28) being older than 60 years of age. Allergies were the third most common co-morbidity reported (n= 9), and again the highest number of patients that presented with allergies were older than 60 years of age (n=4 out of 28). Overall, the highest number of co-morbidities have been reported in the age group of 60 and older (Affirmative response percentages are illustrated in Table 30).

		Total Count	Hypertension		Diabetes		Allergies	
			Count	%	Count	%	Count	%
Age group	<20	0	0	.0%	0	.0%	0	.0%
	20-29	0	0	.0%	0	.0%	0	.0%
	30-39	5	2	8.0%	0	.0%	3	12.0%
	40-49	15	10	26.3%	4	10.5%	1	2.6%
	50-59	25	19	45.2%	5	11.9%	1	2.4%
	>=60	28	13	39.4%	11	33.3%	4	12.1%

Table 30: Age vs top 3 co-morbidities

4.7 Tendency analysis of Gender

4.7.1 Gender versus top three diagnoses

There was almost an equal percentage of male to female patients that presented with sacroiliac syndrome. A relatively higher percentage of males presented with cervical facet syndrome (28.3%), where double the amount of females presented with general myofasciitis (26.1%). (Row percentages are represented in Table 31)

Gender	Total	Sacroiliac syndrome		Cervical Facet syndrome		General myofasciitis	
		Count	%	Count	%	Count	%
Male	41	22	47.8%	13	28.3%	6	13.0%
Female	106	53	47.7%	24	21.6%	29	26.1%

Table 31: Gender vs top 3 diagnoses

4.7.2 Gender versus aetiology of complaint

A higher percentage of females reported the aetiology of the complaint to be “unknown” (37.8%) or “non-traumatic” (37.8%) in nature. A higher percentage of males reported on traumatic causes of complaint (54.3%). (Row percentages are illustrated in Table 32)

Gender	Total Count	aetiology					
		Unknown		Non-traumatic		Traumatic	
		Count	%	Count	%	Count	%
Male	46	10	21.7%	11	23.9%	25	54.3%
Female	111	42	37.8%	42	37.8%	27	24.3%

Table 32: Gender vs aetiology

4.7.3 Gender versus occupation

A higher percentage of males than females reported manual labour (20.0%). In comparison to the males a slightly higher percentage of females were involved in non-manual type occupations (11.7%). A substantially higher proportion of females (18.0%) were involved with those occupations that involved a combination of both manual and non-manual occupations. (Row percentages are illustrated in Table 33)

Gender	Total Count	occupations							
		Manual labour		Non-manual		Combination		N/A	
		Count	%	Count	%	Count	%	Count	%
Male	45	9	20.0%	5	11.1%	3	6.7%	28	62.2%
Female	111	15	13.5%	13	11.7%	20	18.0%	63	56.8%

Table 33: Gender vs occupation

4.7.4 Gender versus chronicity

There is no significant difference noted in Table 34 with regards to the chronicity of the complaint reported according to the gender of the patient. (Row percentages are illustrated in Table 34)

Gender	Total Count	duration					
		Acute		Sub-acute		Chronic	
		Count	%	Count	%	Count	%
Male	46	11	23.9%	5	10.9%	30	65.2%
Female	112	23	20.7%	11	9.9%	77	69.4%

Table 34: Gender vs chronicity

4.7.5 Gender versus top three co-morbidities

Females presented with a slightly higher percentage of hypertension (29.1%) and diabetes (13.5%) as compared to the male counterparts. Although a slightly higher percentage of

males presented with allergies (10.9%). (Affirmative response percentages are illustrated in Table 35)

Gender	Total	Hypertension		Diabetes		Allergies	
		Count	%	Count	%	Count	%
Male	22	12	26.1%	5	10.9%	5	10.9%
Female	51	32	29.1%	15	13.5%	4	3.6%

Table 35: Gender vs top 3 co – morbidities

4.8 Tendency analysis in Ethnicity

4.8.1 Ethnicity versus top three diagnoses as diagnosed by the resident chiropractor

Percentages were excluded in the interpretation of the following data, conclusions drawn from the results would be misleading. The study illustrated that of the Black patients, the most common diagnosis was sacroiliac syndrome, (n = 40 out of 79), a trend which is repeated within the Coloured group (n = 20 out of 40) and within the White group (n = 13 out of 25). The Indian patients, (n = 1 out of 2) presented with all three top diagnoses (Affirmative response percentages are illustrated in Table 36).

ethnicity	Total Count	Sacroiliac syndrome		Cervical Facet syndrome		General myofasciitis	
		Count	%	Count	%	Count	%
Black	79	40	48.2%	19	22.9%	20	24.1%
Coloured	40	20	40.8%	10	20.4%	10	20.4%
White	25	13	59.1%	7	31.8%	5	22.7%
Indian	2	1	50.0%	1	50.0%	0	.0%
Asian	0	0	.0%	0	.0%	0	.0%
Other	0	0	.0%	0	.0%	0	.0%

Table 36: Ethnicity vs Top 3 Diagnoses

4.8.2 Ethnicity versus top three co-morbidities

Percentages were excluded in the interpretation of the following data, as the conclusions drawn from the would be misleading. The top three co-morbidities found in this patient population was hypertension, diabetes and allergies. The study illustrated that of the Black patients, the most common co-morbidity reported was hypertension (n = 23 out of 36 who reported a co-morbidity), a trend which is repeated within the Coloured (n = 14 out of 23) and

White ethnic groups (n = 6 out of 11). (Affirmative response percentages are illustrated in Table 37)

ethnicity	Total Count	Hypertension		Diabetes		Allergies	
		Count	%	Count	%	Count	%
Black	36	23	27.7%	12	14.5%	1	1.2%
Coloured	23	14	29.2%	6	12.2%	3	6.1%
White	11	6	27.3%	1	4.5%	4	18.2%
Indian	3	1	50.0%	1	50.0%	1	50.0%
Asian	0	0	.0%	0	.0%	0	.0%
Other	0	0	.0%	0	.0%	0	.0%

Table 37: Ethnicity vs Top 3 co-morbidities

4.9 Tendency analysis of Occupation

4.9.1 Occupation versus top three diagnoses

Of the 20 patients who reported their employment status as manual labour, 11 most commonly presented with sacroiliac syndrome (45.8%). Of the 20 patients who were involved in a combination of non-manual and manual work, most commonly presented with cervical facet syndrome (43.5%). Of the 15 patients that reported on doing non-manual work, 7 presented with sacroiliac syndrome (38.9%). The row that is represented as “not applicable” includes all patients that were unemployed, scholars and pensioners, were (53.8%) had been diagnosed with sacroiliac syndrome (Affirmative response percentages are illustrated in Table 38).

occupations	Total Count	Sacroiliac syndrome		Cervical Facet syndrome		General myofascitis	
		Count	%	Count	%	Count	%
Manual labour	20	11	45.8%	7	29.2%	2	8.3%
Non-manual	15	7	38.9%	4	22.2%	4	22.2%
Combination	20	7	30.4%	10	43.5%	3	13.0%
N/A	91	49	53.8%	16	17.6%	26	28.6%

Table 38: Occupation vs Top 3 Diagnoses

4.9.2 Occupation versus aetiology

Of those patients that reported doing manual labour, the highest reported complaint was traumatic (50%). Of those that participated in non-manual labour, the highest percentage was reported to have unknown causes of complaint (55.6%). Patients involved in a combination of manual and non-manual work reported the highest non-traumatic causes (36.3%). “Not

applicable" accounted for the highest non-traumatic aetiology (36.3%). (Row percentages are illustrated in Table 39).

		aetiology					
		Unknown		Non-traumatic		Traumatic	
		Count	%	Count	%	Count	%
occupations	Manual labour	2	8.3%	10	41.7%	12	50.0%
	Non-manual	10	55.6%	3	16.7%	5	27.8%
	Combination	10	43.5%	7	30.4%	6	26.1%
	N/A	30	33.0%	33	36.3%	28	30.8%

Table 39: Occupation vs Aetiology

4.9.3 Occupation versus top three areas of complaint

Patients that reported an occupation of manual labour, presented with the highest percentage of lumbar pain (14.5%), sacroiliac pain (18.8%), shoulder pain (16.7%), leg pain (22.9%) and hip pain (20.0%). Patient that reported an occupation of non-manual labour, presented with the highest percentage of elbow pain (30.0%). Patients that were involved in a combination of non-manual and manual work presented with the highest percentage of neck pain (37.9%), knee pain (23.5%), thoracic pain (27.3%) and headache (25.0%). "Non-applicable" represents the patients that were unemployed, pensioners or scholars presented with the highest percentage of hip pain (70%). (Affirmative response percentages are illustrated in Table 40).

	occupations							
	Manual labour		Non-manual		Combination		N/A	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
lumbar pain	8	14.5%	3	5.5%	7	12.7%	37	67.3%
sacroiliac pain	9	18.8%	5	10.4%	3	6.3%	31	64.6%
shoulder pain	7	16.7%	5	11.9%	6	14.3%	24	57.1%
leg pain	8	22.9%	2	5.7%	1	2.9%	24	68.6%
neck pain	3	10.3%	6	20.7%	11	37.9%	9	31.0%
knee pain	2	11.8%	3	17.6%	4	23.5%	8	47.1%
thoracic	1	9.1%	1	9.1%	3	27.3%	6	54.5%
hip pain	2	20.0%	0	.0%	1	10.0%	7	70.0%
elbow pain	1	10.0%	3	30.0%	0	.0%	6	60.0%
headache	1	12.5%	1	12.5%	2	25.0%	4	50.0%

Table 40: Occupation vs Top 3 areas of complaint

4.9.4 Occupation versus level of education

From Table 41, it can be extrapolated that the lower the education level, the higher the percentage of patients who are involved in manual and combination types of occupation. Whereas the higher the level of education, the higher the percentage of patients involved in non-manual labour. It can be seen that the highest number of patients that completed primary school education was involved in manual labour (n = 16). The highest number of patients that completed senior school was involved in non-manual occupations (n = 10). The highest number of patients that was involved in a combination of manual and non-manual labour, completed primary school education (n = 9). (Affirmative response percentages are illustrated in Table 41).

Education	Total Count	Occupation					
		Manual		Non-manual		Combination	
		Count	%	Count	%	Count	%
No Education	6	3	12%	0	.0%	3	13%
Partly Completed Primary School	4	2	8%	0	.0%	2	12.7%
Completed Primary School	28	16	64%	3	16.6%	9	39.1%
Completed Senior School	21	4	16%	10	55.5%	7	30.4%
Completed Tertiary Education	7	0	0%	5	27.7%	2	12.7%

Table 41: Occupation vs level of education

5.1 Tendency analysis in Education and Chronicity

5.1.1 Education versus Chronicity

The highest percentage of patients in an acute stage of injury (41.7%) and sub-acute stage of injury (25.0%) had completed a tertiary education. The highest percentage of patients that was in a chronic stage of injury (91.7%) had no education at all. (Affirmative response percentages are illustrated in Table 42)

Education	Total Count	duration					
		Acute		Sub-acute		Chronic	
		Count	%	Count	%	Count	%
No Education	12	0	.0%	1	8.3%	11	91.7%
Partly Completed Primary School	14	4	28.6 %	0	.0%	10	71.4%
Completed Primary School	80	16	20.0 %	8	10.0%	56	70.0%
Completed Senior School	37	9	24.3 %	4	10.8%	24	64.9%

	Completed Tertiary Education	12	5	41.7 %	3	25.0%	4	33.3%

Table 42: Education vs Chronicity

5.1.2. Education versus top three co-morbidities

The highest number of patients that reported hypertension (n=26), diabetes (n=10) and allergies (n=5) as a co-morbidity, had completed primary school education (Affirmative response percentages are represented in Table 43).

Education	Hypertension		Diabetes		Allergies	
	Count	%	Count	%	Count	%
No Education	2	16.7%	1	8.3%	0	.0%
Partly Completed Primary School	4	28.6%	4	28.6%	0	.0%
Completed Primary School	26	32.5%	10	12.5%	5	6.3%
Completed Senior School	9	25.0%	3	8.1%	2	5.4%
Completed Tertiary Education	3	25.0%	2	16.7%	2	16.7%

Table 43: Education vs top 3 co-morbidities

5.2 Tendency analysis of smoking

5.2.1 Smoking versus top three co-morbidities

Sixteen percent of smokers presented with allergies and hypertension. No allergies were accounted for in previous smokers, although they presented with the highest percentage of hypertension (31.6%), which was closely followed by non-smokers (30.4%). The highest percent of diabetes (14.2%) was reported in non-smokers (Affirmative response percentages are illustrated in Table 44).

Smoker	Total Count	Hypertension		Diabetes		Allergies	
		Count	%	Count	%	Count	%
no	55	34	30.4%	16	14.2%	5	4.4%
yes	10	4	16.0%	2	8.0%	4	16.0%
Previous smoker	8	6	31.6%	2	10.5%	0	.0%

Table 44: Smoking vs top 3 co-morbidities

5.2.2. Smoking versus the top three areas of complaint

There is no association between the top three complaints and patients who smoke.

Smoker	Total Count	Lumbar pain		Sacroiliac pain		Shoulder pain	
		Count	%	Count	%	Count	%
no	104	37	32.7%	37	32.7%	30	26.5%

	yes	21	9	36.0%	6	24.0%	6	24.0%
	Previous smoker	21	9	47.4%	6	31.6%	6	31.6%

Table 45: Smoking vs top 3 areas of complaint

5.2.3 Smoking versus all co-morbidities

The highest percentage of co-morbidities were documented in non-smokers as compared to smokers and previous smokers (Affirmative response percentages are illustrated in Table 46).

	Total Count	smoker					
		no		yes		Previous smoker	
		Count	Column N %	Count	Column N %	Count	Column N %
allergies	5	3	6.3%	2	22.2%	0	.0%
asthma	4	4	8.3%	0	.0%	0	.0%
cancer	1	1	2.1%	0	.0%	0	.0%
diabetes	12	9	18.8%	2	22.2%	1	12.5%
epilepsy	0	0	.0%	0	.0%	0	.0%
heart conditions	3	1	2.1%	1	11.1%	1	12.5%
hypertension	25	17	35.4%	3	33.3%	5	62.5%
Tuberculosis	4	2	4.2%	0	.0%	2	25.0%
Stroke	0	0	.0%	0	.0%	0	.0%
Rheumatoid Arthritis	2	2	4.2%	0	.0%	0	.0%
Osteoarthritis	3	3	6.3%	0	.0%	0	.0%

Table 46: Smoking vs. all co-morbidities

5.3 Follow-up rate versus chronicity

Of the patients that presented to the KHCCC in an acute stage, 55.9% of them had less than six treatments. Of the patients that presented in a sub-acute stage, 43.8% were that of new patients. Of the patients that presented in a chronic stage, 29.9% had less than six treatments, followed by 24.3% who had more than 18 visits (Affirmative response percentages are illustrated in Table 47).

Duration	Total Count	previous									
		< 6 visits		6-11 visits		12-17 visits		>18 visits		new	
		Count	%	Count	%	Count	%	Count	%	Count	%
Acute	34	19	55.9%	4	11.8%	0	.0%	5	14.7%	6	17.6%
Sub-acute	16	5	31.3%	2	12.5%	2	12.5%	0	.0%	7	43.8%
	107	32	29.9%	18	16.8%	9	8.4%	26	24.3%	22	20.6%

Chronic											

Table 47: Follow up rate vs. chronicity

6.1 Cross Tabulations and associations

Only those cross tabulations and associations that may have brought out a positive or a negative response was documented in chapter four.

6.1.1 To assess the causal association between demographics and common complaints

6.1.1.1 Gender

Gender was not associated with any of the common complaints.

6.1.1.2 Age

Table 48 indicates that the mean age was younger in those with thoracic pain than those without (p=0.046). Table 49 indicates that the mean age was older in those with lower hip pain than those without (p=0.006). (Lower hip pain as associated with lower extremity complaints).

	Thoracic	N	Mean	Std. Deviation	Std. Error Mean	p value
Age	no	146	48.15	15.884	1.315	0.046
	yes	11	38.18	14.912	4.496	

Table 48: Comparison of mean age between those with and without thoracic pain

	Lower Hip Pain	N	Mean	Std. Deviation	Std. Error Mean	p value
Age	no	150	46.70	15.816	1.291	0.006
	yes	7	63.57	10.406	3.933	

Table 49: Comparison of mean age between those with and without lower hip pain

6.1.1.3 Employment

Employment was significantly associated with neck pain (p=0.036), thoracic pain (p=0.029) and lower hip pain (p=0.011). Scholars were most likely to have thoracic pain (Table 51), where as pensioners were most likely to have lower hip pain (Table 52).

			Neck pain		Total
			no	yes	
Employment	Employed	Count	47	19	66
		% within employment	71.2%	28.8%	100.0%
	Unemployed	Count	40	7	47
		% within employment	85.1%	14.9%	100.0%
	Pensioner	Count	32	3	35
		% within employment	91.4%	8.6%	100.0%
	Scholar	Count	6	0	6
		% within employment	100.0%	.0%	100.0%
Total		Count	125	29	154
		% within employment	81.2%	18.8%	100.0%

Pearson's chi square =8.560, p=0.036

Table 50: Cross tabulation of employment and neck pain

			thoracic		Total
			no	yes	
Employment	Employed	Count	61	5	66
		% within employment	92.4%	7.6%	100.0%
	Unemployed	Count	43	4	47
		% within employment	91.5%	8.5%	100.0%
	Pensioner	Count	35	0	35
		% within employment	100.0%	.0%	100.0%
	Scholar	Count	4	2	6
		% within employment	66.7%	33.3%	100.0%
Total		Count	143	11	154
		% within employment	92.9%	7.1%	100.0%

Pearson's chi square =9.049, p=0.029

Table 51: Cross tabulation of employment and thoracic pain

			lower hip pain		Total
			no	yes	
Employment	Employed	Count	66	0	66
		% within employment	100.0%	.0%	100.0%
	Unemployed	Count	45	2	47
		% within employment	95.7%	4.3%	100.0%
	Pensioner	Count	30	5	35
		% within employment	85.7%	14.3%	100.0%
	Scholar	Count	6	0	6
		% within employment	100.0%	.0%	100.0%
Total		Count	147	7	154
		% within employment	95.5%	4.5%	100.0%

Pearson's chi square =11.091, p=0.011

Table 52: Cross tabulation of employment and lower hip pain

6.1.1.4 Occupation

Those occupations that consisted of a combination of manual and non manual labour were more at risk of neck pain (p<0.001) (Table 53). Manual labourers had significantly more leg pain than others (p=0.043) (Table 54).

			Neck pain		Total
			no	yes	
Occupation	Manual labour	Count	21	3	24
		% within occupations	87.5%	12.5%	100.0%
	Non-manual	Count	12	6	18
		% within occupations	66.7%	33.3%	100.0%
	Combination	Count	12	11	23
		% within occupations	52.2%	47.8%	100.0%
	N/A	Count	82	9	91
		% within occupations	90.1%	9.9%	100.0%
Total		Count	127	29	156
		% within occupations	81.4%	18.6%	100.0%

Pearson's chi square =20.715, p<0.001

Table 53: Cross tabulation of occupation and neck pain

			Leg pain		Total
			no	yes	
Occupations	Manual labour	Count	16	8	24
		% within occupations	66.7%	33.3%	100.0%
	Non-manual	Count	16	2	18
		% within occupations	88.9%	11.1%	100.0%
	Combination	Count	22	1	23
		% within occupations	95.7%	4.3%	100.0%
	N/A	Count	66	24	90
		% within occupations	73.3%	26.7%	100.0%
Total		Count	120	35	155
		% within occupations	77.4%	22.6%	100.0%

Pearson's chi square =8.175, p=0.043

Table 54: Cross tabulation of occupation and leg pain

6.2 To assess any relationships between demographics and diagnosis

6.2.1 Employment

Patients who were unemployed and scholars were more likely to have general myofasciitis (p=0.014).

			General Myofasciitis		Total
			no	yes	
Employment	Employed	Count	57	9	66
		% within employment	86.4%	13.6%	100.0%
	Unemployed	Count	29	18	47
		% within employment	61.7%	38.3%	100.0%
	Pensioner	Count	29	6	35
		% within employment	82.9%	17.1%	100.0%
	Scholar	Count	4	2	6
		% within employment	66.7%	33.3%	100.0%
Total		Count	119	35	154
		% within employment	77.3%	22.7%	100.0%

Pearson's chi square =10.600, p=0.014

Table 55: Cross tabulation of employment by general myofasciitis

6.2.2 Occupation

Those with a combination of occupations were most likely to have general myofasciitis (p=0.043).

			General Myofasciitis		Total
			no	yes	
Occupations	Manual labour	Count	22	2	24
		% within occupations	91.7%	8.3%	100.0%
	Non-manual	Count	16	2	18
		% within occupations	88.9%	11.1%	100.0%
	Combination	Count	19	4	23
		% within occupations	82.6%	17.4%	100.0%
	N/A	Count	89	2	91
		% within occupations	97.8%	2.2%	100.0%
Total		Count	146	10	156
		% within occupations	93.6%	6.4%	100.0%

Pearson's chi square =8.124, p=0.043

Table 56: Cross tabulation of occupations by general myofasciitis

6.3.1 To assess the association between smoking and co-morbidities in chiropractic patients

Smokers were significantly more prone to allergies than non smokers or previous smokers. Table 57 indicates that 16% of smokers had allergies but only 4.4% of non smokers and 0% of previous smokers had allergies (p=0.041). None of the other co-morbidities were associated with smoking status.

			Allergies		Total
			No	Yes	
Smoker	no	Count	108	5	113
		% within smoker	95.6%	4.4%	100.0%
	yes	Count	21	4	25
		% within smoker	84.0%	16.0%	100.0%
	Previous smoker	Count	19	0	19
		% within smoker	100.0%	.0%	100.0%
Total		Count	148	9	157
		% within smoker	94.3%	5.7%	100.0%

Pearson's chi square = 6.390, p=0.041

Table 57: Cross tabulation of smoking status by allergies

7.1 Summary

Chapter four documented and illustrated the results of this study by the use of the SPSS version 15.0 program (SPSS Inc., Chicago, Illinois, USA). A p value <0.05 was considered as statistically significant. Descriptive statistics categorised responses through the use of bar charts and frequency tabulations reporting percentages. Quantitative data was summarized using standard deviation, mean and range. Means of quantitative variables were compared between two independent groups using student's t-tests. Associations between categorical variables were assessed using Pearson's chi square tests. As a result 63 tables were created to illustrate the findings of this study. The findings were sub-divided according to the first four objectives in this study and objective five was discussed in the literature review in chapter two. The discussion of the results will follow in chapter five. A comprehensive summary of results will be revealed in chapter six.

Chapter Five
Discussion Chapter

5.1 Introduction

Chapter five firstly discusses the results of chapter four in relation to each objective, whereby the results are stipulated in chapter five and discussed with regards to the workings of the KHCCC. Secondly, the results are then compared to the study of Till and Till (2000) to document any changes that have occurred over the past decade. Thirdly, where possible the results are then objectively compared to the local and international private, public and teaching clinics, where similarities and differences will be stipulated.

A total number of 600 patients presented to the KHCCC during this three month period prevalence study. The average number of patients seen at the KHCCC on a monthly basis was between 190 to 200 patients. This can be further broken down to between 22 and 30 new patients that presented on a monthly basis to the KHCCC. On average about 30 patients a month had been receiving treatment at the KHCCC prior to 2005 (before the present resident chiropractor was employed). Over the three month data collection period at the KHCCC, all patients that fell into the inclusion criteria agreed to participate in this study resulting in a total of 157 patients.

5.2 Interpretation of data

The results documented in this study (in chapter four) will be discussed according to the first four objectives listed in chapter one. Objective five will be discussed throughout chapter five under each objective and not as a separate entity.

5.2.1 Objective 1: To identify selected demographics of patients that present to the KHCCC (Gender, age, ethnicity, employment and occupation, grant status, area of residence and level of education).

5.2.1.1 Gender

The majority of the patient sample was female (70.7%). Data regarding gender was represented in section 4.5.1.1. This was comparable to the Till and Till (2000) study, where

79% of the sample consisted of females. This was also similar to the local private sector of South Africa (Mahomed, 2007 (62.60%)) and two of the four studies conducted at the teaching clinic of South Africa (Venketsamy, 2007 (59.60%) and Benjamin, 2007 (54.80%)). This study also concurs with the international private sector (Mootz *et al.,* 2005, Coulter and Shekelle, 2005, Hartvigsen *et al.,* 2002, Rubinstein *et al.,* 2000 and Pederson, 1994) studies and a few studies of the public sector domains (Stevens, 2007 and Gaumer and Gemmen, 2006) and teaching clinics (Morschauser *et al.,* 2003, Nyiendo *et al.,* 1989 (excluding Cleveland), Walsh, 1992, Walsh and Jamison, 1992, Holt and Beck, 2005). This finding could be attributed to the fact that, although both genders are affected with back pain (Kirkaldy-Willis, 1992), statistics have shown that females are more willing to pick up on signs of illness and seek treatment, thus tending to use health services more often than their male counter parts (Popenoe *et al.,* 1997:226; Schaefer and Lamm, 1998:491). This body of evidence supports, and is reinforced by, the findings of the majority of similar studies, this being that in the majority of studies, females are more likely to present.

5.2.1.2 Age

It was found that the mean age of patients that presented to the KHCCC was 47.45 years old (standard deviation 15.978), with a range from three to 87 years. Of the 9 patients that were under the age of 21, three patients were under the age of 11, namely three, six and ten years of age. Ten patients were between the ages of 21 and 29. Twenty five patients were between the ages of 30 and 39 years and 38 patients were between the ages of 40 and 49. The largest age grouping comprising 42 patients were between the ages of 50 and 59. Thirty three patients were older than 65 years of age, the oldest being that of 87 years of age. The mean age of patients are represented in 4.5.1.2, where Table 2 gives a breakdown of age statistics.

The mean age documented at KHCCC by Till and Till (2000) almost a decade ago was 53.3 years of age. This decrease in mean age may be attributed to the change of the internship site at KHCCC to a full time post for a chiropractor at this government funded hospital being established in January 1998, making it possible for other medical professions and staff at the KHC to refer patients just as readily to the KHCCC (as compared to other departments) when they are in an acute stage presentation. Additionally, the awareness of the medical profession at the KHC of the chiropractic clinic and of the role and function of a chiropractor may have improved, which would be supported by the data of this study that showed that the sizeable majority of 66.3% (Table 20) of the patients referred to the KHCCC were referred by members

of the profession and that a considerably high percentage of KHC staff present as patients to the KHCCC (10.8%). Detailed investigations into this aspect have not been undertaken, but may yield interesting findings.

Although the mean age of the patients presenting in this study was slightly higher, it was relatively similar to the previous studies in the local private sector (Mahomed, 2007 (41.8)), and the private sector internationally (Pederson, 1994 (40.8), Rubinstein *et al.,* 2000 (41), Hartvigsen *et al.,* 2002 (42), Mootz *et al.,* 2005 (46), Sorensen *et al.,* 2002 (42) and Coulter and Shekelle, 2005 (38)). Overall the mean age of the private clinics locally and internationally ranged from 41 to 46 years of age. In comparison to these, it was noted that the mean age of patients presenting to the majority of teaching clinics were predominantly younger, ranging from 32.3 to 41.81 years of age. This supports the findings of Nyiendo et al., (1989) as discussed previously in chapter two, regarding the younger range of patients that are referred to teaching clinics. These findings support the results of this study and are in keeping with those of the majority of other studies, (with the exception of Till and Till (2000) study). Therefore it can be concluded that the mean age of patients documented in this study was slightly higher than patients presenting to local and international private clinics and substantially higher than patients in public teaching clinics.

5.2.1.3 Ethnicity

The ethnicity statistics are represented at 4.5.1.3, Table 3. Of the 157 patients that presented to the KHCCC, a predominance of Black and Coloured patients (84.6%) presented to the KHCCC. These results reflect the ethnicity statistics of the Kimberley municipal area which consists of 211 000 inhabitants, of which 87.3% consists of Coloured and Black people. The minority of people consist of White (12.4%) and Indian (0.3%) (www.academic.sun.ac.za). Similar results were reported by Till and Till (2000), which showed that 83% of the patients that presented to the KHCCC almost a decade ago were from the Coloured and Black ethnic groups. Similar results relating to the majority of Black patients that presented to the KHCCC were observed in the public sector internationally (Stevens, 2007 (63% African American) and Morschhauser *et al.,* 2003 inner city (44% African American)).

The present study documented a minority of White patients that presented to the KHCCC (14.1%). It was noted that these patients were predominately referred from the military hospital for treatment. This was due to the fact that chiropractic services were only offered at

KHCCC and were not available at the military hospital or the private hospital which was located next to the KHC. The results of this minority of White patients documented was in contrast to the private sector locally and internationally, where majority of the patients that presented were White (Coulter and Shekelle, 2005 (82.5%), Mootz *et al.,* 2005 (95%) and Mahomed, 2007 (75.66%)), and to teaching clinics internationally where predominantly White patients presented to the clinic (Morschhauser *et al.,* 2003 (65%-90%)). The results of this study could not be compared to the local teaching clinics as this factor was not documented. The results of this study are therefore in accordance with the views of Nyiendo *et al*., (1989) and Hurwitz *et al*., (1998), with respect to the location of the clinic as discussed previously in chapter two.

5.2.1.4 Place of residence

Figure 1 represents the residence of patients that presented to the KHCCC, where 71.79% were from Kimberley urban area, whereas 28.2% presented from surrounding rural areas and smaller rural town communities. The residences of patients cannot be compared to the study undertaken by Till and Till (2000) as this factor was not documented by them at the time.

5.2.1.5 Education level

51.6% of the patients who presented at the KHCCC completed primary school education. 23.9% had only completed high school. There were only 12 patients (7.7%) that had received any form of tertiary education. Twelve patients (7.7%) had not received any formal education. The level of schooling and education cannot be compared to the Till and Till (2000) study, nor to the local teaching clinics and to the majority of international public clinics, as this information was not recorded at the time. The level of education of the patients that present to KHCCC was in contrast to the private sector in South Africa, (Mahomed, 2007) where up to 40.97% of the patients that presented to the private sector had tertiary education. This information was also in contrast to the private sector studies and international public sector (Sorenson *et al.,* 2002, Coulter and Shekelle, 2005, Gaumer and Gemmen, 2006, Nyiendo *et al.,* 1989). Therefore this study regarding the level of schooling and education is in contrast to the majority of studies.

5.2.1.6 Grant status

81.3% of the patients received no grant. The remaining 18.7% received a grant, of which the majority claimed for disability (14.8%), followed by those that claimed form ‘workman’s

compensation' (2.6%) and Road Accident Fund (1.3%). Grant status was not documented by Till and Till (2000), nor was it documented in local private and teaching clinics. This relatively high percentage of patients that presented to the KHCCC that received grants was substantially higher than two other studies (Suleman, 2001 and Pedersen, 1994) that where found regarding grant status in the literature documented in this study. One study conducted at the CUPS facility, presented with two patients that reported being on a social assistance, one of whom specifically indicated assistance from AISH, (Assured Income for the Severely Handicapped) (Suleman, 2001). The second study, conducted in Europe, documented 1.4% of the patients unable to work due to a disability although no mention of receiving a grant status was stipulated (Pedersen, 1994).

5.2.1.7.1 Employment profile and occupation type

Employment was sub-divided into four primary headings, namely employed, un-employed, pensioner and scholar. A larger part of the sample group that presented to the KHCCC was employed (42.86%), whereas almost a third of the sample group was unemployed (30.52%). Pensioners accounted for 22.73% and scholars 3.90%. It was documented by Till and Till (2000), that pensioners and unemployed patients comprised of 42.4% of the population that presented to the KHCCC over a decade ago. Therefore, the unemployed and pensioner group combined in this study result in 53.25%, it represents more than half the sample group that presented to the KHCCC. This is observed as a substantial ten percent increase over the last decade. These substantially high levels of the unemployed and pensioners in this study, is in contrast to the local private and teaching clinics of South Africa (Mahomed, 2007 (88% employed, 2% pensioners), Benjamin, 2007 (58.1% employed, 2.1% retired) and Jaman, 2007 (65.3% employed, 8.6% retired)). This lower level of employment documented in this study, is also in contrast to the international private sector (Pedersen, 1994 (58.6% employed), Leboeuf-Yde *et al*., 1997 (67% employed)). However, similar results of un-employment found at KHCCC have been documented in the international public sector by Giles *et al*., (2002), where 33% of the sample group that presented to this public facility in Australia was unemployed. Similarly, results found in international teaching clinic by Nyiendo *et al.,* (1989), found between 24% and 47% of the patients that presented were unemployed. Therefore, it can be concluded that the results of this study is in contrast to the private and most teaching clinics, but similar to the public facilities overall.

Occupation type was sub-divided into four main headings namely, 'manual labour', 'non-manual labour', 'combination of manual labour' and 'not applicable'. This non-applicable option was given to the patients if they were unemployed, pensioners or scholars. Definition of occupation status as used in the present study, and the list of occupations that were listed per category, can be found in the definitions list (page xvii).

5.2.1.7.2 Employment profile versus occupation type

It was documented that of the 43% of the employed patients that presented to the KHCCC, 15.4% of the patients were manual labourers, 14.74% did a combination of manual and non-manual labour, and 11.5% were involved in non-manual activity. Occupation status was not documented in the study undertaken by Till and Till (2000), and therefore no comparison can be made. However, Mahomed (2007) documented occupation categories in the local private sector of South Africa, where 24% of the patients had a professional status, 16% managerial, 10% skilled artisan, 10% were housewives and 28% held other professions including that of educators, businessmen, salesman, retired, pensioners and scholars and farmers to name a few. Direct comparisons were not possible due to the different terminology used to document occupation, versus occupation type, as well as a different sample set (private sector only versus public sector). Mohamed's (2007) study, found that only 1% of patients in the private sector, were involved in manual labour, whereas 68% were involved in non-manual labour and 23% were involved in a combination of both. Pensioners and scholars were included into this count, whilst the current study excludes pensioners and scholars. It can be concluded that a substantially higher percentage of patients in the Mohamed (2007) study comprised of those involved in non-manual labour. Similar results to Mahomed's (2007) study were reported by Nyiendo *et al.,* (1989) at the Palmer-west teaching clinic, where it was documented that up to 75% of the patients reported non-manual occupations. Majority of the studies that were documented in the tables used different terminology to describe the type of occupation. As a result only a general overview may be discussed. It seemed that where patients are predominantly employed in the private sector, the majority of these patients will be involved in non-manual labour, whereas in patients predominantly employed in the public sector, the majority will be employed in manual labour or a combination of both.

5.2.1.7.3 Occupation and level of education

Table 39, investigated the relationship between occupation and the level of education. It can be extrapolated that the highest number of patients that completed primary school education was involved in manual labour (n = 16) and a combination of manual and non-manual labour (n = 9). On the other hand, the highest number of patients that completed senior school (n = 10) and tertiary education (n = 5) was involved in non-manual occupation. It was noted that the majority of studies, had a higher level of non-manual/sedentary work, as compared to the manual type of occupation. One example had been at the Palmer-West teaching clinic, where up to 75% of patients had non-manual occupations. This may be related to the fact that Palmer-West teaching clinic also had patients with the highest level of education in the six teaching clinics that were compared by Nyiendo, *et al*. (1989). A similar observation was made in Mahomed (2007) study of private patients in South Africa, where there was a higher level of education and a relatively higher percentage of liberal and managerial positions. Only two studies with this link between level of education and occupation type can be discussed from the tables, as other studies that had a higher level of education, did not document employment or occupation type (Sorensen, *et al.* 2002, Coulter and Shekelle, 2005 and Gaumer and Gemmen, 2006). Therefore, it may be suggested that studies that did investigate this seem to indicate that there may be a proportional relationship between education and non-manual/liberal occupations. More detailed investigations may be required in order to assess the influence of the level of education and occupation within chiropractic patients.

5.2.1.7.4 Occupation and gender

A higher percentage of males presenting in the current study, were involved in manual labour (20.0%), as compared to the higher percentage of females that were involved in non-manual (11.7%) and combination labour (18.0%) (Table 33). This could be due to the work force required in the diamond mining industry in Kimberley (Kimberley in South Africa, 2008), which traditionally employs a higher percentage of males than females. The high percentage of females in non-manual and combination labour can be attributed to the presence of large textile manufacturers in Kimberley (Kimberley in South Africa, 2008) , where many of the women work as seamstresses and are involved with associated activities in the industry. Furthermore, a large percentage of the KHC staff who utilized the chiropractic facility was female.

5.2.2 Objective 2: To document the common presenting conditions (anatomical locations and diagnosis), chronicity, common aetiologies of complaint, special investigations used and referral patterns, at the KHCCC.

5.2.2.1 Common presenting conditions:

5.2.2.1.1 Anatomical locations

The anatomical location of complaint was represented in Table 6 which documented the most common anatomical location of complaint that was reported by the patient at the KHCCC. The number of anatomical locations totals more than 157, since many patients presented with more than one area of complaint. Table 6 was categorized into five main areas of complaint in this discussion to achieve an overall view of the most common anatomical areas of complaint that presented to the KHCCC. It was observed that spinal conditions (including cervical, thoracic, lumbar and sacroiliac complaints), were the most common anatomical locations of pain (n=144). This was followed by lower extremity complaints, (including the leg, hip, groin, buttock, knee, shin, calf, ankle and foot buttock), (n= 87), upper extremity complaints, (shoulder, elbow, forearm, wrist, arm and hand complaints) (n= 68) and headaches (generalised, cervicogenic, cluster and tension type) (n= 21).

The most common specific location of complaint that was documented on Table 6 was that of lumbar pain (35%) followed by sacroiliac pain (31.2%), shoulder pain (26.8%), leg pain (22.4%), neck pain (18.5%), hip pain (10.9%), knee pain (10.8%), thoracic pain (7.0%), elbow pain (6.4%), headache associated with neck pain (5.1%). The remainder of the presenting conditions included that of insomnia, chest and facial pain and oedema which constitutes the non-musculoskeletal conditions that presented to the KHCCC. Only one patient presented to the KHCCC with no complaint. This occurred due to the patient returning for a follow-up visit when the original presenting complaint had been completely resolved.

With respect to anatomical locations and age, the mean age was found to be younger in those that presented with thoracic pain (p=0.046) (Table 48). The mean age of patients with lower hip pain (hip pain that is associated with lower extremity complaints) were older (p=0.006) (Table 49). These results indicated that associations can be linked to the type of occupations that is the younger the age group, the more involved in manual and combination

types of occupations, whereas the patients over the age of 60 were involved in less steadier types of occupation or were retired. This age is more commonly associated with a higher preponderance of arthritic bone changes which may noticeably involve the weight bear joints, namely the hips (Yochum and Rowe, 2005). This can be supported by the positive associations illustrated in this study with regards to area of complaint and employment, where a significant association with neck pain (p=0.036), thoracic pain (p=0.029) and lower hip pain (p=0.011) was found with those employed. Scholars were most likely to have thoracic pain (Table 51), this may be supported by the ergonomics of this sample group, were they are involved in studies. Based on these ergonomics involved in this group, future research will need to be conducted in order to validate this assumption. Pensioners were most likely to have lower hip pain (Table 52). It was also indicated that patients who were employed in a combination of manual and non manual labour were more at risk of neck pain (p<0.001) (Table 53), yet manual labourers had significantly more leg pain than the other groups (p=0.043) (Table 54).

The findings of this study concurred with the findings of the study undertaken by Till and Till (2000), where it had been reported that lumbar pain (19.4%) was the most common specific area of complaint. This was followed by cervical pain (14.4%), sacroiliac pain (13.9%) and thoracic pain (12.5%). This demonstrates that the top five reported anatomical locations of pain have not changed notably over the past decade. However, the data obtained in this study was in contrast to data pertaining to chiropractic patients that presented to the private sector in South Africa. Mahomed (2007) documented that the most common presenting complaint in patients was headache and neck pain (25.6%), with low back pain being the second (18.5%). A similar pattern was found by Coulter and Shekelle (2005), where patients presented primarily with neck problems (27%) and secondly with low back problems (22%). Although Mootz *et al*., (2005) and Pedersen (1994) found similar percentages for neck complaints, the low back complaints were much greater, 41% and 51.8% respectively.

Similarly, the results of this study were comparable to international data in various other studies undertaken at private clinics (Pedersen, 1994, Leboeuf-Yde *et al*., 1997, Rubinstein *et al.,* 2000, Hartvigsen *et al.,* 2002, Sorensen *et al.,* 2002 and Mootz *et al., 2005)* and in the public sector (Stevens, 2007 and Kopansky-Giles *et al.,* 2007), as well as in teaching clinics (Nyiendo *et al*., 1989, Walsh, 1992, Morschhauser *et al.,* 2003 and Holt and Beck, 2005)

where the most common anatomical location of pain was that of the low back region in chiropractic patients.

5.2.2.1.2 Diagnosis

The diagnosis list was represented in Table 7. From this table, the most common diagnosis made at the KHCCC was established. This diagnosis table was drawn up, irrespective of whether it was a primary, secondary or tertiary diagnoses. The list represents all the diagnoses made, where some patients may have had more than one diagnosis. The most common diagnosis was that of sacroiliac syndrome (47.8%), followed by cervical facet syndrome (23.6%) and general lumbar myofasciitis (22.3%). The diagnoses that follow represent less commonly made diagnoses, namely, Thoracic facet syndrome (15.9%), Lumbar facet syndrome (14.0%),General thoracic myofasciitis (7.6%), General cervical myofasciitis (6.4%), rotator cuff syndrome (5.7%), osteoarthritis of the extremities (5.7%), nerve root entrapment (5.7%), cervicogenic headache (4.5%). Diagnoses that were only made once are represented on the rest of Table 7, but individually represent less than 1% of the diagnoses.

5.2.2.1.3 Link between primary, secondary and tertiary diagnoses made

The list of diagnoses in Table 7 was then further split into primary, secondary and tertiary diagnoses, shown in Tables 8 to 10 respectively. This was done to establish the link between secondary and tertiary diagnoses to the top three primary diagnoses as illustrated in chapter four. Table 8 shows that sacroiliac syndrome was the most common primary diagnosis (n = 58, 36.9%), followed by cervical facet syndrome (n = 25, 15.9%), and lumbar facet syndrome (n = 20, 12.7%). Table 9 represented the secondary diagnoses. It was noted that the most common secondary diagnosis was lumbar myofasciitis, (n = 33, 21%), followed by that of thoracic facet syndrome, (n = 15, 9.6%) and sacroiliac syndrome, (n = 14, 8.9%). Table 10 represented the tertiary diagnoses, where the most common tertiary diagnosis was lumbar myofasciitis, (n = 10, 6.3%). When viewing the orange and green secondary and tertiary diagnosis coded in Tables 9 and 10, that match the orange and green in Table 8 it can be seen that many corresponding links have been found between the secondary and tertiary diagnoses in Tables 9 and 10, and the primary diagnosis in Table 8. This may be due to a number of reasons: firstly, due to the anatomical proximity of areas of complaint in relation to each other. Secondly, the biomechanical function as they relate to each other in terms of the affected joints and associated muscles in the proximal and distal components of each area of

complaint. Thirdly, the entire body is essentially one kinematic chain and this is perhaps the most commonly identified dimension of chiropractic care in clinical practice (Ebrall *et al.,* 2004). Ebrall *et al.,* 2004 states that "the practitioner must be aware of structural asymmetries, functional changes and the concept of areas of compensation". These corresponding links that are presented in the tables, clearly indicates that managment of the secondary and/or tertiary diagnosis had a corresponding link to the common primary diagnoses made.

Comparison to the most common diagnosis made in the South African private sector was cervical facet syndrome (7.05%); which is in contrast to the public sector. The data cannot be compared to the teaching clinics in South Africa, as the research conducted in Durban was area specific and no comparisons were prepared, which might have enabled any conclusions of results between the studies. Comparisons to international studies are not possible and as a result not discussed. This gap in the knowledge would allow for future research.

5.2.2.1.4 Specific diagnostic findings with respect to age, gender, ethnicity and occupation

Specific diagnostic tendencies regarding the documented age, gender, ethnicity and occupation was investigated in this study to find a relationship between the diagnoses made and the variables mentioned above.

An analysis of the diagnoses per age group (Table 27), illustrated that, in the group below 20 years of age, the most common diagnosis was sacroiliac syndrome (44.4%), followed by cervical myofasciitis (33.8%). In the age group 20 – 29 years, most patients were diagnosed with cervical fact syndrome (40%) followed by general myofasciitis (30%). In the age group 30 – 39, most were diagnosed with sacroiliac syndrome (48%), followed by cervical facet syndrome (32%). In the age group 40 – 49, most patients were diagnosed with sacroiliac syndrome (52.6%), followed by cervical facet syndrome (26.3%). In the age group 50 – 59, most patients were diagnosed with sacroiliac syndrome (47.6%) followed by cervical myofasciitis, (31%). In the oldest age group, 60 years and above, most patients were diagnosed with sacroiliac syndrome (51.5%) followed by cervical myofasciitis, (21.2%). The study therefore illustrated that the most common diagnoses within all age groups was sacroiliac syndrome, except for the age group of 20 – 29 years of age. It is possible that cervical facet syndrome and myofasciitis could be as a result of the work related conditions in this age group.

Furthermore, of the males in this study (Table 31), 47.8% were diagnosed with sacroiliac syndrome, and similarly, of the females presenting in this study, 47.7% were diagnosed with sacroiliac syndrome. On average, cervical facet syndrome was more commonly diagnosed in men than women, (28.3% versus 21.6%), whilst general myofasciitis was more commonly diagnosed amongst women (26.1%) than men (13.0%). These results can be linked to the higher percentage of men who take part in manual type occupations (20.0%), as compared to the higher percentage of women who partake in a combination of manual and non-manual occupations (18.0%).

This study illustrated that of the Black patients, the most common diagnosis was sacroiliac syndrome, (48.2%), a trend which is repeated within the Coloured group (40.8%) and within the White group (59.1%) (4.8.1, Table 36). The sample size of the Indian patients, (n = 2) has been ignored for the purpose of this specific analysis. Therefore, it may be concluded that sacroiliac syndrome is the most common diagnosis irrespective of the ethnicity.

It was also found that of the patients involved in manual labour, which consisted of activities that included bending, lifting, twisting and any other movement that required to be done manually, 45.8% of these patients were diagnosed with sacroiliac syndrome. Similarly, of those patients involved in non-manual labour, which consisted of sedentary desk work, the diagnosis was also sacroiliac syndrome (38.9%). This is in contrast to those patients who are involved in a combination of labour, which involved some tasks of manual labour and non-manual who were diagnosed with cervical facet syndrome (43.5%).

A positive association was illustrated between the unemployed, scholars and those that were involved in a combination of work were more likely to be diagnosed with general myofasciitis (Table 55 and 56). As a result, it can be concluded that with a few exceptions, sacroiliac syndrome was the most common diagnosis made at the KHCCC irrespective of age, gender, ethnicity and occupation.

5.2.2.1.5 Chronicity

The chronicity of complaint was represented at 4.5.3.3.Table 11. It was documented in this study, that majority of the patients at the KHCCC were in a chronic state of presentation (68.2%), followed by acute (21.7%) and sub-acute (10.2%). The chronicity of complaint was not previously documented by Till and Till (2000), therefore no comparisons are possible.

However, these results that were documented in KHCCC were found to be similar to the study conducted by Mahomed, (2007) in the private sector of South Africa, where it was found that the majority of patients treated in private practices were in a chronic stage of presentation (58%), while much fewer presented in acute stage (28.8%) and minimal were in a sub-acute stage (13.2%). These results supported other findings which have been discussed previously in chapter two, where comparisons of all the studies documented in this research, indicate that, in developing countries like South Africa and other areas of lower socioeconomic status, patients are more likely to present in a chronic stage. This can be supported by studies conducted in the international public sector (Stevens, 2007 and Kopansky-Giles *et al.,* 2007) and the international teaching clinics (Morschhauser *et al.,* 2003, Nyiendo *et al.,* 1989 and Walsh and Jamison, 1992), where a larger part of the sampled populations in these studies presented in a chronic stage.

In light of this, supportive literature was found to support the trend discussed above regarding the stage of presentation between first and third world countries, as for the majority of complaints that presented in the international private sector were within the acute presentation stage (Pedersen, 1994, Leboeuf-Yde, 1997, Sorensen *et al.,* 2002 and Coulter and Shekelle, 2005). With regards to chronicity and level of education, it was found in this study that the highest percentage of patients in an acute stage of injury (41.7%) and sub-acute stage of injury (25.0%) had completed a tertiary education. The highest percentage of patients that was in a chronic stage of injury (91.7%) had no education at all. This body of literature supports the findings of the majority of similar studies, that patients are more likely to present in a chronic presentation stage within areas of lower socioeconomic status.

With respect to chronicity and age (Table 29), it was found that the greatest number of the patients (107 out of 157) presented to the KHCCC in a chronic stage of presentation. The highest percentage (78.8%) of chronic complaints presented in patients older then 60 years of age. This may be due to the decreased awareness of these patients to the chiropractic profession, secondly this older age group may not have had the opportunity for a secondary or tertiary education and thirdly, the patient most likely acquired their injury many years ago and has now become chronic in nature.

With respect to chronicity and follow-up rate (Table 47), it was found in this study that, of the patients that presented in a chronic stage 29.9% had less than six treatments and 24.3% had 18 visits and more. This may be due to the nature of the manual therapy of chiropractic, in

which majority of patients need multiple treatments, especially if the patients presents in a chronic stage.

As a result, it can be concluded that with a few exceptions, majority of the patients present in a chronic stage of presentation, and majority that were in a chronic presentation had minimal education. It can also be concluded that the highest percentage of chronic patients that presented were older then 60 years of age and has had more then 18 visits.

5.2.2.1.6 Aetiology of complaint

The aetiology of complaint was represented at 4.5.3.4, Table 12. It was established in this study that the aetiology of complaint were almost equally divided between unknown (33.1%), non-traumatic (33.8%) and traumatic (33.1%). The cause of complaint was not previously documented in the study of Till and Till (2000) or in the private sector of South Africa. However, the top four causes of complaint were documented in the South African teaching clinic. These included the following: unknown (53-61%), accident (5.2-14.9%), sport (4.6%-25.4%) and carrying injuries (4.4%-12.3%) (Benjamen, 2007, Jaman, 2007, Kandhai, 2007 and Venketsamy, 2007), as discussed previously in the literature review. Coulter and Shekelle (2002) found that of the patients presenting, more than half reported injuries (53%), of which non-work related accounted for 43% and work related injuries for 16%. Non-specific causes accounted for 21% of the injuries reported. The international teaching clinics also reported on causes of injury. The common causes listed being unknown causes, trauma, sport, stress and lifting (Walsh, 1992 and Walsh and Jamison, 1992). The comparisons are difficult to formulate in this component of the data as no common terminology was used to report on the aetiology of the complaint. Further studies into this aspect may be viable.

With respect to age groups (Table 28), 50.0% of traumatic causes of complaint were noted in patients in the age group of 20-29. This was in contrast to the highest level of non-traumatic causes seen in patients older then 60 years of age (45.5%). These findings can be attributed to the fact that patients in the age group 20 – 29 are more commonly associated with active types of occupations and daily activities, in contrast with those patients in the age group older than 60.

With respect to specific aetiologies of complaint as they related to gender (Table 32), it was noted in this study that a higher percentage of males reported a traumatic cause of complaint

(54.3%). This was supported by the fact that there were a higher percentage of males (20%) that participated in manual labour and that 50% of manual labourers reported a traumatic cause of complaint. It was found that of those patients that reported doing manual labour, the highest percentage of reported causes of complaint was traumatic (50%). However a higher percentage of females reported the cause of complaint as being non-traumatic (37.8%) or unknown (37.8%). This was supported by the fact, that a higher percentage of females participated in non-manual (11.7%) and combination (18%) occupations and that 55.6% of non-manual labourers had reported an unknown cause of complaint. These findings suggest that because a higher percentage of males participated in manual occupations they were more likely to present with a traumatic cause of complaint at the KHCCC.

5.2.2.1.7 Special Investigations

Special investigations are represented at 4.5.4.3. Table 13. Of the 157 patients in this study, only 9.5% of the patients were sent for special investigations, the majority of the investigations being those sent for x-rays (7.6% of the total sample). Furthermore, it was noted that tests including urine analysis and glucometer readings (which the chiropractor is trained to conduct and interpret) were not undertaken at the KHCCC and none of the special investigations in Table 20 were required and referred for, during the 3 month period of the study. A few explanations exist as to the low percentages of special investigations done and this may be related to the protocols within this multidisciplinary setting at the KHC and the operation of such an establishment. Firstly, most of the patients that presented to the KHCCC first presented to casualty and other departments and were then only referred to KHCCC when considered appropriate. Due to this filtering system, mainly musculoskeletal conditions are treated at KHCCC, and therefore minimal special investigations are required. Secondly, a large number (66.3%) of patients are referred from casualty, physiotherapy and other specialised clinics, where the patient would have already been examined and may have been sent for x-rays and other special investigations conducted before been referred off to the KHCCC. Thirdly, due to the limited funding and high cost factor involved in such tests patients are only sent for x-rays, or other special investigations, when the need arises. However, if further investigation is deemed necessary by the resident chiropractor at the KHCCC, the patients are referred to specialists within the 16 specialist clinics. These specialist clinics then refer the patients for further investigations (these may include CT, MRI, colonoscopy, bone density tests, bone scan, ultrasound and ECG).

With regards to special investigations performed, x-rays were the most common investigation conducted in majority of the studies that were reviewed in this study. These included studies in the international private sector (Pedersen, 1994, Sorensen *et al.,* 2002 and Mootz *et al.,* 2005), in the international public sector (Walsh and Jamison, 1992 and Holt and Beck, 2005) and local teaching clinic (Venketsamy, 2007, Benjamin, 2007, Jaman, 2007 and Kandhai, 2007) and the local private sector (Mahomed, 2007 (37.4%). This may be due to the affordability of the x-ray in comparison to CT and MRI scans and the time taken to perform these specific investigations.

5.2.2.1.8 Source of patients

Source of patients are represented at 4.5.4.4. Table 14. 66.3% of the patients presenting to the KHCCC were referred to the KHCCC from the medical profession, 60% of which were referred from within the KHC and 40% form outside the KHC (rural and urban clinics and the military hospital). These results were substantially higher as compared to the private sector of South Africa, where only 7.2% of patients were referred from within the medical profession (Mahomed, 2007). This low percentage of patients that were referred from the medical profession in the private sector is in contrast to the results of the study conducted by Louw (2005), were it was found that up to 46% of the participating general practitioners in South Africa had referred patients to chiropractors. This high percentage of patients referred from the medical profession in the public sector provides a body of evidence which supports the success of the integrative approach that was intended from the first inclusion of a full time post for chiropractic at KHC back in January 1998 (Till and Till, 2000). From these results, the referral pattern observed from the medical staff at KHC reflects a high acceptance towards the chiropractic profession. These findings are supported by the relatively high percentages documented in previous studies conducted in the international private sector by Hartvigsen *et al.,* (2002) where 49% were referred from the general practitioners, and similar results were found in the international public sector by Giles *et al.,* (2002) where 49% were referred from the medical profession.

Medical referrals to the KHCCC consisted of those referred from rural clinics (14.6%), general medical clinics (8.9%), out patients (2.5%), orthopeadics (3.2%), oncology (2.5%), pediatrics (1.8%), ENT (0.6%) and urology (0.6%) departments. KHC staff constituted 10.8% of the sample. The highest number of referrals from the medical profession to the KHCCC, were referred from the physiotherapy department within the KHC (15.25%). This observation was in

contrast to the private sector of South Africa where only 1.8% was referred by physiotherapists (Mahomed, 2007). This observation made in the private sector of South Africa can be supported by the findings of Hunter (2004), where it was found that 82% of South African physiotherapists were not knowledgeable about chiropractic and that they would like to know more about the profession. Hence, the low awareness levels about the chiropractic profession could be restricting the potential for improved relationships and increased referrals between physiotherapists and chiropractors, as was seen to be occurring in the public sector of South Africa. This low percentage of referrals from physiotherapists' found in the private sector of South Africa supported the study conducted by Sorensen *et al.,* (2002), where only a 2% referral rate from physiotherapists was observed.

It was documented in this study that "self-referrals", consisted of those patients who presented to the KHCCC on their own accord (walk-ins), and those that may have been referred from friends and family, only consisted of 22.9%. However, these results were documented separately in majority of the studies. Mahomed (2007), found that referrals from friends and relatives still remained the highest form of referrals in the South African private sector (45%), were self-referrals accounted for 25.7%. Similar results of referrals from friends and family were reported in the international private and public sector (Hartvigsen *et al.,* 2000, Sorensen *et al.,* 2002 and Nyiendo *et al.,* 1989), although substantially higher percentages of referral from friends and family were documented in some cases (Rubinstein *et al.,* 2000 and Mootz *et al.,* 2005). Self-referral was relatively higher in the studies conducted in the international sector by Giles *et al.,* 2002 (40.3%) and those of Mootz *et al.,* 2005 (85%). Stevens (2007) reported on a 25% walk-in rate. However, it was found by Nyiendo *et al.,* (1989) that a significantly larger proportion of patients that attended the teaching clinics were referred by the chiropractic students. The percentage of patients referred by the students at these teaching clinics ranged from 35% to as much as 78% at the six different teaching clinics in his study. Therefore, no conclusion can be drawn as to the fact that walk-ins, self-referral and referral from friends and family were collectively documented in this study. Therefore, there is a considerable contrast in this study with regards to the higher percentage of patients that are referred within the medical profession and what was documented in any other local and international study.

However, with these results it can be suggested that the goals set out by Till and Till (2000) when starting the program at the KHC were met over the past decade, with regards to the

increased awareness of chiropractic and improving relations with staff at the KHC, the positive publicity and the integration of the chiropractic profession into a multidisciplinary setting. This can be supported by documented data stated above with regards to the high percentage of referrals from within the medical profession including the physiotherapy department and the high percentage of medical staff that utilise the chiropractic facility at the KHCCC.

5.2.3 Objective 3: To determine the prevalence of musculoskeletal and non-musculoskeletal conditions in patients that present to the KHCCC. (History of co-morbidities, history of smoking, blood pressure, history of spinal conditions, history of surgery and history of previous chiropractic treatment for the same condition).

5.2.3.1 History of co-morbidity

History of co-morbidity was represented at 4.5.3.1. Figure 4. Of the 157 patients that presented to KHCCC, 68 patients had reported on an existing co-morbidity (43.3%). The most common co-morbidity was hypertension (28.2%), followed by diabetes (12.8%), allergies (5.8%), heart conditions (5.1%) and asthma (4.5%), suggesting that cardiovascular and endocrine were common complaints. It must be noted that some patients may have reported on more then one co-morbidity. Co-morbidities reported less commonly are illustrated on figure 4. The history of co-morbidities cannot be compared to the Till and Till (2000) study, as this information was not recorded at the time.

In terms of co-morbidity and gender (Table 34), females presented with a slightly higher percentage of co-morbidity, with hypertension (29.1%) and diabetes (13.5%), than men with hypertension (26.1%) and diabetes (10.9%). However, this contrasts with the co-morbidity rate of men presenting with allergies (10.9%) over that of women (3.6%). This is in contrast to data on patients in the international private sector (Sorensen *et al., 2002*), where a higher percentage of males had diabetes (2%) and an equal percentage of males and females presented with cardiovascular conditions (5%).

With respect to co-morbidity and age (Table 30), co-morbidities were most commonly reported on in the age group 50 – 59, where hypertension was documented amongst 45.2% of the patients. Notably, no patients between the ages of 3 – 29, reported co-morbidity.

In terms of co-morbidity and ethnicity (Table 37), only two patients that presented to the KHCCC were Indian and one of whom reported on hypertension, diabetes and allergies. This anomaly resulted in a high percentage of co-morbidity (50%) being documented in this study. The average incidences of hypertension amongst Whites, Blacks and Coloureds was similar (ranging from 27.3% to 29.2%), whereas, Blacks and Coloureds reported with higher levels of diabetes, (14.5% and 12.2% respectively), than Whites (4.5%). Conversely, whites reported a higher level of allergies (18.2%) than Blacks (1.2%) or Coloureds (6.1%).

This study found that patients that had only completed primary schooling had the highest number of co-morbidities including that of hypertension (n=26), diabetes (n=10) and allergies (n=5). This could be due to several reasons: lower education levels may result in patients being employed in basic skilled jobs, which in an environment such as Kimberley, could include the mining and textile industries. These industries often dictate that employees work long hours, earn minimal wages, suffer from, inter alia, environmental stress, and are poorly educated regarding health care, or diet. However, it was interesting to note that those who had no education and those who had tertiary education reported the lowest number of co-morbidities. This could be understood as those with no education were those more likely to come from the farming communities who would live on basic food items like maize meal, with higher nutritional values, and who took part in more physical work on farms. Furthermore, those who had the benefit of tertiary education may have acquired the knowledge of basic health care and may be employed and therefore be able to afford better health care, if necessary.

Relative to the top three co-morbidities that presented to KHCCC, namely hypertension, diabetes and allergies, results were found in the local teaching clinic, where the top co-morbidities that presented were that of respiratory, cardiac and endocrine related conditions (Jaman, 2007; Kandhai, 2007 and Venketsamy, 2007). This was also observed in the public international setting (Stevens, 2007) where high blood pressure (27%), depression (22%), high cholesterol (13%) and diabetes (12%) was rated in the top four co-morbidities that presented. It can therefore be concluded that patients predominantly present with co-morbidities that comprise of cardiovascular and endocrine related conditions in both the private sector and public sector; that patients without secondary or tertiary education are more likely to present with co-morbidity than their counterparts; and that older age group more than the younger age groups.

5.2.3.2 History of smoking

History of smoking is represented at 4.5.3.2. Table 16. Of the 157 patients documented, 25 patients (15.9%) were current smokers and 19 (12.1%) patients were previous smokers. The majority of patients (n = 113, 72%) were non smokers. The status of smoking in South Africa has revealed that one in three adult South Africans smoke, with the Northern Cape Province having the highest percentage of smokers (55%) (http://www.essentialdrugs.org/newsview.php/7/). Interestingly, a higher percentage of non-smokers (35.4%) and previous smokers (62.5%) had hypertension, than smokers (33.3%), although a higher percentage of smokers (16%) had allergies (22.2%) and diabetes (22.2%). An association was made between two categorical variables, namely that of smokers and co-morbidities (Table 63), where it was found that smokers were significantly more prone to allergies than non-smokers or previous smokers. However, there was no link found between those that were smokers to the anatomical location of complaint. In view of the history of smoking amongst the patients, it was found in a study conducted by Karter *et al.,* (2007) on "*The educational disparities in health behaviors among patients with diabetes*", that predicted probabilities of being a non-smoker or engaging in regular exercise and health-seeking behaviour were significantly lower among those with less education. This study was in contrast to both the international private sector, where it was documented that up to 32% of the participating patients were smokers (Sorensen *et al.,* 2002), and the international public sector where 30% of the participating patients were smokers (Stevens, 2007). These results were substantially higher than the results documented at KHCCC. It can be suggested that this low percentage of smokers may be related to the low socio-demographic indicators in patients at the KHCCC this making cigarettes a "luxury" that may not be affordable to patients that present to the public sector in Kimberley.

5.2.3.3. History of blood pressure

History of blood pressure was represented at 4.5.3.3. Table 17. It was interesting to note that 28.2% of the 157 patients reported hypertension as a co-morbidity in this study, patients were co-managed by the relevant departments at the KHC. Of the 136 patients that had their blood pressure taken at KHCCC, 12 patients (8.8%) were diagnosed with high blood pressure. No patients were diagnosed by the resident chiropractor as having low blood pressure (readings lower then 110mmHg systolic). However, due to some patients already having been diagnosed with hypertension previously, some may not have had their blood pressure under

control at the time of the consultation. This may have resulted in patients being diagnosed with hypertension at the consultation, that already had a history of blood pressure abnormalities and as a result, the 8.8% that were diagnosed with hypertension may be higher than it should be.

History of blood pressure was not documented in the Till and Till (2000) study, therefore no comparisons can be made. The results of this study were slightly lower than those diagnosed at the local teaching clinic (12.3%-13.6%) (Jaman, 2007, Kandhai, 2007 and Venketsamy, 2007 but substantially higher if the reported hypertension was taken into account. This study is more comparable to the study by Stevens (2007) where 27% of the patients were diagnosed with hypertension. It can be concluded that a higher number of patients with hypertension present to the KHCCC, but that the hypertension may be well controlled. These results provide evidence as to the integration and co-management of patients at the KHC as if the blood pressure readings are not in the normal range, before treatment commences, the patient is referred for appropriate management.

5.2.3.4 History of pre-existing spinal conditions

History of pre-existing spinal conditions was represented at 4.5.3.4. (Table 18) It was found in this study that only 12 patients that presented to the KHCCC had a history of spinal conditions (7.7%). Of these 12 patients, two reported scoliosis. This finding was concurrent with that of local teaching clinics (Benjamin, 2007 and Jaman, 2007), where it was found that scoliosis was documented as a spinal sign and symptom that presented to the teaching clinic. Additional spinal conditions that were reported on included those of, neurofibroma, degenerative disc disease, fibromyalgia, osteoarthritis and rheumatoid arthritis. No other study referred to in this research documented the reported history of spinal conditions. A study conducted by Giles *et al.,* (2002), undertook extensive radiological investigations aimed at documenting any radiological abnormalities detected in the patients. A variety of conditions were found in Giles (2002) study; the top three included that of intervertabral disc bulges (35.3%), degenerative changes (29.9%), disc herniations (19.0%) and miscellaneous conditions (6.9%) including that of idiopathic scoliosis. Further studies into this aspect may yield interesting findings and allow better comparison.

5.2.3.5 History of surgery

History of surgery was represented at 4.5.3.5. Table 19. More than half the patients that presented to the KHCCC reported having had previous surgery (n = 79, 50.3%). In general, surgeries comprised of hysterectomies, cesareans, tonsillectomies, spinal surgeries, removals of gall stones and cysts, to name a few. No other studies that were referred to in this study had documented history of surgery. However, Giles *et al.,* (2002) reported on the percentage of failed spinal surgeries (6.76%) that presented to the spinal pain unit.

5.2.3.6 History of previous treatment by the chiropractor for same complaint

History of previous treatment by the chiropractor for the same complaint was represented at 4.5.3.6. Table 20. With respect to the frequency of visits, Table 8 shows the largest percentage of patients that presented to KHCCC were existing patients who had received treatment for less than 6 visits (35.7%). Almost 20% of the patients had received 18 treatments or more, 22.3% received between 6 and 17 treatments and the remainder represented 22.3 %.

This information was not possible to document in the study of Till and Till (2000), as the KHCCC was new to the area and to the hospital setting. With regards to the history of previous treatment for the same complaint, it was documented by Rubenstein et al., (2000) and Hartvigsen et al., (2002), that 14% and 15% of patients respectively had previous treatment for the same complaint in the international private sector. However, it was documented by Mootz *et al.,* (2005), that 81% of the patients that had previously been seen, 90% were treated for the same complaint. This was also noted within the local private sector, where 70% of the patients had previously been seen, of which 89% were treated for the same complaint (Mahomed, 2007). It can be suggested that these high percentages of treatment for the same complaint could be due to the nature of the chiropractic approach to patient management. It can be expected, as it is in the norm, to have multiple follow-up visits when receiving chiropractic treatment to benefit from the mechanical effects of treatment and to follow the drug free, conservative patient management approach.

It can be concluded, taking into account objective two and three, that majority of the patients that present to the KHCCC, presented with a musculoskeletal condition, with the exception of a few diagnoses (n = 4). These included diagnoses of oedema of the arm, insomnia, facial neuralgia and chest pain, which were all in part chiropractically treated, whist in co-management with other medical departments within the KHC. This low percentage (2.5%) of

patients that presented with non-musculoskeletal complaints at the KHCCC was similar to results of Till and Till (2000), although it is in contrast to the high percentage of patients that presented with non-musculoskeletal complaints in the study conducted by Hawk *et al.,* (2001) and Leboeuf-Yde *et al.,* (2005) in the international private sector (10.3% and n = 5607).

5.2.4 Objective four: To document the chiropractic management protocol/s that has been used for patients at the KHCCC

5.2.4.1 Referral from the chiropractor

Referral from the chiropractor was represented at 4.5.4.1. Table 21. It was documented that six patients (3.8%) who consulted with the resident chiropractor at the KHCCC were referred to other departments within the KHC. The reasons for referral consisted of a variety of conditions/requirements that presented to the KHCCC that were either out of the chiropractic scope of practice, or could be better dealt with at other departments. The reasons for referral consisted of a variety of conditions. Three were referred to casualty (for high blood pressure and a swollen face), two to the physiotherapy department (muscle strengthening program and other physiotherapy treatment) and one to a paediatric clinic (referred for night sweats).

Feedback was received for two of the referrals made to the casualty department, where both patients had been placed on hypertensive medication and, as a result, when the blood pressure was under control could resume their treatment at the KHCCC. A possible explanation for the low percentage of patients that needed to be referred from the KHCCC, may be due to the “filtering” system at the KHC as discussed previously.

Referrals from the chiropractor were not documented in the study of Till and Till (2000). The findings of the current study support those documented by the local teaching clinic in respect of low referral rates by the chiropractor, and these ranged from 1.6% to 2.9% of the patients that were referred to other practitioners, including those of orthopedic surgeons, gynecologists and general practitioners (Venketsamy, 2007, Benjamin, 2007, Jaman, 2007 and Kandhai, 2007). Referral was not documented in the private sector of South Africa. A comparatively higher proportion of referrals were reported by Giles *et al.,* (2003) where up to 12.6% of the patients were referred to other specialists, including those of orthopedics, neurosurgery, rehabilitative medicine, physiotherapy. No other studies reviewed in this study documented

referrals from the chiropractor. Consequently, from the above mentioned studies conducted locally, showing that not many patients are referred to other medical professions, it can be deduced that the specialist nature of the services provided by the chiropractor, together with the public perception of these services, results in patients presenting to the chiropractor almost exclusively for musculoskeletal complaints.

5.2.4.2 Contraindications to treatment

Contraindications to treatment are represented at 4.5.4.2. Table 22. It was documented that three patients that presented to the KHCCC had contraindications to chiropractic treatment, one case being TB of the spine and the other two cases being high blood pressure. Where above, of the six patients that where referred, only these three did not receive treatment on that day of consultation.

It was documented in the present study that 15 patients that presented to the KHCCC did not receive joint manipulation, for a number of reasons. Of these 15 patients, three did not have manipulation because they had contra-indications to treatment and were referred immediately without any treatment. Six patients were primarily diagnosed with, cervical facet syndrome, thoracic facet syndrome, sacroiliac syndrome, osteoarthritis of the extremities, meniscul injury of the knee and previous shoulder dislocation injury at the initial consultation. In these six patients, when factors were taken into account including that of age, co-morbidities, history of previous spinal conditions and history of surgery where a clinical decision was made in each case, joint mobilisation was considered a better treatment option than manipulation. The remainder of the 15 patients, n = 6 (40%), did not require joint manipulation or joint mobilisation techniques as these treatment were not indicated for the following diagnoses, lumbar myofasciitis, groin strain, oedema in left arm and SLE remission, and in the case of where no diagnosis was made (n = 1) and general check up (n = 1).

It was documented in the present study, that of the 15 patients that did not receive joint manipulation, the highest number of patients (n = 7, 46.7%) were in the age group of 60 years of age and older, followed by the age group of 50 – 59 years of age (n = 3). The percentage of contraindications were similar to the local teaching clinic, where 6.3% contraindicated to manipulation and electrotherapy (Venketsamy, 2007), Seven (2.8%) contraindications to treatment were identified by Benjamin (2007), the reasons stated in this study was that of

hepatomegaly, cancer and x-ray first for suspected pathology. There were 47 contra-indications (3.7%) to treatment identified in the study conducted by Jaman (2007). Manipulation was contra-indicated in 41 cases, while all treatments were contra-indicated in 6 cases. The reasons for contra-indications included that of, disc pathology, high blood pressure and suspected fracture and want to view patient x-rays before deciding on treatment (Jaman, 2007). No other studies investigated in this present study documented on the contraindications to chiropractic treatment.

5.2.4.3 Treatment protocols

Treatment protocols are represented at 4.5.4.3. Table 26. The majority of patients that presented to the KHCCC received chiropractic manipulative therapy (CMT) or what were termed in this study as joint manipulation (90.4%). This was followed by dry needling (76.4%), kinesiotape (42%) and soft tissue therapy (38.9%). Strapping (1.3%), home exercise (0.6%), Non-steroidal anti-inflammatory drugs (0.6%) and nutritional advice (0.6%) were occasionally included as part of the treatment protocol at the KHCCC. The high percentage of joint manipulation documented in this study fits in well with chiropractic literature which states that manipulation is the premise of chiropractic treatment (Gatterman, 1990).

No comparisons were possible to deduct from the study of Till and Till (2000) as this component was not documented at the time. However, it was noted in the majority of the studies reviewed in this research, that manipulative therapy was the most commonly used treatment of choice in the international private sector (Pedersen, 1994 (91.3%) and Mootz *et al.,* 2005 (82%-85%)), in the international public sector (Suleman, 2001 (92%)) and the local teaching clinic (Benjamin, 2007 (82.6%) and Jaman, 2007 (74.5%)). However, the results of this study were in contrast to the international public sector conducted by Giles, *et al.,* (2002), whereby chiropractic spinal manipulation only accounted 11.7%, where majority of the treatment consisted of acupuncture (28.6%).

It was found that in the majority of patients that presented to the KHCCC, with a myofascial component that were routinely treated with dry needling, kinesio-taping and soft tissue techniques. It was found, that the use of kinesiotape as an adjunct to chiropractic manipulative therapy was very useful in the majority of the patients that presented to the KHCCC in a chronic stage of injury because it could be placed on the patient and left on for a period of time, thus giving the patient an extended period of relief before the next consultation (Jacobs, 2008).

KHCCC did not have any physiotherapy modalities available. Consequently, if patients required physiotherapy treatment in relation to rehabilitation, the use of electrotherapy modalities and physical exercise programs, patients were referred to the physiotherapy department for the relevant treatment and were co-managed in conjunction with the KHCCC. Although muscle strengthening programs, rehabilitation and modalities are considered within the scope of chiropractic, due to the workings of the KHCCC, these were referred to the physiotherapy department as there was 14 full time staff versus only one full time resident chiropractor at the KHC. It was often noted that patients attended physiotherapy in the morning before receiving chiropractic treatment later on in the day. This worked mutually between the chiropractic clinic and physiotherapy clinic, as well as all the other specialised clinics as discussed in the referral patterns above. As a result, it was often the case of co-management of patients between the clinics. Again this aspect highlights the good integration of chiropractic into a hospital setting, with regards to the optimal management for the patients that presented to the KHC.

5.2.5 Conclusion

In this study, updated information on chiropractic patients seeking chiropractic care in a South African public hospital setting was provided. This chapter included a discussion based on the results documented in this study as it related to objectives one to four and, where possible, objective five was addressed where comparisons were made with results obtained from other local and international studies.

Chapter six will discuss the conclusions of this study and further recommendations that may be made to improve this type of study in the future.

Chapter Six

Summary and Conclusions and Recommendations

6.1 Introduction

Chiropractic patients at the KHCCC have been described in terms of demographics, common presenting conditions, common aetiologies, special investigations, referral patterns and common chiropractic management protocols used on these chiropractic patients based on the first four main objectives outlined in chapter one. By doing so, this study therefore provided an updated and comprehensive case profile of patients presenting to a public health care facility in South Africa. Objective five was discussed throughout chapter five in terms of the comparison of data obtained in this study to data of a similar nature in both local and international studies conducted in private, public and teaching clinics. In doing so, this study has assisted in giving a better indication as to where and how we as chiropractors are providing a service in the public sector of South Africa and how it fits in into the big picture.

A summary of the findings follow which are deemed similar or different to those found in the literature and previously compared, based on whether the results concurred with more than half of those studies documented in that particular category. Objective five will be discussed at the end of objectives one to four.

6.2 Summary

6.2.1 Objective one: To identify selected demographics of patients that presented to the KHCCC (Age, gender, ethnicity, occupation type, area of residence and level of education).

The demographic profile of the typical South African chiropractic patient that presented to the public sector health care at KHCCC was a Black female, with a mean age of 47.5 years; with a primary school education. Majority of the patients that presented to the KHCCC were patients from the local urban area of Kimberley, where only just more than one quarter

presented from the outer rural communities in the greater Kimberley district. Almost half of the patients that presented to the KHCCC were employed, majority of whom were involved in manual labour, or a combination of manual and non-manual labour. These demographic results, the majority of the patients that presented to the KHCCC were from a lower socioeconomic level.

With respect to objective five, it can be concluded that there was a predominantly divergent and unique set of demographics observed in patients presenting to KHCCC. Regarding age, it was found to be similar to majority of the studies, although considerably higher than teaching clinics and lower to the study of Till and Till (2000). With regards to gender, it was found to be similar to local and international, private and public sectors. However, demographics pertaining to education, employment and occupation of the patients that presented to the KHCCC, were dissimilar to the majority of the studies in the local and international, private and public sectors that were reviewed within this study. With respect to the ethnicity and place of residence, it can be concluded in terms of this study, that it was specific to the location of the clinic from which most patients are drawn.

6.2.2 Objective two: To document the common presenting conditions (anatomical location of pain, diagnosis), chronicity, common aetiologies of complaint, special investigations used and referral patterns in terms of source of patients, where possible, at the KHCCC.

The most common presenting anatomical location of complaint was that of lumbar pain (35%). The most common diagnosis that was made by the resident chiropractor at the KHCCC was that of sacroiliac syndrome. The majority of complaints were chronic in presentation. The aetiology of complaint were almost equally divided between unknown, non traumatic and traumatic. X-rays were the most common special investigation ordered. It was shown in the results of this study that majority of the patients that were referred to the KHCCC were from the medical profession, and majority from KHC itself. With respect to referrals made from the medical profession, the highest percentage of referral was from physiotherapy, followed by rural clinic and the general medical clinic. This gives us a good indication that the chiropractic profession at the KHC has been received well by the medical profession. KHC staff constituted a large percentage of the total sample of patients at the

KHCCC. This evidences effective integration of the chiropractic profession into a multidisciplinary setting at the public hospital at KHC.

With respect to objective five, the majority of studies reported similar findings of the most common anatomical location of complaint, which was that of lumbar and sacroiliac pain. The most common diagnosis in the present study was sacroiliac syndrome which was in contrast to the local private sector where cervical facet syndrome was diagnosed more commonly, followed by a diagnosis of sacroiliac syndrome. With regards to the chronicity of complaint, similarities were found within the local private and teaching clinic and international public and teaching clinics, however these results were in contrast to those of the international private sector, in which majority of patients were in an acute presentation. Comparisons were difficult to formulate with respect to aetiologies of complaint due to inconsistencies used in the reported terminology. With regards to special investigations performed, x-rays were the most common investigation conducted in majority of the studies that were reviewed in this study, including both the local and international, private, public and teaching clinics. With regards to the source of patients, it was noted that the KHCCC had the highest percentage of referrals from within the medical profession, than any other study reviewed within this study. However, relatively high percentages were also documented in the international private sector by Hartvigsen *et al.,* (2002) and international public sector by Giles *et al.,* (2002). Conversely the majority of studies reported higher percentages of referral from friends and family and self-referral.

6.2.3 Objective three: To determine the prevalence of musculoskeletal and non-musculoskeletal conditions in patients that presented to the KHCCC (history of co-morbidities as reported by the patient, history of smoking, blood pressure readings taken at KHCCC on the day of consultation, history of spinal conditions, history of surgery and history of previous chiropractic treatment for the same condition).

The history of the typical patient that presented to the KHCCC, commonly included the reporting of a co-morbidity, of which hypertension (cardiovascular) was the most common, followed by that of diabetes (endocrine). Majority of the patients were non-smokers. It was documented that only 8.8% of the patients that presented to the KHCCC were diagnosed with high blood pressure. The typical patient would in all probability have had some sort of surgery. The majority of patients that presented to KHCCC were existing patients whom had

received treatment for less than 6 visits, although there were several patients mainly from the rural communities that received treatment once a month for more than 18 visits.

With respect to objective five, it was found that majority of the studies reviewed within this study did not investigate these aspects and therefore minimal comparisons could be made. With respect to the co-morbidity of patients, certain similarities were noted where in the majority of the other studies that reported co-morbidities, the top three also seemed to include cardiovascular and endocrine disorders. In terms of the history of previous treatment for the same complaint, majority of all sectors had had several previous treatments for the same complaint by the chiropractor. Therefore when comparing the factors that were investigated in other studies, similar results were found.

It can be concluded, taking into account the factors reviewed in objectives two and three, that majority of the patients that presented to the KHCCC, presented with musculoskeletal conditions (n = 152, 96.8%), with 2.5% (n = 4) accounting for non-musculoskeletal conditions and one patient presented with no complaint (0.6%). The non-musculoskeletal conditions included diagnoses of oedema of the arm, insomnia, facial neuralgia and chest pain. These patients were all in part chiropractically treated, whilst in co-management with other medical departments within the KHC for the complaint that was out of the scope of chiropractic practice. In terms of the general health status of the patient pertaining particularly to the non-musculoskeletal conditions that the patients presented with, it was noted that a high proportion of patients (43.3%) presented to the KHCCC with similar co-morbidities (cardiovascular and endocrine being the most common) as those in other studies.

6.2.4 Objective four: To document the chiropractic management protocol/s that has been used for patients at the KHCCC.

In terms of patient management at the KHCCC, a very small percentage of the patients (3.8%) that where consulted by the chiropractor were referred off to various other departments within the KHC. Three patients that sought treatment at the KHCCC had contraindications to chiropractic treatment. The treatment protocols that were predominantly used at the KHCCC were joint manipulation. This was followed by dry needling, kinesiotape and soft tissue therapy. The treatment protocol usually consisted of a combination of the above mentioned therapies.

With respect to objective five, similarities were noted in respect to the percentage of patients that had contraindications to treatment, as well as, to the referrals made by the chiropractor, in the local teaching clinic. The international public sector study by Giles *et al.,* (2003) had a substantially higher percentage of referrals that were made. Majority of the studies that were reviewed reported manipulation as the primary choice of treatment.

6.2.5 Conclusion

Although this was purely a demographic and descriptive study in nature, it gave a better understanding and adds to the body of knowledge in terms of characteristics of patients that presented to a public hospital in a developing country like South Africa seeking chiropractic care. Therefore this study has contributed to the knowledge by outlining the role of chiropractic in the public health care arena in South Africa.

The demographic and descriptive information obtained in this study, has suggested that although there was a unique population, with its definite characteristics, utilising chiropractic services within the public sector of South Africa, many meaningful similarities could be found between those patients and other chiropractic patients both locally and internationally (regardless of which sector they sought the service).

- With regards to the chiropractic patient in South African:
  Similarities with respect to patients in the public sector to those in the local private practices and teaching clinic included those of similar age, majority females, top five common anatomical locations of complaint, chronic stage of presentation, the common usage of x-ray, similarities with co-morbidities including that of cardiovascular and endocrine, the repeated number of visits for the same complaint, the small percentage of referrals made by the chiropractor and that manipulation remained the treatment of choice.
- With regards to the chiropractic patients globally:
  Similarities with respect to patients in the public sector in South Africa to international chiropractic patients in all sectors include factors such as majority female patients, top five anatomical locations of complaint, common usage of x-rays as a special investigation, similarities with co-morbidities including cardiovascular and endocrine,

the repeated number of visits for the same complaint and manipulation remained treatment of choice.

The similarities that have been highlighted above (both from the South African perspective and the global perspective) may suggest that despite the fact that differences have been found, much of the pertinent characteristics of chiropractic patients may be generalisable to the different sectors, and in different parts of the world. This may indicate that chiropractors are well equipped to manage chiropractic patients in the public sector in South Africa, just as well as any other sector in South Africa and also internationally. It is the opinion of the researcher that no major differences were noted within this study between chiropractic patients seen the different sectors and in different countries that may indicate the need for changes in the chiropractic syllabus.

With regards to differences that were noted, this study has:

- Identifies the most common presentation of the typical patient presenting for chiropractic car in the public sector of South Africa,
- Highlighted what the differences are that were observed between the different sectors in the different parts of the world (from the studies that were reviewed within this study)
- Generated this data that may be used as a database for appropriate use by anybody who might need, for example, those that provide a service to patients in the public sector, those that may be doing research on patients in the public sector, and even perhaps by academics and policy makers should the need arise.

According to Suleman (2001) and Manga (2000), the population subgroups that suffer the greatest musculoskeletal disability tend to be those of a lower socioeconomic level. The low level of socioeconomic indicators that were illustrated in this study is a good indication to the great need of chiropractic services to these communities, and that this service is being provided to the population group at this facility.

Furthermore, the data collected in this study is suggestive that the goals set out over a decade ago (Till and Till, 2000), appear to have been met in terms of exposing people in need of chiropractic care to this service by decreasing the barriers and increasing the access to the chiropractic facility at KHC. This can be seen by the overwhelming body of evidence found

throughout this study, which suggests a high level of integration of the chiropractic profession at the KHC and the acceptance of chiropractic by the medical profession in this public facility. One example of this high level of integration was the difference with respect to the referral patterns in relation to source of patient, where majority of the patients that were referred to the KHCCC was referred from within the medical profession. This factor was not seen anywhere else in the local and international studies reviewed within this study. These results may encourage further integration of the chiropractic profession into more public health care facilities in South Africa and internationally.

6.3 Recommendations

The following recommendations are made to improve similar studies in the future:

- A standard questionnaire should be drawn up for future demographic and descriptive studies, to ensure good, detailed comparisons can be drawn up between similar natured studies, to reduce the ambiguity of certain terms and definitions.

- In future studies, the level of income should be included, as this will be able to give us a better indication of the socio-demographic level of the patients.

- It is recommended that in future studies conducted at the KHCCC, that all special investigations should be documented, those that were sent for by the KHCCC and those special investigations conducted before been referred to the KHCCC from the other medical clinics.

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Appendix A

Dear Participant,
I would like to welcome you into the focus group of my study.

Title of Research:
A retrospective randomised clinical survey of chiropractic cases that present to the Kimberley Hospital Complex.

Name of researcher: Madelaine Higgs 0845092015:mandyatdut@yahoo.com
Name of supervisor: Dr. E Lakhani (031) 3732533 [MTech-Chiropractic; I.C.S.S.D.]

Introduction:
Due to the paucity of information regarding demographics and clinical characteristics of patients presenting to Kimberley Hospital Complex (KHC), the only public hospital in South Africa that provides free chiropractic services to the public. It warrants a study, that may fill the gap in the literature. Studies of this nature have been conducted in South Africa at private practices in 2007, a teaching institution in 2007 and in Kimberley Public Hospital in 1997, whereby they describe the demographics and most common presenting complaints of patients that presented to chiropractors. With this data a comparative analysis can be made with this study.

Purpose of this Study
The purpose of this study is to establish a demographic and descriptive profile of patients presenting to the Kimberley Hospital Complex over a three month period in 2008. The descriptive data will include the common presenting conditions, main areas of complaint, common diagnosis and common chiropractic management protocols.

A data collection sheet will be used by the researcher in the course of the consultation to gain the information required for the research and information extracted from the patient files.

Benefits
With this information the profession will be better equipped in terms of:

a) To identify and describe the chiropractic patient who presents to the KHC.
b) Marketing and promoting the chiropractic profession in public hospitals in South Africa.
c) Determining the prevalence of conditions that present to the KHC chiropractic clinic.
d) Guiding further research in regards to common presenting conditions.
e) Determining the role of chiropractors in a multidisciplinary setting in a public hospital in South Africa.

Procedure:
A data collection template has already been developed by the researcher. You are requested to constructively critique this data collection template and provide your opinions/views on each question so that relevant changes/improvements may be made to the data collection template.

Remuneration:
None. Participation in this focus group is entirely voluntary.

Statement of Agreement to participate in the research study:

I,……ID number……., have read this document in its entirety and understand its contents. Where I have any questions or queries, these have been explained to me by…… to my satisfaction. Furthermore, I fully understand that I may withdraw from this focus group. I, therefore, voluntarily agree t participate in this study.

Subject's name…….. Subjects signature……Date:……

Thank you for your most valuable participation in this focus group and thereby, your immeasurable contributions to this research study.

Thank you.
Yours sincerely,

……	……..
Madelaine Higgs	Dr. E Lakhani
(Research student)	(Supervisor)

Appendix B

INFORMED CONSENT FORM

(To be completed by the participants of the Focus Group)

Date : 9 May 2008

Title of research project: **A Retrospective randomised clinical survey of chiropractic cases that present to the Kimberley Hospital Complex**

Name of supervisor : Dr. E Lakhani [Mtech: Chiropractic; I.C.S.S.D.]
Tel : (031) 3732533

Name of research student : Madelaine Higgs
Tel : 0845092015

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 withdraw from this study? Yes No
   - at any time
   - without having to give any a reason for withdrawing, and
   - without affecting your future health care.
8. Do you agree to voluntarily participate in this study Yes No
9. Who have you spoken to? _____

If you have answered NO to any of the above, please obtain the necessary information before signing.
Thank You.

Please Print in block letters: Please note for research purpose only
Please be assured that your personal particulars will remain anonymous

Particiant:_____ Signature:_____

Witness Name:_____ Signature:_____

Researcher's Name: Madelaine Higgs Signature:_____

Supervisor's Name: Dr E Lakhani Signature:_____

Appendix C

CONFIDENTIALITY STATEMENT- FOCUS GROUP

DECLARATION

IMPORTANT NOTICE:

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

1. All information contained in the research documents and any information discussed during telephonically or electronically 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 data collection templates will kept confidential in the research process.
3. None of the information shall be communicated to any other individual or organisation outside of this specific focus group as to the decisions of this focus group.
4. The information from this focus group will be made public in terms of a journal publication, which will in no way identify any participants of this research.

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

Please print in block letters:

Focus Group Member:_____ Signature:

Witness Name: _____ Signature:

Researcher's Name: Madelaine Higgs Signature:

Supervisor's Name: Dr E Lakhani Signature:

Data Sheet
Template Appendix D

2. Gender:	Male	Female	
3. Age:			
4. Employment:	emloyed:1	Unemployed:2	Pensioner:3
5. Occupations:	Manual Labour:1	Non-manual:2	
6. Race:	Black:1	Coloured:2	White:3
	Indian:4	Asian:5	Other:6
7. Reason for attending Chiropractic Clinic			
	Referral from medical specialist: 1		
	Referral from Friend/Family: 2		
	Self Referral: 3		

8. Main Area of Complaints

Cervical	Neck Pain 1	Headache 2	Arm Pain 3	Jaw Pain 4	Chest Pain 5
Thoracic	Thoracic Pain 6	Chest Pain 7	Rib Pain 8	Arm Pain 9	Shoulder Blade Pain 10
Lumbosacral	Lumber Pain 11	Sacraliliac Pain 12	Leg Pain 13	Iliac crest Pain 14	
TMJ	Jaw Pain 15	TMJ Headache 16	Upper cervical pain 17	Ear Pain 18	
Upper Extremity	Shoulder Pain 19	Elbow 20	Forearm Pain 21	Wrist Pain 22	Hand Pain 23
Lower Extremity	Hip Pain 24	Upper Leg pain	Knee Pain	Shin Pain	Calf Pain

		25	26	27	28
	Ankle Pain 29	Foot Pain 30			

9. Duration of Main Complaint before receiving treatment		
	Acute <3 months	0
	Sub-acute 3-6 months 1	
	Chronic >6 months	2
10. Cause of Main Complaint as determined by the patient		
	Unknown	0
	Non-traumatic	1
	Traumatic	2
11. History of pre-existing spinal conditions		
	No	0
	Yes	1
11A. If Yes Specify:		
12. History of Surgery		
	No	0
	Yes	1
12A. If Yes Specify:		
13. Smoker:	No	0
	Yes	1

14. History of illness:	No	0
		Yes
	Allergies	1
	Asthma	2
	Cancer	3
	Diabetes	4
	Epilepsy	5

	Heart conditions	6
	Hypertension	7
	TB	8
	Stroke	9
	Other:	10
14A. Specify		
15. Family History	No	0
		Yes
	Allergies	1
	Asthma	2
	Cancer	3
	Diabetes	4
	Epilepsy	5
	Heart conditions	6
	Hypertension	7
	Osteoarthritis	8
	RA	9
	TB	10
	Stoke	11
	Other:	12
15A. Specify		

16. Associated Signs	No	0
		Yes
	Wheeze	1
	Murmur	2
	Irregular Pulse	3
	Dyspnoea	4
	Difficulty walking	5
	Loss of Balance	6
	Dizziness	7
	Voice change	8

	paralysis	9
	Genu Varum	10
	Genu Valgam	11
	Genu Recurvatem	12
	Tibial Torsion	13
	Patella Alta	14
	Patella Baja	15
	Other:	16
16A. Specify		

17. Associated Symptoms		
	No	0
		Yes
	Paraethesias	1
	Numbness	2
	Weakness	3
	Vertigo	4
	Palpitations	5
	Coughing	6
	Tingling	7
	Lower Limb Symptoms	8
	Upper Limb Symptoms	9
	Visual Disturbance	10
	Auditiory Disturbance	11
	Cardivascular Symptoms	12
	Viscaral Pain	13
	Morning Stiffness	14
	Pain on valsalva	15
	Bladder/ Bowel	16
	Other:	17

17A. Specify
18. Vitals Blood Pressure

19. Special Investigations		
	No	0
		Yes
	Blood Tests	1
	X-Rays	2
	MRI	3
	CT Scans	4
	Ultrasound	5
	Bone Mineral Density	6
	Bone Scan	7
	ECG	8
	Urine Analysis	9
	Other	10
19A. Specify		

20. Referrals	No	0
	Yes	1
21. Reason for referral:		
22. Specify Specialist:		
23. Feedback from referral		
	No	0
	Yes	1
24. Results from Feedback; if any:		
25. Primary Diagnosis as seen on that day: See Apendix A-E		

26. Contraindications for treatment		
	No	0
	Yes	1
26A. If Yes specify:		

27. Treatment Protocol		
	No Treatment	0
	Cross Friction	1
	Cryotherapy	2
	Dry Kneedling	3
	Electro-Dry Kneedling	4
	Heat theray	5
	Electrotherapy	6
	Traction	7
	Joint Manipulation	8
	Joint Mobilisation	9
	Soft Tissue Manipulation	10
	Soft Tissue Mobilisation	11
	Proprioceptive exercise	12
	Soft Tissue Therapy	13
	Kinesiotape	14
	Strapping	15
	Home Exercise	16
	Orthotics	17
	Others	18
27A. Specify		

Appendix A

Cervical Diagnosis List

Unknown	0
None	1
Cervical Facet Syndrome	2
General Myofaciitis	3
Cervical Sprain/ Strain	4
Cervical Disc Disorder	5
Cervical Dysfunction	6
Cervial Myelopathy	7
Cervical Radiculopathy	8
Cervicogenic Dorsalgia	9
Cervical Instability	10
Torticollis	11
Whiplash	12
Cervical DJD/OA	13
Concussion Grade 1	14
Concussion Grade 2 No wound	15
Concussion Grade 3	16
Concussion with wound	17
DISH	18
Dystonia	19
Cervical # Closed	20
NRE	21
Arthritis	22
Headache- cervicogenic	23
Headache- cluster	24
Headache- Episodic Tension	25
Headache - Migraine	26
Headache- Tension	27

Appendix B

Thoracic Diagnosis List

Unknown	0
None	1
Thoracic Facet Syndrome	2
Costovertevral Dysfunction	3
Sternalcostal Dysfunction	4
Thoracic Sprain/ Strain	5
Thoracic Disc Disorder	6
Thoracic Dysfunction	7
Thoracic Radiculopathy	8
Thoracic Instability	9
Thoracic DJD/OA	10
DISH	11
Thoracic # closed	12
NRE	13
Costrochondritis	14
Rib Dislocation	15
Sternoclavicular Dislocation	16
Joint fixation- Manobriosternal	17
Joint fixation- Thoracic	18
Kyphosis	19
Scoliosis	20
Specify:	

Appendix C

Lumbosacral Diagnosis List

Unknown	0
None	1
Lumbar Facet Syndrome	2
Sacroiliac Syndrome	3
Lumbar Radiculopathy	4
Lumbar disc pathology	5
General Myofaciitis	6
Sciatica	7
NRE	8
Coccydenia	9
Lumber Instability	10
LBP - Idiopathic origin	11
Lumbarisation	12
Myalgia- Pelvic Floor	13
Neuropathy	14
Ostitis Pubis	15
Osteoarthritis	16
Piriformis syndrome	17
Psoas syndrome	18
Pubic Symphysis	19
Sacralisation	20
Siatica	21
Scoliosis	22
Spondylolisthesis	23
Spondylolysis	24
Spondylosis	25
Specify:	

Appendix D

Extremity Diagnosis list

Unknown Avascular necrosis	1
Bakers cyst	2
Boutenniere deformity	3
Brachial plexus injury	4
Bursitis	5
Capsulitis- Hip	6
Capsulitis- Adhesive	7
Capusilits- Shoulder	8
Carpal tunnel syndrome	9
Cellulitis	10
Chondromalasia patella	11
Claudication- intermittent	12
Claudication- neurogenic	13
Claudication- vascular	14
Compartment syndrome	15
Congenital hip dysplasia	16
Contracture- Achilles tendon	17
Contracture- Dupuytrens	18
Contracture- Hip	19
Contracture- Trigger finger	20
Contusion- Bone	21
Contusion- muscle	22
Cuboid syndrome	23
De Quervains disease	24
DVT	25
Diabetic Neuropathy	26
Dislocation- Ankle/foot	27
Dislocation- Elbow	28
Dislocation- Hip	29
Dislocation- Knee	30
Dislocation- Patella	31
Dislocation- Toe	32
Dislocation- Wrist/hand	33
Dislocation- Shoulder	34
Epicondylitis- Lateral	35
Epicondylitis- Medial	36
Fat pad syndrome	37
Fracture	38
Genu recurvatum	39
Genu Valgus	40
Genu Varus	41
Gout	42
Hallux rigidus	43
Hallux valgus	44
Hallux varum	45
Hammer toes	46
Heel spur	47
Hyperpronation syndrome	48
ITB	49
Joint fixation- Ankle	50
Joint fixation - Elbow	51
Joint fixation- Fibula/tibia	52
Joint fixation- Hand	53
Joint fixation- Hip	54
Joint fixation- Knee	55
Joint fixation- Shoulder	56
Joint fixation- wrist	57
Mortons Neuroma	58
Mortons syndrome	59
Patella Alta	60
Patella Baja	61
Patella Bipartite	62
Patella Multipartite	63
Patella tracking syndrome	64
Patello femoral pain syndrome	65
Pes cavus	66
Pes planus	67
Planter fascitis	68
Plica	69
Pronator teres syndrome	70
Radial tunnel syndrome	71
Raynauds disease	72
Rotator cuff syndrome	73
Scapho-lunate dysfunction	74
Scapular winging	75
Shin splints	76
Slipped capital femoral epiphysis	77
Snaping hip syndrome	78
sprain- Specify	79
Strain- Specify	80
Tarsal tunnel syndrome	81
Tear- specify	82
TMJ	83
Tendinitis- Specify	84
Tendinosis- Specify	85
TOS	86
Ulnar tunnel syndrome	87
Specify:	

Comments on data collection template

Appendix E: Data Collection Sheet **Date:**

1. File No:				
2. Gender:	Male: 0	Female: 1		
3. Age:				
4.Employment:	Employed: 0	Unemployed: 1	Pensioner: 2	Workmen's Comp: 3
	Disability grant:: 4	Road Accident Fund: 5	Scholar : 6	
5.Occupations:	Manual Labour: 0	Non-manual: 1	Combination: 2	Not Applicable: 3
6. Ethnicity:	Black: 0	Coloured: 1	White: 2	
	Indian: 3	Asian: 4	Other: 5	
7. Education:	Grade 7: 0	Grade 12: 1	Tertiary education: 2	
	Other: Specify:			
8.Patient Residence :	Kimberley Public: 0	Rural Public: 1	Other: 2	

9. Source of Patient:		
	General medical clinic:	0
	Out patients department	1
	Private	2
	Casualty	3
	Walk in/Self referral	4
	Rural Clinic	5
	Urban Clinic	6
	KHC staff	7
	Other:	8
10. Referred from within the Kimberley Hospital 0 Referred from outside Kimberley Hospital 1		

11. Main Area/s of Complaint today											
Cervical	Neck Pain	1	Headache	2	Arm Pain	3	Jaw Pain	4	Chest Pain	5	
Thoracic	Thoracic Pain	6	Chest Pain	7	Rib Pain	8	Arm Pain	9	Shoulder Blade Pain	10	
Lumbosacral	Lumbar Pain	11	Sacroiliac Pain	12	Leg Pain	13	Iliac crest Pain	14	Hip	15	
TMJ	Jaw Pain	16	TMJ Headache	17	Upper cervical pain	18	Ear Pain	19			
Upper Extremity	Shoulder Pain	20	Elbow Pain	21	Forearm Pain	22	Wrist Pain	23	Hand Pain	24	
Lower Extremity	Hip Pain	25	Upper Leg pain	26	Knee Pain	27	Shin Pain	28	Calf Pain	29	
	Ankle Pain	30	Foot Pain	31							
Headache	Cervicogenic	32	Tension Type	33	Migraine	34	Generalised	35	Other	36	
Other: Specify:											

12. Duration of Main Complaint before receiving treatment		
	Acute < 3 months	0
	Sub-acute 3-6 months	1
	Chronic > 6 months	2
	Specify:	
13. Cause of Main Complaint as determined by the patient		
	Unknown	0
	Non-traumatic	1
	Traumatic	2
14.How many times previously were they treated for same problem:		
	< 6 visits	0
	6-11 visits	1
	12-17 visits	2
	> 18 visits	3
15. What time period did these visits occur:		
16. Which other areas of the body have been treated by the Chiropractor:		

Not Applicable	0	Head/Neck	1	Mid-Back	2
Low Back	3	Shoulder	4	Elbow	5
Hand/wrist	6	Hip	7	Thigh	8
Knee	9	Calf	10	Shin	11
Foot/Ankle	12				

17. History of pre-existing spinal conditions		
	No	0
	Yes	1
18. If Yes Specify:		
19. History of Surgery		
	No	0
	Yes	1
20. If Yes Specify:		
21. Smoker:	No	0
	Yes	1
	Previous Smoker	2

22. History of illness:	No	0
		Yes
	Allergies	1
	Asthma	2
	Cancer	3
	Diabetes	4
	Epilepsy	5
	Heart conditions	6
	Hypertension	7
	TB	8
	Stroke	9
	Rheumatoid Arthritis	10
	Osteoarthritis	11
	Ankylosing Spondylitis	12
	Other:	13
23. Specify		

24. Blood Pressure:		
25. Special Investigations		
	No	0
		Yes
	Blood Tests	1
	X-Rays	2
	MRI	3
	CT Scans	4
	Ultrasound	5
	Bone Mineral Density	6
	Bone Scan	7
	ECG	8
	Urine Analysis	9
	Glucometer	10
	Other	11
26. Specify		

27. Referred	No	0
	Yes	
28. Reason for referral:		
29. Specify Specialist or clinic:		
30. Feedback from referral		
	No	0
	Yes	1
31. Results from Feedback; if any:		
32. Primary Diagnosis as seen on that day: See Apendix A-D		
33. Contraindications for treatment		
	No	0
	Yes	1
34. If Yes specify:		
35. Treatment Protocol		
	No Treatment	0
	Cross Friction	1
	Cryotherapy	2
	Dry needling	3
	Electro-Dry needling	4
	Heat therapy	5
	Electrotherapy	6
	Traction	7
	Joint Manipulation	8
	Joint Mobilisation	9
	Soft Tissue Manipulation	10
	Soft Tissue Mobilisation	11
	Proprioceptive exercise	12
	Soft Tissue Therapy	13
	Kinesiotape	14
	Strapping	15
	Home Exercise	16
	Orthotics	17
	NSAIDs	18
	Nutritional Advice	19
	Others	20
36. Specify		

Cervical Diagnosis List

Unknown	0
None	1
Cervical Facet Syndrome	2
General Myofasciitis	3
Cervical Sprain/ Strain	4
Cervical Disc Disorder	5
Cervical Dysfunction	6
Cervical Myelopathy	7
Cervical Radiculopathy	8
Cervicogenic Dorsalgia	9
Cervical Instability	10
Torticollis	11
Whiplash	12
Cervical DJD/OA	13
Concussion Grade 1	14
Concussion Grade 2 No wound	15
Concussion Grade 3	16
Concussion with wound	17
DISH	18
Dystonia	19
Cervical Fracture Closed	20
NRE	21
Arthritis	22
Headache- cervicogenic	23
Headache- cluster	24
Headache- Episodic Tension	25
Headache - Migraine	26
Headache- Tension	27

Other: Specify

Thoracic Diagnosis List

Unknown	0
None	1
Thoracic Facet Syndrome	2
Costovertebral Dysfunction	3
Sternocostal Dysfunction	4
Thoracic Sprain/ Strain	5
Thoracic Disc Disorder	6
Thoracic Dysfunction	7
Thoracic Radiculopathy	8
Thoracic Instability	9
Thoracic DJD/OA	10
DISH	11
Thoracic fracture closed	12
NRE	13
Costochondritis	14
Rib Dislocation	15
Sternoclavicular Dislocation	16
Joint fixation- Manubriosternal	17
Joint fixation- Thoracic	18
Kyphosis	19
Scoliosis	20
Other Specify:	

Lumbosacral Diagnosis List

Unknown	0
None	1
Lumbar Facet Syndrome	2
Sacroiliac Syndrome	3
Lumbar Radiculopathy	4
Lumbar disc pathology	5
General Myofasciitis	6
Sciatica	7
NRE	8
Coccydynia	9
Lumber Instability	10
LBP - Idiopathic origin	11
Lumbarisation	12
Myalgia- Pelvic Floor	13
Neuropathy	14
Ostitis Pubis	15
Osteoarthritis	16
Piriformis syndrome	17
Psoas syndrome	18
Pubic Symphysis	19
Sacralisation	20
Sciatica	21
Scoliosis	22
Spondylolisthesis	23
Spondylolysis	24
Spondylosis	25
Other Specify:	

Extremity Diagnosis list

Unknown Avascular necrosis	1
Bakers cyst	2
Boutenniere deformity	3
Brachial plexus injury	4
Bursitis	5
Capsulitis- Hip	6
Capsulitis- Adhesive	7
Capusilits- Shoulder	8
Carpal tunnel syndrome	9
Cellulitis	10
Chondromalacia patella	11
Claudication- intermittent	12
Claudication- neurogenic	13
Claudication- vascular	14
Compartment syndrome	15
Congenital hip dysplasia	16
Contracture- Achilles tendon	17
Contracture- Dupuytrens	18
Contracture- Hip	19
Contracture- Trigger finger	20
Contusion- Bone	21
Contusion- muscle	22
Cuboid syndrome	23
De Quervains disease	24
DVT	25
Diabetic Neuropathy	26
Dislocation- Ankle/foot	27
Dislocation- Elbow	28
Dislocation- Hip	29
Dislocation- Knee	30
Dislocation- Patella	31
Dislocation- Toe	32
Dislocation- Wrist/hand	33
Dislocation- Shoulder	34
Epicondylitis- Lateral	35
Epicondylitis- Medial	36
Fat pad syndrome	37
Fracture	38
Genu recurvatum	39
Genu Valgus	40
Genu Varus	41
Gout	42
Hallux rigidus	43
Hallux valgus	44
Hallux varus	45
Hammer toes	46
Heel spur	47
Hyperpronation syndrome	48
ITB	49
Joint fixation- Ankle	50
Joint fixation - Elbow	51
Joint fixation- Fibula/tibia	52
Joint fixation- Hand	53
Joint fixation- Hip	54
Joint fixation- Knee	55
Joint fixation- Shoulder	56
Joint fixation- wrist	57
Mortons Neuroma	58
Mortons syndrome	59
Patella Alta	60
Patella Baja	61
Patella Bipartite	62
Patella Multipartite	63
Patella tracking syndrome	64
Patello femoral pain syndrome	65
Pes cavus	66
Pes planus	67
Planter fasciitis	68
Plica	69
Pronator teres syndrome	70
Radial tunnel syndrome	71
Raynauds disease	72
Rotator cuff syndrome	73
Scapho-lunate dysfunction	74
Scapular winging	75
Shin splints	76
Slipped capital femoral epiphysis	77
Snapping hip syndrome	78
sprain- Specify	79
Strain- Specify	80
Tarsal tunnel syndrome	81
Tear- specify	82
TMJ	83
Tendinitis- Specify	84
Tendinosis- Specify	85
TOS	86
Ulnar tunnel syndrome	87
Specify:	

Appendix F

Dear Participant, welcome to my research project.

Title: A demographic and descriptive survey of chiropractic patients at the Chiropractic Clinic at Kimberley Hospital Complex.
Name of researcher: Madelaine Higgs (0845092015)
Name of supervisor: Dr E Lakhani[M.Tech: Chiropractic; I.C.S.S.D.]
Name of co-supervisor: Dr R Jacobs [M.Tech: Chiropractic]
Name of institution: Durban University of Technology

Introduction and purpose of study:
In South Africa, Chiropractic has become popular in the treatment of musculoskeletal disorders. However very little information on the chiropractic patient at public hospitals is available. The purpose of this study is to describe who the patient is that presents to the Chiropractic Clinic at the Kimberley Hospital Complex. The data will include the common presenting conditions, main areas of complaint, common diagnosis and common chiropractic treatment protocols.

Benefits:
This information will help the profession by:

- Determining the prevalence of conditions that present to the KHC chiropractic clinic.
- Determining the role of chiropractors in a multidisciplinary setting in a public hospital in South Africa.

Procedure [including confidentiality]:
You are requested to sign the letter of information only if you are willing to participate in this study. Personal details appear on the letter of information but will be separated from the data collection sheet, thus ensuring confidentiality. Please take note that information will be extracted from your patient file and documented on a data collection sheet which will be kept confidential.
You may ask any questions pertaining to the research if unclear.

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

Inclusion criteria for the patients are as follows:

- If the patient is a minor, a parent/guardian is required to complete the assent form, should they agree to participate
- The patient needs to be willing to allow the researcher to access the patient file

Persons to contact in the event of any problems or queries:
Dr R Jacobs research co-supervisor, Kimberley Hospital Complex, Chiropractic Clinic, Telephone number: (053) 8022419

Statement of Agreement to participate in the research study:

I,…….ID number……., have read this document in its entirety and understand its contents. Where I have any questions or queries, these have been explained to me by…… to my satisfaction. Furthermore, I fully understand that I may withdraw from this study at any stage without any adverse consequences and my future health care will not be compromised. I, therefore, voluntarily agree to participate in this study.
Subject's signature……..
Signed on behalf of parent/ guardian of minor……. Date:…….

Madelaine Higgs	Dr E Lakhani	Dr R Jacobs
(Research student)	(Supervisor)	(co-supervisor)

Appendix G

Geagte Deelnemer, welkom by hierdie navorsings studie.

Titel: Chiropraktisyn pasiente by die Kimberly se Hospitaal Kompleks, (KHK) ‘n beskrywende kliniese studie van gevalle
Naam van navorser: Madelaine Higgs (0845092015)
Naam van toesighouer: Dr. Lakhani [M.Tech: Chiropractic; I.C.S.S.D.]
Naam van mede toesighouer: Dr R. Jacobs [M.Tech: Chiropractic]
Naam van Instituut: Durban Universiteit van Tegnologie

Inleiding:
Die Chiropraktisyn professie, vir die behandeling van skelet en spierstelsel kondisies, het baie toegeneem in gewildheid in Suid Afrika in die privaat sektor. Nie teen staande die feit, is daar baie min inligting oor Chiropraktisyn gevalle in publieke hospitale, dus aangesien die Kimberly se Hospitaal Kompleks (KHK) die enigste is waar die Chiropraktisyn behandeling beskikbaar aan die algehele publiek.

Doel van die studie:
Die doel van die studie is om ‘n demografiese en beskrywende profiel van pasiente by die Kimberly se Hospitaal Kompleks (KHK) te ontwikkel. Die beskrywende data sal die volgende insluit: mees algemene kondisies, hoofareas van pyn, mees algemene diagnosis en die mees algemeenste behandeling aan die pasiente.

‘n Data opgawe bladsy sal tydens die ondersoek deur die navorser gebruik word, wat die nodige inligting vir die studies sal verskaf. Met hiedie inligting kan ons die professie beter toerus in terme van:

a) Vasstelling van die mees algemeenste kondisies wat by die KHK se Chiropraktisy Kliniek voorkom.
b) Vasstelling van die rol van Chiropraktisyns by ‘n multi-behandeling eenheid in publieke hospitale in Suid Afrika.

Procedure:
U sal versoek word om ‘n ingeligtings brief te voltooi nadat u die inligtings brief gelees het. U is vry om eneige vrae aangaande die studie te vra, indien iets onduidelik is.

Wees verseker dat u persoonlike inligting sowel as die ingeligtings brief as hoog konfidensieel beskou sal word. Geen persoonlike inligting sal op die data opgawe bladsy voorkom nie. U is vry om te enige tyd sonder enige nagevolge van die studie te onttrek.

Omvattende Kriteria vir die pasiente is as volg:

- Indien u minderjarig is, moet u ouers/voog die toestemmings brief onderteken indien hulle toestem tot die behandeling.

- U moet bereidwillig wees om hulle diagnose te verklaar.

Voordele:
Die resultate sal in ‘n joernaal artikel gepubliseer word wat beskikbaar sal wees by die biblioteek van die Durbanse Universiteit van Tegnologie.

Vergoeding:
Gee vergoeding word veskaf nie, die pasiente neem geheel en al vrywillig deel.

Baie dankie vir u waardevolle en onmeetbare bydrae tot hierdie navorsing studie.

Verklaaring van ooreenkoms om deel te neem aan die volgende narvorsing studie:
Ek,……ID……, verklaar dat ek die document ten volle gelees het en die inhaud daarvan verstaan. Enige vrae wat ek het is aan y verduidelik deur……..
Ek verstaan ten volle dat ek mag onttrek van die studie en dat ek dus uit vrye wil aan die studie deelneem.
Naam……..
Ouer/Voog teken……
Teken……. Datum……..

Madelaine Higgs
(Navorsing student)

Dr. Lakhani
(Toesighouer)

Dr R. Jacobs
(Mede Toesighouer)

ETHICS CLEARANCE CERTIFICATE

Student Name	Madelaine Higgs	**Student No**	20300540
Ethics Reference Number	FHSEC c27/08	**Date of FRC Approval**	18 August 2008
Research Title:	A demographic and descriptive survey of chiropractic patients at the Chiropractic Clinic at Kimberley Hospital Complex		

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

1. The researcher has read and understood the research ethics policy and procedures as endorsed by the Durban University of Technology, has sufficiently answered all questions pertaining to ethics in the DUT 186 and agrees to comply with them.
2. The researcher will report any serious adverse events pertaining to the research to the Faculty of Health Sciences Research Ethics Committee.
3. The researcher will submit any major additions or changes to the research proposal after approval has been granted to the Faculty of Health Sciences Research Committee for consideration.
4. The researcher, with the supervisor and co-researchers will take full responsibility in ensuring that the protocol is adhered to.
5. ***The following section must be completed if the research involves human participants:***

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

SIGNATURE OF STUDENT/RESEARCHER — 19/08/2008 DATE

SIGNATURE OF SUPERVISOR/S — 19/8/2008 DATE

SIGNATURE OF HEAD OF DEPARTMENT — 20/8/8 DATE

SIGNATURE: CHAIRPERSON OF RESEARCH ETHICS COMMITTEE — 20/8/8 DATE