A STUDY OF THE FACTORS THAT MAY INFLUENCE THE PREVALENCE OF BACK PAIN IN CHIROPRACTORS.

A dissertation presented to the Faculty of Health Services, Technikon Natal in partial fulfilment of the requirements for the Master's Diploma in Technology: Chiropractic.

by

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I, Anthony Tim, do hereby declare that the following dissertation represents my own work, both in conception and in execution.

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This Dissertation is dedicated to
my parents Doreen and Peter Tim, for all their
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ABSTRACT

The purpose of this study was to assess the prevalence of back pain in chiropractors in South Africa, in terms of workplace factors which surrounded them and individual factors which they possessed, in order to establish under which circumstances, workplace and individual factors possibly influenced the prevalence of back pain in chiropractors.

The total population of South African chiropractors (N=138), registered with the Chiropractors, Homoeopaths and Allied Health Service Professions Council of South Africa for 1994, were sent a questionnaire. A total of 68 questionnaires returned, which represented a 49,3% response rate. The questionnaire consisted of questions regarding : the prevalences of back pain and low back pain; the intensity and frequency of back pain; the prevalence of different pain locations eg. headache, cervical pain, lumbar pain etc.; the workplace factors included : static work postures, bending, twisting and lifting, repetitive work, overexertion, ergonomics, psychological work factors, number of hours and days worked per week; the individual factors included : age and gender, anthropometry, posture, physical fitness, spinal mobility, psychological factors, social factors, environmental factors and the number of years in practice.

The results were statistically analyzed using cross-tabulation and Log-linear analysis. The results were represented by cross-tabulations, bar and pie charts and then descriptively analyzed. The overall prevalence of back pain amongst South African chiropractors was 55,9% and the low back pain prevalence was 65,1%.

Among other findings, certain ergonomic factors such as desk and physical examination table heights were found to be significantly associated with the respondents having more back pain. Those respondents who exercised for longer than 60 minutes per exercise session had significantly less back pain than those respondents who exercised for shorter periods of time. Of interest was that those respondents who used adjustment techniques which required the use of force, had significantly more back pain than those who used non-force techniques.

It must be emphasized that extreme caution should be exercised in attempting to generalise the findings of this survey, since the workplace and individual factors associated with back pain were based on the respondent's subjective evaluations. This study was not designed to establish cause and effect relationships between workplace and individual factors, and the prevalence of back pain amongst chiropractors.

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1.1 THE STATEMENT OF THE PROBLEM

The purpose of this study is to assess the prevalence of back pain in chiropractors in South Africa, in terms of workplace factors which they may be exposed to and individual factors which they may possess, in order to establish under which circumstances workplace and individual factors may be associated with the prevalence of back pain among chiropractors.

1.2 THE STATEMENT OF THE SUBPROBLEMS

1.2.1 The first subproblem

The first subproblem is to assess the prevalence of back pain in chiropractors, in terms of workplace factors which they may be exposed to, in order to establish under which circumstances workplace factors may be associated with the prevalence of back pain among chiropractors.

1.2.2 The second subproblem

The second subproblem is to assess the prevalence of back pain in chiropractors, in terms of individual factors which they may possess, in order to establish under which circumstances individual factors may be associated with the prevalence of back pain among chiropractors.

1.2.3 The third subproblem

The third subproblem is to integrate and extrapolate the results of the chiropractor's workplace factors which they may be exposed to, with the results of the chiropractor's individual factors which they may possess, in order to establish under which circumstances workplace and individual factors may be associated with the prevalence of back pain among chiropractors.

1.3 THE HYPOTHESES

1.3.1 The first hypothesis

It is hypothesized that, as revealed by another study (Mior and Diakow, 1987), a higher prevalence of back pain among chiropractors in South Africa may be predicted.

1.3.2 The second hypothesis

It is hypothesized that workplace factors surrounding the chiropractor, may contribute to any higher prevalence of back pain among chiropractors.

1.3.3 The third hypothesis

It is hypothesized that individual factors which the chiropractor possesses, may contribute to any higher prevalence of back pain among chiropractors.

1.3.4 The fourth hypothesis

It is hypothesized that there may be a strong association between workplace and individual factors affecting the chiropractors, explaining any higher prevalence of back pain among chiropractors.

1.4 THE DELIMITATIONS

i) Only chiropractors who are registered with the Chiropractors, Homoeopaths and Allied Health Service Professions Council of South Africa for 1994 will be

eligible for the study.

ii) Only chiropractors who are practising in the Republic of South Africa will be eligible for the study.

iii) This study will only be concerned with workplace and individual factors which are set out in the definitions.

iv) Any deductions made or explanations inferred are purely hypothetical. The extremely subjective nature of answering a questionnaire prevents a cause and effect relationship to be assumed.

1.5 THE ASSUMPTIONS

i) It is assumed that the questionnaire will be answered as truthfully and objectively as is possible.

ii) It is assumed that the results obtained through the use of the questionnaire will provide information which is representative of the chiropractic profession in the Republic of South Africa.

1.6 THE DEFINITIONS

i) PREVALENCE

Frymoyer (1991), defined prevalence as a measure of the number of people in a given population who have a symptom or disease at a particular time.

ii) WORKPLACE FACTORS

Workplace factors will include:

a) Static work postures;

b) bending, twisting and lifting;

c) repetitive work;

d) overexertion;

e) ergonomics (Def: the study of man and his environment, eg. the chiropractor in his or her practice.);

f) psychological work factors and

g) number of days worked per week.

iii) INDIVIDUAL FACTORS

Individual factors will include the following:

a) Age and gender;

b) anthropometry (Def: the science dealing with measurement of the size, weight and proportions of the human body, eg.

height, weight and body type);

c) posture;

d) physical fitness;

e) spinal mobility;

f) psychological factors;

g) social factors eg. divorce rates;

h) environmental factors eg. smoking;

i) number of years in practice, part-time or full-time and

j) types of chiropractic techniques used.

1.7 THE IMPORTANCE OF THE STUDY

Back pain is as common as headache in Western society and it is estimated that 30 to 35 percent of any large group, at any point in time, will have some degree of back pain, and that 80 percent will suffer at least one disabling bout of back pain during their lives (Twomey and Taylor, 1987). Low back pain is one of the most frequent and disabling conditions affecting people in the productive years (Andersson, 1981).

Chiropractors are required to bend, twist, lift, push and pull during the daily practice of carrying out a variety of manipulative and other techniques in treating their patients, the same tasks which have been associated with back pain in other occupations and they may therefore predispose the chiropractor to prevalences of back pain which are higher than in the general population (Mior and Diakow, 1987). Therefore, the need for preventive attention is extremely important. In order to

implement such measures we must be able to identify the workplace factors from which the individual must be protected (Andersson, 1981). We also need to identify the individual factors which plague the individual and thereby know where to concentrate our prevention (Andersson, 1981).

The benefits gained from this study may be a greater understanding as to the extent of back pain afflicting an occupation such as chiropractic, which will add to what is already known about the aetiological factors of back pain in certain occupations, such as physical therapists, dentists and nurses. If chiropractors and other healthcare practitioners who also treat back pain have themselves back pain, may it not adversely affect their efficiency in applying a quality service to the public? With this in mind, and if the information regarding the factors associated with back pain is acquired, recommendations may be made in order to execute strategies of prevention and a study looking at specific causes may in future be attempted.

This study is feasible because the cost of running a questionnaire is relatively low. If the back pain prevalence amongst chiropractors is large enough, as it was amongst the Canadian chiropractors (Mior and Diakow, 1987), then there should not be a problem with regards to questionnaire response, because those chiropractors who have back pain may be more inclined to answer the questionnaire.

Because this is a pilot study, there is greater potential for new studies to be generated from the information gathered. Once specific workplace and individual factors have been

identified, those which seem to be associated with higher prevalences of back pain may then be further scrutinised by newly designed projects with higher accuracy. A similar questionnaire may be sent out again in the future so that data may be compared.

CHAPTER 2. A REVIEW OF THE RELATED LITERATURE

2.1 INTRODUCTION

To date, only one study has been published concerning the prevalence of back pain in chiropractors (Mior and Diakow, 1987). A review of the current literature regarding the workplace and individual factors of other work situations and of other occupations eg. dentists, physical therapists, nurses and other occupations, indicates the severity of the problem facing the worker, each in their unique situations. Each factor will be elaborated on at a later stage of the review.

2.2 PREVALENCE

Prevalence may be defined as the total number of cases of a specific disease in existence in a given population at a certain time (Anderson, 1989). Frymoyer (1991), stated that prevalence, in terms of it's use in a survey, has the advantage over incidence in that it can be determined by a single survey over a given period of time. Incidence is the rate at which a certain event occurs, as the number of new cases of a specific disease occurring during a certain period (Anderson, 1989). Therefore studying incidence requires the following of a population which is free of disease and symptoms at the start of the study and then waiting and noting how many individuals acquire symptoms of

that particular disease in a certain period of time.

Prevalence can be related to other variables in the population gathered at the same time, to determine their effect on the disease. Frymoyer (1991), emphasizes however, that this information can generate aetiological hypotheses, but that these data do not prove causality. This statement is particularly important because a specific workplace factor may be found to correlate with an increased prevalence of, for example, back pain. However, in view of the fact that this workplace factor was not physically measured by means of a common reliable instrument, one could not assume that a cause and effect relationship exists in terms of the data obtained.

Data thus obtained through the use of questionnaires only serve as theoretical guidelines which aid one in terms of the areas of greatest importance for further studies which are to be designed with improved scientific accuracy.

2.3 THE PREVALENCE AND INTENSITY OF BACK PAIN IN CHIROPRACTORS AND OTHER HEALTHCARE PROFESSIONALS.

Mior and Diakow (1987), studied a sample of Canadian chiropractors and found their overall prevalence of back pain to be the highest among any occupation yet studied, viz. 87%, with a low-back pain prevalence of 74%. It was suggested that since chiropractic practice deals largely with back pain, they were more likely to develop an " over-awareness " of back pain and therefore were more likely to report even minor occurrences of

back pain. In fact, 68% of the chiropractors reported their complaints to be slight (Mior and Diakow, 1987).

This was not found to be the case in a study which found the incidence "sic" of low-back pain in physical therapist's to be 52% (Molumphy et al., 1985). Molumphy et al. (1985), however, did not assess whether or not a physical therapist would report " slight " attacks of back pain because the intensity of back pain was not studied.

The overall prevalence of back pain amongst Canadian dentists was 57%, whilst their low back pain prevalence was 35,5%. The low back pain prevalence for Californian nurses was 52% (Harber et al., 1985).

2.4 WORKPLACE FACTORS ASSOCIATED WITH BACK PAIN

2.4.1 Static work postures

It seems to be important to change one's work posture in order to reduce the frequency of back pain. Prolonged sitting, standing and bent-over work postures in particular, seem to carry an increased risk for back pain (Magora, 1972). Kelsey and White, (1980) reported that there was an association between an increased risk of prolapsed lumbar discs and those who have had sedentary occupations for years.

The different postures of practising chiropractors have not yet been studied. However, from general observation chiropractors sit and talk to patients whilst taking the case history, then stand to perform a physical examination, take x-rays of the patient if necessary and stand and bend whilst treating the patient. The above would tend to indicate that the chiropractors' work is not mostly sedentary. This study will try to clarify these points.

Damkot et al. (1984), reported on different body postures at work in men with and without low back pain. Forty percent of those with no pain, 36% of those with moderate pain and 59% of those with severe pain were required to stretch and reach. Stretching and reaching would seem to be frequent postures adopted by chiropractors whilst treating patients, eg. lumbar roll adjustment and soft tissue massage. Furthermore, such techniques may well be more difficult for the smaller

chiropractor to perform especially on the large patient (Mior and Diakow, 1987).

2.4.2 Bending and Twisting

Frymoyer et al. (1980), reported that excessive bending, twisting and lifting were found to be significantly related to low back pain. It has been established that back pain could be triggered by lifting, but the frequency with which back pain occurred after lifting varied from 15% to 64% (Bergquist-Ullman and Larsson, 1977; Glover, 1960).

By observation, Chiropractors are frequently required to bend, twist, pull and reach around their patients during a consultation, whether they are performing a chiropractic adjustment, mobilisation of an extremity joint or during massage (Mior and Diakow,1987).

2.4.3 Repetitive work

Bergquist-Ullman and Larsson, (1977) said that repetitive work generally increased the sickness absence rates. For example, assembly line workers had a higher incidence "sic" of low back pain than did office employees.

2.4.4 Over-exertion

The National Institute For Occupational Safety and Health (NIOSH,1981) stated that : 1. Over-exertion was claimed as the cause of low back pain by over 60% of low back pain patients; 2. Approximately two-thirds of over-exertion injury claims involved lifting, and about 20% involved pushing or pulling; 3. Less than one-third of the patients with low back pain from over-exertion and with significant time loss from work eventually returned to their previous jobs.

2.4.5 Ergonomics

Schafer and Faye, (1989, pg. 35) commented that the ideal adjusting table height is 45,7 cm (18 inches) for an adjustor of average stature. They further elaborated that if the table is too high, a mechanical disadvantage to the adjustor occurs, whereas if the table is too low, overstress on the adjustor's spine results when several patients must be treated. It has been advised that the average adjusting table height for pelvic, lumbar and thoracic adjusting is the distance from the floor to the middle or superior aspect of the knee (Bergmann, Petersen and Lawrence, 1993).

Mior and Diakow (1987), deduced that adjusting table heights that caused a chiropractor to bend excessively (ie. adjusting table that is too low) or excessive reaching with the external load distant from him or her (ie. adjusting table that is too

high), should be avoided. They also said that higher adjusting tables might reduced the ability of the chiropractor to use his or her own weight to the best advantage, thus forcing him or her to rely more on arm and chest muscles to perform the adjustment.

Schultz et al. (1982), studied the myoelectric activity of loads on the lumbar spine, whilst holding weights in standing postures. Ten healthy male subjects, with no history of back pain or previous trauma, had to perform specific weight- holding tasks with different weights at 30 degrees of forward flexion (Schultz et al., 1982). The lumbar spinal compression forces, lumbar trunk muscle contraction forces and the myoelectric activity of the lumbar trunk muscle were recorded. They concluded that in order to keep the lumbar trunk muscle contraction forces and spinal compression forces small, one should keep the works loads light, the trunk upright and the arms close to the body.

According to Kirkaldy-Willis and Burton (1992), prolonged muscular stress may lead to myofascial syndromes of the postural muscles of the lower back. Furthermore, increasing muscular stress may facilitate posterior facet strain leading to posterior lumbar facet syndromes (Kirkaldy-Willis and Burton, 1992).

2.4.6 Psychological work factors

Monotony was primarily related to low back pain (Svensson and Andersson, 1983). Workers with monotonous jobs requiring little concentration had a longer sickness absence following low back

pain than did others (Bergquist-Ullman and Larsson, 1977).

2.5 INDIVIDUAL FACTORS ASSOCIATED WITH BACK PAIN

2.5.1 Age and gender

Those workers in the United States of America, consisting of farm, service, blue collar and clerical workers, who were aged between 50-64 years of age had significantly more back pain than those workers in younger or older age categories (Leigh and Sheetz, 1989). Deyo and Tsui-Wu (1987), whilst studying the second National Health and Nutrition Examination Survey in the United States of America, found that the prevalences of back pain peaked at the 55-64 year old range.

Horal, (1969) stated that low back pain seemed to be as frequent in females as in males. This pattern changed when the work situation was taken into account, 35% of women in physically heavy jobs had low back pain, as compared to 19.1% of males (Magora, 1970). Frymoyer et al.(1980), noted that women commonly reported a bending mode of onset of low back complaints, whereas men often reported acute onset of pain after lifting.

Mior and Diakow (1987), had found marked differences in the presentations of back problems between male and female chiropractors. Female chiropractors complained more of thoracic pain while male chiropractors complained more of low back pain (Mior and Diakow, 1987).

2.5.2 Anthropometry

Svensson and Andersson (1983), found the relation between anthropometric data (ie. height, weight and build-type) and low back pain to be conflicting.

Mior and Diakow (1987), hypothesized that chiropractors who were smaller in stature would be straining their upper backs and shoulders more easily during adjustive techniques. They also elaborated that with the patient in the lateral recumbent position, the smaller chiropractors may have to reach around the patient, placing excessive strain on the shoulder girdle, or the thoracic spine. The larger chiropractors have the advantage of maintaining the leverage necessary to perform an adjustment without reaching or straining.

2.5.3 Posture

Magora (1975), found that lumbar hypolordosis and scoliosis (functional) were good and reliable indicators of low back pain. Robin et al. (1982), studied 554 subjects aged between 50-84 years and did not find any significant relationship between the presence of scoliosis and having back pain.

It was found that the prevalence of leg length inequalities greater than 0,5cm was similar for all three patient groups (none, moderate and severe low back pain), but that the absolute measurements showed a higher proportion of leg length inequalities in the severe group (Pope et al. 1985).

Postural measurements of lumbar lordosis indicated little relationship between lordosis and subjective low back pain (Pope et al. 1985).

2.5.4 Physical fitness

Cady et al. (1979), studied 1652 Los Angeles firefighters and grouped them according to their fitness levels (259 high-fit, 266 low-fit and 1127 middle-fit). The firefighters were followed prospectively from 1971 to 1974 and their subsequent back injuries were noted (least fit 7,1% injured, middle fit 3,2% injured and most fit 0,8% injured). Cady et al. (1979), concluded from the study that physical fitness and conditioning had preventive effects on back injuries.

Kelsey and Ostfeld (1975), also stated that participation in some sports such as golf, bowling or baseball and insufficient physical exercise were associated with the risk for development of a prolapsed lumbar disc.

2.5.5 Spinal mobility

Magora (1975) and Pope et al. (1985), reported that spinal motions were reduced in most subjects with back pain. Although all motions were restricted, flexion was usually most severely affected.

Magora (1975), reported that together with lumbar

hypolordosis and scoliosis, limited spinal motions were found to be good, reliable indicators of low back pain, especially if they were combined. He further assumed that they may be the results of the primary lesion or part of the defense mechanism (ie. muscle spasm and guarding).

2.5.6 Psychological factors

Frmoyer et al. (1980), found that psychological factors such as anxiety, depression and stressful events were associated with episodes of low back pain. A thirteen year period retrospective study in the Netherlands, studied self-employed dentists, veterinarians, physical therapists and nurses who claimed insurance compensation for low back pain disability (Van Doorn, 1995). Claimants with psychosocial problems, such as depression and somatization, known at the beginning of the disability were at a high risk of long-term low back disability (Van Doorn, 1995).

2.5.7 Social factors

Magora (1973), reported that a high incidence of social problems existed in back patients. Their general social and economic situation was on average worse than non-low back pain sufferers and many low back pain sufferers suffered from drug and alcohol abuse. Divorces and family problems were also more frequent

(1989), found that those subjects who had never married had the highest prevalence of back pain.

2.5.8 Environmental factors

More male patients who reported having low back pain were significantly identified as being smokers and also having chronic coughs (Frymoyer et al., 1980). Leigh and Sheetz (1989), found that smokers reported having significantly more back pain than non-smokers amogst fulltime United States workers. In a study of Swedish industrial workers, coughing was speculated to increase intradiscal pressure and thus increase spinal loading and low back pain (Svensson and Anderson, 1983).

2.5.9 Types of chiropractic techniques

Pedersen (1994), surveyed chiropractors from different European countries and found that there was a large diversity of chiropractic techniques being applied. Those techniques which required the application of force were Diversified (68%), Gonstead (37%), Hole-In-One cervical (16,6%), Techniques derived from biomechnical principles (40,2%) and Toggle (22,5%) (Pedersen, 1994). Those techniques which do not require the use of force were Sacro-Occipital Technique (18%), Applied Kinesiology (19,5%) and Nimmo (43%) (Pedersen, 1994). (Note : values indicate that more than one technique would be used by

values indicate that more than one technique would be used by each chiropractor and thus values do not add up to 100%). Other less used techniques listed were Activator, Pettibon, Pierce-Stillwagon and Toftness. The sample of practitioners varied from 621 to 686 for different techniques (Pedersen, 1994).

Pedersen (1994), assumed that the gentler techniques may be preferred for acute patients and where the chiropractor is physically at a disadvantage in terms of strength or height when treating large patients.

2.6 SUMMARY

Very little has been written concerning the prevalence of back pain in chiropractors, only one study indicated that it was exceptionally high (Mior and Diakow, 1987). The conclusions drawn from data obtained in questionnaires should be treated as hypothetical because of their inherent poor reliability.

Prevalence studies are more convenient than studying incidence because prevalence may be assessed in a single survey.

It is difficult to relate the workplace to a specific worker's complaint of low back pain, and low back pain is found quite often in those with sedentary occupations. Prevalence and severity of low back pain are related to the demands on the individual in the workplace. Among the factors implicated are static work postures, frequent bending and twisting, frequent lifting, repetitive work, overexertion, poor ergonomics and psychological work factors.

prevalence of low back pain. The factors implicated are age and gender, anthropometry, posture, level of physical fitness, degree of spinal mobility, psychological factors, social factors, smoking and the types of chiropractic techniques used by chiropractors.

CHAPTER 3. THE DATA AND THEIR TREATMENT

3.1 THE DATA

The data of this study consisted of two kinds: primary and secondary data.

3.1.1 The primary data

One type of primary data was needed:
The response of the chiropractors to the questionnaire in terms of workplace factors which they are exposed to and individual factors which they possess.

3.1.2 The secondary data

This consisted of published data concerning occupational low back pain, epidemiology of back pain, workplace factors and also individual factors which may influence the prevalence of back pain in the workplace.

3.2 THE CRITERIA GOVERNING THE ADMISSIBILITY OF THE DATA

Only the data from the questionnaires completed by those who conformed to the details as set out in the delimitations were used.

3.3 RESEARCH METHODOLOGY

Before the questionnaire was sent to the chiropractors in the field, the questionnaire was initially pretested in order to test it's clarity in terms of the questions asked and for the presence of ambiguity. Pretesting included sending the questionnaire to 5 chiropractors in Durban. The data was analysed and adjustments to the questionnaire were made.

A single questionnaire was used and mailed to all 138 chiropractors throughout South Africa.

A single mailing which consisted of a questionnaire, a letter of introduction to the study and a stamped return envelope was performed. In order to facilitate the rapid answering of the questionnaire, the questions were limited to tick-off tables or brackets and yes or no brackets.

3.4 THE SPECIFIC TREATMENT OF EACH SUBPROBLEM

3.4.1 Subproblem One

The first subproblem is to assess the prevalence of back pain in chiropractors in South Africa, in terms of workplace factors which they may be exposed to, in order to establish under which circumstances workplace factors may be associated with the prevalence of back pain among chiropractors.

3.4.1.1 The data needed

The data needed for testing the first subproblem will be obtained from the questionnaires completed by the chiropractors. (See Appendix B).

Data required will include information on:

a) Static work postures;

b) bending, twisting and lifting;

c) repetitive work;

d) over-exertion;

e) ergonomics;

f) psychologic work factors.

g) number of days worked per week.

3.4.1.2 **The location of the data**

Only the responses from those chiropractors who meet the requirements as set out in the delimitations will be used.

3.4.1.3 **The means of obtaining the data**

The data needed will be obtained by means of a questionnaire posted to the chiropractors selected for the study.

3.4.1.4 **The treatment of the data**

The responses gathered will be used to construct frequency tables, other tables and/or bar-charts. If appropriate, cross-tabular and/or Log-linear analysis will be performed in order to compare different factors. The results obtained may be compared with those of Mior and Diakow's study (1987).

3.4.1.5 **The interpretation of the data**

The data will be interpreted by means of analyzing the responses to the questions through the use of frequency tables, tables and/or bar-charts. If appropriate, subsequent comparison between different workplace factors with each other may be obtained through cross-tabular and/or Log-linear analysis and then

descriptively analyzed. Furthermore, the data gathered may identify those workplace factors from which the chiropractor needs to take preventative action against any possible higher prevalence of back pain, that may be revealed by this study.

3.4.2.1 Subproblem Two

The second subproblem is to assess the prevalence of back pain in chiropractors in South Africa, in terms of individual factors which they may possess, in order to establish under which circumstances individual factors may be associated with the prevalence of back pain among chiropractors.

3.4.2.2 The data needed

The data needed for testing the second subproblem will be obtained from the questionnaires completed by the chiropractors. (See Appendix B).

Data required will include information on:

a) Age and gender;

b) anthropometry;

c) posture:

d) physical fitness;

e) spinal mobility;

f) psychological factors;

g) social factors eg. divorce rates;

h) environmental factors eg. smoking;

i) number of years in practice, part-time or full-time;

j) types of chiropractic techniques used.

3.4.2.2 The location of the data

Only the responses from those chiropractors who meet the requirements as set out in the delimitations will be used.

3.4.2.3 The means of obtaining the data

The data needed will be obtained by means of a questionnaire posted to the chiropractors selected for the study.

3.4.2.4 The treatment of the data

Every response to each question will be analyzed. The responses gathered will be used to construct frequency tables, tables and/or bar-charts. If appropriate, cross-tabular and/or Log-linear analysis may be performed in order to compare different factors. Results obtained may be compared with those of Mior and Diakow's study (1987).

3.4.2.5 The interpretation of the data

The data will be interpreted by means of analyzing the responses to the questions through the use of frequency tables, tables and/or bar-charts. If appropriate, subsequent comparisons between different individual factors with each other may be obtained through cross-tabular and/or Log-linear analysis and then descriptively analyzed. Furthermore, the data gathered may identify those individual factors which he or she may possess from which the chiropractor needs to take preventive action, against any possible higher prevalence of back pain that may be revealed by this study.

3.4.3 Subproblem Three

The third subproblem is to integrate and extrapolate the results of the chiropractors workplace factors which they may be exposed to, with the results of the chiropractors individual factors which they may possess, in order to establish under which circumstances workplace and individual factors may be associated with the prevalence of back pain among chiropractors.

3.4.3.1 The data needed

The data needed for testing the third subproblem will be obtained

from the questionnaires completed by the chiropractors. (See Appendix B).

The data obtained will be integrated and extrapolated, in order to establish under which circumstances workplace and individual factors may influence the prevalence of back pain among chiropractors.

3.4.3.2 The location of the data

Only the responses from those chiropractors who meet the requirements as set out in the delimitations will be used.

3.4.3.3 The means of obtaining the data

All the data needed will be obtained by means of a questionnaire posted to the chiropractors selected for the study.

3.4.3.4 The treatment of the data

The data concerning workplace factors which surround the chiropractor and individual factors which the chiropractor possesses will be integrated and extrapolated in order to find possible differences, similarities or interactions that may influence the prevalence of back pain among chiropractors.

If appropriate, cross-tabular and/or Log-linear analysis

will be performed in order to compare different factors.

3.4.3.5 The interpretation of the data

The data will be interpreted by means of the integration and extrapolation of different workplace and individual factors. Subsequent descriptive analyses will take place whereby hypothetical conclusions and deductions will be made.

The data will also be compared with the data in the related literature in order to determine whether or not a relationship exists between the data obtained in the questionnaire and the data in the related literature.

3.5 STATISTICS

The Log-Linear analysis procedure allows one to analyze data in a multi-way table to obtain a description of the relationships among the specific factors. Log-linear analysis demonstrates if there is a dependency between two variables and also identifies where the interaction exists eg. if contingency tables are used. In Log-linear analysis the Z-value is the critical value and the alpha level set at 5% should not change. By alpha = 5% we mean that we are willing to take a 5% chance of rejecting the so-called null hypotheses when in fact it is true. This implies an error of Type 1.

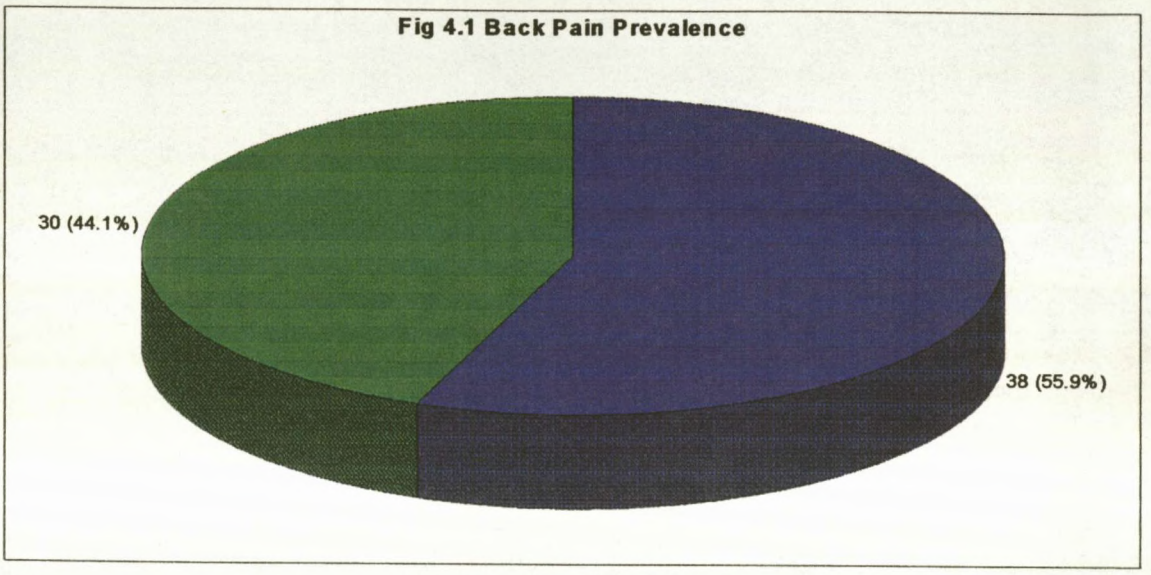
Alpha norms are as follows : 1% level of significance, as

used by the Medical research councils, usually with vast funding available; 5% level of significance, normally used by consulting statisticians; 10% level of significance, which is only used in cases where the sample size is very small.

The statistical software package used to process the data accumulated was the STATSGRAPHICS PLUS version 6.0 by Manugistics Inc.

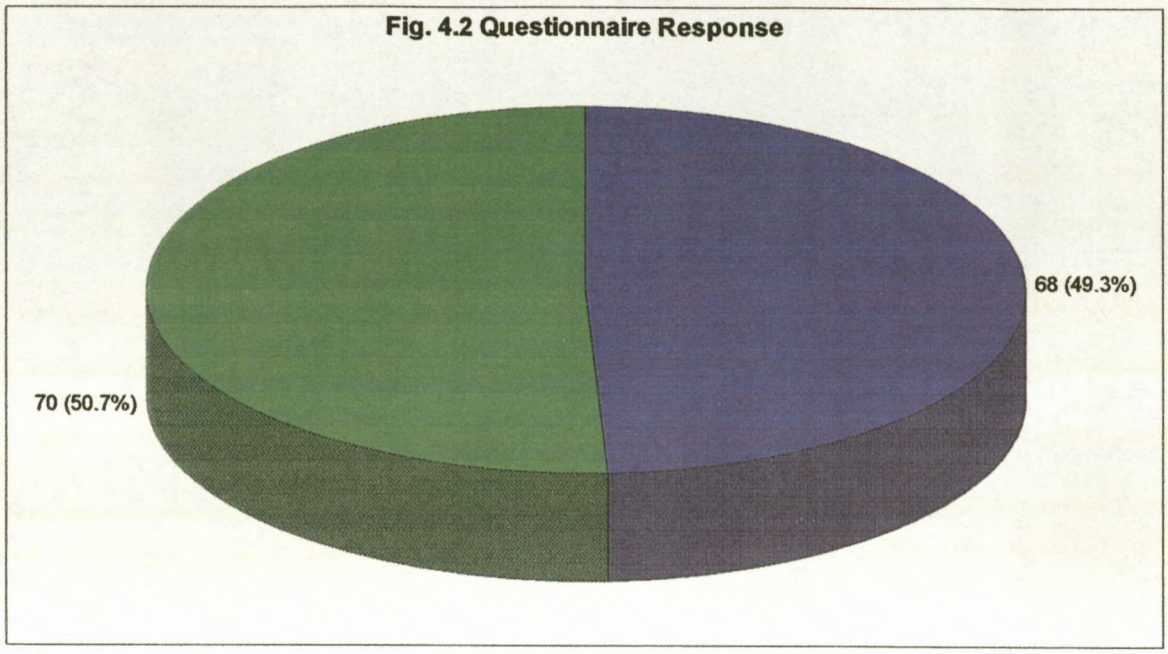
CHAPTER 4. THE RESULTS

4.1.1 THE PREVALENCE OF BACK PAIN AMONGST SOUTH AFRICAN CHIROPRACTORS -



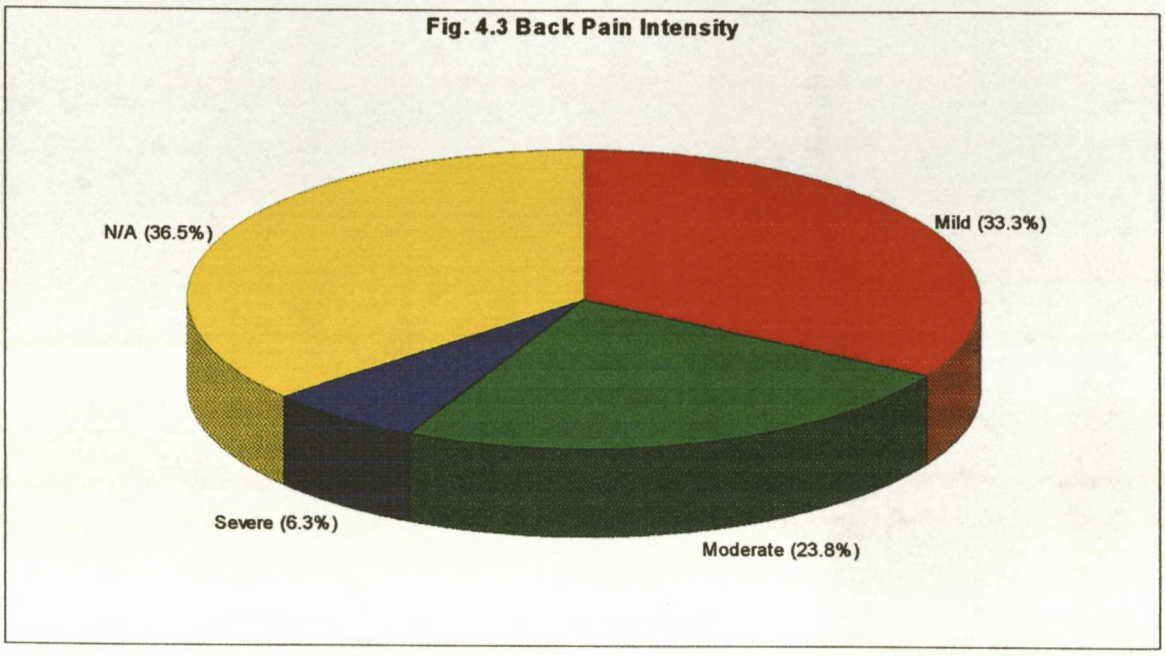
The overall prevalence of back pain amongst South African chiropractors was 55,9% (N=38). (See Fig. 4.1)

4.1.2 **THE QUESTIONNAIRE RESPONSE RATE -**



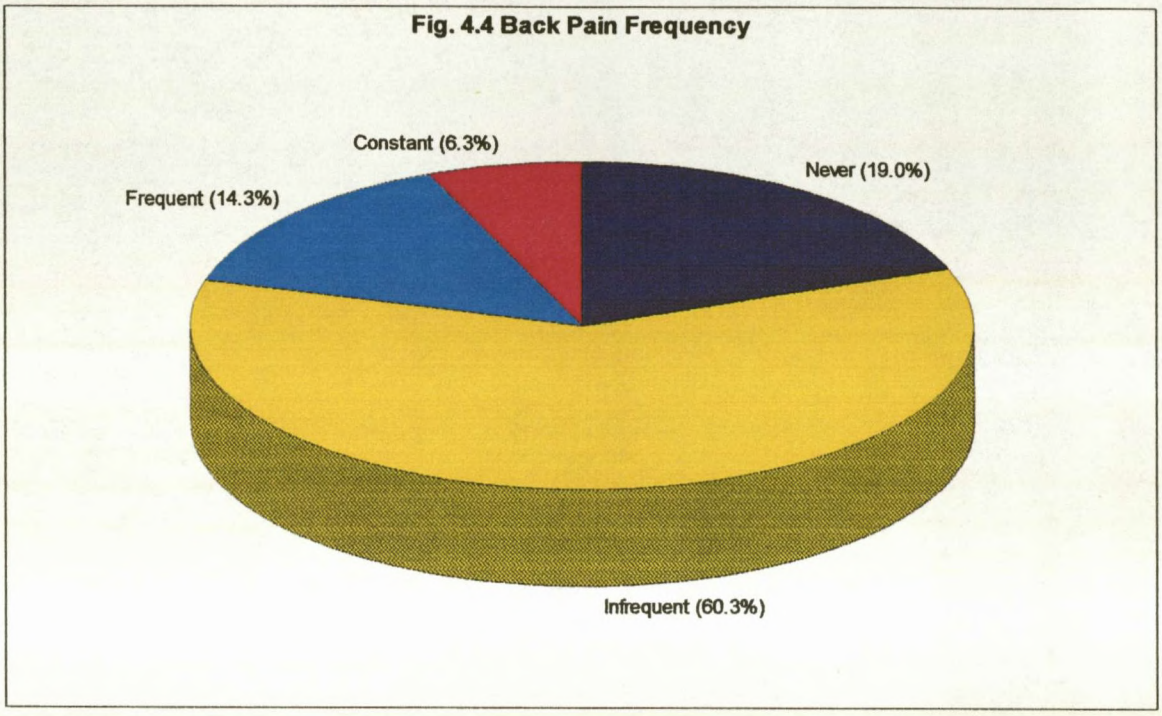
The questionnaire response rate was 49,3% (68 questionnaires were returned from 138 chiropractors). (See Fig. 4.2)

4.1.3 **THE INTENSITY OF THE RESPONDENT'S BACK PAIN -**



The majority of respondents who indicated having back pain, complained of a mild intensity of back pain (33,3%), whilst 23,8% complained of moderate back pain and 6,3% reported having severe back pain. Thirty six and a half percent did not report any pain intensity (N/A). (See Fig. 4.3)

4.1.4 THE FREQUENCY OF THE RESPONDENT'S BACK PAIN -



Of those respondents who had back pain, 60,3% of the respondents reported their back pain to be infrequent, 19,0% reported that they never had any back pain, 14,3% reported frequent occurrences of back pain and 6,3% reported having constant back pain. (See Fig. 4.4)

4.1.5 THE PAIN LOCATIONS AND PREVALENCES OF THE RESPONDENT'S BACK PAIN -

Table 4.1

PAIN LOCATION	PREVALENCE OF PAIN
HEADACHE	35 (59,3%)
NECK PAIN	48 (78,7%)
SHOULDER PAIN	33 (56,9%)
THORACIC PAIN	37 (62,7%)
LUMBAR PAIN	45 (72,6%)
SACROILIAC PAIN	35 (57,6%)
BUTTOCK PAIN	20 (35,1%)
LOWER LEG PAIN	17 (29,3%)
UPPER LEG PAIN	15 (26,8%)

In Table 4.1, the Low-back pain prevalence was 65,1% (the lumbar and sacroiliac pain average). If the pain prevalences are further analyzed, it is clear that neck pain was reported to have the highest prevalence at 78,7% with lumbar pain following next at 72,6%.

4.1.6 THE PAIN LOCATIONS AND THE PREVALENCES OF EACH TYPE OF BACK PAIN -

Table 4.2

PAIN LOCATION	NEVER	INFRE-QUENT	FREQUENT	CONST-ANT
HEADACHE	24 (40,7%)	31 (52,5%)	3 (5,1%)	1 (1,69%)
NECK PAIN	13 (21,3%)	35 (57,4%)	13 (21,3%)	NONE
SHOULDER PAIN	25 (43,1%)	22 (37,9%)	11 (19%)	NONE
THORACIC PAIN	22 (37,3%)	23 (38,9%)	12 (20,3%)	2 (3,39%)
LUMBAR PAIN	17 (27,4%)	33 (53,2%)	9 (14,5%)	3 (4,8%)
SACROILIAC PAIN	25 (42,4%)	27 (45,8%)	4 (6,8%)	3 (5,1%)
BUTTOCK PAIN	37 (64,9%)	17 (29,8%)	3 (5,3%)	NONE
LOWER LEG PAIN	41 (70,7%)	15 (25,9%)	1 (1,7%)	1 (1,7%)
UPPER LEG PAIN	41 (73,2%)	13 (23,2%)	2 (3,6%)	NONE

Notably in Table 4.2, most of the pain locations occurred infrequently and that neck pain was the most common "infrequent" and "frequent" type of pain at 57,4% and 21,3% respectively. Lumbar pain and headache were almost equal in their prevalences with lumbar pain at 53,2% and headache at 52,5% of infrequent pain but lumbar pain was reported to be a more frequent pain at 14,5% as oppposed to headaches at 5,1%.

4.1.7 THE RESPONSES THAT WERE GIVEN BY THE RESPONDENTS FOR THE CAUSES OF THEIR BACK PAIN WERE:

43 RESPONSES WERE GIVEN AND 5 CATEGORIES WERE IDENTIFIED AND ALL RESPONSES WERE IN THE RESPONDENT'S OWN WORDS -

1. WORKPLACE FACTORS :

[17 (39,5%) responses were alleged to be due to the following workplace factors]

- Work.
- Environmental stress.
- Posture and muscle overload due to working in a slightly flexed position.
- Careless moving of a short patient.
- Too many patients per day (40 per day).
- Work positions.
- Standing all day and posture.
- Posture during adjusting.
- Heavy lifting.
- Twisting movements.

2. STRUCTURAL:

[9 (20,9%) responses were alleged to be due to the following structural factors]

- Spinal degeneration.
- L5 Spondylolisthesis with nerve root entrapment.
- Lumbar stenosis and spondylosis.
- Intervertebral disc rupture at C6 and T6 spinal levels.
- Unilateral sacralization at L5/S1.

- Leg length inequality.

3. TRAUMA:

[6 (14,0%) responses were alleged to be due to the following traumatic factors]

- Kicked by a horse.
- Whiplash injury.
- Old injury causing left sacroiliac weakness.
- Fell during a 315 lbs squat at gym.
- Motor vehicle accident.

4. SPORT:

[4 (9,3%) responses were due to the following sports factors]

- Rugby.
- Sports related.
- Cycling.
- Horseriding.

5. FUNCTIONAL:

[7 (16,3%) of responses were due to the following functional factors]

- Sleeping prone.
- Muscular strain.
- L5 strain with sciatica
- Psoas referred pain syndrome
- Chiropractic subluxation.
- Poor diet and tension.
- Fatigue.

4.2 Subproblem One

4.2.1. NUMBER OF PATIENTS SEEN PER DAY AND THE PRESENCE OF BACK PAIN -

Table 4.3

NUMBER OF PATIENTS SEEN PER DAY

PRESENCE OF BACK PAIN	0-14	15-29	30-44	45-59	Row Total
Yes	8 53.3%	15 65.2%	11 45.8%	3 60.0%	37 55.2%
No	7 46.7%	8 34.8%	13 54.2%	2 40.0%	30 44.8%
Column Total	15 22.4%	23 34.3%	24 35.8%	5 7.5%	67 100.0%

Cross-tabulation between the number of patients seen per day and the presence of back pain demonstrated that 15 (22,4%) respondents saw between 0-14 patients per day and 8 (53,3%) of this group had back pain; 23 (34,3%) respondents saw between 15-29 patients per day and 15 (65,2%) of them had back pain; 24 (35,8%) respondents saw between 30-44 patients per day and 11 (45,8%) of them had back pain; 5 (7,5%) respondents saw between 45-59 patients per day and 3 (60%) of them had back pain. (See Table 4.3)

Log-linear analysis was not significant in terms of seeing more patients and having back pain.

4.2.2 THE NUMBER OF DAYS WORKED PER WEEK AND THE PRESENCE OF BACK PAIN -

Table 4.4

NUMBER OF DAYS WORKED PER WEEK

PRESENCE OF BACK PAIN	3	4	5	6	7	Row Total
Yes	0 0.0%	9 90.0%	19 50.0%	9 50.0%	1 100.0%	38 55.9%
No	1 100.0%	1 10.0%	19 50.0%	9 50.0%	0 0.0%	30 44.1%
Column Total	1 1.5%	10 14.7%	38 55.9%	18 26.5%	1 1.5%	68 100.0%

Cross-tabulation between the number of days worked per week and the presence of back pain showed that 56 (82,4%) respondents worked 5 or 6 days per week. Only 2 (3%) respondents worked unusually, one worked 3 days per week and the other 7 days per week (See Table 4.4)

Log-linear analysis was not significant with regards to the number of days worked per week and having back pain.

4.2.3 TIME TAKEN TO PERFORM TASKS SEATED OR STANDING.

Table 4.5

STATEMENT	NOT DONE	0-5 min.	5-10 min.	10-20 min.	>20 min.
1. Case history seated.	NONE	13 (20%)	**38 (58,5%)**	13 (20%)	1 (1.5%)
2. Case history standing.	**41 (71,9%)**	8 (14%)	8 (14%)	NONE	NONE
3. Perform physical exam.	3 (4,8%)	20 (31,8%)	**33 (52,4%)**	6 (9,5%)	1 (1,6%)
4. Perform adjustment seated.	**33 (55,0%)**	25 (41,7%)	1 (1,7%)	1 (1,7%)	NONE
5. Perform adjustment standing.	12 (18,8%)	**32 (50,0%)**	18 (28,1%)	2 (3,1%)	NONE
6. Perform massage seated.	**43 (78,2%)**	8 (14,6%)	4 (7,3%)	NONE	NONE
7. Perform massage standing.	17 (28,3%)	**23 (38,3%)**	18 (30,0%)	2 (3,3%)	NONE
8. Perform McManis traction standing.	**41 (70,7%)**	12 (20,7%)	5 (8,6%)	NONE	NONE
9. Perform Acupuncture seated.	**47 (87,0%)**	4 (7,4%)	1 (1,9%)	2 (4,0%)	NONE
10.Perform Acupuncture standing.	**45 (83,3%)**	7 (13,0%)	2 (3,7%)	NONE	NONE
11.Perform ischaemic compression seated.	**46 (79,3%)**	11 (19,0%)	1 (1,7%)	NONE	NONE

12.Perform ischaemic compre-ssion standing.	**34 (60,7%)**	19 (33,9%)	3 (5,4%)	NONE	NONE
13.Perform stretching techniques seated.	**42 (72,4%)**	14 (24,1%)	2 (3,5%)	NONE	NONE
14.Perform stretching techniques standing.	**26 (49,1%)**	21 (39,6%)	5 (9,4%)	1 (1,9%)	NONE
15.Perform ultrasound seated.	**44 (78,6%)**	7 (12,5%)	5 (8,9%)	NONE	NONE
16.Perform ultrasound standing.	**40 (72,7%)**	11 (20,0%)	5 (7,3%)	NONE	NONE
17.Set up electro-therapy seated.	**46 (82,1%)**	7 (12,5%)	3 (5,4%)	NONE	NONE
18.Set up electro-therapy standing.	**41 (75,9%)**	13 (24,1%)	NONE	NONE	NONE
19.Perform laser seated.	**50 (92,6%)**	3 (5,6%)	1 (1,9%)	NONE	NONE
20.Perform laser standing.	**51 (94,4%)**	3 (5,6%)	NONE	NONE	NONE

4.2.4 OTHER TASKS THAT WERE PERFORMED BY THE RESPONDENTS:

Table 4.6

Note : Those tasks that are without numbers were reported by individual respondents.

STANDING :
- Applied Kinesiology Diagnostics (AK) (7)
- Bio-Energetic Synchronisation Technique (BEST) (3)
- Sacro-Occipital Technique (SOT) (2)
- Nerve assistance
- Radiography
- Injections
- Moist Heat
- Traction
- Extremity Adjusting

SITTING :
- Bio-Energetic Synchronisation Technique (BEST) (2)
- Postural Balance
- Counselling
- Exercise Instruction
- Orthotics Evaluation
- Cryotherapy

4.2.3 CHIROPRACTIC ADJUSTING TABLE HEIGHT AND THE PRESENCE OF BACK PAIN :

Table 4.7

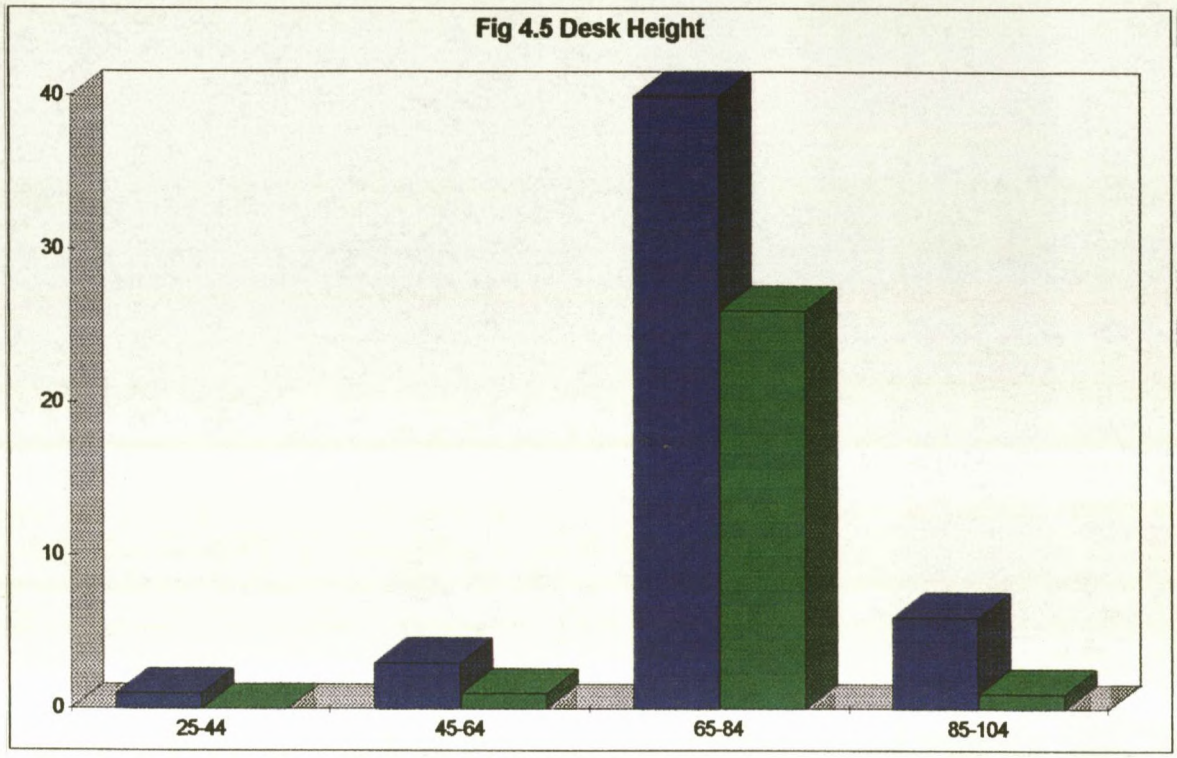
ADJUSTING TABLE HEIGHT

PRESENCE OF BACK PAIN	20-34cm	35-49cm	50-64cm	65-79cm	Row Total
Yes	1 50.0%	1 33.3%	24 61.5%	4 80.0%	4 80.0%
No	1 50.0%	2 66.7%	15 38.5%	1 20.0%	1 20.0%
Column Total	2 4.1%	3 6.1%	39 79.6%	5 10.2%	49 100.0%

Cross-tabulation between the height of the respondent's adjusting table and the presence of back pain revealed that the majority of respondents had adjusting tables measuring between 50-64 cm in height (79,6%). Five (10,2%) respondents had adjusting tables measuring between 20-49 cm. (See Table 4.7)

Log-linear analysis did not show any interaction between adjusting table height and having more back pain.

4.2.4 THE RESPONDENT'S DESK HEIGHT AND THE PRESENCE OF BACK PAIN:



BLUE = height (cm) GREEN = Back Pain

Cross-tabulation between the respondent's desk height and the presence of back pain demonstrated that 1 (2,0%) respondent reported having a desk measuring between 25-44cm high and did not have back pain; 3 (6,0%) respondents reported having desks measuring between 45-64cm high and 1 (33,3%) of the same group had back pain; 40 (80,0%) respondents reported having desks which measured between 65-84 cm high and 26 (65,0%) of them reported having back pain; 6 (12,0%) respondents reported having desks

which measured between 85-104cm high and 1 (16,7%) of them reported having back pain. (See Figure 4.5)

Log-linear analysis demonstrated that there was an interaction between those respondents who had desks measuring between 65-84 cm and having back pain (Z-value : 2.00398). Since 2.00398 > 1.96 it can therfore be concluded, at a 10% level of significance, that there were significantly more respondents with back pain that had desks measuring between 65-84 cm.

4.2.5 THE RESPONDENT'S CHAIR HEIGHT AND THE PRESENCE OF BACK PAIN :

Table 4.8

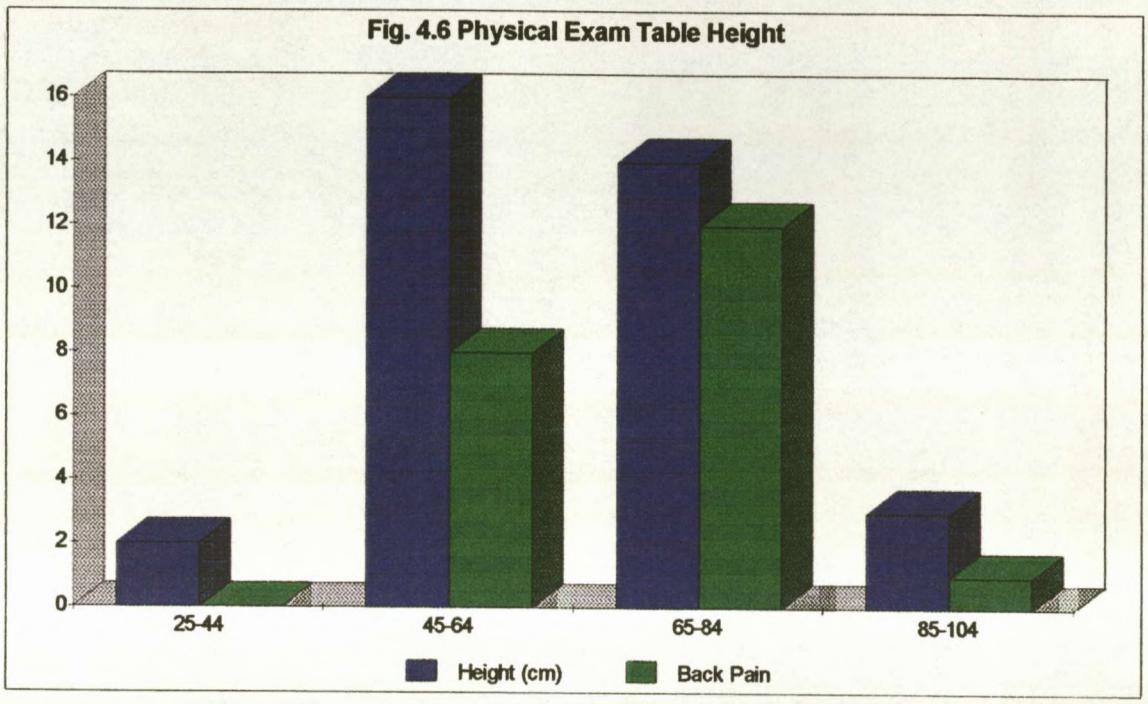
CHAIR HEIGHT

PRESENCE OF BACK PAIN	20-34cm	35-49cm	50-64cm	65-79cm	Row Total
Yes	1 33.3%	17 68.0%	7 43.8%	1 33.0%	26 55.3%
No	2 66.7%	8 32.0%	9 56.3%	2 66.7%	21 44.7%
Column Total	3 6.4%	25 53.2%	16 34.0%	3 6.4%	47 100.0%

Cross-tabulation between the respondent's chair height and the prescence of back pain showed that 3 (6,4%) respondents had very short chairs, measuring between 20-34cm. Three (6,4%) respondents had very tall chairs, measuring between 65-79cm. (See Table 4.8)

Log-linear analysis did not show any significance between chair height and back pain.

4.2.6 THE RESPONDENT'S PHYSICAL EXAMINATION TABLE HEIGHT AND THE PRESENCE OF BACK PAIN :



Cross-tabulation between the respondent's physical examination table height and the presence of back pain revealed that 2 (5,7%) respondents reported that their physical exam tables measured between 25-44cm high and none of them had back pain; 16 (45,7%) respondents reported having physical exam tables measuring between 45-64cm high and 8 (50,0%) of them had back pain; 14 (40,0%) respondents reported having physical exam tables measuring between 65-84cm high and 12 (85,7%) of them had back

pain; 3 (8,6%) respondents reported having physical exam tables measuring between 85-104cm high and 1 (33,3%) of them had back pain.

Log-linear analysis demonstrated that there was an interaction between those respondents who had physical examination tables measuring between 65-84 cm in height and having more back pain (Z-value : 2.45333). Since 2.45333 > 2.32 it can be concluded, at a 5% level of significance, that there were significantly more respondents with back pain that had physical examination tables that measured between 65-84 cm in height.

4.2.7 THE RESPONDENT'S ELECTRIC ELEVATION ADJUSTING TABLE'S MAXIMUM HEIGHT AND THE PRESENCE OF BACK PAIN :

Table 4.9

ELECTRIC TABLE MAXIMUM HEIGHT

PRESENCE OF BACK PAIN	50-84cm	85-119 cm	120-154 cm	155-189 cm	Row Total
Yes	5 62.5%	2 66.7%	1 100.0%	0 0.0%	8 61.5%
No	3 37.5%	1 33.3%	0 0.0%	1 100.0%	5 38.5%
Column Total	8 61.54%	3 23.1%	1 7.7%	1 7.7%	13 100.0%

Cross-tabulation between the respondent's elevation table's highest height and the presence of back pain revealed that only 13 respondents possessed electric elevation tables. The data did not distinguish which type of electric table the respondent's possessed, eg. vertically adjustable or Hi-Lo tables. The respondent who reported having a table that reached a height of between 155-189cm would most probably have been a Hi-Lo table. (See Table 4.9)

Log-linear analysis was not significant with regards to the elevation table's maximum height and having back pain.

4.2.8 THE RESPONDENT'S ELECTRIC ELEVATION TABLE'S MINIMUM HEIGHT AND THE PRESENCE OF BACK PAIN :

Table 4.10

ELECTRIC TABLE MINIMUM HEIGHT

PRESENCE OF BACK PAIN	30-44cm	45-59cm	60-74cm	75-89cm	Row Total
Yes	2 100.0%	3 42.9%	2 100.0%	1 100.0%	8 66.7%
No	0 0.0%	4 57.1%	0 0.0%	0 0.0%	4 33.3%
Column Total	2 16.7%	7 58.3%	2 16.7%	1 8.3%	12 100.0%

Cross-tabulation between the respondent's elevation adjusting table's lowest height and the presence of back pain showed that even at it's lowest height, one respondent's table measured between 75-89cm. (See Table 4.10)

Log-linear analysis was not significant in terms of the elevation table's lowest height and having back pain.

4.2.9 THE RESPONDENT'S KNEELING CHAIR HEIGHT AND THE PRESENCE OF BACK PAIN :

Table 4.11

KNEELING CHAIR HEIGHT

PRESENCE OF BACK PAIN	45cm	52cm	54cm	Row Total
Yes	2 100.0%	0 0.0%	1 100.0%	3 75.0%
No	0 0.0%	1 100.0%	0 0.0%	1 25.0%
Column Total	2 50.0%	1 25.0%	1 25.0%	4 100.0%

Cross-tabulation between the respondent's kneeling chair and the prescence of back pain demonstrated that only 4 respondents had kneeling chairs. Interestingly, 75% of them had back pain. (See Table 4.11)

There was no significance between kneeling chair heights and having back pain.

4.2.10 RESPONDENT'S EXPERIENCE WITH REGARDS TO THE WORKPLACE AND HAVING BACK PAIN.

Table 4.12

STATE-MENTS	NEVER	INFRE-QUENT	FREQUENT	CONSTANT	TOTAL % WITH BACK PAIN.
1. Sit-ting at my desk causes back pain.	52 (80,0%)	9 (13,9%)	2 (3,1%)	2 (3,1%)	13 (20,0%)
2. Sit-ting whilst perfor-ming massage causes back pain.	55 (91,7%)	3 (5,0%)	1 (1,7%)	1 (1,7%)	5 (8,3%)
3.Stan-ding whilst perfor-ming massage causes back pain.	37 (58,7%)	19 (30,2%)	6 (9,5%)	1 (1,6%)	26 (41,3%)
4.Sit-ting whilst perfor-ming adjust-ments causes back pain.	57 (86,4%)	6 (9,1%)	2 (3,0%)	1 (1,5%)	9 (13,6%)

5.Standing whilst performing adjustments causes back pain.	**34 (51,5%)**	27 (40,9%)	4 (6,1%)	1 (1,5%)	32 (48,5%)
6.Sitting during motion palpation causes back pain.	**53 (82,8%)**	8 (12,5%)	2 (3,1%)	1 (1,6%)	11 (17,2%)
7.Standing during motion palpation causes back pain.	**41 (66,1%)**	19 (30,7%)	1 (1,6%)	1 (1,6%)	21 (33,9%)
8.Frequent bending and twisting over a patient whilst applying an adjustment causes back pain.	25 (38,5%)	32 (49,2%)	6 (9,2%)	2 (3,1%)	**40 (61,5%)**

9.Frequent bending and twisting over a patient whilst performing massage causes back pain.	30 (48,4%)	24 (38,7%)	6 (9,7%)	2 (3,2%)	**32 (51,6%)**
10.Frequent lifting of patients into position pre-adjustment causes back pain.	**37 (57,8%)**	15 (23,4%)	9 (14,1%)	3 (4,7%)	27 (42,2%)
11.Applying adjustments, eg.Lumbar roll, cause back pain.	**42 (64,6%)**	18 (27,7%)	3 (4,6%)	2 (3,1%)	23 (35,4%)
12.Seeing too many patients per day causes back pain.	**33 (50,8%)**	20 (30,8%)	8 (12,3%)	4 (6,2%)	32 (49,2%)

13.Working too many days per week causes back pain.	38 (58,5%)	16 (24,6%)	7 (10,8%)	4 (6,2%)	27 (41,5%)
14.My adjusting table is too low for my height and causes back pain when I have to perform adjustments.	59 (90,8%)	5 (7,7%)	1 (1,5%)	NONE	6 (9,2%)
15.My adjusting table is too high for my height and causes back pain when I have to perform adjustments.	63 (96,9%)	2 (3,1%)	NONE	NONE	2 (3,1%)

16.When I have to adjust patients who are larger than myself, I get back pain.	**41 (63,1%)**	17 (26,2%)	5 (7,7%)	2 (3,1%)	24 (36,9%)
17.The heights of my desk and chair are not complementary and cause back pain when I sit.	**60 (92,3%)**	3 (4,6%)	1 (1,5%)	1 (1,5%)	5 (7,7%)
18.Sitting during static palpation causes back pain.	**59 (95,2%)**	2 (3,2%)	1 (1,6%)	NONE	3 (4,8%)
19.Standing during static palpation causes back pain.	**51 (79,7%)**	10 (15,6%)	2 (3,1%)	1 (1,6%)	13 (20,3%)

4.2.11 DEGREE OF WORK SATISFACTION AND THE PRESENCE OF BACK PAIN -

Table 4.13

DEGREE OF SATISFACTION

PRESENCE OF BACK PAIN	A	B	C	Row Total
Yes	27 50.9%	9 69.2%	2 100.0%	38 55.9%
No	26 49.1%	4 30.8%	0 0.0%	30 44.1%
Column Total	53 77.9%	13 19.1%	2 2.9%	68 100.0%

Key : **A - Great Satisfaction**
B - Satisfaction
C - Neither Satisfaction nor Disatisfaction

Cross-tabulation between satisfaction levels in practice and the presence of back pain revealed that 66 (97%) respondents had either great satisfaction or satisfaction in practising chiropractic. (See Table 4.13) None of the respondents expressed any "Dissatisfaction" or "Great Dissatisfaction" in practising chiropractic.

There was no signficant interaction between job satisfaction and having back pain.

4.2.12 NUMBER OF DAYS ABSENT FROM PRACTICE DUE TO BACK PAIN IN 1993 AND THE PRESENCE OF BACK PAIN -

Table 4.14

NUMBER OF DAYS ABSENT

PRESENCE OF BACK PAIN	0	1-4	5-9	Row Total
Yes	34 53.1%	2 100.0%	2 100.0%	38 55.9%
No	30 46.9%	0 0.0%	0 0.0%	30 44.1%
Column Total	64 94.1%	2 2.9%	2 2.9%	68 100.0%

Cross-tabulation between the number of days that the respondents were absent from practice in 1993 due to back pain and the presence of back pain showed that 64 (94,1%) respondents were not absent from practice due to back pain in 1993 and 34 (53,1%) of the same group had back pain. Two (2,9%) respondents were absent from practice for between 1 and 4 days. Two (2,9%) repondents were absent from practice for between 5 and 9 days. (See Table 4.14)

Log-linear analysis showed no significance between absenteeism due to back pain and having back pain.

4.3 Subproblem Two

4.3.1 THE AGE OF THE RESPONDENTS AND THE PRESENCE OF BACK PAIN -

Table 4.15

AGE OF RESPONDENTS

PRESENCE OF BACK PAIN	25-39 years	40-54 years	55-69 years	70-84 years	Row Total
Yes	10 55.6%	16 53.3%	9 64.3%	3 60.0%	38 56.7%
No	8 44.4%	14 46.7%	5 35.7%	2 40.0%	29 43.3%
Column Total	18 26.9%	30 44.8%	14 20.9%	5 7.5%	67 100.0%

Cross-tabulation between the age of the respondent and the presence of back pain revealed that most respondents (44,8%) were aged between 40-54 years. Surprisingly there were still 5 (7,5%) respondents aged between 70-84 years who were still practising. (See Table 4.15)

Log-linear analysis was not significant in terms of age and back pain.

4.3.2 THE GENDER OF THE RESPONDENTS AND THE PRESENCE OF BACK PAIN –

Table 4.16

GENDER OF RESPONDENTS

PRESENCE OF BACK PAIN	MALE	FEMALE	Row Total
YES	33 53.2%	4 80.0%	37 55.2%
NO	29 46.8%	1 20.0%	30 44.8%
Column Total	62 92.5%	5 7.5%	67 100.0%

Cross-tabulation between the gender of the respondents and the presence of back pain showed that 62 (92,54%) respondents were male and 5 (7,46%) were female. 33 (53,23%) male respondents and 4 (80%) female respondents had back pain. (See Table. 4.16)

Log-linear analysis was not significant with regards to gender and having back pain.

4.3.3 THE WEIGHTS OF RESPONDENTS IN KILOGRAMS AND THE PRESENCE OF BACK PAIN -

Table 4.17

WEIGHT OF RESPONDENTS

PRESENCE OF BACK PAIN	40-54 kg	55-69 kg	70-84 kg	85-99 kg	>100 kg	Row Total
Yes	1 50.0%	5 55.6%	22 55.0%	8 57.1%	2 66.7%	38 55.9%
No	1 50.0%	4 44.3%	18 45.0%	6 42.9	1 33.3%	30 44.1%
Column Total	2 2.9%	9 13.2%	40 58.8%	14 20.6%	3 4.4%	68 100.0%

Cross-tabulation between the weights of the respondents and the prescence of back pain demonstrated that most respondents, 40 (58,8%), weighed between 70-84 kg and 22 (55%) of them had back pain. (See Table 4.17)

Log-linear analysis between body weight and back pain was not significant.

4.3.4 THE HEIGHTS OF THE RESPONDENTS AND THE PRESENCE OF BACK PAIN -

Table 4.18

HEIGHT OF RESPONDENTS

PRESENCE OF BACK PAIN	152-159,5 cm	164,5-169,5 cm	172-180 cm	182,5-190 cm	>192,5 cm	Row Total
Yes	2 66.7%	6 54.5%	19 54.3%	10 58.8%	0 0.0%	37 55.2%
No	1 33.3%	5 45.5%	16 45.7%	7 41.2%	1 100.0%	30 44.8%
Column Total	3 4.5%	11 16.4%	35 52.2%	17 25.4%	1 1.5%	67 100.0%

Cross-tabulation between the heights of the respondents and the presence of back pain revealed that the majority of respondents, 35 (52,2%), measured between 172-180cm in height and 54,3% of them had back pain. (See Table 4.18)

There was no significance between height and back pain.

4.3.5 THE KNEE HEIGHTS OF RESPONDENTS AND THE PRESENCE OF BACK PAIN -

Table 4.19

KNEE HEIGHTS OF RESPONDENTS

PRESENCE OF BACK PAIN	35-39 cm	40-44 cm	45-49 cm	50-54 cm	55-59 cm	Row Total
Yes	1 100.0%	2 66.7%	4 50.0%	4 44.4%	4 44.4%	15 50.0%
No	0 0.0%	1 33.3%	4 50.0%	5 55.6%	5 55.6%	15 50.0%
Column Total	1 3.2%	3 9.7%	8 25.8%	9 29.0%	9 29.0%	30 100.0%

Cross-tabulation between the knee height of the respondents and the presence of back pain showed that 1 (3,2%) respondent reported having a knee height of between 35-39cm and also reported having back pain; 3 (9,7%) respondents reported having knee heights of between 40-44cm and 2 (66,7%) respondents of the same group reported having back pain; 8 (25,8%) respondents reported having knee heights of between 45-49cm and 4 (50,0%) respondents of the same group reported having back pain; 9 (29,0%) respondents reported having knee heights of between 50-54cm and 4 (44,4%) of the same group reported having back pain; 9 (29,0%) respondents reported having knee heights of between 55-59cm and 4 (44,4%) of them reported having back pain. (See Table 4.19). Log-linear analysis was not significant between knee height and having back pain.

4.3.6 THE BUILD CLASSIFICATION OF THE RESPONDENT AND THE PRESENCE OF BACK PAIN -

Table 4.20

BUILD-TYPE OF RESPONDENT

PRESENCE OF BACK PAIN.	ECTOMORPH	MESOMORPH	ENDOMORPH	Row Total
Yes	3 50.0%	28 59.6%	7 46.7%	38 55.9%
No	3 50.0%	19 40.4%	8 53.3%	30 44.1%
Column Total	6 8.8%	47 69.1%	15 22.1%	68 100.0%

Cross-tabulation between the build-types of the respondents and the prescence of back pain showed that most respondents, 45(69,1%), reported to be mesomorphic in build and 59,6% had back pain. (See Table 4.20)

Log-linear analysis was not significant in terms of back pain and build-type.

4.3.7. THE PRESENCE OF A SPINAL DEFORMITY

Table 4.21

STATEMENT	YES	NO
1. Do you have a scoliosis?	4(12,1%), 4(100%) had back pain	58(87,9%), 28(48,3%) had back pain
2. Do you have a thoracic kyphosis?	3(5,1%), 2(66,7%) had back pain	56(94,9%), 29(51,8%) had back pain
3. Do you have a lumbar Hypo-lordosis?	3(4,8%), 2(66,7%) had back pain	60(95,2%), 31(51,7%) had back pain
4. Do you have a lumbar Hyperlordosis?	4(6,4%), 2(50%) had back pain	59(93,7%), 31(50,9%) had back pain
5. Do you have a leg length inequality.	16(25,8%), 15(93,8%) had back pain	46(74,2%), 20(43,5%) had back pain

4.3.8 TYPES OF EXERCISE PERFORMED -

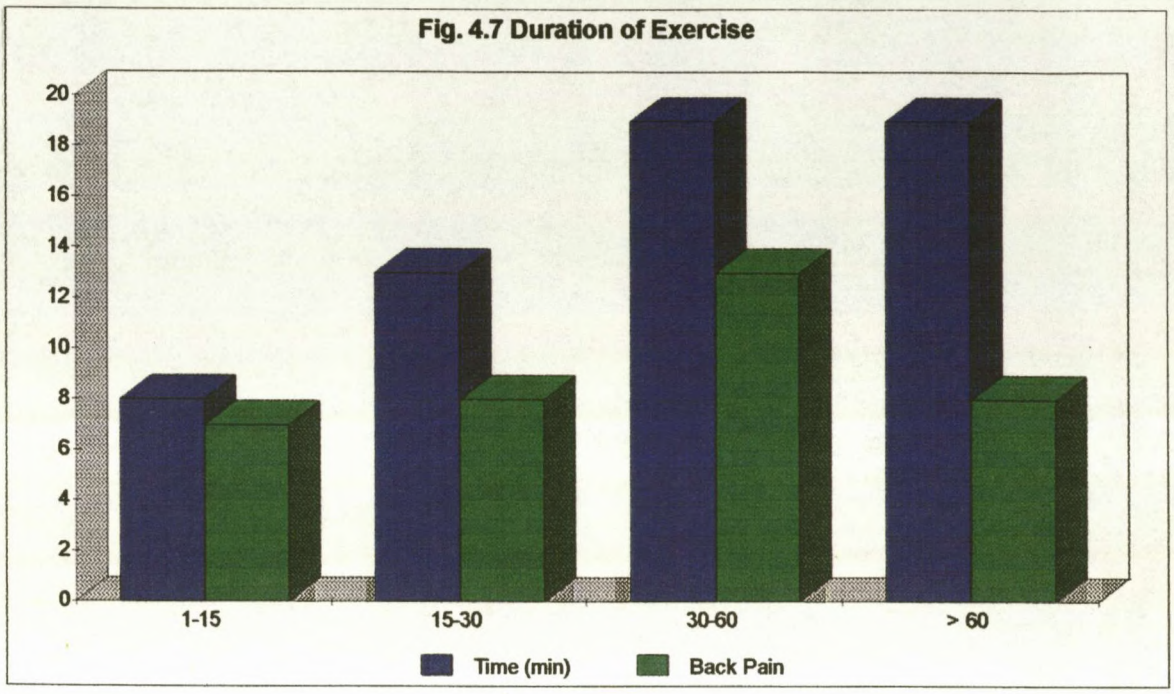
22 DIFFERENT EXERCISES, SPORTS OR ACTIVITIES WERE IDENTIFIED : THOSE WITHOUT FIGURES ARE RELATED TO SINGLE RESPONDENTS.

1. JOGGING	7. TENNIS	13.BOWLING
2. SWIMMING	8. GOLF	14.PLAYING WITHKIDS
3. CYCLING	9. YOGA	15.SAILING
4. WINDSURFING	10.HORSERIDING	16.PADDLING
5. WEIGHTLIFTING	11.SCUBADIVING	17.HIKING
6. AEROBICS	12.ROCKCLIMBING	18.STRETCHING

19. GARDENING 4(6,2%)
20. WALKING 9(13,9%)
21. CIRCUIT TRAINING
22. AQUA-AEROBICS

These exercises were not cross-tabulated with the prevalence of back pain for two reasons, which made cross-tabulation impossible. Firstly, the question regarding what type of exercise was done by the respondent did not specify only one main sport (See Appendix B, question 3.5). Secondly, many respondents listed more than one sport, often upto five or six sports. For future studies, it is advisable that question 3.5 be changed and that only one main sport is stipulated, so that cross tabulation and Log-linear analysis may be applied.

4.3.9 THE LENGTH OF TIME SPENT EXERCISING AND THE PRESENCE OF BACK PAIN -



Cross-tabulation between the length of exercise sessions performed by the respondents and the presence of back pain showed that 8 (13,6%) respondents exercised between 1-15 minutes per session and 7 (87,5%) from the same group had back pain. Thirteen (22%) respondents exercised between 15-30 minutes per session and 8 (61,5%) from the same group had back pain. Nineteen (32,2%) respondents exercised between 30-60 minutes per session and 13 (68,4%) from the same group had back pain. Nineteen (32,2%) respondents exercised for 60 minutes or longer per session and 8 (42,1%) from the same group had back pain. (See Fig. 4.7)

Log-linear analysis demonstrated that there was an interaction between those respondents who exercised for 60 min. or more per exercise session and not having back pain (Z-value : 2.16794). Since 2.16794 > 1.96 it can be concluded, at a 10% level of significance, that there were significantly more respondents without back pain that exercised for 60 min. or longer per exercise session. (See Figure 4.7)

4.3.10 THE NUMBER OF EXERCISE SESSIONS PER WEEK AND THE PRESENCE OF BACK PAIN -

Table 4.22

NUMBER OF EXERCISE SESSIONS PER WEEK

PRESENCE OF BACK PAIN.	Once/week	Twice/week	Three times/ week	> Five times/ week	Row Total
Yes	2 67.7%	8 57.1%	15 60.0%	11 64.7%	36 61.0%
No	1 33.3%	6 42.9%	10 30.0%	6 35.3%	23 39.0%
Column Total	3 5.1%	14 23.7%	25 42.4%	17 28.8%	59 100.0%

Cross-tabulation between the number of exercise sessions per week and the prescence of back pain showed that 3 (5,1%) respondents exercised once per week and 2 (66,7%) from the same group had back pain; 14 (23,7%) respondents exercised twice per week and 8 (57,1%) from the same group had back pain; 25 (42,4%) respondents exercised three times per week and 15 (60,0%) from the same group had back pain; 17 (28,8%) respondents exercised five times per week or more and 11 (64,7%) from the same group had back pain. (See Table 4.22)

Log-linear analysis was not significant in terms of the number of exercise sessions per week and having back pain.

4.3.11 THE DEGREE OF SPINAL MOBILITY AND THE PRESENCE OF BACK PAIN -

Table 4.23

DEGREE OF SPINAL MOBILITY

PRESENCE OF BACK PAIN	Very Mobile	Mobile	Not Mobile nor Stiff	Stiff	Very Stiff	Row Total
Yes	6 37.5%	11 55.0%	13 56.5%	7 100.0%	1 50.0%	38 55.9%
No	10 62.5%	9 45.0%	10 43.5%	0 0.0%	1 50.0%	30 44.1%
Column Total	16 23.5%	20 29.4%	23 33.8%	7 10.3%	2 2.9%	68 100%

Cross-tabulation between the respondent's subjective assessment of the degree of his or her spinal mobility and the presence of the back pain demonstrated that 9 (13,2%) respondents reported having either stiff or very stiff spines. (See Table 4.22)

Log-linear analysis was not significant with regards to spinal mobility and having back pain.

4.3.12 THE NUMBER OF MARRIAGES AND THE PRESENCE OF BACK PAIN-

Table 4.24

NUMBER OF MARRIAGES

PRESENCE OF BACK PAIN	0x	1x	2x	3x	Row Total
Yes	18 62.1%	17 50.0%	2 50.0%	1 100.0%	38 55.9%
No	11 37.9%	17 50.0%	2 50.0%	0 0.0%	30 44.1%
Column Total	29 42.6%	34 50.0%	4 5.9%	1 1.5%	68 100.0%

Cross-tabulation between the number of marriages and the prescence of back pain revealed that 29 (42,7%) respondents reported that they were single and 18 (62,1%) of them had also reported having back pain. The majority of respondents, 34 (50,0%), reported having married once and 17 (50,0%) of them had back pain. Only one respondent had married three times (See table 4.24).

Due to the fact that there is no direct cause and effect relationship between number of marriages and back pain, the researcher was hesitant to attempt Log-linear analyses.

4.3.13 THE NUMBER OF DIVORCES AND THE PRESENCE OF BACK PAIN -

Table 4.25

NUMBER OF DIVORCES

PRESENCE OF BACK PAIN	0x	1x	2x	Row Total
Yes	32 59.3%	2 33.3%	1 100.0%	35 57.4%
No	22 40.7%	4 66.7%	0 0.0%	26 42.6%
Column Total	54 88.5%	6 9.8%	1 1.6%	61 100.0%

Cross-tabulation between the number of divorces and the prescence of back pain revealed that 54 (88,5%) respondents reported that they had never been divorced and 32 (59,3%) of them reported having back pain. Only one (1,6%) respondent reported having divorced twice and also had back pain. (See Table 4.25)

Log-linear analysis was not attempted because of the lack of a direct link between divorce rates and having back pain.

4.3.14 THE NUMBER OF CLOSE FRIENDS AND THE PRESENCE OF BACK PAIN -

Table 4.26

NUMBER OF CLOSE FRIENDS

PRESENCE OF BACK PAIN	0	1-3	4-6	7-9	>10	Row Total
Yes	1 50.0%	8 61.5%	13 56.5%	10 90.9%	5 31.3%	37 56.9%
No	1 50.0%	5 38.5%	10 43.5%	1 9.1%	11 68.7%	28 43.1%
Column Total	2 3.1%	13 20.0%	23 35.4%	11 16.9%	16 24.6%	65 100.0%

Cross-tabulation between the number of close friends that each respondent had and the prescence of back pain showed that only 2 (3.1%) respondents reported that they did not have any close friends and 1 (50,0%) of them reported having back pain. (See Table 4.26)

Log-linear analysis was not attempted due to the lack of a direct link between the number of close friends and having back pain.

4.3.15 THE RESPONDENT'S FUTURE PROSPECTS IN TEN YEARS TIME-

15 RESPONSES WERE GIVEN BY THE RESPONDENTS : THOSE WITHOUT FIGURES ARE SINGULAR.

1.	CHIROPRACTIC	32(50,79%)
2.	WHO KNOWS?	6(9,52%)
3.	RETIRED/SEMIRETIRED	7(11,11%)
4.	PUSHING UP DAISIES	4(6,35%)
5.	LIVING IN THE COUNTRY	2(3,17%)
6.	HAVING FUN	
7.	RAISING KIDS	
8.	PLAYING HARD	
9.	MINISTERING	
10.	LIVING	
11.	SAILING	
12.	GOLF	
13.	WRITING AND PAINTING	
14.	TRAVELLING	
15	PRAISING GOD IN HIS KINGDOM	

The above responses were also not cross tabulated, for the same reasons as applied to question 3.5 (See Appendix B). Most respondents included more than one answer and therefore cross tabulation was not possible. In future, question 3.12 should be amended and only one answer should be stipulated in order for cross tabulation and Log-linear analysis to be properly applied. All the responses were in the respondent's own words.

4.3.16 THE RESPONDENT'S SOCIAL STANDING AND THE PRESENCE OF BACK PAIN -

Table 4.27

SOCIAL STANDING OF RESPONDENTS

PRESENCE OF BACK PAIN	HIGHLY RESPECTED	RESPECTED	NOT RESPECTED NOR SHUNNED	Row Total
Yes	15 48.4%	15 57.7%	7 87.5%	37 56.9%
No	16 51.6%	11 42.3%	1 12.5%	28 43.1%
Column Total	31 47.7%	26 40.0%	8 12.3%	65 100.0%

Cross-tabulation between the social standing of each respondent and the prescence of back pain showed that 31 (47,7%) respondents reported being highly respected in their communities and 15 (48,4%) from this group also reported having back pain; 26 (40,0%) respondents reported being respected in their communities and 15 (57,7%) from this group also reported having back pain; 8 (12,3%) respondents reported not being respected nor shunned in their communities and 7 (87,5%) from this group reported having back pain. (See Table 4.27) None of the respondents reported being shunned nor grossly shunned in their communities.

Log-linear analysis was not significant because there is no direct relationship between social standing and having back pain.

4.3.17 THE RESPONDENT'S FAMILY AND/OR HOME SITUATION AND THE PRESENCE OF BACK PAIN -

Table 4.28

FAMILY AND/OR HOME SITUATION

PRESENCE OF BACK PAIN	VERY HAPPY	HAPPY	NEITHER HAPPY NOR UNHAPPY	UNHAPPY	Row Total
Yes	21 55.3%	13 59.1%	2 50.0%	1 100.0%	37 56.9%
No	17 44.7%	9 40.9%	2 50.0%	0 0.0%	28 43.1%
Column Total	38 58.5%	22 33.8%	4 6.2%	1 1.5%	65 100.0%

Cross-tabulation between the family and/or home situation of each respondent and the presence of back pain showed that 38 (59,5%) respondents reported that their home or family situations were very happy and 21 (55,3%) from the same group reported having back pain; 22 (33,9%) respondents reported to be happy in their home situations and 13 (59,1%) of them reported having back pain; 4 (6,2%) respondents reported being neither happy nor unhappy in their home or family situations and 2 (50,0%) of them reported having back pain; 1 (1,5%) respondent reported being unhappy in his home or family situation and also had back pain. (See Table 4.28) None of the respondents reported being very unhappy in their home or family situations.

Log-linear analysis was not attempted due to a lack of direct cause and effect relationship between family life and back pain.

4.3.18 THE RESPONDENT'S GROSS SALARY/TURNOVER PER MONTH AND THE PRESENCE OF BACK PAIN -

Table 4.29

GROSS SALARY OR TURNOVER

PRESENCE OF BACK PAIN	R1000-8999	R9000-16999	R17000-24999	R25000-44999	> R50000	Row Total
Yes	6 60.0%	10 45.5%	6 54.5%	9 75.0%	1 100.0%	32 57.1%
No	4 40.0%	12 54.5%	5 45.5%	3 25.0%	0 0.0%	24 42.9%
Column Total	10 17.8%	22 38.3%	11 19.64%	12 21.43%	1 1.8%	56 100%

Cross-tabulation between the gross salary/turnover of each respondent and the presence of back pain revealed that 10 (17,9%) respondents reported earning gross salaries of between R1000-R8999 per month and 6 (60,0%) of the same group reported having back pain; 22 (39,3%) respondents reported earning gross salaries of between R9000-R16999 per month and 10 (45,5%) reported having back pain; 11 (19,6%) respondents reported earning between R17000-R24999 per month and 6 (54,6%) reported having back pain; 12 (21,4%) respondents reported earning between R25000-R44999 per month and 9 (75,0%) reported having back pain; 1 (1,8%) respondent reported earning R50000 or more per month and also reported having back pain.(See table 4.29)

Log-linear analysis was not analysed because there is no direct relationship between income earned and having back pain.

4.3.19 THE RESPONDENT'S CIGARETTE SMOKING AND THE PRESENCE OF BACK PAIN -

Table 4.30

NUMBER OF SMOKERS

PRESENCE OF BACK PAIN	SMOKERS	NON-SMOKERS	Row Total
Yes	6 60.0%	31 54.4%	37 55.2%
No	4 40.0%	26 45.6%	30 44.8%
Column Total	10 14.9%	57 85.1%	57 100.0%

Cross-tabulation between the number of respondents who smoked cigarettes and the prescence of back pain demonstrated that 10 (14,9%) respondents smoked cigarettes and 6 (60,0%) of this group had back pain. 57 (85,1%) respondents did not smoke cigarettes and 31 (54,4%) of them had back pain.(See Table 4.30)

Log-linear analysis was not analysed due to the lack of a cause and effect relationship between smoking and back pain.

Table 4.31

NUMBER OF SMOKING SESSIONS PER DAY

PRESENCE OF BACK PAIN	1x	2-5x	6-10x	11-15x	>20	Row Total
Yes	5 71.4%	2 50.0%	1 100.0%	1 100.0%	1 100.0%	10 66.7%
No	2 28.6%	2 50.0%	0 0.0%	0 0.0%	0 0.0%	5 33.3%
Column Total	7 46.7%	4 26.7%	1 6.7%	1 6.7%	1 6.7%	15 100%

Seven (46,7%) respondents smoked once per day and 5 (71,4%) of this group had back pain; 4 (26,7%) respondents smoked between 2-5 times per day and 2 (50,0%) of them had back pain; 1 (6,7%) respondent smoked between 6-10 times per day and also reported having back pain; 1 (6,7%) respondent smoked between 11-15 times per day and also reported having back pain; 2 (13,3%) respondents reported smoking 20 times or more and 1 (50,0%) also reported having back pain.(See Table 4.31)

Log-linear analysis was not attempted. The number of smoking sessions was meant to indicate the number of cigarettes smoked per day. In future question 3.17 should be changed to the number of cigarettes smoked per day. (See Appendix B)

4.3.20 THE RESPONDENT'S ALCOHOL DRINKING AND THE PRESENCE OF BACK PAIN -

Table 4.32

NUMBER OF ALCOHOL CONSUMERS

PRESENCE OF BACK PAIN	Yes	No	Row Total
Yes	29 54.7%	8 61.5%	37 56.1%
No	24 45.3%	5 38.5%	29 43.9%
Column Total	53 80.3%	13 19.7%	66 100.0%

Cross-tabulation between the respondents who drank alcohol and the prescence of back pain showed that 53 (80,3%) respondents drank alcohol and 29 (54,7%) of them had back pain.
13 (19,7%) respondents did not drink alcohol and 8 (62,5%) of them had back pain.(See Table 4.32)

Log-linear analysis was not attempted.

Table 4.33

NUMBER OF BEERS CONSUMED PER DAY

PRESENCE OF BACK PAIN	1	2-3	4-5	Row Total
Yes	15 57.7%	5 83.3%	0 0.0%	20 60.6%
No	11 42.3%	1 16.7%	1 100.0%	13 39.4%
Column Total	26 78.8	6 18.2%	1 3.0%	33 100.0%

Twenty six (78,8%) reported to drink one beer per day and 15 (57,7%) of them had back pain; 6 (18,2%) respondents reported

drinking between 2-3 beers per day and 5 (83,3%) of them had back pain; 1 (3,0%) respondent reported drinking between 4-5 beers per day and did not have back pain.(see Table 4.33)

Log-linear analysis was not attempted.

Table 4.34

NUMBER OF SPIRITS/LIQUEURS CONSUMED PER DAY

PRESENCE OF BACK PAIN	1	2-3	4-5	Row Total
Yes	14 51.9%	2 50.0%	3 100.0%	19 55.9%
No	13 48.1%	2 50.0%	0 0.0%	15 44.1%
Column Total	27 79.4%	4 11.8%	3 8.8%	34 100.0%

Twenty seven (79,4%) respondents reported drinking one spirit or liqueur per day and 14 (51,9%) of them had back pain; 4 (11,8%) respondents reported drinking between 2-3 spirits or liqeurs per day and 2 (50,0%) had back pain; 3 (8,8%) respondents reported drinking between 4-5 spirits or liquers per day and all 3 had back pain. (See Table 4.34)

Log-linear analysis was not attempted.

4.3.21 THE PRESENCE OF COUGHING AND THE PRESENCE OF BACK PAIN-

Table 4.35

PRESENCE OF A COUGH

PRESENCE OF BACK PAIN	Yes	No	Row Total
Yes	2 66.7%	33 55.0%	35 55.6%
No	1 33.3%	27 45.0%	28 44.4%
Column Total	3 4.8%	60 95.2%	63 100.0%

Cross-tabulation between those respondents who had a cough and the prescence of back pain revealed that 60 (95,2%) respondents did not have a cough and 33 (55,0%) of them had back pain. 3 (4,8%) respondents reported having coughs and 2 (66,7%) of them had back pain.(see Table 4.35)

Log-linear analysis was not analysed. One (25,0%) respondent reported having an acute cough, 2 (50,0%) respondents reported having subacute coughs and 1 (25,0%) respondent reported having a chronic cough.

4.3.22 NUMBER OF YEARS PRACTISING CHIROPRACTIC -

FULL-TIME -

Table 4.36

NUMBER OF YEARS

PRESENCE OF BACK PAIN	1-14	15-29	30-44	45-59	Row Total
Yes	14 56.0%	15 55.6%	6 66.7%	2 50.0%	37 56.9%
No	11 44.0%	12 44.4%	3 33.3%	2 50.0%	28 43.1%
Column Total	25 38.5	27 41.5%	9 13.8%	4 6.2%	65 100.0%

Cross-tabulation between the number of respondents who practised full-time and the presence of back pain showed that 25 (38,5%) respondents reported practising between 1-14 years and 14 (56,0%) reported having back pain; 27 (41,5%) respondents reported practising between 15-29 years and 15 (55,6%) reported having back pain; 9 (13,9%) respondents reported practising between 30-44 years and 6 (66,7%) reported having back pain; 4 (6,2%) respondents reported practising between 45-59 years and 2 (50,0%) reported having back pain.(see Table 4.36)

Log-linear analysis was not attempted.

PART-TIME -

Table 4.37

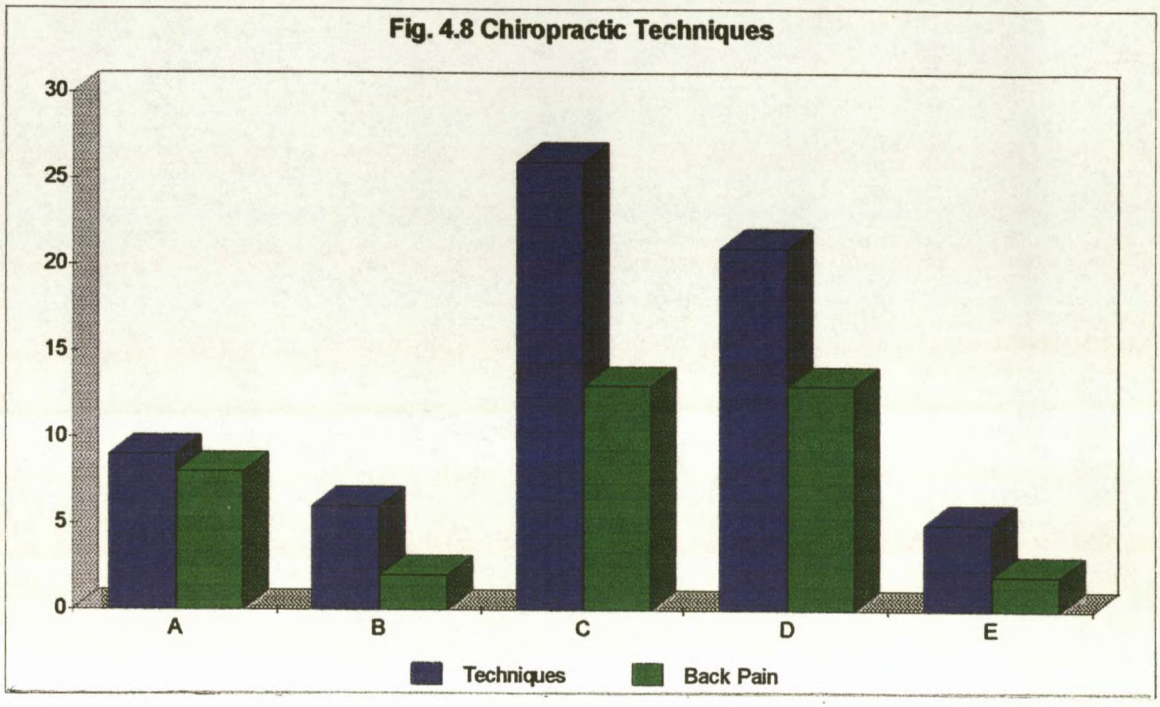
NUMBER OF YEARS

PRESENCE OF BACK PAIN	1-4	5-9	15-19	Row Total
Yes	1 25.0%	2 100.0%	0 0.0%	3 42.9%
No	3 75.0%	0 0.0%	1 100.0%	4 57.1%
Column Total	4 57.1%	2 28.6%	1 14.3%	7 100.0%

Cross-tabulation between the number of part-time practitioners and the presence of back pain demonstrated that 7 respondents practised part-time and 3 (42,9%) had back pain.(see Table 4.37) There were no respondents who practised between 10-14 years on a part-time basis.

Log-linear analysis was not attempted.

4.3.23 CHIROPRACTIC TECHNIQUES AND THE PRESENCE OF BACK PAIN-



Key : A - Force Techniques Only.

B - Non-Force Techniques Only.

C - 50% Force & 50% Non-Force.

D - Majority Force, Minority Non-Force.

E - Majority Non-Force, Minority Force.

Cross-tabulation between the types of chiropractic techniques employed and the prescence of back pain revealed that 9 (13,42%) respondents reported using force techniques only and 8 (88,89%) of them had back pain; 6 (8,96%) respondents used non-force techniques only and 2 (33,33%) of them had back pain; 26 (38,81%) respondents reported to use 50% force and 50% non-force

techniques and 13 (50%) of them had back pain. Twenty one (31,34%) respondents reported to use a majority of force and a minority of non-force techniques and 13 (61,90%) of them had back pain; 5 (7,46%) respondents reported using majority non-force and minority force techniques and 2 (40%) of them had back pain.

Log-linear analysis demonstrated that there was an interaction between those respondents who practised chiropractic adjusting techniques which required the use of force only and having more back pain (Z-value : 2.00005). Since 2.00005 > 1.96 it can be concluded, at a 10% level of significance, that there were significantly more respondents with back pain that used chiropractic force techniques only. (See Fig. 4.8)

CHAPTER 5. THE DISCUSSION

5.1 Prevalence of Back Pain

The 55,9% prevalence of back pain in South African chiropractors was not as high as the 87% prevalence of back pain in Canadian chiropractors (Mior and Diakow, 1987). This may be due to the fact that the Canadian study had 329 (66%) respondents, almost eight and a half times the sample of respondents in this study and consequently a closer representation of the total population was probably achieved. Thus a general under-representation of the results for other questions in this study could be expected.

The 55,9% prevalence of back pain amongst South African chiropractors was similar to the that of Canadian Dentists, viz. 57% (Diakow and Cassidy, 1984).

The prevalence of low back pain (the average percentage obtained from the lumbar and sacroiliac pain prevalences) was 65,1% (See Table 4.1). This percentage of low back pain was still not as high as the low back pain prevalence (lumbar and sacroiliac pain prevalence average) of the Canadian chiropractors, viz. 74% (Mior and Diakow, 1987). The prevalence of low back pain in Canadian dentists was 35.5%, (Diakow and Cassidy, 1984) and for Californian nurses it was 52% (Harber et al., 1985). In this South African survey, the 65,1% low back pain prevalence was higher than the 55,9% back pain prevalence. This could have been due to back pain prevalence being a point prevalence, where the respondents were asked: " Do you currently suffer from back pain? " (ie. one point in time); whereas the low

back pain prevalence was a period prevalence, where respondents were asked : " Do you have or ever get the following ? " (ie. over a period of time). Thus the low back pain prevalence was a figure which included not only low back pain being experienced at the time of filling in the questionnaire but also episodes which occurred in the past. Future studies could also determine specific period prevalences eg. one year prevalences of back pain and low back pain.

From Table 4.1 it was notable that neck pain (78,7%) and not lumbar pain (72,6%) had the highest prevalence. In Mior and Diakow's study (1987), neck pain and lumbar pain had frequencies of 30% and 59% respectively. The neck pain could be caused by the chiropractor having to stretch out his or her arms with his neck and head extended, whilst adjusting or massaging the patient. This could place a chronic overstress on the trapezii and posterior cervical muscles, possibly leading to myofascial pain and dysfunction syndromes (Travell and Simons, 1983). Studies should in future be conducted in order to diagnose specific conditions which afflict the chiropractor, whether they are in the neck region or the lower back area.

5.2 Intensity and Frequency of Back Pain

The largest group of respondents (33,3%) reported having mild back pain (See Figure 4.3), whereas 68% of the Canadian respondents reported having back pain categorized as being slight (Mior and Diakow, 1987). Forty-two percent of the Canadian

respondents reported their back pain to be of moderate or severe intensity, whereas 30,2% of respondents in this survey reported their back pain to be moderate or severe. Mior and Diakow (1987), suggested that since a large part of chiropractic practice deals with back pain, it was possible that chiropractors themselves may be more likely to report even minor complaints.

Eighty percent of the Canadian respondents reported having occasional back pain while 20% reported frequent or constant back pain (Mior and Diakow, 1987). In this survey, 60,3% reported having infrequent back pain, 20,6% reported having frequent or constant pain and 19% marked the question as Not Applicable (See Figure 4.4). In a future study "Not Applicable" should be changed to "Never" in order to avoid ambiguity.

5.3 Subproblem One : Workplace Factors

5.3.1 Static work postures

When asked about possible reasons for the respondent's back pain, 17 (39,5%) responses attributed it to workplace factors. The majority of these workplace factors were alleged to include : posture and muscle overload due to working in a slightly flexed position, work positions, posture and standing all day and posture during adjusting (See p40).

According to Magora (1972), prolonged sitting, standing and especially bent-over work postures seem to carry an increased risk for back pain. The respondents in this survey were questioned on the time spent performing specific daily procedures in order to determine the approximate time that the respondents spent seated or standing whilst treating their patients (See Table 4.5). Thirty-eight (58,5%) respondents reported spending between 5-10 minutes whilst taking a case history seated, 33 (52,4%) respondents also spent between 5-10 minutes whilst performing a physical examination standing, 32 (50,0%) respondents spent between 0-5 minutes adjusting their patients in the standing position, 23 (38,8%) and 18 (30,0%) respondents massaged their patients in the standing position for between 0-5 and 5-10 minutes respectively. Nineteen (33,9%) respondents indicated spending between 0-5 minutes performing ischaemic compression on their patients and 21 (39,6%) respondents also spent between 0-5 minutes performing stretching techniques, both in the standing position.

From the above, it was clear that on average per patient, the respondents spent between 5-10 minutes in the seated position whilst history taking and then stood for approximately 15-25 minutes whilst providing treatment to the patient. In this scenario the respondent was not standing, sitting or bending over for extended periods of time. However, this would depend upon the number of patients that the respondent saw in a day on average because the busy chiropractor would be placing greater stress on his body by bending and twisting over more patients. The less busy chiropractor would have more time to sit in between patients either studying or doing administrative work. Magora (1972), found that both too much (more than 4 hours daily) and too little (less than 4 hours daily) sitting was related to a higher incidence of low back pain, regardless of job physical requirement. Too little standing (less than 4 hours daily) caused more back pain than standing for longer than 4 hours per day (Magora, 1972). Magora (1972) explained that this was possibly due to the prolonged periods of uninterrupted sitting.

This would tend to imply that both busy and less busy chiropractors would both have increased incidences of back pain. This survey, however, did not reveal any significance in terms of patient volume and having higher or lower prevalences of back pain.

Kelsey and White (1980), reported that there was an association between an increased risk of prolapsed lumbar discs and those who had sedentary occupations for years. In this survey only one respondent reported having prolapsed discs at the C6 and T6 levels, but there was no mention of the mechanism of injury

and therefore there was no clear association with occupational factors causing the prolapsed disc.

Standing whilst performing adjustments seemed to cause more back pain than when the chiropractor sat and performed adjustments (See Table 4.12). From the data received, 49% (32) of the respondents reported that performing adjustments while standing caused them back pain, whereas only 9 (13,6%) respondents indicated that sitting whilst performing adjustments caused them back pain (See Table 4.12). Prolonged standing as an isolated factor had been reported to cause back pain (Magora, 1972), and stretching and reaching postures were found to cause low back pain (Damkot et al., 1984).

When a chiropractor performs a "lumbar roll" adjustment as an example, he or she is required to stand in a bent over posture and stretch and reach around the patient in order to execute the adjustment. In this survey, 64,6% percent of respondents reported that the lumbar roll adjusting technique did not cause them back pain, as opposed to the 35,4% who felt that it did (See Table 4.12). Fortunately, it does not require a lot of time for an adjustment to be performed, 52% of respondents reported that it would take between 0-5 minutes in order to perform an adjustment (See Table 4.5).

Stretching and reaching is also required when performing massage and motion palpation. Massage (42%) and motion palpation (35%) performed whilst standing seemed to cause the respondents more back pain than when they were performed when sitting (See Table 4.12). As with adjusting, most respondents did not spend too long in massaging their patients, 38% spent between 0-5

minutes on massage (See Table 4.12). Further investigation needs to be done in order to compare the effects of performing adjusting, motion palpation and massaging in standing and sitting positions on the chiropractor's back pain in terms of spinal loading and back pain acquired in the different positions.

5.3.2 Bending, Twisting and Lifting

Sixty one percent of respondents reported that frequent bending and twisting whilst performing an adjustment caused them back pain (See Table 4.12). Fifty-two percent agreed that frequent bending and twisting whilst performing massage would also cause them back pain (See Table 4.12). This was in keeping with Magora's (1972), findings that excessive bending, twisting and lifting were found to be the most frequent causes of low back pain.

Forty-two percent of respondents also reported that frequent lifting of patients into position for an adjustment would cause them back pain. Schultz et al. (1982), studied the myoelectric activity of muscles of the lumbar spine, whilst standing and holding weights at 30 degrees of forward flexion. The lumbar spinal compression forces, lumbar trunk muscle contraction forces and the myoelectric activity of the lumbar trunk muscle were then recorded. Schultz et al. (1982), concluded that in order to keep the lumbar trunk muscle contraction forces and spinal compression forces small, one should keep the works loads light, the trunk upright and the arms close to the body.

According to Kirkaldy-Willis and Burton (1992), prolonged muscular stress may lead to myofascial syndromes of the postural muscles of the spine. Furthermore, increasing muscular stress may facilitate posterior lumbar facet strain and possibly lead to posterior lumbar facet syndromes (Kirkaldy-Willis and Burton, 1992). This problem could be compounded when the chiropractor has to adjust a larger patient. In this survey, 36,9% of respondents reported that adjusting patients who were larger than themselves caused them to have back pain (See Table 4.12). This survey did not enquire as to whether or not adjusting patients of similar builds or smaller than the respondents would cause them more or less back pain.

Clinical and biomechanical studies in the future need to compare the effects that frequent bending, twisting and lifting have on the chiropractor's spine when performing adjustments, motion palpation and massage. Comparisons could also be made when the chiropractor treats only large patients in one group and the other group, small patients are treated, in order to see the effects on the prevalence of back pain in the chiropractor.

5.3.3 Over-exertion

Over-exertion may play a role in the back pain scenario. Forty-nine percent of respondents reported that seeing too many patients each day caused them back pain and 42% reported that working too many days per week was as added factor which afflicted them with back pain (See Table 4.12). Mior and Diakow

(1987), did not find a clear relationship between working more hours per week and having more back pain.

The largest single group of respondents (20%) were seeing between 20-24 patients per day and a small minority (3%) saw between 55-59 patients per day (See Table 4.3). During an eight hour day those who saw between 20-24 patients per day would on average be spending 20 minutes per patient. Those seeing 55-59 per day would be hard pressed for a lunch hour, spending about 9 minutes per patient. There was however no statistical significance with regards to seeing more patients and having back pain.

5.3.4 Ergonomics

Log-linear analysis showed that there was a significant interaction between those respondents who had desks measuring between 65-84 cm in height and having more back pain (Z-value = 2.00398) (See Fig. 4.5). This data, however was in conflict with the respondent's perception of whether their desk and chair heights were complementary. Sixty (92,3%) respondents believed that their desk and chair heights were complementary and did not cause more back pain when they sat at their desks (See Table 4.12). Statistical analyses between chair height and back pain was not significant. Due to the small sample size of 68 respondents multivariate analyses, such as what desk, chair and respondent heights were associated with more back pain, could not be attempted.

Statistical significance was also found between physical examination table height and the presence of back pain (See Fig. 4.6). Log-linear analysis revealed that those respondents who had physical examination tables measuring between 65-84 cm had more back pain than respondents with other table heights (Z-value : 2.45333).

No significance was attached to any specific adjusting table height causing more back pain and 93,9% of respondents did not believe that their adjusting tables were too high or too low for their heights and did not cause them to have back pain (See Table 4.12). Only 25% of Canadian respondents believed that incorrect table height was a factor in the production of their back pain (Mior and Diakow,1987). The question concerning knee heights was only answered by 30 (44,1%) respondents and thus no correlation between knee height and back pain could be found (See Table 4.19). It has been advised that the average adjusting table height for pelvic, lumbar and thoracic adjusting is the distance from the floor to the middle or superior aspect of the knee (Bergmann, Petersen and Lawrence, 1993). No studies have been done concerning knee heights, adjusting table heights and the prevalence of back pain to chiropractors. Future study should endeavour to determine the exact knee height ranges that correlate with specific adjusting table heights which prevent or cause more back pain. Due to the small sample size in this survey, multivariate analysis between knee height, adjusting table height and the prevalence of back pain could not be attempted. Once the total population of South African chiropractors has increased then multivariate analysis may be

attempted.

No significance was attached to kneeling chair heights and the presence of back pain (See Table 4.11).

5.3.5 Psychological and Repetitive Work Factors.

Most respondents, 53 (77,9%), had great satisfaction in practising chiropractic. Only 2 (2,9%) respondents had neither satisfaction nor dissatisfaction in practising chiropractic (See Table 4.13). Pope et al. (1991) stated that monotony and work dissatisfaction were found to increase the risk of low back pain. Bergquist-Ullman and Larsson (1977), found that repetitive work generally increased the sickness absence rates and that assembly line workers had a higher incidence of low back pain than did office employees. Workers with monotonous jobs requiring little concentration had a longer sickness absence following low back pain than did others (Bergquist-Ullman and Larsson, 1977).

A direct comparison could not be made between the job of an assembly line worker and that of a chiropractor, however those chiropractors who spend less time on their patients and see many patients per day could have a degree of repetitiveness in their daily practice. This survey did not enquire as to whether or not chiropractors found practice boring, but from the level of satisfaction experienced by the respondents it was not surprising that the majority of respondents, 64 (94,1%), were not absent from practice in 1993 due to back pain (See Table 4.14).

5.4 Subproblem Two : Individual Factors

5.4.1 Age and Gender

The largest single group of respondents, 30 (44,8%), were aged between 40-54 years (See Table 4.15). The age range of respondents amongst the South African respondents was between 25 to 84 years. There was no significant interaction between age and having back pain. The age range in Mior and Diakow's (1987), study was between 20-90 years and no significance was attached to age and back pain either. It is questionable that a 20 year old was practising as a chiropractor in Canada in 1987, due to fact that it takes approximately 6 years post matric to qualify as chiropractor. The probable reason for this must be that the age class in Mior and Diakow's study probably started at between 20 to 29 years. Larger samples would possibly be needed in future studies in order for significant levels, in terms of age and back pain, to be obtained.

With 62 male and 5 female respondents, a gender distinction with regards to having more back pain was not possible (See Table 4.16). Thus no statistical significance was noted. In Mior and Diakow's study (1987), it was reported that lumbar pain was more prevalent amongst male respondents whereas females reported having more thoracic pain. Again a larger sample with greater percentages of female chiropractors would be needed in order for a significant distinction to be made in terms of gender related back pain. Future studies could be set up where one group

consisting of female chiropractors and the other consisting of male chiropractors are compared, and their prevalences of back pain recorded.

5.4.2 Anthropometry

Most respondents in this survey, 35 (52,2%), reported being between 1,72 to 1,80 centimetres tall (See Table 4.18), and 40 (58,8%) reported weighing between 70-84 kg (See Table 4.17). The average height and weight of the respondents in Mior and Diakow's study (1987), were 175,5 centimetres (males), 1,67 centimetres (females) and 70,3 kilograms (males) and 56,7 kilograms (females) respectively. Mior and Diakow (1987), did not report any significance with regards to height and weight being associated with the prevalence of back pain.

The majority of respondents in this survey, 47 (69,1%), reported being mesomorphic in build (See Table 4.20). Both knee height classes of between 50-54 centimetres and 55-59 centimetres had 9 (29%) respondents (See Table 4.17). There was no significance with regards to the above anthropometric data and having more back pain. Svensson and Anderson (1983), indicated that there was no strong correlation between height, weight, body build and low back pain. Due to the lack of female respondents in this survey, it was difficult to come any significant conclusion that females suffered more from thoracic pain and males from lumbar pain, as was the case in Mior and Diakow's study (1987). Once the population of male and female

chiropractors increases only then may a significant figure be obtained. The use of a questionnaire is not the most reliable method of recording anthropometric data, thus future studies would have to be done with standardized scales and measuring instruments.

5.4.3 Posture

Most respondents did not report having any postural deformities such as scoliosis, thoracic kyphosis, lumbar hypo/hyperlordosis or a leg length inequality (See Table 4.21). It was interesting to note, however, that of the four respondents who reported having a scoliosis, all four of them also reported having back pain (See Table 4.21). Of equal interest was the fact that, of the 16 respondents who indicated having a leg length inequality, 15 (93,8%) also had back pain (See Table 4.21). This study did not accurately quantify the prevalence of leg length inequality amongst the respondents and it could not identify whether the differences were functional or anatomical in nature.

Due to the subjective nature of the assessment, it would be unwise to conclude that postural deformities are not associated with the prevalence of back pain amongst the respondents. Future studies should devise more accurate assessments of spinal posture in order to confirm or refute the apparent lack of postural deformity in the respondents.

5.4.4 Physical fitness

The length of time spent exercising revealed a significant percentage relative to presence of back pain. Log-linear analysis revealed that those respondents who exercised for 60 minutes or more per session had significantly less back pain (Z-value : 2.16794) (See Fig. 4.7). Cady et al., (1979) concluded from the study of Los Angeles fire fighters that physical fitness and conditioning had preventative effects on back injuries. The fittest firefighters had fewer injuries than the less fit. There was no significant difference between the number of exercise sessions and the presence of back pain (See Table 4.22).

Future studies could be set up where one group of chiropractors are put on a cardiovascular exercise regimen and the control group of chiropractors do not exercise at all. Both groups are then subjected to the daily routines of practice and then compared, in terms of their incidences and recurrences of back pain, over a specific period of time.

5.4.5 Spinal Mobility

There was no significant perception of the respondents in terms of the mobility of their spines and having back pain (See Table 4.23). Magora (1975) found that spinal motions were reduced in most subjects with pain and that decreased spinal motion was a good indicator of low back pain. More accurate measurement of spinal mobility would be needed in order to confirm the lack of

significance attached to degree of spinal mobility of the respondents.

5.4.6 Psychological factors

On enquiry as to the future prospects of the respondents, none of the responses seemed to be of a depressive nature. The largest single group of respondents, 32 (50,79%) would still be practising as chiropractors (See pg 75). It must however, be emphatically stressed that this finding does not prove that depression does not exist amongst the respondents. Enquiring about the future prospects of an individual serves only as an indication of possible depression (Bates, 1987). In order that depression is diagnosed, the Minnesota Multiphasic Personality Inventory (MMPI) should be used (Gerow, 1993). For brevity sake the MMPI was not used in this study and furthermore, it's application and interpretation is beyond the expertise of the author. The majority of respondents, 31 (47,7%) and 26 (40%), reported being highly respected and respected in their communities respectively (See Table 4.27). The family and home situations of most respondents 64 (87,7%) were indicated as being either very happy or happy (See Table 4.29).

5.4.7 Social factors

By pure observation of the descriptive analyses of social factors such as the number of marriages, number of divorces, number of close friends, amount of alcohol consumed, earning power and family problems, it would seem that these factors were not associated with having more back pain (See Tables 4.24, 4.25, 4.26, 4.29, 4.32, 4.33, 4.34). From the data received it seems as though most respondents enjoy a high standard of living. Twenty-two (38,3%) respondents reported earning between R9000-16999 as a gross salary or turnover per month. Twelve (21,43%) respondents earned between R25000-44999 per month (See Table 4.29).

5.4.8 Environmental factors

The majority of respondents did not smoke and did not have coughs (See Tables 4.30 and 4.31). In order to statistically compare the prevalence of back pain amongst smokers and non-smokers, greater samples would be needed.

5.4.9 Chiropractic techniques

An interesting observation was observed in that there was a statistically significant difference between those respondents who used force techniques only and having a greater prevalence

of back pain, as opposed to those who used non-force techniques and having less back pain (Z-value : 2.00005) (See Fig. 4.8). Perhaps those chiropractors who use force techniques may be placing their spines under greater stress than those who use gentler techniques. In Europe, Pedersen (1994), found that most chiropractors used force techniques namely Diversified (68%), Gonstead (37%), Hole-In-One cervical technique (16,6%), Techniques derived from biomechanical principles (40,2%) and Toggle (22,5%). Those techniques which did not require forceful application were Sacro-occipital technique (18%), Applied Kinesiology (19,5%) and Nimmo (43%). Note that most Europian chiropractors used more than one adjusting technique and therefore the values in brackets do not add up to 100% (Pedersen, 1994). In this survey, 7 (10,3%) respondents reported applying Applied Kinesiology, 3 (4,4%) respondents applied Bio-Energetic Synchronisation Technique (BEST) and 2 (2,9%) respondents used Sacro-Occipital Technique whilst in the standing position (See Table 4.6). Two (2,9%) respondents used BEST in the sitting position (See Table 4.6).

Studies in the future need to be done in order to determine which chiropractic techniques (force and non-force) are associated with higher or lower prevalences of back pain.

CHAPTER 6. THE CONCLUSIONS AND RECOMMENDATIONS

6.1 Subproblem Three

The following conclusions can be drawn from this survey :

1. Great caution should be exercised in attempting to generalise the findings in this survey, since the workplace and individual factors associated with back pain were based on the respondent's subjective evaluations.

2. The prevalences of back pain and low back pain in South African chiropractors were not as high as those of Mior and Diakow's study (1987), perhaps due to the differences in sample size.

3. Neck pain seemed to have a greater prevalence than lumbar pain.

4. The work of a chiropractor is not a sedentary one. Standing seems to cause more back pain than when the chiropractor sits and applies treatment.

5. Frequent bending, twisting and lifting seems to aggravate the prevalence of back pain in the chiropractor, but further studies are needed in order to statistically demonstrate this effectively.

8. Over-exertion may be associated with higher prevalences of back pain. Forty-nine percent of the respondents perceived that seeing too many patients per day seemed to cause them back pain. However there was no statistical significance with regards to patient numbers seen per day and the presence of back pain. Future studies could explore whether treating more patients per day is associated with higher incidences of back pain.

9. Certain ergonomic factors seemed to be associated with having more back pain. According to the analyzed data, certain classes of desk and physical examination table heights were associated with having higher prevalences of back pain. Other measurements of the adjusting table, elevation table and kneeling chair heights did not reveal any significance with regard to having more back pain. The accuracy of the measurements given by the respondents should be accepted with scepticism due to the inherent unreliability of measuring methods. Therefore the data only suggests that a possible relationship exists between ergonomic factors and having back pain.

10. Most respondents did not seem to be depressed about practising as chiropractors and most respondents reported having happy family and home situations.

11. Age and gender did not seem to be significantly associated with having more back pain.

12. Anthropometric data did not reveal any significant relationship with regards to having more back pain. However, like the evaluation of ergonomic data, the anthropometric data was recorded in an unreliable manner and thus the results only suggest that there is no significance between anthropometry and back pain.

13. Postural deformity does not seem to be prevalent amongst the respondents of this survey, however the presence of scoliosis and leg length inequality may suggest that an association between postural deformity and back pain may exist. More reliable studies should be conducted in order to be certain.

14. It appears that the longer the length of an exercise session, the less back pain is prevalent. However, the number of exercise sessions per week did not seem to be associated with having back pain.

15. There was no indication that the respondents had limited spinal mobility and an increased association with having back pain, but more reliable measurement should be attempted in future studies.

16. Most respondents did not smoke or have coughs.

17. Notably, it was found that using adjusting techniques that required the use of force were significantly associated with having more back pain than using non-force techniques.

18. This study was not designed to establish cause and effect relationships, between workplace and individual factors and the prevalence of back pain.

The following recommendations can be made :

1. The most important factor which adversely affected most, if not all the questions in this survey was the small sample size (N=68). Therefore, an under-representation of the results possibly occurred and multivariate analysis could not be attempted. Depending on the statistical methods chosen, in order for increased significance to be demonstrated, many hundreds of respondents would be needed.

2. If this questionnaire is sent out in the future a number of changes should be done beforehand :

   2.1 In all open-ended questions (questions : 1.4.10; 1.5; 1.8.21; 1.8.22; 3.5.14; 3.12), it must be stipulated that only one answer is required. This will facilitate cross-tabulation between different answers and the prevalence of back pain and then Log-linear

analysis may be applied.

2.2 Question 1.4, which concerns the prevalence of different pain locations, should be changed to : " Do you have or have you ever had one or more of the following complaints in the past year ?" This manner of questioning will endeavour to express a period prevalence of the different pain locations.

2.3 The number of hours worked per day should be enquired about.

2.4 Question 3.17, which asks about the number of times that the respondent smokes per day, should be changed to number of cigarettes smoked per day.

2.5 Question 1.2 should come after question 3. and should also start as follows: "When you have back pain ....."

2.6 Question 1.3 should start as follows: "Do you get back pain from time to time? If so ....."

2.7 Question 3.5a should start as follows: "Do you do regular exercise at all? Yes or No. Question 3.5b should then follow with : "If so what type of exercise do you do?"

2.8 Questions 3.6 and 3.7 should both include N/A.

2.9 Wine drinkers should also be accomodated.

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Dear Practitioner

I am currently researching the prevalence of back pain in chiropractors and the factors that lead to this problem. The information gained from my study could well make the daily routine of all chiropractors a lot more comfortable.

All that I ask of you is to complete the questionnaire, which should not take longer than twenty minutes to complete and return it to me in the stamped return envelope enclosed.

May I request that the questionnaire reach me as soon as possible.

Let me emphasize that all the information that you furnish will be held in the utmost confidence and you do not have to identify yourself in any way, should you so wish.

If you have any queries, please don't hesitate to contact me at (031)2252205 between 1pm and 7pm, Mon. to Fri. If I am not in please leave a message and I will phone you back.

Your assistance in this matter is greatly appreciated.
Yours sincerely

Anthony Tim
(Fifth Year Student)

PLEASE ANSWER ALL QUESTIONS BY PLACING A TICK OR BY PRINTING ON THE LINES PROVIDED.

SECTION ONE

1.DO YOU CURRENTLY SUFFER FROM BACK PAIN (ie. ANY PAIN RELATING TO THE SPINE, PELVIS AND RELATED MUSCLES)?

YES [___]01 NO [___]02

2.WHICH TERM BEST DESCRIBES THE INTENSITY OF YOUR BACK PAIN?

MILD [___]01 MODERATE [___]02 SEVERE [___]03 EXCRUCIATING [___]04 N/A [___]05

3.WHICH TERM BEST DESCRIBES THE FREQUENCY OF YOUR BACK PAIN?

NEVER [___]01 INFREQUENT [___]02 FREQUENT [___]03 CONSTANT [___]04

4.DO YOU HAVE OR EVER GET ONE OR MORE OF THE FOLLOWING COMPLAINTS?
PLEASE TICK THE APPROPRIATE BOX.

COMPLAINT	A.NEVER	B.INFREQUENT	C.FREQUENT	D.CONSTANT
1.HEADACHE				
2.CERVICAL PAIN				
3.SHOULDER PAIN				
4.THORACIC PAIN				
5.LUMBAR PAIN				
6.SACROILIAC PAIN				
7.BUTTOCK PAIN				
8.LOWER LIMB PAIN				
9.UPPER LIMB PAIN				
10.OTHER (PLEASE PRINT):_____				

5.WHAT DO YOU BELIEVE IS THE CAUSE OF YOUR BACK PAIN?

(PLEASE PRINT)_____

6.HOW MANY PATIENTS DO YOU SEE PER DAY?
PLEASE INDICATE AVERAGE OR ACCURATE NUMBER:

1. 0-4	[___]01	10. 45-49	[___]10
2. 5-9	[___]02	11. 50-54	[___]11
3. 10-14	[___]03	12. 55-59	[___]12
4. 15-19	[___]04	13. 60-64	[___]13
5. 20-24	[___]05	14. 65-69	[___]14
6. 25-29	[___]06	15. 70-74	[___]15
7. 30-34	[___]07	16. 75-79	[___]16
8. 35-39	[___]08	17. 80 OR MORE	[___]17
9. 40-44	[___]09		

7.HOW MANY DAYS DO YOU WORK PER WEEK?

1 DAY/WEEK	[___]01
2 DAYS/WEEK	[___]02
3 "	[___]03
4 "	[___]04
5 "	[___]05
6 "	[___]06
7 "	[___]07

8.ON AVERAGE HOW MUCH TIME DO YOU SPEND PERFORMING THE FOLLOWING TASKS PER PATIENT?

PLEASE TICK THE APPROPRIATE BOX, FOR ANY PROCEDURE YOU DON'T USE, TICK A. A = 0 MINUTES, B = 0-5 MINUTES, C = 5-10 minutes, D = 10-20 MINUTES, E = 20 MINUTES or LONGER.

STATEMENTS	A	B	C	D	E
1. TAKE A CASE HISTORY SEATED.					
2. TAKE A CASE HISTORY STANDING.					
3. PERFORM A PHYSICAL EXAM.					
4. PERFORM AN ADJUSTMENT SEATED.					
5. PERFORM AN ADJUSTMENT STANDING.					
6. PERFORM MASSAGE THERAPY SEATED.					
7. PERFORM MASSAGE THERAPY STANDING.					
8. PERFORM MCMANIS TRACTION STANDING.					
9. PERFORM ACUPUNCTURE SEATED.					
10.PERFORM ACUPUNCTURE STANDING.					
11.PERFORM ISCHAEMIC COMPRESSION SEATED					
12.PERFORM ISCHAEMIC COMPRESSION STANDING.					
13.PERFORM STRETCHING TECHNIQUES SEATED.					
14.PERFORM STRETCHING TECHNIQUES STANDING.					
15.PERFORM ULTRASOUND THERAPY SEATED.					
16.PERFORM ULTRASOUND THERAPY STANDING.					
17.SET UP ELECTROTHERAPY (TENS,INTERFERENTIAL CURRENT,DIATHERMY,INFRARED ETC.) SEATED.					
18.SET UP ELECTROTHERAPY STANDING.					
19.PERFORM LASER THERAPY SEATED.					
20.PERFORM LASER THERAPY STANDING.					
21.OTHER PROCEDURES STANDING, PLEASE PRINT:_____					
22.OTHER PROCEDURES SEATED, PLEASE PRINT:_____					

SECTION TWO

1.APPROXIMATELY, WHAT ARE THE FOLLOWING HEIGHTS IN CENTIMETRES OF YOUR:

1.ADJUSTING TABLE [____]
2.DESK [____]
3.CHAIR SEAT [____]
4.PHYSICAL EXAM TABLE [____]
5.ELECTRIC ELEVATION TABLE [____](HIGHEST)
6. " ELEVATION TABLE [____](LOWEST)
7.KNEELING CHAIR [____]

2.PLEASE TICK THE APPROPRIATE BOX. A=NEVER, B=INFREQUENT, C=FREQUENT AND D=CONSTANT

STATEMENTS	A	B	C	D
1. SITTING AT MY DESK CAUSES BACK PAIN.				
2. SITTING WHILST PERFORMING MASSAGE THERAPY CAUSES BACK PAIN.				
3. STANDING WHILST PERFORMING MASSAGE THERAPY CAUSES BACK PAIN.				
4. SITTING WHILST PERFORMING ADJUSTMENTS CAUSES BACK PAIN.				

	A	B	C	D
5. STANDING WHILST PERFORMING ADJUSTMENTS CAUSES BACK PAIN.				
6. SITTING DURING MOTION PALPATION CAUSES BACK PAIN.				
7. STANDING DURING MOTION PALPATION CAUSES BACK PAIN.				
8. FREQUENT BENDING AND TWISTING OVER A PATIENT, WHILST APPLYING AN ADJUSTMENT CAUSES BACK PAIN.				
9. FREQUENT BENDING AND TWISTING OVER A PATIENT, WHILST PERFORMING MASSAGE CAUSES BACK PAIN.				
10.FREQUENT LIFTING OF PATIENTS INTO POSITION PRE-ADJUSTMENT CAUSES BACK PAIN.				
11.APPLYING ADJUSTMENTS eg.LUMBAR ROLL, CAUSES BACK PAIN.				
12.SEEING TOO MANY PATIENTS PER DAY CAUSES BACK PAIN.				
13.WORKING TOO MANY DAYS PER WEEK CAUSES BACK PAIN.				
14.MY ADJUSTING TABLE IS TOO LOW FOR MY HEIGHT AND CAUSES BACK PAIN WHEN I HAVE TO PERFORM ADJUSTMENTS.				
15.MY ADJUSTING TABLE IS TOO HIGH FOR MY HEIGHT AND CAUSES BACK PAIN WHEN I HAVE TO PERFORM ADJUSTMENTS.				
16.WHEN I ADJUST PATIENTS WHO ARE LARGER THAN MYSELF, I GET BACK PAIN.				
17.THE HEIGHTS OF MY DESK AND CHAIR ARE NOT COMPLEMENTARY AND CAUSE BACK PAIN WHEN I SIT.				
18.SITTING DURING STATIC PALPATION CAUSES BACK PAIN.				
19.STANDING DURING STATIC PALPATION CAUSES BACK PAIN.				

2.PLEASE INDICATE THE DEGREE TO WHICH YOU LIKE OR DISLIKE PRACTISING CHIROPRACTIC.

1. GREAT SATISFACTION [___]01
2. SATISFACTION [___]02
3. NEITHER SATISFIED NOR DISSATISFIED [___]03
4. DISSATISFACTION [___]04
5. GREAT DISSATISFACTION [___]05

3.HOW MANY DAYS WERE YOU ABSENT FROM PRACTICE IN 1993 BECAUSE OF BACK PAIN?

1. 0 [___]01
2. 1-4 [___]02
3. 5-9 [___]03
4. 10-14 [___]04
5. 15-19 [___]05
6. 20-24 [___]06
7. 25-29 [___]07
8. 30 OR MORE [___]08

SECTION THREE

1.WHAT IS YOUR AGE AND GENDER?

AGE [___] MALE [___]01 FEMALE [___]02

2.WHAT IS YOUR WEIGHT IN KILOGRAMS?

1. 40-44 [___]01
2. 45-49 [___]02
3. 50-54 [___]03
4. 55-59 [___]04
5. 60-64 [___]05
6. 65-69 [___]06
7. 70-74 [___]07
8. 75-79 [___]08
9. 80-84 [___]09
10. 85-89 [___]10
11. 90-94 [___]11
12. 95-99 [___]12
13. 100 OR MORE [___]13

3A.WHAT IS YOUR HEIGHT?

1. 5 FT.(152CM)	[___]01
2. 5'1" (154.5CM)	[___]02
3. 5'2" (157CM)	[___]03
4. 5'3" (159.5CM)	[___]04
5. 5'4" (162CM)	[___]05
6. 5'5" (164.5CM)	[___]06
7. 5'6" (167CM)	[___]07
8. 5'7" (169.5CM)	[___]08
9. 5'8" (172CM)	[___]09
10. 5'9" (175.5CM)	[___]10
11. 5'10"(177CM)	[___]11
12. 5'11"(180CM)	[___]12
13. 6 FT (182.5CM)	[___]13
14. 6'1" (185CM)	[___]14
15. 6'2" (187.5CM)	[___]15
16. 6'3" (190CM)	[___]16
17. 6'4" (192.5CM) OR MORE	[___]17

3B.WHAT IS YOUR KNEE HEIGHT IN CENTIMETRES?

1. 30-34	[___]01
2. 35-39	[___]02
3. 40-44	[___]03
4. 45-49	[___]04
5. 50-54	[___]05
6. 55-59	[___]06

3.WHAT IS YOUR BUILD CLASSIFICATION?

ECTOMORPHIC (THIN AND SLIGHTLY BUILT)	[___]01
MESOMORPHIC (MEDIUM AND ATHLETICALLY BUILT)	[___]02
ENDOMORPHIC (HEAVY AND BROADLY BUILT)	[___]03

4.PLEASE TICK THE FOLLOWING BOXES?

STATEMENT	YES	NO
1. DO YOU HAVE A SCOLIOSIS? PLEASE SPECIFY eg. LUMBAR OR THORACIC_____		
2. IF SO, WHAT IS THE COBB'S ANGLE OF SCOLIOSIS IN DEGREES? (PLEASE SPECIFY, _____		
3. DO YOU HAVE A THORACIC KYPHOSIS? (PLEASE SPECIFY COBB'S ANGLE IN DEGREES, IF POSSIBLE, _____.		
4. DO YOU HAVE A LUMBAR HYPOLORDOSIS? (PLEASE SPECIFY COBB'S ANGLE IN DEGREES,IF POSSIBLE, _____.		
5. DO YOU HAVE A LUMBAR HYPERLORDOSIS? (PLEASE SPECIFY COBB'S ANGLE IN DEGREES,IF POSSIBLE, _____.		
6. DO YOU HAVE A LEG LENGTH DISCREPANCY? (PLEASE SPECIFY DISCREPANCY IN CENTIMETRES AND ANATOMICAL LANDMARKS USED TO MEASURE IT, _____ _____		

5.WHAT TYPE OF EXERCISE DO YOU DO?

1. JOGGING	[___]01	8. TENNIS	[___]08
2. SWIMMING	[___]02	9. RUGBY	[___]09
3. CYCLING	[___]03	10.GOLF	[___]10
4. WALKING	[___]04	11.BASEBALL	[___]11
5. WEIGHTLIFTING	[___]05	12.TEN PIN BOWLING	[___]12
6. AEROBICS	[___]06	13.NONE	[___]13
7. SQUASH	[___]07	14.OTHER. PLEASE SPECIFY:	

6.HOW LONG DO YOU EXERCISE DURING EACH SESSION?

1-15MIN [___]01 15-30MIN [___]02 30-60MIN [___]03 60MIN OR MORE [___]04

7.HOW MANY TIMES PER WEEK DO YOU EXERCISE?

1X/WEEK [___]01 2X/WEEK [___]02 3X/WEEK [___]03 5X/WEEK OR MORE [___]04

8.PLEASE TICK THE APPROPRIATE BOX INDICATING THE DEGREE OF MOBILITY OF YOUR SPINE?

VERY MOBILE [___]01 [___]02 [___]03 [___]04 [___]05 VERY STIFF

9.PLEASE TICK THE APPROPRIATE BOX INDICATING THE NUMBER OF TIMES YOU HAVE BEEN MARRIED?

0X [___]01 1X [___]02 2X [___]03 3X [___]04 4x OR MORE [___]05

10. PLEASE TICK THE APPROPRIATE BOX INDICATING THE NUMBER OF TIMES YOU HAVE BEEN DIVORCED?

0X [___]01 1X [___]02 2X [___]03 3X [___] 04 4X OR MORE [___]05

11. HOW MANY CLOSE FRIENDS DO YOU HAVE?

0 [___]01 1-3 [___]02 4-6 [___]03 7-9 [___]04 10 OR MORE [___]05

12. WHAT WILL YOU BE DOING IN TEN YEARS TIME?

PLEASE PRINT: _____

13. HOW WOULD YOU RATE YOUR SOCIAL STANDING IN YOUR COMMUNITY?

HIGHLY RESPECTED [___]01 [___]02 [___]03 [___]04 [___]05 GROSSLY SHUNNED

14. HOW WOULD YOU DESCRIBE YOUR FAMILY AND/OR HOME SITUATION?

VERY HAPPY [___]01 HAPPY [___]02 NEITHER HAPPY OR UNHAPPY [___]03 UNHAPPY [___]04 VERY UNHAPPY [___]05

15. WHAT IS YOUR APPROXIMATE GROSS SALARY/TURNOVER PER MONTH IN RANDS?

1.	0-999	[___]01	10. 17000-18999	[___]10
2.	1000-2999	[___]02	11. 19000-20999	[___]11
3.	3000-4999	[___]03	12. 21000-22999	[___]12
4.	5000-6999	[___]04	13. 23000-24999	[___]13
5.	7000-8999	[___]05	14. 25000-29999	[___]14
6.	9000-10999	[___]06	15. 30000-34999	[___]15
7.	11000-12999	[___]07	16. 35000-39999	[___]16
8.	13000-14999	[___]08	17. 40000-44999	[___]17
9.	15000-16999	[___]09	18. 50000 OR MORE	[___]18

16. DO YOU SMOKE CIGARETTES?

YES [___]01 NO [___]02

17. IF SO, HOW MANY TIMES DO YOU SMOKE PER DAY?

1X [___]01 2-5X [___]02 6-10X [___]03 11-15X [___]04 20X OR MORE [___]05

18. DO YOU DRINK ALCOHOL?

YES [___]01 NO [___]02

19. IF SO, HOW MANY BEERS DO YOU DRINK PER DAY?

1 [___]01 2-3 [___]02 4-5 [___]03 6-7 [___]04 8 OR MORE [___]05

20. HOW MANY SPIRITS AND/OR LIQUEURS DO YOU DRINK PER DAY?

1 [___]01 2-3 [___]02 4-5 [___]03 6-7[___]04 8 OR MORE [___]05

21. DO YOU HAVE A COUGH?

YES [___]01 NO [___]02

22. IS YOUR COUGH?

ACUTE (<6 WEEKS) [___]01
SUBACUTE (6 WEEKS-3 MONTHS) [___]02
CHRONIC (>3 MONTHS) [___]03

23.FOR HOW MANY YEARS HAVE YOU PRACTISED CHIROPRACTIC?

1. FULL-TIME:	1-4 YEAR	[___]01
	5-9 "	[___]02
	10-14 "	[___]03
	15-19 "	[___]04
	20-24 "	[___]05
	25-29 "	[___]06
	30-34 "	[___]07
	35-39 "	[___]08
	40-44 "	[___]09
	45-49 "	[___]10
	50-54 "	[___]11
	55-59 "	[___]12
	60-64 "	[___]13
	65-69 "	[___]14
	70 OR MORE	[___]15
2. PART-TIME:	1-4 YEARS	[___]16
	5-9 "	[___]17
	10-14 "	[___]18
	15-19 "	[___]19
	20 OR MORE	[___]20

24.WHAT CHIROPRACTIC TECHNIQUE DO YOU APPLY? (FORCE:EG.DIVERSIFIED. NON-FORCE:EG. APPLIED KINESIOLOGY.)

1. FORCE TECHNIQUES ONLY	[___]01
2. NON-FORCE TECHNIQUES ONLY	[___]02
3. 50% FORCE, 50% NON-FORCE	[___]03
4. MAJORITY FORCE, MINORITY NON-FORCE	[___]04
5. MAJORITY NON-FORCE, MINORITY FORCE	[___]05

THANK YOU ONCE AGAIN FOR YOUR TIME AND EFFORT.

PLEASE RETURN THE QUESTIONNAIRE BY POSTING IT IN THE STAMPED RETURN ENVELOPE PROVIDED.