A retrospective cross sectional survey of thoracic cases on record at Durban University of Technology Chiropractic day clinic.

By

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I, Rhoda Lynn Benjamin, do hereby declare that this dissertation represents my own work in both conception and execution, except where specific assistance is sought and duly acknowledged.

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DEDICATION

I would like to dedicate this dissertation to:

My Lord and saviour Jesus Christ. He is the giver of all good and perfect gifts.

My mother, Jean Kodi, and my grandmother, Eunice Kodi, because of the confidence you have in me and the love you have shown me, I believe that my dreams can come true.

My sister, Trudy, you are very precious to me. Thank you for being more than a sister.

My fiancé, Dr. Deena Naidoo. Your love has nurtured my spirit and warmed my soul throughout these trying years. Thank you for the unconditional love you have shown me.

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ABSTRACT

AIM:

The purpose of this research is to conduct a descriptive study of cases that presented with thoracic complaints to Durban University of Technology chiropractic Day Clinic from the 13 January 1995 to 30 November 2005.

STUDY DESIGN:

This is a retrospective, quantitative, non-experimental, clinical survey.

RESEARCH PROCEDURE:

Phase one

7487 Random file numbers were chosen via a computer program. This list was used to choose the random files and keep a record of the research, pediatric and incomplete paperwork in the files (exclusion criteria).

An independent individual (blocker) used the list of random file numbers and examined the file to find out if it was a thoracic complaint on initial consult. If it was found to be a thoracic complaint file the independent individual filled in the technical details from the file (File code, age, gender and occupation). After this information was recorded, the individual removed the relevant initial paperwork from the files and blocked off the names. The blocked off paperwork was then given to the researcher to collect the relevant data and record it on the data collection sheet.

This procedure excluded the following files: files containing cervical, lumbar, and extremity regions on the initial visit, files containing incomplete paperwork, files of paediatric patients and files of patients involved in research on the initial consult.

Phase two

On completion of data collection of each file the researcher handed the blocked off paperwork to the independent individual to place the paper work back in the correct files. These files were then filed back into the filing system.

Phase three

The templates were the only source of patient information the researcher used from that point on. The researcher then started the data capturing process. The data was captured onto a Microsoft Excel spreadsheet. This spreadsheet was then handed in to a statistician for statistical analysis.

Phase four

This involved the analysis and interpretation of the data (after statistical analysis) and the completion of the written mini-dissertation.

Statistical Analysis

The statistical package SPSS, Version 11.5 (as supplied by SPSS Incorporated, Marketing Department - 1999, Chicago, USA) was used to analyze the data in this study. Descriptive analysis of data in this study involved frequency tables and bar charts for categorical variables and summary statistics for quantitative variables including mean, standard deviation and range. In order to compare trends over the years, Pearson's chi square tests were used for categorical variables and ANOVA for quantitative variables.

RESULTS:

The sample size for this study included 7111 cases obtained from the Durban University of Technology chiropractic day clinic. The selected time period was 13 January 1995 to 30 November 2005. There were no thoracic cases recorded in the random sample for the year 1995, therefore the random sample allocated for this year was subtracted from the total sample. 249 Thoracic cases were included in this research.

The overall prevalence for the time period 1996 - 2005 was 3.5%.

Gender: 248 of the 249 patients had recorded gender information. The majority were female 54.8% while 45.2% were male.

Age: The ages ranged from 11 to 73 years. The mean age was 33.3 years.

Occupation: 241 patients had a recorded occupation. 21.6% of them were classified as active or non-sedentary while the majority had sedentary jobs.

The main complaint was mid-back pain which was noted in 41.4% of the population.

Thoracic facet syndrome was the primary diagnosis given in 74.7% of the population; myofasciitis was the second most diagnosed condition with 8.8% of the population having this primary diagnosis.

The most common treatment was joint manipulation, which was used in 82.6% of the cases, followed by soft tissue therapy (79.4%) and stretches (44.9%).

The facets that were most commonly found to be fixated were in the T5 toT8 region.

The investigative procedure that was used most often in the sample was x-rays. Fourteen patients were sent for x-rays (5.6%). One patient was sent for a blood test (0.4%). No other investigative procedures were used in these patients.

Of the 249 thoracic patients, 177 (71.1%) presented for a follow up visit. Thirty-four patients had a new complaint (14.1%), of which the most common site was cervical (44.1%), followed by lumbar (38.2%).

CONCLUSION:

From the findings of the study the following conclusions were drawn:

- There was shift in demographics recorded among the thoracic pain sufferers seen at the Durban University of Technology chiropractic day clinic from 1996 to 2005.
- There was a lower prevalence of thoracic complaints from 1996 to 2000 and a higher prevalence from 2001 to 2005.

Even though the overall prevalence of thoracic pain sufferers was only 3.5% over the ten year period, it is still an area of pain that must be investigated. The thoracic spine has been overlooked as a major region for research. This study has proved that there is need for continuing research in this area, to assist chiropractors to treat the thoracic spine more effectively.

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CHAPTER ONE

INTRODUCTION

1.1 Introduction:

A teaching clinic is an outpatient clinic that provides health care for patients - as opposed to inpatients treated in a hospital. Teaching clinics are traditionally operated by educational institutes 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 low cost treatments to patients (http://en.wikipedia.org/wiki/Teaching_clinic).

In April 1994 the chiropractic day clinic was officially opened at the former Technikon Natal (now the Durban University of Technology). Thousands of patients have been treated at this clinic over this twelve year period. The opening of this clinic gave the students studying chiropractic an opportunity to gain practical experience and knowledge for their future careers. The clinic also offers gentle, safe chiropractic assessment, care and management for a range of health problems as well as health promotion and rehabilitation from injury for patients seeking treatment.

In 1994, Drews conducted research aimed at identifying characteristics of chiropractic patients and their complaints at the chiropractic teaching clinic at Technikon Natal and private practices in South Africa. This survey was conducted from February 1994 to the end of April 1994. 162 Patients were involved in this study. A survey was completed which included the patient's age, gender, occupation, presenting condition, duration of complaint, previous treatment, referral, severity and quality of pain and their disability. A comparison

was made between patients seen in private practice and at the teaching clinic. It was found that generally both populations were very similar with the exception of the patients' age and occupation.

Despite the widespread use of chiropractic, good descriptive data on chiropractors and their patients is limited (Coulter and Shekelle, 2005). Few studies have been reported which deal specifically with patients attending chiropractic teaching clinics (Nyiendo and Olsen, 1988).

No other research investigating patient characteristics has been undertaken at Durban University of Technology chiropractic day clinic after 1994. Furthermore, in the study conducted by Drews (1994) no mention was made of the type of treatment that was given to patients either in private practice or at the teaching clinic.

Although the first successful chiropractic adjustment recorded was in the thoracic spine by Dr. D.D. Palmer, research since then has focused on the lumbar spine (Di Fabio, 1992). In reviewing literature relating to the thoracic spine, it is apparent that in comparison to the cervical and lumbar regions, the thoracic spine has been neglected (Edmonston and Singer, 1997).

This may be attributed to the technical difficulties associated with movement analysis in this region and the belief that the thoracic spine is less commonly implicated in clinical pain syndromes (Edmonston and Singer, 1997). Thoracic pain although less common, can be as disabling as cervical and lumbar pain (Dreyfuss et al 1994). It is a common site of chronic pain syndromes. Therefore there is a need for direct treatment to the area (Haldeman, 1992).

Although there is a perceived need for this kind of retrospective study, the chiropractic academic environment in South Africa also provides a stimulus to allow for the ongoing development of the profession. In South Africa there remains a paucity of information on the types of thoracic conditions chiropractors treat and the management protocols. The present research aimed to shed light

on this aspect by collecting data from one of only two chiropractic teaching clinics in South Africa, namely the Durban University of Technology Chiropractic Day Clinic. The purpose of this research was to investigate the age, gender, occupation (whether sedentary or non-sedentary in nature), prevalence of pain, presenting complaints, common conditions treated and common management protocols of patients who presented with thoracic pain to the Durban University of Technology Chiropractic Day Clinic.

1.2 Objectives:

- **Objective 1:** To identify the demographics of patients. (age, gender, and occupation)
- **Objective 2:** To identify the prevalence of thoracic pain in patients who presented to the Durban University of Technology Chiropractic Day Clinic from 1995 – 2005.
- **Objective 3:** To document the common presenting condition, the presenting signs and symptoms and the aetiology of the complaint.
- **Objective 4:** To identify common management protocols at first consult and note any contraindications to treatment as recorded by interns.
- **Objective 5:** To determine if patients with thoracic conditions presented for a follow up consultation and had been treated for a new complaint.

1.3 Hypotheses:

- **Hypothesis one:** The null hypothesis (H_o) states that there shall not be a shift in demographics of patients presenting with thoracic conditions to the DUT Chiropractic Day Clinic over the ten year period. The alternate hypothesis (H_a) states that there shall be a shift in demographics of patients presenting with thoracic conditions to the DUT Chiropractic Day Clinic over the ten year period.

- **Hypothesis two:** The null hypothesis (H_o) states that there shall not be a lower prevalence of thoracic complaints from 1995 to 2000 and a

comparatively higher prevalence from 2001 to 2005. The alternate hypothesis (H_a) states that there shall be a lower prevalence of thoracic complaints during the period 1995 to 2000 and a comparatively higher prevalence from 2001 to 2005.

1.4 Aim:

The aim of this retrospective, quantitative, non-experimental, clinical survey was to study the demographic and clinical characteristics of patients with thoracic complaints, who presented to Durban University of Technology chiropractic day clinic from 13 January 1995 to 30 November 2005.

1.5 Rationale:

Teaching clinics are often used as a data source for research purposes (Walsh, 1992). As the chiropractic teaching clinic at Durban University of Technology was initially modelled on various overseas teaching clinics, it would be of interest to see the similarities and differences of patient characteristics between patients seen at Durban University of Technology Chiropractic Day Clinic and teaching clinics abroad.

The results of this study would also be meaningful to describe the therapeutic activities of the chiropractic profession and allow us to define more clearly the guidelines for chiropractic practice. This is then indispensable in promoting the development of the profession.

1.6 Limitations:

- This study was limited to patients presenting to the Chiropractic Day Clinic at the Durban University of Technology.
- Pediatric files were not analyzed.
- All research files were not analysed.

1.7 Conclusion:

This chapter has introduced the research and has provided an overview of the aims, objectives and rationale of this study. Chapter two goes on to highlight the literature surrounding this research.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter gives a review of the available literature concerning this research.

Research is more than merely an academic exercise. It is a key ingredient in establishing chiropractic's role in an evolving health care system (Dallas, 1997). Very little is known about the changes in the chiropractic patient population over time (Hartvigsen *et al.* 2003).

The contribution of chiropractors in health care has generated interest in understanding the characteristics of chiropractic practice patterns and treatments (Mootz *et al.* 2005).

Chiropractic is a profession at the crossroads of mainstream and alternative medicine. According to surveys of patients seeking alternative health care, chiropractors are used more often than any other alternative health care provider (Meeker and Haldeman, 2002).

Although the first successful chiropractic adjustment recorded was in the thoracic spine by Dr. D.D. Palmer, research since then has focused on the lumbar spine (Di Fabio, 1992). In reviewing literature relating to the thoracic spine, it is apparent that in comparison to the cervical and lumbar regions, the thoracic spine has been neglected (Edmonston and Singer, 1997). Although literature on dysfunction and pain in the lumbar and cervical regions is abundant, similar information related to the thoracic region remains relatively scarce. Similarly, a great deal of literature exists on shoulder pain, yet little exists in the area of periscapular or rib pain (Fruth, 2006).

2.2 Prevalence

Musculoskeletal conditions are prevalent and they impact us daily. They are the most common cause of severe long term pain and physical disability. Self reported persistent pain related to the musculoskeletal system has been used in a number of population based surveys to assess the prevalence of musculoskeletal conditions. It affects up to 20% of adults. The prevalence is higher among women and increases markedly with age (Woolf and Pfleger, 2003).

French (2005) wrote an article on the physiotherapeutic perspective of thoracic spine pain. In this article she aimed to highlight the enigmas of the thoracic spine, to consider its role in spinal pain and document what physiotherapists can do for these conditions. In this article she notes that the incidence of thoracic pain is much less than lumbar or cervical pain. A total of 7-14% of the United Kingdom sample experienced dorsal pain compared to 30-44% who experienced neck and arm pain and 80-90% who experienced low back pain. In the chronic pain setting, thoracic pain accounted for only 2-3% of patients.

A study was conducted on 1178 French school children of both sexes. These children were asked to answer a questionnaire, in order to determine the prevalence of back pain. The cumulative presence of back pain was 51.2%. The following were noted in the different regions: - lumbar (36.8%), lumbar and leg pain (4.2%), thoracic pain (34%) and cervical (26.5%) (Troussier *et al.* 1994). It can then be concluded that thoracic pain, although not as frequent as lumbar pain, presents itself enough to warrant investigation (Pillay, 2001).
In the United States of America, a comparative survey between six chiropractic college clinics indicated that the number of patients seen for low back pain ranged between 31-41%, neck pain between 19-27%, and mid-back pain ranged between 10-15% (Nyiendo and Olsen,1989).

Bechgaard (1981) studied 1097 patients who presented to a coronary unit with clinical findings of chest pain, which was dull and continuous and aggravated by an increase in intra-thoracic pressure caused by coughing and sneezing. Of the 1097 patients, 143 (13%) of them had thoracic spinal pain.
Bryant, Atkins and Bull (2003) reported on the demographic and diagnostic profile of patients presenting to the Macquarie University chiropractic clinic from 1999-2001. It was found that 40% of patients presented with lumbar complaints, 24% with cervical complaints, 19% with thoracic complaints and 17% with peripheral complaints.

According to Edmonston and Singer (1997) minimum attention has been placed on the incidence of thoracic spine pain, its cause and treatment protocol.
Linton, Hellsing and Hallden (1998) undertook a population based study of spinal pain among 35-45 year old individuals. An annual prevalence of spinal pain in this population was 66%. Of this 66% only 15% reported thoracic pain.
Occhipiniti et al (1993) described the prevalence of thoracic pain. The prevalence was found to be 5% but did not show any association with age.
Occupational activities may influence the development of thoracic spine pain. Milgrom et al. (1993) observed a 14 week army training program and 8% of the recruits had suffered with exertional thoracic pain.

The literature has indicated the widespread incidence of thoracic spine pain, making research a necessity in this field of study.

2.3 Demographics

2.3.1 Age

In a study performed in the United Kingdom by Bruckner *et al.* (1987), 73 patients with mid-dorsal pain were seen in a rheumatology clinic by a single clinician over

three years. The ages of patients ranged from 15 – 63 with the most common age being in the third decade.

Nohejl et al. (1987) published the preliminary results of an ongoing epidemiological study designed to determine the prevalence of back pain at selected worksites of Czechoslovak State Railways and Avia Letnany, an industrial plant. Examination of a total of 1,555 subjects was conducted by a field team of health-care workers of the Research Institute of Rheumatic Diseases based in Prague. First complaints (initial visit of a patient to a clinic and their first complaint they were treated for) of back pain are most frequently reported by subjects in their 20s and 30s. The highest prevalence rate was registered in persons aged 50.

Holt and Beck (2005) reported on the basic characteristics of new chiropractic patients presenting to the New Zealand College of chiropractic teaching clinic. In the retrospective analysis of 1004 new patient files opened between 1997 and 2001, the average age of patients was 32.

2.3.2 Gender

In the above study by Bruckner et al. (1987) the female to male ratio for the whole group was 5:1. Dreiser *et al.* (1997) published an epidemiological study involving 132 mechanical thoracic pain patients in France. They found that 62% of those patients were women and 38% were men, strengthening previous findings that mechanical thoracic spine problems are more common in females.

Holt and Beck (2005) also reported that 51.9% of the patients that presented to the New Zealand College chiropractic clinic were female.

2.3.3 Occupation

In the Netherlands, health surveys were conducted on the working population which aimed to identify the prevalence rates of back pain. Trades with relatively high prevalence rates were found to be the construction and wholesale industry

as well as road transportation, cleaners and plumbers. Professions that reported a low prevalence rate of back pain were chemists, scientists, bookkeepers, secretaries and those in administrative positions. It is concluded that high prevalence rates of back pain are found in non-sedentary professions (Hildebrandt, 1995).

Most frequently cited complaints among seated employees
(http:// www.dauphin.com/)

- 24%pain in the neck and shoulder
- 57% pain in the spine
- 16% problems in the buttock region
- 19% pain in the thighs
- 29% pain in the knees and legs
  (As cited in *A review of optimal seated and computing posture and the prevention of VDT operation related overuse disorders)*

2.4 Presenting conditions and diagnosis

Chiropractic training and literature, approach clinical diagnosis in a similar fashion to that of all health care disciplines, in that the history, physical and regional examination and special studies are routinely incorporated into patient work-ups (Haldeman, 1992). All accredited chiropractic teaching institutions incorporate history and physical examination into their curricula. Standard history and physical examination methods are basic chiropractic clinical competencies (Meeker and Haldeman, 2002).

The patient conditions that chiropractors indicated they routinely, often, or sometimes see in their practice are listed: (Christensen, 1993).

- Routinely seen:

- ❖ Spinal subluxation/ joint dysfunction
- ❖ Headaches

- Often seen:
  - ❖ Muscle strain or tear
  - ❖ Osteoarthritis
  - ❖ Peripheral neuritis
  - ❖ Vertebral facet syndrome
  - ❖ Bursitis
  - ❖ High or low blood pressure
  - ❖ Hyperlordosis of cervical or lumbar spine
  - ❖ Scoliosis

- Sometimes seen:
  - ❖ Osteoporosis
  - ❖ Carpal tunnel syndrome
  - ❖ Congenital anomalies (skeletal)
  - ❖ Thoracic outlet syndrome

Bryant, Atkins and Bull (2003), when reporting on the demographic and diagnostic profiles of patients attending the Macquarie University chiropractic clinic, noted that the most common diagnosis was facet syndrome.

There are a variety of diagnostic methods used by chiropractors to assess the patient's spine and to ascertain the need for spinal manipulations. These include the palpation of vertebral prominences and soft tissues for pain, orthopaedic tests, motion palpation, neurological examination, x-rays, computed tomography, and magnetic resonance imaging (Walker and Buchbinder, 1997).

2.5 Causes of thoracic pain

The most common cause of back pain is due to muscular strains. This happens when an unexpected force, twist, or pull is applied to one or several of the muscles in the back. Ligamentous sprains are another common cause of back pain. This occurs when the ligaments of the back are stretched beyond their

means. Sprains often occur along with muscular strains. Osteoarthritis affects the joints of the spine. It is found more commonly in people over 50 years of age. It is often referred to as degenerative joint disease. With time, cartilage starts to degenerate in the discs between vertebrae and in the joints of the spine. Without this cartilaginous cushion, bones begin to rub against each other. This results in inflammation, swelling and stiffness that in turn cause back pain. Osteoporosis is a common cause of back pain especially in women. It is a disease characterized by progressive loss of bone density. This results in thinning of bone tissue making one more susceptible to fractures, or broken bones. The bones of the spine are especially affected by this disorder. Injury from falls, lifting of heavy objects, or even the force of sneezing can result in painful vertebral compression fractures. Fibromyalgia is a common cause of chronic back pain. It is a rheumatic condition characterized by widespread soft tissue pain, fatigue, sleep disturbance, and the presence of evenly distributed areas of tenderness. A history of at least three months of widespread pain and tenderness in eleven or more of the eighteen designated tender point sites is required in diagnosing this disorder (Inverarity, 2006).

Upper back pain can occur as a result of trauma or sudden injury, or it can occur through strain or poor posture over time. In recent years, upper back pain has become a familiar complaint from people who work at computers most of the day. Often, upper back pain occurs along with neck pain and/or shoulder pain (Sellers, 2002).

The vast majority of cases of upper back pain are due to the following causes: (Sellers, 2002) :

- Muscular irritation (myofascial pain)
- Joint dysfunction

Mechanical consequences of the changes in thoracic morphology and posture are likely to be important in the development of spinal pain (Edmonston and Singer, 1997).

2.6 Management

Chiropractic treatment, as well as diagnostic practices, varies by geographic region (Mootz and Shekelle 1993). The therapeutic procedure most closely associated with chiropractic, is spinal manipulation. However, chiropractic patient management often includes lifestyle counselling, nutritional management, rehabilitation, various physiotherapeutic modalities, and a variety of other interventions (Haldeman, 1992).

Mootz et al. (2005) described characteristics of chiropractic practitioners and patients in Arizona and Massachusetts. On analysis of treatment procedures 85% of the visits were treated with spinal adjustments. Ischaemic compression was administered at 10-15% of the visits. Electrical modalities were used in 20-30% of the visits. Rehabilitation exercises were given in 20-26% of cases.

Therapeutic interventions frequently involved chiropractic manipulation with a substantial proportion of soft tissue and physiotherapy techniques (Mootz et al. 2005).

Nyiendo and Olsen (1988) investigated the characteristics of 217 children attending a chiropractic college teaching clinic in Portland, U.S.A. 100% Of the children diagnosed with musculoskeletal conditions were treated with spinal manipulation. Thus spinal manipulation is the most frequently used treatment modality. Soft tissue manipulation was used in 22.8% of patients.

2.7 Contraindications to treatment

Manipulation is starting to play an important role in the handling of spinal disorders thus making it imperative that a thorough examination is performed on each patient, eliminating contra-indications to manipulation (Dvorak et al. 1993)

Although manipulation can be very effective for hypomobility, there are a number of contraindications to its use, such as osteoporosis, inflammatory arthropathies and prolonged steroid use (French 2005).

Spinal manipulative therapy is the primary therapeutic procedure used by chiropractors, and because spinal manipulation involves the forceful passive movement of the joint beyond its active limit of motion, chiropractors must identify the risk factors that contraindicate manipulation or mobilization (WHO guidelines on basic training and safety in chiropractic 2005).

Absolute contraindications to spinal manipulation

1. acute fracture
2. tumour in the spinal cord or vertebrae
3. acute infection such as osteomyelitis or tuberculosis of the spine
4. meningeal tumour
5. dislocated vertebra
6. cauda equine syndrome
7. signs or patterns of instability
8. diastematomyelia
9. positive Kernigs or Lhermittes tests

Contra-indications to adjunctive and supportive therapies

Electrotherapies: such as TENS, IFC and ultrasound.
(www.electrotherapy.org/index.htm)

- Patients who are taking anticoagulation therapy or have a history of pulmonary embolism
- Patients whose skin may be easily damaged or bruised
- **Application over :**
- The trunk or pelvis during pregnancy
- Active or suspected malignancy

- The eyes
- The anterior aspect of the neck
- The carotid sinuses (stimulation in this area may cause a drop in blood pressure)
- Patients with pacemakers
- Dermatological conditions e.g. dermatitis, broken skin
- Danger of haemorrhage or current tissue bleeding (e.g. recent soft tissue injury)
- Active epiphyseal regions in children

2.8 Investigations

Chiropractic training includes the use of clinical laboratory studies. Radiology and imaging is used with far greater frequency than laboratory studies. In the National Board of Chiropractic Examiners survey (Christensen and Morgan 1993), chiropractors indicated that radiographs were "frequently" ordered and special imaging studies such as CT or MRI were "sometimes" ordered.

In the previously mentioned Mootz et al. (2005) study, plain film radiographic imaging was the most frequently reported diagnostic study.

2.9 Similar studies conducted at clinics

A study was undertaken by Walsh (1992) at three chiropractic teaching clinics in Australia for the purpose of comparing their new patient characteristics and presenting complaints. In terms of sex, age, and occupation, there was no significant difference between the three clinics. The chief presenting complaints were similar among all clinics, and the characteristics of these complaints, such as location, etiology, duration, and number of previous episodes, were also found to be similar across all clinics. The chief complaint overall in the three clinics were 73% spinal, 15.8% extremity and 11.3% visceral. The cause of the chief

complaint was unknown in 44.9% of cases. The overall gender distribution was 47.4% male and 52.6% female and the average age was 34. This study aimed to compare the characteristics of the three clinics and to determine whether the findings were similar to findings in research conducted abroad. It was concluded that many similarities were found between this study and studies conducted in the United States of America and Canada.

In Australia, research was conducted to report the demographics and diagnostic profiles of patients attending the Macquarie University Chiropractic Clinic and Research Centre in Summer Hill, on initial consultation. Researchers reviewed data from 1018 new patient files which included the period 1999-2001. Data collected consisted of age, sex, marital status, financial status, symptomatic region and diagnosis. Of the 1018 patient files reviewed, 70% of patients were aged between 22 and 51 years of age. Patients were predominantly from the local area with no major gender bias detected. A total of 40% of patients had symptoms in the lumbar region, and the most common diagnosis was facet syndrome (Bryant *et al. 2003).* This study aimed to shed light on the patients seen at the Macquarie University Chiropractic Clinic and to investigate their demographics and the diagnosis that was given.

Hartvigsen et al. (2003) conducted a study to describe the basic characteristics of chiropractic patients in Denmark. Out of 2020 patients from the participating clinics, 1897 (94%) filled out a questionnaire. The mean age of participants was 42 years, and slightly more women than men returned the questionnaire. By far the most frequent area of complaint was pain related to the lower back (50%) followed by pain related to the neck (15%).

In 1994 Jamison undertook research to identify discrepancies between practice characteristics of teaching and private clinics with a view to defining research issues for clinical training. Four chiropractic students elected to participate in this pilot study by undertaking a survey of all new patients during the study period. A total of 33 patients were included in the study. A prospective study of the learning

experience of four students in a teaching clinic suggests that undergraduate clinical education may benefit from further research into student access to paediatric patients, the duration of initial consultations, the positive correlation between the chronicity of the presenting condition, the duration of therapy and the dominant nature of musculoskeletal clinical learning provided by a population that also has the expectation of effective disease screening.

This type of epidemiological research as done by the above researchers is becoming more important everyday.

It is important to all in the chiropractic community to learn more about the physical nature of man. Constant study and investigation will allow us to provide the kind of professional service our patients have a right to expect (Christensen and Morgan, 1993).
The present research is one more step in the direction of understanding the physical nature of man and the measures to heal effectively.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter deals with the research methodology utilized and the collection of data. The statistical analysis process will also be discussed.

3.2 Research Design

This was a retrospective, quantitative, non-experimental clinical survey. Data was collected from patient files with relevance to the thoracic spine. Data was obtained from patient files that were opened at the Durban University of Technology Chiropractic Day Clinic from the 13 January 1995 to 30 November 2005.

3.2.1 Clinic Setting

Data collection was undertaken at the Durban University of Technology Chiropractic Day Clinic located in Berea, which has been operating since February 1993 (Korporaal 2003). The clinic provides a controlled environment in which chiropractic students are able to gain the necessary experience prior to qualification.

3.2.2 Patient Confidentiality

Essential steps were undertaken to maintain patient confidentiality throughout the research process. Data collection was undertaken at the Durban University of Technology Chiropractic Day Clinic. All files were analyzed within the confines of the clinic.

All information was extracted from patient files and captured on a data collection sheet. The researcher and the supervisor were the only two people who had access to these data collection sheets.

All file numbers were converted to codes so the information stored on data collection sheets could not be traced back to the patient file.

Patient names were blocked off by an independent individual; this individual recorded the converted file code, the age, the gender and the occupation of each patient on the data collection sheet. The individual then blocked off the names of the patient on the relevant paperwork (completed case history, physical, thoracic regional and SOAPE note) and handed this information to the researcher for data collection. Once the information from this file was collected the independent blocker placed the paperwork back in the file and filed it on the shelves as it was found. This blocking process ensured that the patient's medical information remained confidential.

Permission to conduct this epidemiological research was obtained from the Director of Durban University of Technology Chiropractic Day Clinic. The researcher has signed a statement of confidentiality which was handed to the clinic director.

3.2.3 Sampling

In the timeframe selected from the 13 January 1995 to 30 November 2005, 24487 active and dormant patient files were seen at the Durban University of Technology Chiropractic Day Clinic. A minimum of 30% of the files were randomly selected. Of this 30%, the patients treated for thoracic complaints on initial visit were analyzed.

3.2.4 Sample allocation

A list of the 24487 file numbers underwent a computer-generated process of randomization (random simple sampling), whereby 7487 file numbers were randomly extracted (approximately 30% of the total number of files). These 7487 file numbers that were the representative sample were analyzed and sorted into thoracic and non-thoracic. The data from these thoracic files was collected and a record was kept of the number of incomplete files, paediatric files, research cases and files seen before 1995 and after 2005. These files were not analyzed.

3.2.5 Inclusion criteria

- Files opened from 13 January 1995 to 30 November 2005.
- Analysis included dormant and active files. (Dormant files refer to files belonging to patients who have not been seen for treatment for 3 or more years. Active files refer to files of patients being seen on a regular basis and that have not passed the 3 year dormant cut off.)
- Analysis was undertaken on files that had the completed initial visit paperwork with all attached and completed thoracic regional examinations and SOAPE notes.

3.2.6 Exclusion Criteria

- Data that pertains to the cervical spine, lumbosacral spine and extra-spinal system were not analyzed.
- Data pertaining to any other clinical research study done during the allocated timeframe was not analyzed due to the possibility of those results being skewed either through participant or researcher bias.
- Patient files containing incomplete paperwork were excluded.

3.3 Data Collection (primary and secondary data)

3.3.1 Primary data

Primary data was obtained from patient files.

File selection

Files on record pertaining to the thoracic region, which contained completed case history (Appendix A), physical examination (Appendix B), thoracic regional (Appendix C), SOAPE note (Appendix D) and Patient confidential information sheet (Appendix E) on the initial visit were analyzed with focus on the following:

- Demographics (age, gender and occupation)
- Medical history
- Associated signs and symptoms

- History of trauma to the thoracic spine and ribs
- Blood pressure abnormality
- Abnormality on general examination
- Cause of main complaint
- Main complaint
- Diagnosis
- Management protocol
- Contraindication to treatment
- Level of management
- New complaints
- Follow up visit
- Payment made
- Patient involvement in previous thoracic research
- Investigations done
- Referrals

3.3.2 Secondary data

This was obtained from various sources which included journals, books and the internet.

3.4 Development of the Template (Data Collection Tool)

The author has designed and used the thoracic template (data collection sheet) (Appendix 5). The template was first formed by using the questions and examinations listed on the case history (Appendix A), physical examination (Appendix B), thoracic regional (Appendix C) and the SOAPE note (Appendix D). The template was further developed through the input given at the focus group.

3.4.1 Focus group

Focus groups are a somewhat informal technique that can help you assess user needs and feelings both before interface design, and long after implementation.

The focus group allows one to assess the validity of the template. The focus group was used to assess the validity of the template or survey sheet.
The following validity criteria were addressed:-
According to Bernard (2000):

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

Content Validity: An instrument has *content validity* when the content of the questionnaire is considered effective, and well rounded enough to be able to assess a particular concept. This was achieved by having the individuals in the focus group representative of the specific areas of expertise related to the research to be conducted as well as respondent representation. This was achieved by undertaking a pilot study prior to the start of the research.

The focus group was attended by eight people:

- Five registered chiropractors
- Two chiropractic interns
- One biomedical statistician
- One staff member of the Durban University of Technology Chiropractic Day Clinic.

During the focus group meeting the template, an Informed Consent Form (Appendix 1), Confidentiality Statement (Appendix 2), Code of Conduct form (Appendix 3) and a Letter of Information (Appendix 4) was completed and signed by the participants. The participants met as a group to assess and criticize the template. Logical solutions to any problems were proposed. The participants suggested that relevant questions be added and irrelevant questions be removed. General consensus of the changes proposed were obtained from all the participants. Relevant changes were made to the template to show content

validity. A final corrected template was then developed and printed for use in this study (Appendix 5).

A pilot study was undertaken to evaluate the efficacy of the template. In the pilot study, random files were examined to determine the research procedure.

3.4.2 Categories listed on the template:

3.4.2.1 Technical detail from file

- File code
- Date (month and year)
- Demographics
    - Age
    - Gender
    - Occupation
- Payment (fee reduction, no charge, full payment)

3.4.2.2 Details the patient had given

- History of pre-existing conditions
- History of trauma to thoracic spine or ribs
- Cause of chief complaint
- Associated symptoms
- Main complaint

3.4.2.3 Pre-examination diagnosis

- Blood pressure abnormality noted
- Abnormalities detected on general examination
- Associated signs
- Diagnosis

3.4.2.4 Student action and patient reaction after initial consult

- Management protocols
- Level of management
- Contra-indication to treatment
- Investigations (x-rays, blood tests etc)
- Referrals
- New complaint
- Follow-up consultation
- Frequency of consultations in one month
- Patient participation in previous thoracic research

3.5 Research Procedure

3.5.1 Phase one

Seven thousand four hundred and eighty seven (7487) random file numbers were chosen via a computer program. This list was used to choose the random files and keep a record of the research, pediatric and incomplete paperwork in the files (exclusion criteria).

An independent individual (blocker) used the list of random file numbers and examined the file to find out if it was a thoracic complaint on initial consult. If it was found to be a thoracic complaint file the independent individual filled in the technical details from the file (file code, age, gender and occupation). After this information was recorded, the individual removed the relevant initial paperwork from the files and blocked off the names. The blocked off paperwork was then given to the researcher to collect the relevant data and record it on the template.

This procedure excluded the following files: files containing cervical, lumbar, and extremity regional on the initial visit, files containing incomplete paperwork, files of pediatric patients and files of patients involved in research on the initial consult.

3.5.2 Phase two

On completion of data collection of each file the researcher handed the blocked off paperwork to the independent individual to place the paper work back in the

correct files. These files were then filed back into the filing system as they were found.

3.5.3 Phase three

The templates were the only source of patient information the researcher used from that point on. The researcher then started the data capturing process. The data was captured onto a Microsoft Excel spreadsheet. This spreadsheet was then handed in to a statistician for statistical analysis.

3.5.4 Phase four

This involved the analysis and interpretation of the data after statistical analysis and the completion of the written mini-dissertation.

3.6 Statistical Analysis

The statistical package SPSS, Version 11.5 (as supplied by SPSS Incorporated, Marketing Department - 1999, Chicago, USA) was used to analyze the data in this study. Descriptive analysis of data in this study involved frequency tables and bar charts for categorical variables and summary statistics for quantitative variables including mean, standard deviation and range. In order to compare trends over the years, Pearson's chi square tests were used for categorical variables and ANOVA for quantitative variables.

CHAPTER FOUR

RESULTS

4.1 Introduction

SPSS version 13 (SPSS Inc., Chicago, Illinois, USA) was used to analyse the data. A two-tailed 0.05 level of significance was used. Prevalence and 95% confidence intervals (95%CI) per year, per 5 years and overall were calculated and compared using EpiCalc 2000 version 1.02 (Joe Gilman and Mark Myatt, 1998 Brixton Books).

Descriptive statistics such as frequencies and percentages for categorical variables, and mean, standard deviation and range for quantitative variables were used to describe the sample in terms of demographics and other characteristics. Comparisons of these factors between the two successive five year periods were made using Pearson's chi square tests for categorical variables, and independent t-tests for quantitative variables.

4.2 Results

4.2.1 Period prevalence:

A total of 7111 files from 1996 to 2005 were extracted randomly from the clinic's records. There were 249 files which met the criteria for thoracic complaints, and these formed the sample for this study.

The annual prevalence's and 95% CI are shown in Table 1. Overall in the 10 year period the prevalence was 3.5% (95% CI 3.09% to 3.96%). A statistically significant increase in prevalence between the first 5 years (1996 to 2000) and the second five years (2001-2005) was detected ($p<0.001$) from 2.85% to 4.33%.

Table 1: Prevalence (95% CI) of thoracic complaints at the Chiropractic clinic from 1996 to 2005

Year	Prevalence	95% CI
1996	2.61%	1.70 – 3.96%
1997	2.18%	1.33 – 3.49%
1998	2.15%	1.31 - 3.44%
1999	2.64%	1.72 – 3.99%
2000	5.54%	3.88 – 7.81%
5 years (1996-2000)	2.85%	2.37 – 3.43%
2001	3.45%	2.40 – 4.92%
2002	3.44%	2.26 – 5.15%
2003	4.74%	3.07 – 7.20%
2004	5.61%	3.88 – 8.00%
2005	5.38%	3.67 – 7.78%
5 years (2001-2005)	4.33%	3.66 – 5.12%
10 years (1996-2005)	3.50%	3.09 – 3.96%

4.2.2 Demographics:

4.2.2.1 Gender

Of the 249 patients in the sample, 248 had gender information. The majority were female 54.8% while 45.2% were male. The gender distribution in the overall sample is shown in Table 2.

Table 2: Gender of the sample

	Frequency	Percent
Female	136	54.7
Male	112	44.9
Not Recorded	1	0.4
Total	249	100.0

There was no difference in gender between the first and second five year periods (p=0.158). Table 3 shows that the gender proportions remained almost the same between the two five year periods, except that the proportion of females rose slightly in the second five year period.

Table 3: Gender by five year period

			Five year period		Total
			1996-2000	2001-2005	
GENDER	**Female**	**Count**	57	79	136
		Row %	41.9%	58.1%	100.0%
	Male	**Count**	57	55	112
		Row %	50.9%	49.1%	100.0%
Total		**Count**	114	134	248
		Row %	46.0%	54.0%	100.0%

Pearson's chi square value =1.995, p=0.158.

4.2.2.2 Age

Age of the sample ranged from 11 years to 73 years. The mean age was 33.3 years (SD 13.6 years). There was no significant change in mean age between the first and second five year period (p=0.103), although the mean age was slightly higher in the second five year period. This is shown in Table 4.

Table 4: Comparison of mean age between two five year periods

	Five year period	N	Mean	Std. Deviation	Std. Error Mean	p value
AGE	1996-2000	114	31.73	12.985	1.216	0.103
	2001-2005	135	34.54	13.973	1.203	

4.2.2.3 Occupation / Employment

Two hundred and forty-one (241) participants had a recorded occupation. Of these, only 52 (21.6%) were employed in occupations that were classified as active/ non-sedentary (eg. biokineticist, dancer, fitness consultant, housewife etc.) while the majority had sedentary jobs which mostly involved office work 125 (51.9%).

Figure 1 shows this distribution in the sample as a whole.

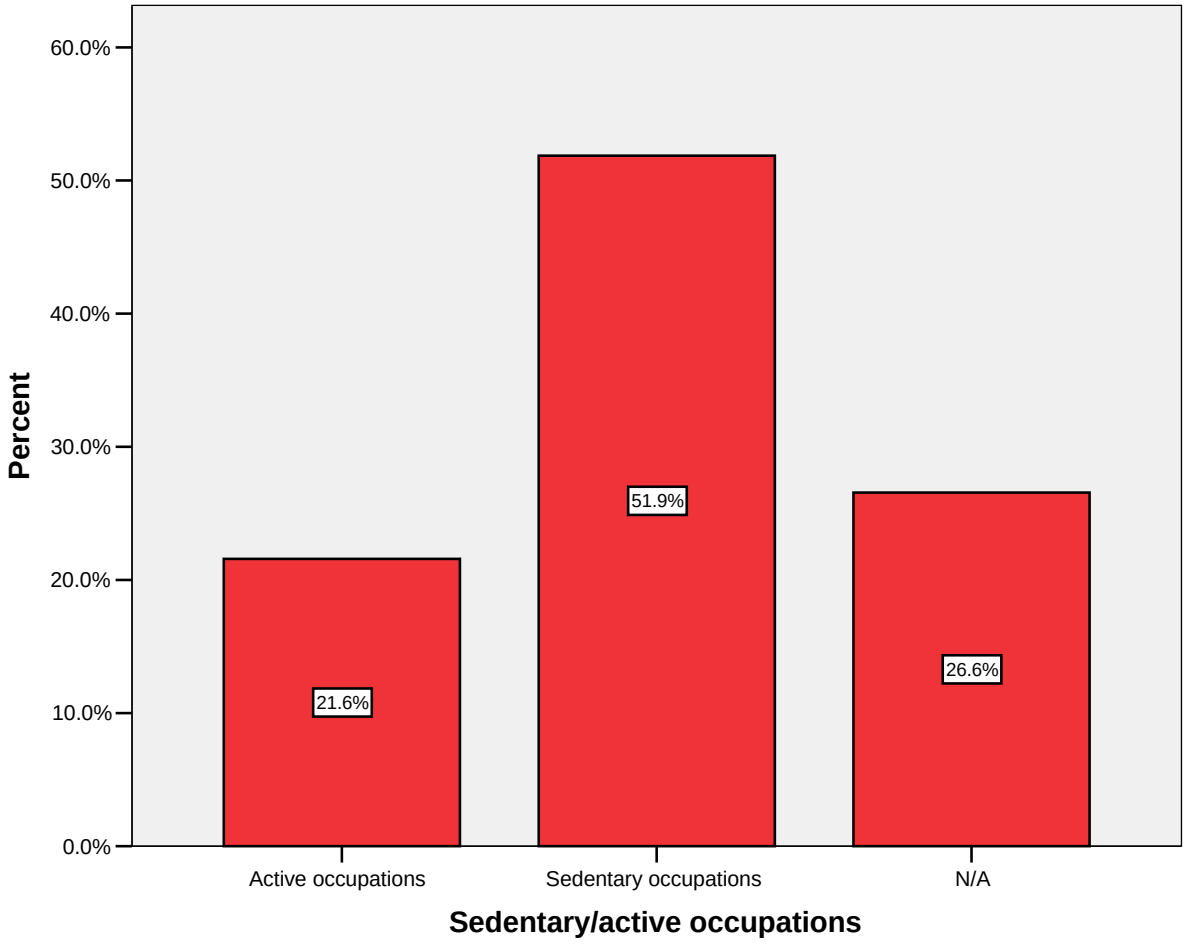


Figure 1: Type of occupation in the sample (n=241)

When the distribution of sedentary or active jobs was compared between the two five year periods, there was a non significant difference (p=0.137). This is shown in Table 5. There was a slight trend towards an increase in cases with active jobs.

Table 5: Comparison of type of occupation over the two five year periods

			Five year period		Total
			1996-2000	2001-2005	
Sedentary / active occupations	**Active occupations**	**Count**	18	34	52
		Row %	34.6%	65.4%	100.0%
	Sedentary occupations	**Count**	57	68	125
		Row %	45.6%	54.4%	100.0%
	Not recorded	**Count**	34	30	64
		Row %	53.1%	46.9%	100.0%
Total		**Count**	109	132	241
		Row %	45.2%	54.8%	100.0%

Pearson chi square 3.982, p=0.137

Over half the sample was employed (58.1%). There was also a high percentage of scholars or students (21.2%). The distribution for the sample is shown in Table 6.

Table 6: Distribution of employment in sample (n=241)

	Frequency	Percent
Employed	140	58.1
Scholar/student	51	21.2
Housewife	27	11.2
Self employed	11	4.6
Unemployed	7	2.9
Retired/welfare	5	2.1
Total	241	100.0

There was no significant difference in the distribution of employment over the two five year periods (p=0.235). The prevalence of self employment and housewives increased from the first to the second five year period, but the prevalence of scholars or students and unemployed people decreased. This is shown in Table 7.

Table 7: Comparison of the distribution of employment over the two five year periods (n=241)

			Five year period		Total
			1996-2000	2001-2005	
Employment	**Employed**	**Count**	64	76	140
		Row %	45.7%	54.3%	100.0%
	Self employed	**Count**	4	7	11
		Row %	36.4%	63.6%	100.0%
	Scholar/ student	**Count**	28	23	51
		Row %	54.9%	45.1%	100.0%
	Housewife	**Count**	7	20	27
		Row %	25.9%	74.1%	100.0%
	Unemployed	**Count**	4	3	7
		Row %	57.1%	42.9%	100.0%
	Retired/welfare	**Count**	2	3	5
		Row %	40.0%	60.0%	100.0%
Total		**Count**	109	132	241
		Row %	45.2%	54.8%	100.0%

Pearson's chi square 6.08, p=0.235

4.2.3 Main complaint:

The main presenting complaint of the 249 thoracic patients is shown in Table 8. It is clear that mid-back pain was the most common complaint (41.4%). Thoracic pain was present in 26.5% of the cases.

Table 8: Main complaint in the sample (n=249)

	Frequency	Percent
MIDBACK PAIN (T1 – T12)	103	41.4
THORACIC PAIN	66	26.5
PAIN BET SHOULDER BLADES	18	7.2
UPPER BACK PAIN (T1 – T4)	15	6.0
MIDTHORACIC PAIN (T5 – T8)	8	3.2
CHEST PAIN	7	2.8
RIB PAIN	2	.8
SCAPULAR PAIN	2	.8
ANTERIOR CHEST PAIN	2	.8
INTERSCAPULAR PAIN	2	.8
THORACIC AND CHEST PAIN	2	.8
THORACIC SPINE PAIN	2	.8
LOW BACK PAIN	1	.4
LOWER STERNAL PAIN	1	.4
LOWER THORACIC PAIN (T9 – T12)	1	.4
CHEST AND SHOULDER PAIN	1	.4
BACK PAIN	1	.4
MID &UPPER T-SPINE PAIN (T1 – T8)	1	.4
LEFT SHOULDER PAIN	1	.4
MIGRAINE HEADACHES	1	.4

THORACIC AND RIB PAIN	1	.4
THORACIC AND RHOMBOID PAIN	1	.4
TENSE THORACIC AREA	1	.4
T-SPINE PAIN	1	.4
SHOULDER PAIN	1	.4
SHARP THORACIC PAIN	1	.4
RIGHT THORACIC PAIN	1	.4
PAIN IN STERNUM AND CHEST	1	.4
UPPER THORACIC PAIN	1	.4
NECK PAIN AND HEADACHES	1	.4
NECK PAIN	1	.4
PAIN IN RIB CAGE	1	.4
Total	249	100.0

4.2.4 Associated signs and symptoms:

Associated signs and symptoms are shown in Figures 2 and 3. Only 30 patients presented with associated symptoms and 11 had associated signs. The most common associated symptom was headache (30%) while the most common sign was scoliosis (54.5%).

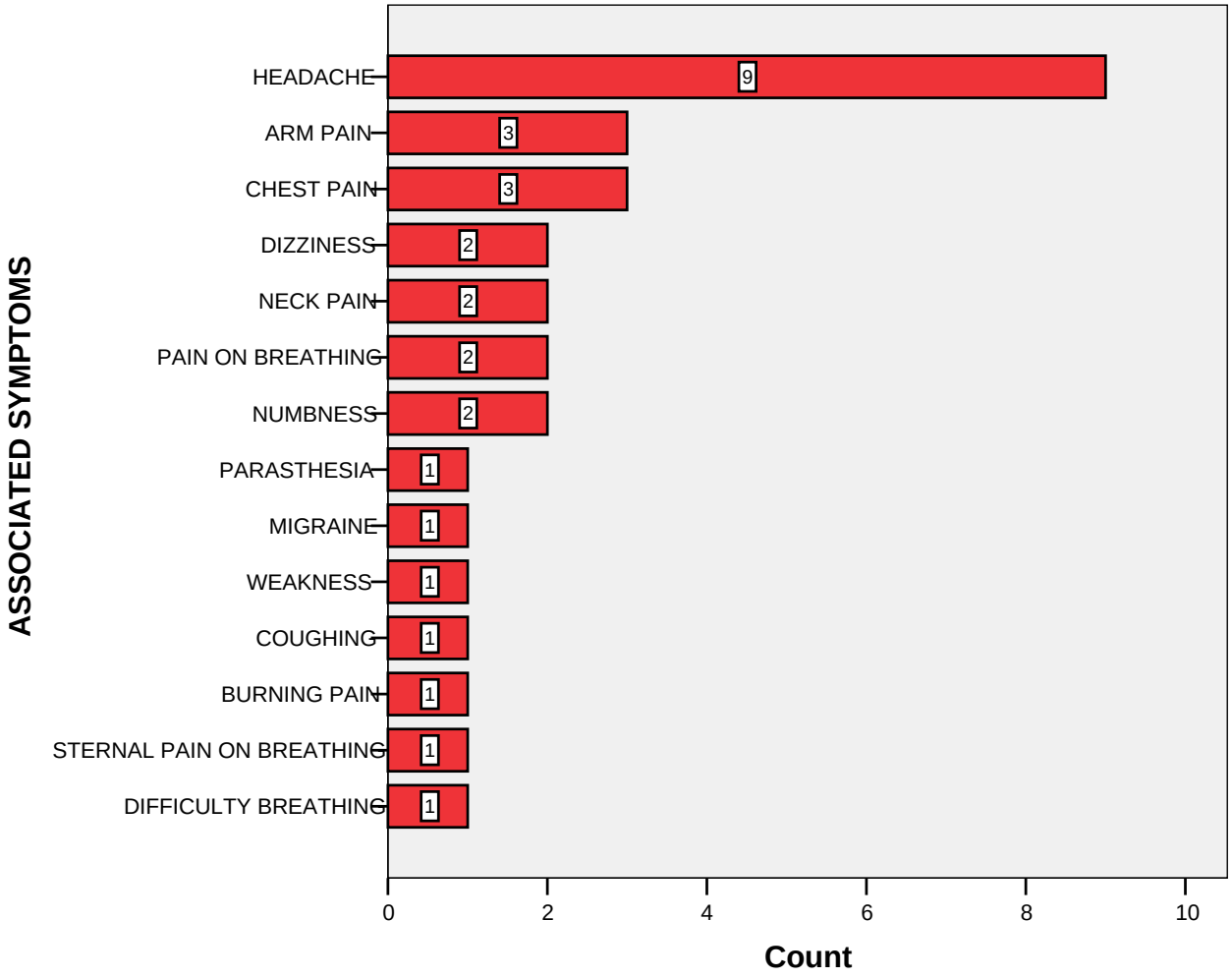


Figure 2: Associated symptoms of sample (n=30)

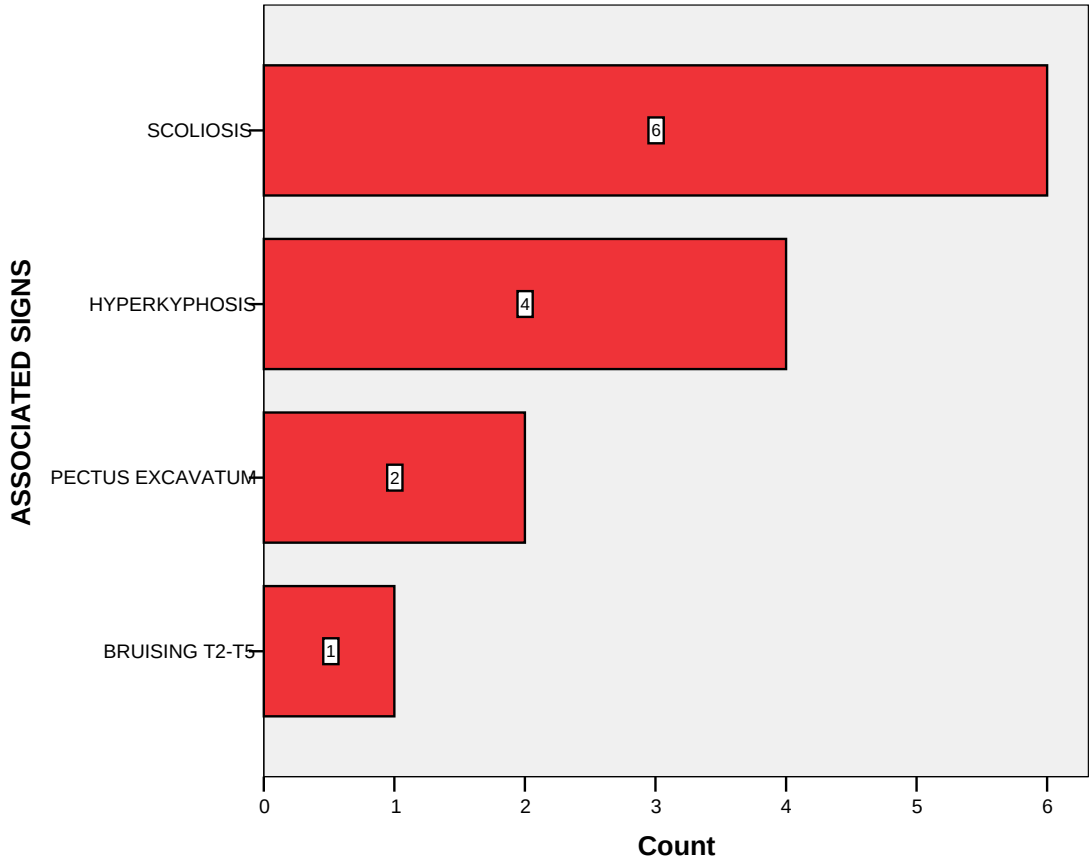


Figure 3: Associated signs of sample (n=11)

4.2.5 Cause of main complaint:

Table 9 shows that in most cases the cause was unknown (61.4%), while the most common known cause was sport related (8.4%).

Table 9: Cause of main complaint

	Frequency	Percent
Unknown	153	61.4
Sport	21	8.4
Lifting / carrying	14	5.6

Fall / accident	13	5.2
Occupational ergonomics	13	5.2
Stress	11	4.4
Driving	7	2.8
Poor posture	6	2.4
Medical / surgical	6	2.4
Breastfeeding	3	1.2
Standing/walking	2	.8
Total	249	100.0

4.2.6 Primary diagnosis:

While up to three different diagnoses were made for some patients, the main diagnosis is shown in Table 10. The most common diagnosis was thoracic facet syndrome (74.7%).

Table 10: Primary diagnosis of sample patients (n=249)

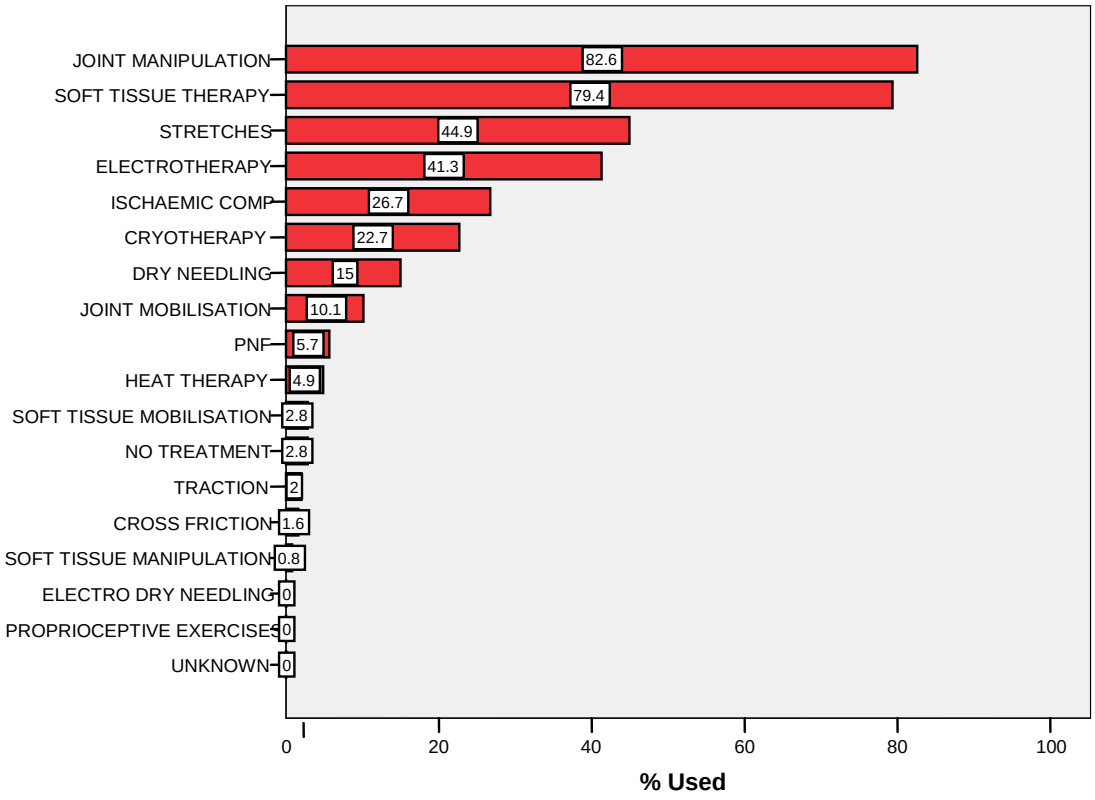
	Frequency	Percent
THORACIC FACET SYNDROME	186	74.7
MYOFASCIITIS	22	8.8
COSTOTRANSVERSE SYNDROME	5	2.0
COSTOCHONDRITIS	4	1.6
RIB FIXATION	4	1.6
NO DIAGNOSIS	2	0.8
RIB FRACTURE	2	0.8
THORACO-LUMBAR SCOLIOSIS	2	0.8
COSTOVERTEBRAL SYNDROME	2	0.8

MAIGNES SYNDROME	2	0.8
VERTEBRAL FRACTURE	1	0.4
GRADE THREE SCOLIOSIS	1	0.4
STERNOCOSTAL PAIN	1	0.4
THORACIC SCOLIOSIS	1	0.4
SACROILIAC SYNDROME	1	0.4
THORACIC DYSFUNCTION	1	0.4
SOFT TISSUE INJURY	1	0.4
THORACO-LUMBAR DYSFUNCTION	1	0.4
GRADE ONE MUSCLE STRAIN	1	0.4
STERNOCLAVICULAR SPRAIN	1	0.4
ASTHMA	1	0.4
GALLBLADDER DYSFUNCTION	1	0.4
COSTOCHONDRAL DYSFUNCTION	1	0.4
INTERSPINOUS LIGMT SPRAIN	1	0.4
INTERCOSTAL STRAIN	1	0.4
ANTERIOR CHEST PAIN	1	0.4
T4 JOINT DYSFUNCTION	1	0.4
RIB CONTUSION	1	0.4
Total	249	100.0

4.2.7 Management:

Treatment protocols used are shown in Figure 4. Often several combinations of treatments were used on a patient. The most common one was joint manipulation which was used in 82.6% of the cases, followed by soft tissue therapy (79.4%) and stretches (44.9%). The only treatments listed under “other” were Graston (n=1), grip and rip (n=2), and postural advice (n=1).

Figure 4: Percentage of times that each treatment was used



PNF: Peripheral Neuromuscular Facilitation

4.2.8 Location of fixations:

Figure 5 shows that the T5-8 fixation was the most frequent site of fixation (58.5%, n=145), followed by T1-4 (41.5%, n=103). The costochondral fixations were the least common (2%, n=5).

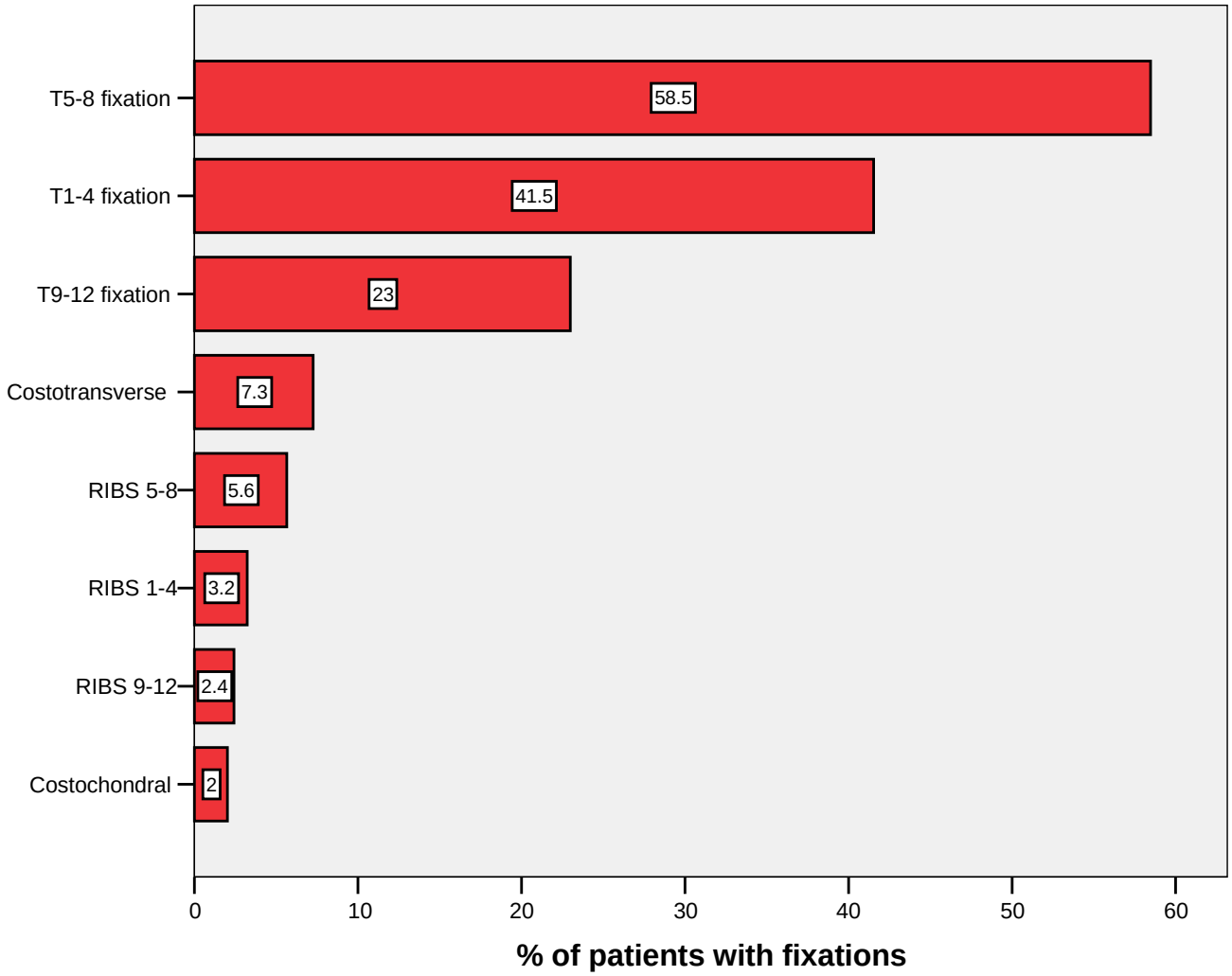


Figure 5: Percentage of thoracic patients with fixations at different sites

4.2.9 Investigations:

The investigation that was used most often in the sample was X-rays (Table 11). Fourteen patients were sent for x-rays (5.6%). One patient was sent for a blood test (0.4%) No other investigations were used in these patients.

Table 11: Frequency of X-Ray investigations in Thoracic patients

	Frequency	Percent
No	234	94.4
Yes	14	5.6
Total	248	100.0

4.2.10 Contraindications:

Seven contraindications to treatment were identified (2.8%), 5 to manipulation and 2 to all treatments. The reasons stated were hepatomegaly (n=1), cancer (n=1) and x-ray first for suspected pathology (n=5).

4.2.11 Follow-up visits and new complaints:

Of the 249 thoracic patients, 177 (71.1%) presented for a follow up visit. Thirty-four patients had a new complaint (14.1%), of which the most common site was cervical (44.1%), followed by lumbar (38.2%). This is shown in Table 12.

Table 12: Regions completed in 34 new complaints

	Frequency	Valid Percent
CERVICAL	15	44.1
ELBOW	1	2.9
FOOT	1	2.9
HIP	1	2.9
KNEE	1	2.9
LUMBAR	13	38.2
SHOULDER	2	5.9
Total	34	100.0

4.2.12 Payment:

There were 2 patients in the thoracic sample of 249 that were not charged for treatment (n=2). 247 had paid in full.

4.2.13 Referrals:

Two referrals were identified. One to a Gynaecologist for suspected ovarian cysts (n=1) and the other to an Orthopaedic Surgeon for managing the progression of a scoliosis (n=1).

CHAPTER FIVE

DISCUSSION OF RESULTS

5.1 Introduction

This chapter discusses the results obtained through the statistical analysis of the data.

The sample size for this study included 7111 cases obtained from the Durban University of Technology chiropractic day clinic. The selected time period was 13 January 1995 to 30 November 2005. There were no thoracic cases recorded in the random sample for the year 1995, therefore the random sample allocated for this year was subtracted from the total sample. 249 Thoracic cases were included in this research. The remainder was excluded due to the exclusion criteria.

5.2 Interpretation of data

5.2.1 The Period prevalence of thoracic complaints

From a total of 7111 files that were analyzed, 249 were thoracic cases. This resulted in a total period prevalence of 3.5%. This may be a significantly small value, however since it was only formed from the population visiting the Durban University of Technology Chiropractic Day Clinic from 13 January 1995 to 30 November 2005, it is therefore, not a true reflection of the general population. The period prevalence during the first five years (1996 – 2000) was 2.85%, for the second five years (2001 – 2005) it was 4.33%. There was an increase in prevalence over the second five year period.

5.2.2 Demographics

- **5.2.2.1 Gender**

Two hundred and forty eight (248) patients of the 249 had recorded gender information. The majority of thoracic pain sufferers were female 54.8% (136), whilst the male thoracic pain sufferers accounted for 45.2% (112).
In undertaking the study in the United Kingdom, Bruckner *et al.* (1987) found that the female to male ratio of mid dorsal pain sufferers was 5:1, showing that this is not a consistent ratio finding with this study; however more females presented with thoracic pain in each study.
Dreiser *et al.* (1997) published an epidemiological study involving 132 mechanical thoracic pain patients in France. Similarly, they found that 62% of patients were women and 38% were men, strengthening previous findings that mechanical thoracic spine problems are more common in females.

- **5.2.2.2 Age**

The ages in the present sample ranged from 11 years of age to 73 years of age. The mean age over the ten year period was 33.3 years.
When comparing the mean age between the two five year periods, there was a higher mean age over the second five year period. From 1996 - 2000 the mean age was 31.73 years, from 2001 – 2005 the mean age was 34.54 years.
These findings are similar to the findings in other studies; Bruckner *et al.* (1987) studied 73 patients with mid dorsal pain. The most common ages occurred in the third decade.
Similarly, Holt and Beck (2005) reported on the basic characteristics of new chiropractic patients presenting to the New Zealand College of chiropractic teaching clinic. In the retrospective analysis of 1004 new patient files opened between 1997 and 2001, the average age of patients was 32.

- **5.2.2.3 Occupation / Employment**

Of the 241participants with recorded occupations 52 (21.6%) were employed in occupations that are classified as non-sedentary or active (eg. biokineticist, dancer, fitness consultant, housewife etc.), 125 (51.9%) participants had sedentary jobs which involved office and desk work and 8 cases had no recorded occupation.
140 participants were employed (58.1%), 11 self employed (4.6%), 51 were scholars or students (21.2%), 27 were housewives (11.2%), 7 were unemployed (2.9%) and 5 were retired (2.1%).

Bryant, Atkins and Bull (2003) reported on the demographic and diagnostic profiles of patients attending the Macquarie University Department of Chiropractic Clinic. Their findings showed 37% of patients were white collar workers (sedentary workers), 31% were blue collar workers (non-sedentary or active workers), 19% were students and 13% were unemployed.
When comparing this to the present study, there are similarities. In the present study there was a higher percentage of sedentary workers (51.9% versus 37%) and a lower percentage of non-sedentary workers (21.6% versus 31%). Due to the fact that the clinic was situated on the university premises, there were also a high percentage of students that visited the Durban University of Technology Chiropractic Day Clinic.

5.2.3 Main complaint

The complaint most often recorded by the interns was mid-back pain (41.4%). The second most common was thoracic pain (26.5%) and the third most common was pain between the shoulder blades (7.2%).

5.2.4 Associated symptoms

Thirty (30) patients presented with associated symptoms. Of the 30 patients, 9 (30%) presented with associated headaches, 3 (10%) presented with associated arm pain, 3 (10%) presented with associated chest pain, 8 (26.7%) had complained of associated dizziness, neck pain, pain on breathing or numbness and 7 (23.3%) complained of associated parasthesia, migraines, weakness, coughing, sternal pain or difficulty breathing. Frequently in chiropractic practice patients present with a primary complaint with associated symptoms or with secondary complaints, as is the case with the present study.

5.2.5 Associated signs

Eleven (11) patients presented with associated signs. 6 (54.5%) patients presented with an associated scoliosis, 4 (36.6%) presented with an associated hyperkyphosis, 2 (18.2%) presented with an associated pectus excavatum and 1 (9.1%) presented with bruising over T2 –T5 vertebrae. Such associated signs could be found in day to day chiropractic practice.

5.2.6 Cause / Aetiology

The majority of cases, 61.4% presented with an unknown cause whilst 8.4% reported that sports injuries were the causative factor. Lifting and carrying goods was the cause in 5.6% of the population.

Walsh and Jamison (1992) recorded similar findings when conducting a retrospective analysis of all new patient files at four chiropractic clinics (three private and one teaching clinic). In the teaching clinic similar findings were recorded, 44.9% of the population had an unknown cause of the main complaint, 10.2% reported that sports injuries were the causes and 10.2% reported that lifting was the cause. The top three causes were found to be the same in the present study.

5.2.7 Primary diagnosis

Thoracic facet syndrome was the most common primary diagnosis given in 74.7% (186) of the population. Myofasciitis was the second most common primary diagnosis given in 8.8% (22) of the population.
In the study conducted by Bryant, Atkins and Bull (2003) the patient profiles showed that facet joints were the primary tissues in the lesion (47%) and it was followed by muscle problems (39%). This shows a common area of diagnosis even though in the above study, cases of patients with all complaints and not thoracic complaints alone were studied.

5.2.8 Management / Treatment protocols

Although several different combinations of treatments were used on each patient the most common was joint manipulation which was the treatment used in 82.6% of the cases analyzed. Soft tissue therapy accounted for 79.4% and stretch 44.9%. Soft tissue therapy included massage, ischaemic compression and manual lymph drainage.
The findings in the present study are consistent with those found by Mootz *et al. (2005)* in their study of chiropractic practitioners, patients and encounters in Massachusetts and Arizona. They reported that 82% of patients had been treated with spinal adjustments (joint manipulation) in Arizona and 85% in Massachusetts.
In the study conducted by Mootz *et al. (2005)* soft tissue therapy was used in 33% of patients in Arizona and 43% in Massachusetts. A lower percentage of patients received soft tissue therapy as compared to the present study.

5.2.9 Most common fixations recorded

The most commonly fixated joints in the thorax were the facet joints located at T5 to T8 (58.5%), followed by T1 to T4 (41.5%) and T9 to T12 (23%).
Costotransverse joints were found to be fixated in 7.3% of the cases.
Joints located along ribs 5 to 8 were the most fixated (5.6%), followed by joints located over ribs 1 to 4 (3.2%) and ribs 9 to 12 (2.3%).
Costochondral fixations only accounted for 2% of the recorded fixations.
Studies abroad did not record the location of fixations as in the present research.

5.2.10 Follow-up visits and new complaints

Of the 249 cases analyzed, only 177 (71.1%) returned for a follow up visit.
34 (14.1%) patients reported with a new complaint. Of these the most common new complaint was located in the cervical region (44.1%) followed by lumbar complaints (38.2%).

5.2.11 Investigations

X-rays were the investigative procedure patients were most often sent for by the interns. X-rays were sent for in 14 (5.6%) of the patients and 1 (0.4%) was sent for a blood test.
No other investigations were ordered. This gives an indication of the frequency with which these procedures were utilised for thoracic cases presenting to the Durban University of Technology Chiropractic Day Clinic during the period of time covered by this study.

5.3 Hypotheses

Hypothesis one: The null hypothesis (H_o) states that there shall not be a shift in demographics of patients presenting with thoracic conditions to the DUT Chiropractic Day Clinic over the eleven year period. The alternate hypothesis (H_a) states that there shall be a shift in demographics of patients presenting with thoracic conditions to the DUT Chiropractic Day Clinic over the eleven year period. With respect to hypothesis one, there was a shift in demographics of patients presenting with thoracic pain to the Durban University of Technology Chiropractic Day Clinic.

Gender: The male population seen throughout the period of 1996 to 2005 ranged from 49% to 50.9% (1.9%) whereas the female population increased from 57% in 1996 to 2000 to 79% in 2001 to 2005 (22%), which is considerably greater than for males.

Age: There was no significant change in mean age between the two time periods (1996-2000 and 2001-2005). The overall mean age was 33.3 years.

Occupation: There was evidence of a shift in the percentage of both active and sedentary occupations. From 1996 – 2000, 34.6% of the population had active jobs; this increased to 65.4% from 2001 – 2005. The sedentary jobs had also increased from 45.6% in 1996 – 2000 to 54.4% in 2001 – 2005.

This then allows for the conclusion that there was a shift in demographics, if two of the three recorded demographics showed the hypothesized results.

The null hypothesis is then rejected and the alternate hypothesis is accepted.

Hypothesis two: The null hypothesis (H_o) states that there shall not be a lower prevalence of thoracic complaints from 1995 to 2000 and a comparatively higher prevalence from 2001 to 2005. The alternate hypothesis (H_a) states that there shall be a lower prevalence of thoracic complaints 1995 to 2000 and a comparatively higher prevalence from 2001 to 2005.

There were no thoracic cases recorded in the random sample in the year 1995. This then allows the present author to assume that there were few thoracic cases

treated at the Durban University of Technology Chiropractic Day Clinic during the year 1995.

From 1996 to 2000 the period prevalence of thoracic pain was 2.85% and from 2001 to 2005 the period prevalence was 4.33%. This gives the evidence that the second five year period showed a comparatively higher prevalence of thoracic pain cases.

The null hypothesis is then rejected and the alternate hypothesis is accepted.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The present study has identified and described some of the relevant demographic information and clinical characteristics obtained from patients with thoracic complaints, who were treated at the Durban University of Technology Chiropractic Day Clinic.

From the findings of the study the following conclusions were drawn:

- There was a shift in demographics recorded among the thoracic pain sufferers seen at the Durban University of Technology Chiropractic Day Clinic from 1996 to 2005.

- There was a lower prevalence of thoracic complaints from 1996 to 2000 and a higher prevalence from 2001 to 2005.

- This study compared some of the characteristics of the Durban University of Technology Chiropractic Day Clinic's population of thoracic pain sufferers to those of other clinics. Many similarities were found when comparing findings with other clinics. There was no literature found on a retrospective study on thoracic pain sufferers alone in a chiropractic teaching clinic. Therefore there could not be a direct comparison of all features of this study.

Even though the overall prevalence of thoracic pain sufferers was only 3.5% over the ten year period, it is still an area of pain that must be investigated. The thoracic spine has been overlooked as a major region for clinical research. This

study has proved that there is need for continuing research in this area, to assist chiropractors to treat the thoracic spine more effectively.

6.2 Recommendations

- It is recommended that a similar study be conducted at the University of Johannesburg Chiropractic Day Clinic, in order to compare the characteristics and demographics of patients seen at the two teaching clinics.

- The present study did not record the patient's ethnicity because patient confidential information sheet did not allow for this. It is recommended that the sheet be amended to add on this information for future research purposes.

- It is important for teaching clinics to reflect the clinical situations in which new graduates and interns will find themselves. Research such as the present study promotes this process. It is recommended that new, efficient data collection tools or instruments be employed.

- It is recommended that a similar study be conducted at private chiropractic clinics in Durban to compare patient characteristics with the information obtained from this study.

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Appendix 1

INFORMED CONSENT FORM

(TO BE COMPLETED BY THE PARTICIPANTS OF THE FOCUS GROUP)

DATE:

TITLE OF RESEARCH PROJECT: A Retrospective survey of patients presenting with thoracic complaints to the Durban University of Technology Chiropractic Day Clinic (1995-2005).

NAME OF SUPERVISOR:

Dr E. Lakhani (M.Tech Chiropractic, ICSSD) (031- 2042533)

NAME OF RESEARCH STUDENT:

Rhoda Lynn Benjamin

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

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

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

Participant: _____ **Signature:** _____

Witness Name: _____ Signature:_____

Researcher's Name: _____

Signature:_____

Appendix 2

CONFIDENTIALITY STATEMENT – FOCUS GROUP DECLARATION

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

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

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

Please Print in block letters:

Focus Group Member: _____ Signature:_____

Witness Name: _____ Signature:_____

Researchers Name: _____ Signature:_____

Supervisors Name: _____

Signature:_____

Appendix 3

CODE OF CONDUCT

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

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

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

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

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

Member represents	Member's Name	Signature	Contact Details

Appendix 4

LETTER OF INFORMATION – FOCUS GROUP

Dear Participant,

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

The title of my research project is: A retrospective survey of patients presenting with thoracic complaints to Durban University of Technology Chiropractic Day Clinic (1995 - 2005)

Background to the study:

In April 1994 the chiropractic day clinic was officially opened at the former Technikon Natal (now Durban University of Technology D.U.T). Thousands of patients have been treated at the clinic over this twelve year period.

A survey was conducted by Drews in 1994, in order to identify characteristics of 162 chiropractic patients seen at Technikon Natal chiropractic day clinic over a period of three months, and compare these characteristics to patients seen at private chiropractic practices in South Africa. The study was retrospective, files of patients seen at both the Technikon Natal chiropractic day clinic and private practices were analysed. Thoracic complaints were found to be more common at the teaching clinic 29.6% versus 23.5% in private practice.

A study was conducted on 1178 Scandinavian school children of both sexes in order to determine the prevalence of back pain. Pupils were asked to answer a questionnaire. The cumulative presence of back pain was 51.2%. The prevalence of back pain was broken down into the different regions, lumbar (36.8%), lumbar and leg pain (4.2%), thoracic pain (34%) and cervical (26.5%) (Troussier et al. 1994). It can then be concluded that thoracic pain although not as frequent as lumbar pain, presents itself enough to warrant investigation (Pillay 2001).

This study is an attempt to analyse demographic and clinical trends of patients who have attended the Durban University of Technology Chiropractic day clinic, with regard to thoracic pain and to identify and highlight the following: - age, gender, ethnicity, presenting complaints, common conditions treated, prevalence of pain and common management protocols of these patients with regard to the thoracic spine.

The aim of this research is to describe the patients that attended the Chiropractic Day Clinic at the Durban University of Technology from 1995 – 2005, with regard to their thoracic pain and the treatment they received.

- **Objective 1:** To compare trends and analyse any patterns or changes that may have occurred with regards to the chiropractic patient over the past decade at the Durban University of Technology Chiropractic Day Clinic.
- **Objective 2:** To identify the demographics of patients.

- **Objective 3:** To document the aetiology of the complaint and the presenting signs and symptoms.
- **Objective 4:** To note contraindications to treatment as recorded by interns.
- **Objective 5 :** To identify the prevalence of thoracic pain in patients who presented to the Durban University of Technology chiropractic day clinic from 1995 – 2005.

Your participation in this study is much appreciated and you are assured that your comments and contributions to the discussion will be kept confidential. The results of the discussion will only be used for research purposes.
If you have any further questions please feel free to contact me.
Rhoda Lynn Benjamin cell: 0836020006

THORACIC SPINE TEMPLATE (APPENDIX 5)

FILE NO:		
DATE	MONTH:	
	YEAR:	
GENDER:	MALE	FEMALE
AGE:		

OCCUPATION: SPECIFY

REASON FOR ATTENDING CLINIC	
UNKNOWN	0
OTHER - SPECIFY:	1
REFERRAL	2
2ND OPINION	3
SELF REFERRAL	4
GENERAL CHECK-UP	5

HISTORY OF PRE-EXISTING CONDITIONS	
NO	0
YES	1
IF YES SPECIFY:	

HISTORY OF TRAUMA TO THORACIC SPINE/ RIBS	
NO	0
YES	1
SPECIFY	

BLOOD PRESSURE ABNORMALITY NOTED		
NO		0
YES		1
SPECIFY:	HIGH	2
	LOW	3

ABNORMALITY NOTED ON GENERAL EXAM	
NO	0
YES	1
SPECIFY:	

CAUSE OF CHIEF COMPLAINT

MAIN COMPLAINT

ASSOCIATED SYMPTOMS	YES	NO
PARAESTHESIAS	1	0
NUMBNESS	1	0
WEAKNESS	1	0
VERTIGO	1	0
PALPITATIONS	1	0
COUGHING	1	0
OTHER	1	0
SPECIFY:		

ASSOCIATED SIGNS	YES	NO
WHEEZE	1	0
MURMUR	1	0
IRREGULAR PULSE	1	0
DYSPNOEA	1	0
TACHYPNOEA	1	0
OTHER	1	0
SPECIFY:		

PRIMARY DIAGNOSIS

ASSOCIATED DIAGNOSIS

CONCOMITANT DIAGNOSIS	NO	YES
1		
2		
3		
4		
5		

MANAGEMENT	YES	NO
UNKNOWN	1	0
NO TREATMENT	1	0
CROSS FRICTION MASSAGE	1	0
CRYOTHERAPY	1	0
DRY NEEDLING	1	0
ELECTRO-DRY NEEDLING	1	0
HEAT THERAPY	1	0
ELECTROTHERAPY	1	0
(IFC, TENS, LASER, U/S)	1	0
TRACTION	1	0
JOINT MANIPULATION	1	0
JOINT MOBILIZATION	1	0
SOFT TISSUE MANIPULATION	1	0
SOFT TISSUE MOBILIZATION	1	0
PROPRIOCEPTIVE EXERCISES	1	0
SOFT TISSUE THERAPY	1	0
OTHER	1	0
SPECIFY:		

CONTRA-INDICATION TO TREATMENT	
NO	0
YES	1
SPECIFY WHICH TREATMENT:	
REASON:	

LEVEL OF MANAGEMENT (FIXATIONS)					
T-SPINE:	Y/N	**COSTOTRANSVERSE:**	Y/N	**RIBS:**	Y/N
UPPER (T1-4)				UPPER (1-4)	
MIDDLE (T5-8)				MIDDLE (5-8)	
LOWER(T9-12)				LOWER (1-12)	

COSTOCHONDRAL: (SPECIFY LEVEL)	Y/N

INVESTIGATIONS		
UNKNOWN	NO	YES
BLOOD TESTS	0	1
X-RAYS	0	1
MRI	0	1
CT SCANS	0	1
ULTRASOUND	0	1
BONE MINERAL DENSITY	0	1
BONE SCAN	0	1
ECG	0	1
OTHER	0	1
SPECIFY:		

REFERRALS	
NO	0
YES	1
REASON FOR REFERRAL:	
SPECIFY SPECIALIST:	

FREQUENCY OF CONSULTATIONS IN ONE MONTH
(NO OF VISITS)

NEW COMPLAINT	
NO	0
YES	1
REGIONAL COMPLETED	

PAYMENT	NO	YES
FEE REDUCTION	0	1
NO CHARGE	0	1
NORMAL CHARGE	0	1

FOLLOW UP CONSULTATION	
NO	0
YES	1

PATIENT INVOLVEMENT IN PREVIOUS THORACIC RESEARCH	
NO	0
YES	1