AN EPIDEMIOLOGICAL STUDY OF LOW BACK PAIN IN A STUDENT POPULATION OF A SOUTH AFRICAN TERTIARY EDUCATIONAL INSTITUTION

Mini-dissertation in partial compliance with the requirements for the Masters Degree in Technology: Chiropractic, in the Department of Chiropractic at the Durban Institute of Technology.

by

Craig Desmond Smith

I, Craig Desmond Smith, declare that this dissertation represents my own work, both in conception and execution.

DATE:

APPROVED FOR FINAL SUBMISSION

Dr. A. G. van der Meulen
M.Tech: Chiro

DATE:

This dissertation is dedicated to my aunt Judy. Her support towards me has been unwaivering, even through the dark times.

ACKNOWLEDGEMENTS

I would like to thank the following people for their support, in whatever way, with this dissertation.

My mother, Shirley Palmer, whose inspiration through following her dreams across the world, has made me who I am today.

My father, Desmond Smith, for providing me with transport and much laughter.

Sue, Graham, Ros, Nigel, Kimmi, Karen and Greg for occasionally allowing me to escape from the mundane. For all the great times, I thank you.

Tonya Esterhuizen, for her outstanding assistance with the statistical analysis of this study. I would have been lost without you.

My supervisor, Dr Anthony van der Meulen, for reading and re-reading this dissertation countless number of times. Your input and help have played a large part in this dissertation.

All the students who took the time to fill in the questionnaire. Without you this study would not have been possible.

Durban Institute of Technology for funding this study.

ABSTRACT

Epidemiological studies, conducted in various countries around the world suggest that low back pain (LBP) represents a serious health risk, affecting populations all over the world. Evidence suggests that the prevalence of LBP is relatively high among people in their 20's and 30's. A few epidemiological studies on student populations in other countries suggest prevalence rates of 27 to 71% (Gemmel et al. 1990, Klaber-Moffet et al. 1993, Reis et al. 1996, Lebowski 1997), however LBP among students in South Africa had not yet been investigated.

This study concentrated on the prevalence of LBP among the student population of a South African tertiary institution, i.e. Durban Institute of Technology (DIT). This study also proposed to investigate the level and nature of care seeking among those people suffering from LBP. A third aim of this study was to investigate the correlation between potential risk factors and the prevalence of LBP among the student population of South Africa. These were: age, gender, race, height, weight, smoking habits, parity, physical exercise and occupation.

A population based epidemiological study on LBP was conducted on 1000 students from the DIT. Subjects were selected by means of stratified random sampling from all the campuses of the DIT, i.e. all the campuses that had registered full time students. The data was collected by means of questionnaires, which were completed by the subjects, in the presence of the researcher.

The prevalence rate of LBP was found to be 27.9%, while the lifetime incidence was found to be 55.8%. Of those who had suffered from LBP, 41.2% reported suffering from LBP on a weekly basis, and 22.6% reported LBP on monthly basis. The majority of those currently experiencing LBP reported having suffered for 2-3 years. Only 14.9% of those who had ever had LBP had ever had to stay away from work. Of those who had ever had LBP only 26.5% had sought

treatment with the majority of those consulting either a general practitioner (27.9%) or a Chiropractor (22.4%). The length of treatment was normally less than 1 week (45.5%). Cross tabulations between the presence of LBP and various individual factors, and the use of the Pearson chi-square test as well as logistic regression analysis revealed significant associations ($p<0.05$) between low back pain and gender, race, depression, urinary tract infections, faculty of study, study year, prolonged sitting, working in uncomfortable positions, level of enjoyment of studies, smoking (including number of cigarettes smoked per day and number of years student has been smoking), pregnancy and part-time work (including the type of work and number of hours worked).

The results of this study correlate well with other similar international studies. They also suggest that LBP occurs commonly amongst the student population and adversely affected the lives of many of those affected. This study suggests a more specialized approach towards students needs to be adapted with regards to low back care. Further study in this area could potentially help students to reduce or avoid LBP in the future.

TABLE OF CONTENTS.

LIST OF TABLES

LIST OF FIGURES

Page

LIST OF APPENDICES

CHAPTER 1 INTRODUCTION

1.1 Introduction

Durban Institute of Technology (DIT) is the result of the first successful merger between two tertiary educational institutions in South Africa. There are presently more than half a million tertiary education students in South Africa (S.A. Statistical Bureau 2003). With approximately 17449 students registered at DIT a randomly selected sample from this institution should represent the South African tertiary education student population as a whole.

LBP represents a serious health risk, affecting populations in developed countries (Horal 1969, Valkenburg 1982, Biering-Sørensen 1982 Svensson and Andersson et al. 1983, Damkot et al. 1984, Heleovaara 1988, Walsh 1992, Masset and Malchaire 1994, Carey, Evans et al. 1995, Balagué et al. 1995, Toroptsova et al. 1995 and Leboeuf-Yde et al. 1996) as well as in developing countries (Mulimba 1990, Mijiyawa 1993, van der Meulen 1997, Docrat 1999, Worku 2000, Omokhodion 2002, Hoy 2003).

Evidence suggests that the prevalence of LBP is relatively high among people in their 20's and 30's (Skovron, 1992). A few epidemiological studies on student populations in other countries suggest prevalence rates of 27 to 71% (Gemmel et al. 1990, Klaber-Moffet et al. 1993, Reis et al. 1996, Lebowski 1997), however LBP among students in South Africa has never been investigated.

Chiropractic is concerned primarily with the treatment and prevention of musculo-skeletal disorders. LBP is one of the mainstay areas within the chiropractic scope of practice, therefore differentiation of patient populations is integral to the understanding of this epidemic. It is in the interests of the profession to investigate the potential need or demand for specialised low back care, by

investigating the extent to which various populations are affected by this condition.

The purpose of this study was to determine the prevalence of LBP within a student population and to assess the association between specific factors of student life and the prevalence of LBP. The data obtained from this study should provide valuable information on the prevalence of LBP amongst a student population, identify student-specific risk factors as well as obtain information on the nature and level of care-seeking of those suffering from LBP.

1.2 Objectives of the study

The first objective is data collection and documentation with respect to:

- Prevalence
- Subject demographics
- Severity
- Disability
- Type of treatment / management
- Association between potential risk factors (age; gender; race; height; weight; smoking habits; parity; physical exercise; occupation and stress) and LBP.

CHAPTER 2 REVIEW OF THE RELATED LITERATURE

2.1 Introduction

It is well established that LBP represents a major health problem in developed countries (de Girolamo 1991), where it is one of the most common causes of disability and working days lost (Mohseni-Bandpei et al. 1998). According to Frymoyer (1991) the diagnosis and management of LBP in the USA costs $25 billion annually; excluding indirect costs such as loss of earnings and compensation claims. Epidemiological studies conducted in developed countries such as the Netherlands (Valkenburg 1982), Britain (Walsh 1992), Finland (Heleovaara 1988), the USA (Damkot et al. 1984; Carey, Evans et al. 1995), Sweden (Horal 1969; Svensson and Andersson et al. 1983, Balagué et al. 1995), Denmark (Biering-Sørensen 1982; Leboeuf-Yde et al. 1996), Belgium (Masset and Malchaire 1994) and Russia (Toroptsova et al. 1995) have reported lifetime incidence rates of 40 to 80% and prevalence rates of 25 to 36%.

Although relatively little research has been done in developing countries, particularly Africa, as commented by Mulimba (1990) and Mijiyawa (1993); results from studies in Lesotho (Worku 2000), Nigeria (Omokhodion 2002), Tibet (Hoy 2003), West and Southern Africa (Mijiyawa 1993) and South Africa (van der Meulen 1997, Docrat 1999) suggest that LBP is as common among these populations as in more developed nations.

2.2 The lifetime incidence and prevalence of LBP

Evidence suggests that the prevalence of LBP among young adults is relatively high, and that the age of onset of LBP is often in the 20's and 30's (Rowe 1969;Svensson and Andersson 1982; Carey, Evans et al. 1995). In a review article, Skovron (1992) reported that the highest age-specific incidence rate of low back pain was in the early 20's, with a gradual decline in later years. South

African' studies on general populations (van der Meulen 1997, Docrat 1999) found LBP prevalence rates in the 18 to 25 year old age group to be higher than the population mean. The significant impact of LBP on young people is further suggested by Porter et al. (2000), who reported that LBP is the most common cause of activity limitation in persons under 45 years.

There are presently more than half a million tertiary education students in South Africa (S.A. Statistical Bureau 2003). Considering the evidence suggesting that the impact of LBP on young adults is significant, it is important that the epidemiology of LBP among this population group be investigated in South Africa. Epidemiological studies on student populations in other countries (Gemmel et al. 1990, Klaber-Moffet et al. 1993, Reis et al. 1996, Lebowski 1997) have reported prevalence rates of 27 to 71%.

2.3 Risk factors for LBP

Epidemiological research not only helps to determine the magnitude of the problem; but also helps identify the association between LBP and potential risk factors (individual or external), which can then be modified or eliminated (Andersson et al. 1991). A number of risk factors potentially associated with an increased prevalence of LBP have been implicated with varying degrees of certainty. Factors investigated in this study were age, gender, race, height, weight, smoking, parity, physical exercise and occupation.

2.3.1 Gender

Previous studies suggest that there exists a tendency for women to experience LBP more commonly than men (Nagi et al. 1973, Reisbord and Greenland 1985, Balagué et al. 1995, Toroptsova et al. 1995, Carey, Evans et al. 1995, van der Meulen 1997, Lebouef-Yde 1998, Docrat 1999, Alcouffe et al. 1999, Grimmer et al. 2000). This tendency is however most evident in the elderly (Biering-

Sørensen 1982). These studies involved general populations and adolescents, and the role of gender among the student population has not been specifically investigated.

2.3.2 Race

The majority of evidence (Nagi et al. 1973, Reisbord and Greenland 1985, Mijiyawa 1993) seems to suggest that there is no strong association between race and LBP and that the prevalence of LBP among blacks and whites is roughly equal. In two South African' studies, the prevalence of LBP in a black population was 53% (van der Meulen 1997), 45% among Indians and 33% among a coloured population sample (Docrat 1999). No South African study has included the white population.

2.3.3 Height and weight

The results of a number of studies (Gyntelberg 1974, Roncarati and McMullen 1988, Alcouffe 1999, Mortimer et al. 2001) suggest that tallness may be a risk factor for the development of LBP. Garzillo and Garzillo (1994) also suggest that increased weight, particularly severe obesity may play a role in the pathogenesis of LBP and that weight reduction could be successful in reducing or eliminating LBP (Roncarati and McMullen 1988, Orvieto et al. 1994(b), Alcouffe 1999, Mortimer et al. 2001).

2.3.4 Smoking

There is strong evidence that smoking, particularly heavy smoking (Toroptsova et al. 1995), is associated with an increased prevalence of LBP (Frymoyer et al. 1980, Svensson et al. 1983, Svensson and Andersson 1983, Boshuizen et al. 1993, Leboeuf-Yde et al. 1995, van der Meulen 1997, Docrat 1999, Feldman 1999, Omokhodion 2002); supporting the suggestion by Leboeuf-Yde et al.

(1995) that abstinence from smoking may be a good primary prevention measure.

2.3.5 Parity

LBP has been found to be particularly prevalent in multiparous women (Frymoyer et al. 1980, Svensson et al. 1990, van der Meulen 1997, Docrat 1999). Stapleton et al. (2002) however, reported that increased parity did not increase the risk of LBP. Most researchers agree that LBP is a commonly observed symptom during pregnancy and that the risk of developing LBP in the present pregnancy is higher in women who have had a number of previous pregnancies (Östgaard et al. 1991; Östgaard and Andersson 1991; Orvieto, Achiron et al. 1994). Orvieto, Achiron et al. (1994) found that back care advice offered to pregnant women early in pregnancy significantly reduces or prevents LBP as pregnancy progresses, resulting in less troublesome or severe LBP during pregnancy.

2.3.6 Physical exercise

Salminen (1993) found that people who were physically inactive were 27% more likely to suffer from LBP than those who exercised once a week. Evidence from a number of other authors similarly suggests that physical exercise, such as participation in sport, on the whole, tends to have a positive effect on LBP (Svensson et al. 1983, Mundt et al. 1993, Toroptsova et al. 1995).

2.3.7 Part-time employment

As many students are employed on a part-time basis, the type of employment may influence their likelihood of developing LBP (Rowe 1969, Nagi et al. 1973, Svensson and Andersson 1983, Reisbord and Greenland 1985). Although no information specific to student populations is available, Feldman et al. (2002) found that adolescents who worked, particularly those with ‘white-collar’ jobs,

were more likely to develop LBP. There is also evidence to suggest that unemployment, and job and economic insecurity, may be associated with an increased prevalence of LBP, as well as with increased levels of LBP disability and chronicity (Reisbord and Greenland 1985; Volinn et al. 1988S; Sanderson et al. 1995; Carey, Evans et al. 1995).

2.3.8 Treatment of LBP

This study also investigated the extent to which students with LBP are receiving treatment for this condition, as well as the type of treatment being received. The level of care seeking among LBP sufferers is generally quite high, increasing with the severity of LBP. The findings of Gyntelberg (1974), Biering-Sørensen (1982) and Svensson and Andersson (1982) suggest that between 32% and 60% of those who develop LBP consult physicians; while Carey, Evans et al. (1995) reported that 73% of subjects with chronic LBP had sought care. General practitioners, orthopaedic surgeons, physiotherapists and chiropractors are among the more common sources of care (Deyo and Tsui-Wu 1987; Carey, Evans et al. 1995, Docrat 1999). Hospitalization is not uncommon (Deyo et al. 1991, Cherkin and Deyo 1993) and analgesic and other medications are frequently prescribed or bought over the counter (Hurwitz 1994; Carey, Evans et al. 1995; Cherkin and Deyo 1993; Elam et al. 1995; van der Meulen 1997).

CHAPTER 3. MATERIALS AND METHODS

3.1 Study design

3.1.1 Sample

A population based epidemiological study on LBP was conducted on 1000 full-time students studying at the DIT.

3.1.2 Selection procedure

Permission to conduct this research was first obtained from the DIT vice-chancellor, academic (Appendix D).

One thousand full-time DIT students were randomly selected by means of stratified random sampling. The sampling procedure was as follows:

Number of students				
Campuses	Arts	Health	Commerce	Engineering & Science
Durban	1527	1382	8072	4839
Indumiso	155	0	0	0
PMB	0	0	1400	74
Gamalakhe	0	0	0	0
Richards Bay	0	0	0	0
Totals	**1682**	**1382**	**9472**	**4913**
Revised Totals				
Durban	88	79	463	277
Indumiso	9	0	0	0
PMB	0	0	80	4
Totals	**97**	**79**	**543**	**281**

The Durban campus incorporated Steve Bhiko, Ritson road, City and ML Sultan campuses.

i) A faculty was randomly chosen from a box containing the names of the faculties at DIT.
ii) From the selected faculty, a department was randomly chosen from a box containing the names of the departments within that faculty.
iii) From the selected department, a year of study was randomly selected from a box containing the years of study within that department.
iv) From the selected year of study a subject class was randomly chosen. Subject to permission being granted by the lecturer (Appendix E), all students in that class completed a questionnaire (Appendix C).

Due to the size of the total population, i.e. 17449 students, this process was repeated until 1000 questionnaires have been completed. This represented approximately 5% of the total population enabling accurate statistical analysis of the results.

Each potential subject was given a Letter of Information (Appendix A). The research was explained to them and a Letter of Informed Consent (Appendix B) signed**.** In the event of the subject being 17 years of age a letter of Assent (Appendix I) was signed. The questionnaire (Appendix C) was then completed by the subject. The researcher was present to assist with the accurate completion of the questionnaires.

To help increase the validity of the subjective questioning about low back pain, a written definition and a graphic representation of low back pain was included with the questionnaire (Appendix J).

No names or any other form of identification were present on the questionnaires so as to maintain the anonymous nature of the questionnaires and confidentiality

of the subjects. The questionnaires will be stored in the Chiropractic Day Clinic for a period of five years and then shredded.

3.1.3 Inclusion and Exclusion criteria

Inclusion criteria:

1. All subjects, aged 17 years and over, who were randomly selected and present on the day their class completed the questionnaires and were eligible for inclusion.

2. Only those subjects registered with DIT as full-time students were included in this study.

3. People with or without LBP were included in this study.

Exclusion criteria:

1. Any person younger than 17 years of age at the time of the interview was excluded from this study.
2. Any questionnaire that was incomplete or had been inadequately completed was excluded from this study.

3.1.4 Questionnaire background:

Before commencing this investigation, a pilot project was conducted. The LBP questionnaire designed by Docrat (1999) was adapted from the general population to a student population. A focus group was then set up in order to establish the face validity of the adapted questionnaire.

The group consisted of several participants:

1. 2 students who had never had LBP before.
2. 2 students who had suffered from LBP in the past.
3. 3 chiropractic students.

4. 2 chiropractors.
5. 1 orthopaedic registrar.
6. 1 community nurse.
7. 2 final year occupational therapy students.
8. 1 final year homeopath student.
9. 1 statistician.
10. The researcher and a scribe.

These participants were enlisted via word of mouth and advertising, with 18 respondents coming forward and expressing an interest in the focus group. Through a process of self-selection, the focus group at its outset had 15 participants (3 of the participants did not arrive for the focus group).

The participants that did not arrive for the focus group included,

1. 1 biokineticist
2. 1 physiotherapist
3. 1 general practitioner

Before commencing the focus group each participant was required to read an information letter (Appendix F), and sign a confidentiality statement (Appendix G) and informed consent form (Appendix H). In the focus group each participant was given copies of the LBP questionnaires. Comment was requested on how the questionnaire could be modified in order to accurately assess student life and possible aetiologies of LBP specific to students.

The questionnaires were discussed in sequential order. If inconsistencies were found or changes proposed, a unanimous vote (75%) was required to institute change. At the end of the discussion chance was given for any comment on the questionnaire. The student low back pain questionnaire was discussed in terms of accurately reflecting concepts relating to student lifestyles and low back pain.

Suggestions for change were analysed and these changes made to the questionnaire, yielding the version used in this study.

A video of the proceedings was made and is available as evidence of the individuals involved and the content of the discussion.

3.3 Statistical Methods:

3.3.1 Statistical package used:

Data was entered and analyzed using SPSS version 12.0.1 (SPSS Inc. Chicago, Ill).

3.3.2 Descriptive analysis:

Proportions and 95% confidence intervals were used to describe categorical data. Quantitative data were described using means and standard deviations, or medians and IQR where appropriate.

3.3.3Analytical statistics:

Bi-variate analysis of categorical data was achieved using Chi Square or Fisher's exact tests where appropriate. Quantitative data were checked for normality, and where appropriate t-tests or ANOVA were used to compare means between groups in parametrically distributed variables, while Mann-Whitney or Kruskal-Wallis tests were used to compare medians in non-parametric data. Logistic regression models were constructed to assess the independent effects of risk factors on prevalent LBP. Backward stepwise elimination was used, based on likelihood ratio tests. Odds ratios and 95% confidence intervals were reported. An alpha level of 0.05 was used to assess statistical significance.

CHAPTER 4 THE RESULTS

4.1 Statistical results

4.1.1 Abbreviations

N = number
% = Percentage
CI = confidence interval
OR = Odds ratio
IQR = Inter-quartile range
Kg = Kilograms
Df = degrees of freedom
Wald = Wald Chi square test

4.1.2 Introduction

Results of the statistical analysis of the data are presented in this section. Firstly a descriptive analysis is presented, which reports proportions and means, with 95% confidence intervals in order to show how the data were distributed in all study subjects as a whole. This is followed by the analytical section where associations between various risk factors and the outcome of LBP are examined. These are firstly presented as bivariate associations, with only the significant or marginally significant associations shown, followed by a multivariate model of the data showing independent associations with the outcome of current LBP.

4.2 Descriptive analysis

4.2.1 Demographics

4.2.1.1 Age distribution

One thousand students took part in the study. Their ages ranged from 17 to 31+. The distribution of their ages is shown in Figure 1. The median age was 20 years (IQR 19-22 years).

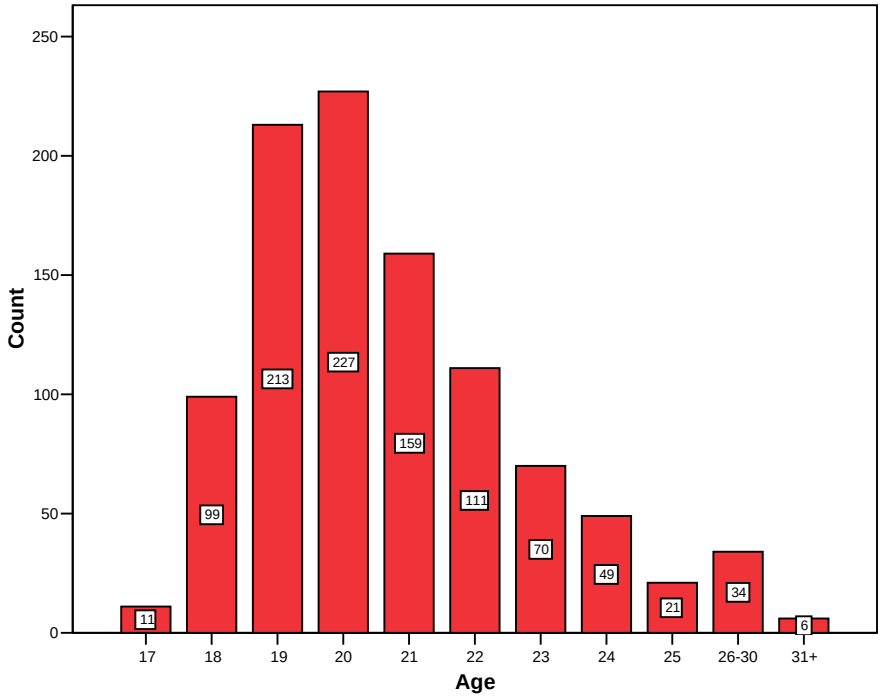


Figure 1: Age distribution of the participants (n=1000)

4.2.1.2 Gender distribution

There were 554 (55.4%) males and 446 (44.6%) females. The gender distribution is shown in Figure 2.

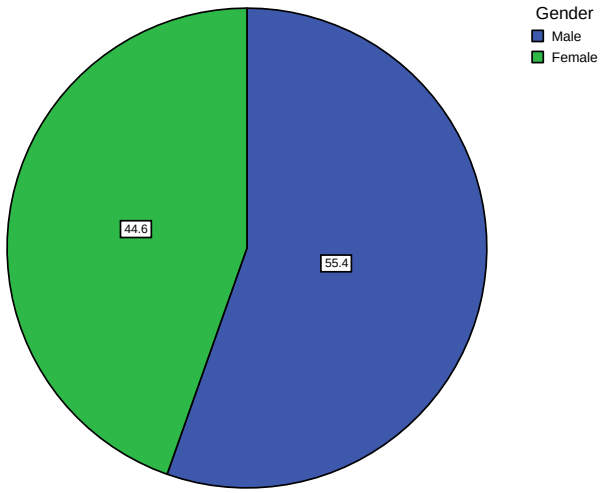


Figure 2: Gender distribution of study participants (n=1000)

4.2.1.3 Height and weight distribution

Participants' heights ranged from 136 to 205 cm, with a mean of 168.7cm and a standard deviation of 10.5. Weights ranged from 35 to 125 kg, with a mean of 63.7kg and standard deviation of 12.3.

4.2.1.4 Race distribution

The majority of participants were black (69.6%), followed by Indian (18.6%). Whites (7.8%), Asians (2.1%) and Coloureds (1.9%) formed the minority.

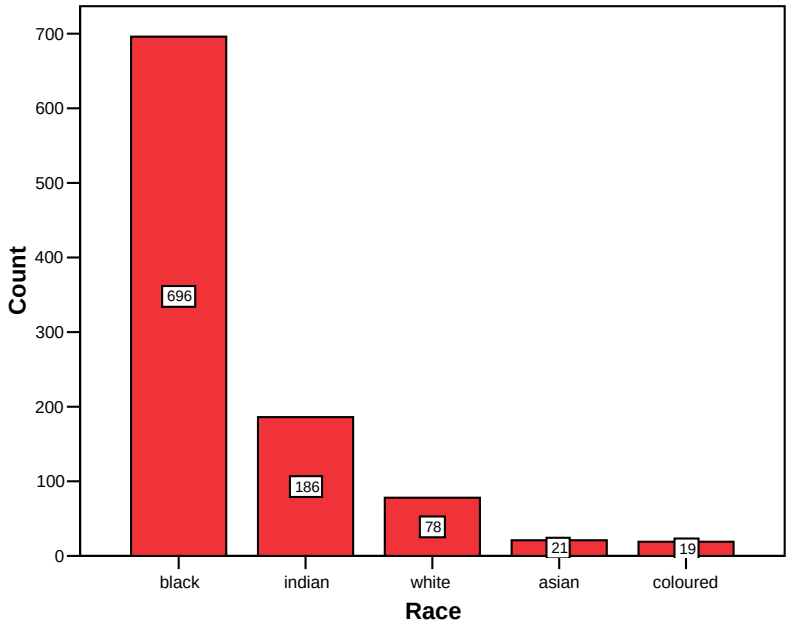


Figure 3: Race group of study participants (n=1000)

4.2.2 Socio-economic factors

4.2.2.1 Medical care distribution

Almost half (47.2%) received private medical care, 24.5% received state care, and 21.3% from community clinics, while 7% visited pharmacists for health care.

4.2.2.2 Transport distribution

The most common mode of travel to DIT was by taxi (30.7%) or bus (29.7%). Only 11.9% had their own car, and 18.1% travelled on foot.

4.2.2.3 Accommodation distribution

Participants mostly lived at home (39.9%) or in residence (24.6%). Some lived in private accommodation (18.2%), with family (11.3%) or with friends (5.7%).

4.3 Descriptive analysis of Outcomes

4.3.1 Lifetime incidence of LBP

More than half the participants (n =558, 55.8%) had experienced LBP at some stage of their life. The 95% CI for this proportion was 52.7% to 58.9%. Therefore the lifetime incidence rate of LBP was 55.8%. Of these students 279 (50.1%, 95% CI 46.7% to 55.2%) were currently experiencing LBP.

4.3.2 Prevalence rate of LBP

Two hundred and seventy nine students were currently experiencing LBP. This was 27.9% (95% CI 25.2% to 30.8%) of the entire sample. Thus the point prevalence of LBP was 27.9%. Figure 4 shows the proportion who had current LBP.

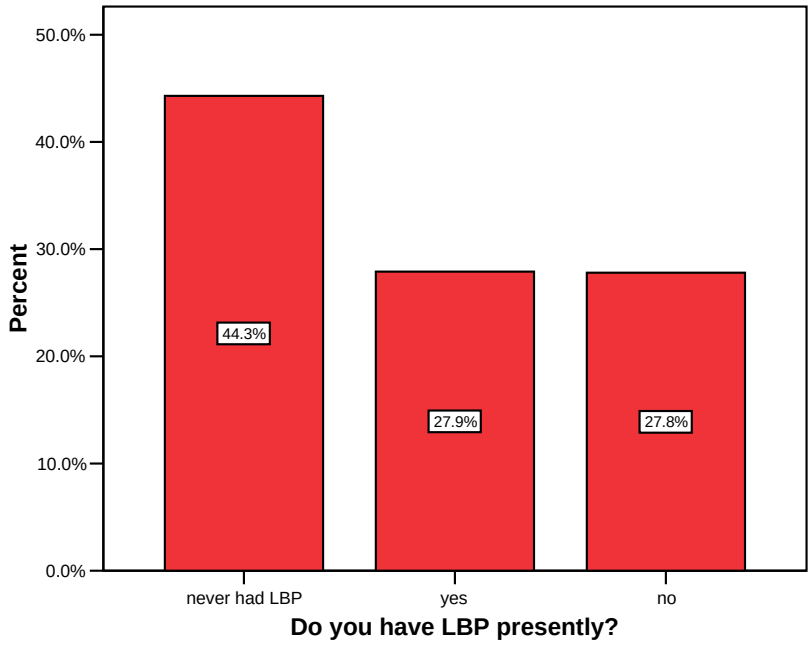


Figure 4: Distribution of responses to current LBP in study participants (n=1000)

4.3.3 Frequency of LBP in subjects currently experiencing LBP

Frequency of pain among those who currently had LBP (n=279) is shown in the Figure below. Of those currently experiencing pain, the majority experienced it weekly. Only 6.6 % were in constant pain.

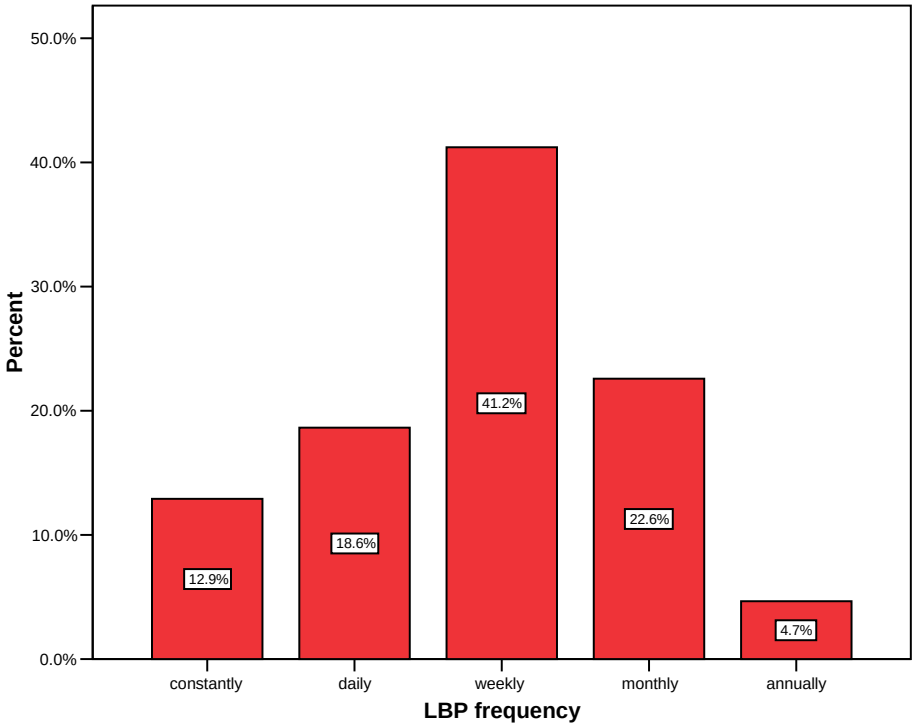


Figure 5: Frequency of pain in participants who currently experience LBP (n = 297)

Note: due to a flaw in the questionnaire design (Questions 36 and 37, Appendix C) only those students who were currently experiencing LBP answered the question regarding frequency (Figure 5) and duration (Figure 6) of LBP.

4.3.4 Duration of LBP in subjects currently experiencing LBP

Those currently experiencing LBP were more likely to have been experiencing it for 2-3 years (n=122). Sixty-five participants had been experiencing it for 4-5 years and 21 for 6-9 years. There were 20 participants who had been experiencing LBP for over 10 years. This is shown in Figure 6 below.

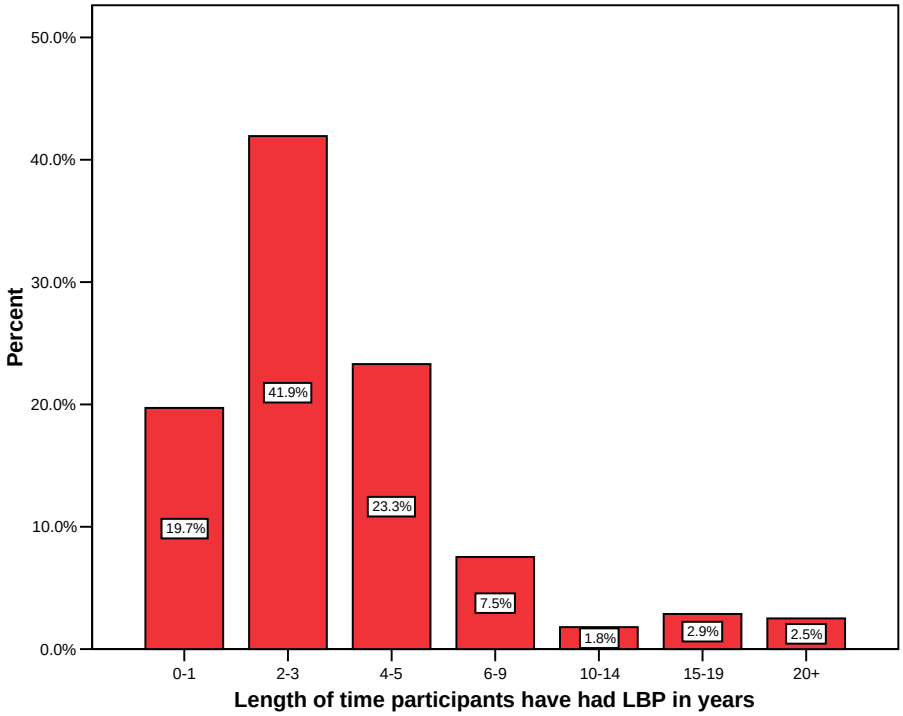


Figure 6: Duration of LBP in subjects currently experiencing LBP (n=297)

4.3.5 Work absenteeism due to LBP

Table 1: Frequency of any work absenteeism in lifetime incidence group (n=558)

Had to stay away from work due to LBP	Frequency	Percent
Yes	83	14.9
No	475	85.1
Total	558	100.0

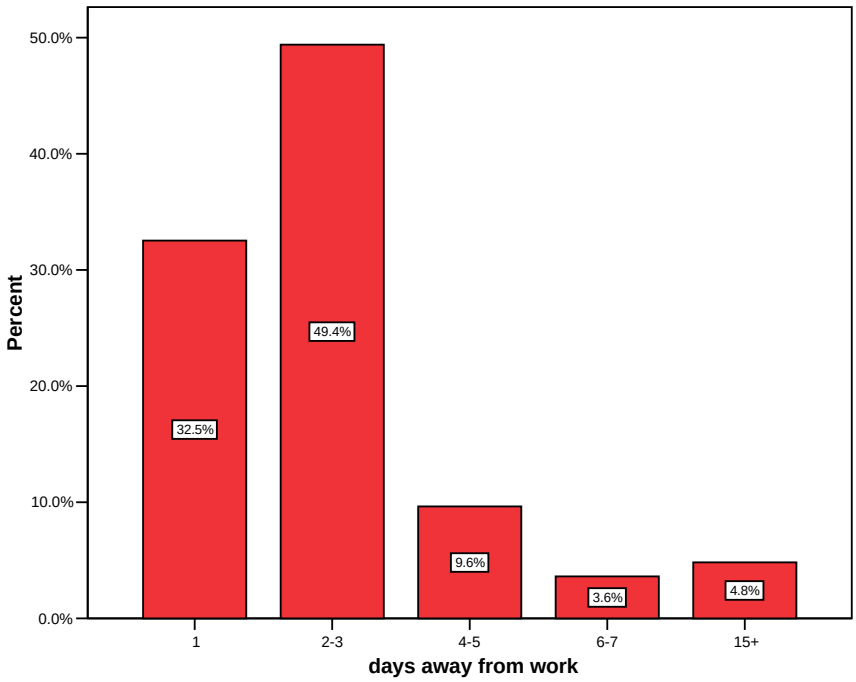


Figure 7: Length of work absenteeism (n=83)

Eighty-three (14.9%) of those who had ever had LBP (n=558), had to stay away from work because of LBP. The majority (49.4%) had to stay away for 2-3 days, and 32.5% (n=27) had to stay away for 1 day. Only 4 (4.8%) were absent for 15 or more days.

4.3.6 Treatment type for LBP

Of those who had ever had LBP, 148 (26.5%) had received treatment for it, and 20 (3.6%) were currently receiving treatment. The treatment type in those who had ever been treated for LBP is shown in Figure 8. It is clear that GP's (27.9%) and chiropractors (22.4%) were the preferred choice of practitioners for treatment of LBP in this sample.

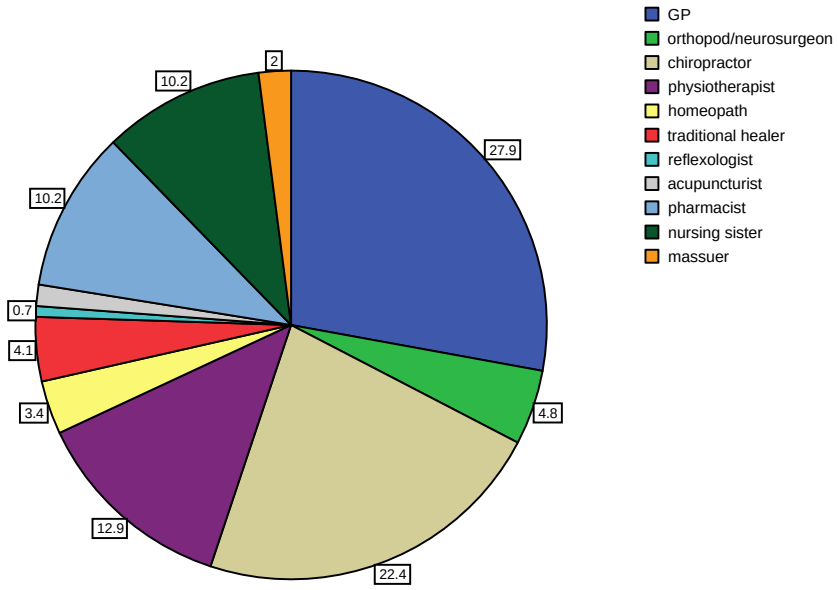


Figure 8: Treatment type in those who had ever been treated for LBP (n=148)

4.3.7 Length of treatment for LBP

Length of treatment was mostly less than a week (45.9%) (Table 2).

Table 2: Length of treatment in participants who were treated for LBP (n=148)

	Frequency	Percent
less than 1 week	68	45.9
1-2	30	20.3
3-4	20	13.5
1 month +	30	20.3
Total	148	100.0

4.3.8 Patient satisfaction with care

Seventy four percent (74.3%) said they were satisfied with the treatment they had received (Table 3).

Table 3: Patient satisfaction with care (n=148)

Patient satistifaction	Frequency	Percent
Yes	110	74.3
No	38	25.7
Total	148	100.0

4.3.9 Clinic awareness at D.I.T.

57.1 % of all participants (n=571) were aware of the chiropractic clinic at DIT, and 16.2% had ever used the clinic. The proportion of participants who had used the clinic was highest in those who had never had LBP. Thus it appears that the clinic was used primarily for conditions other than back pain by participants in this study (Figure 9).

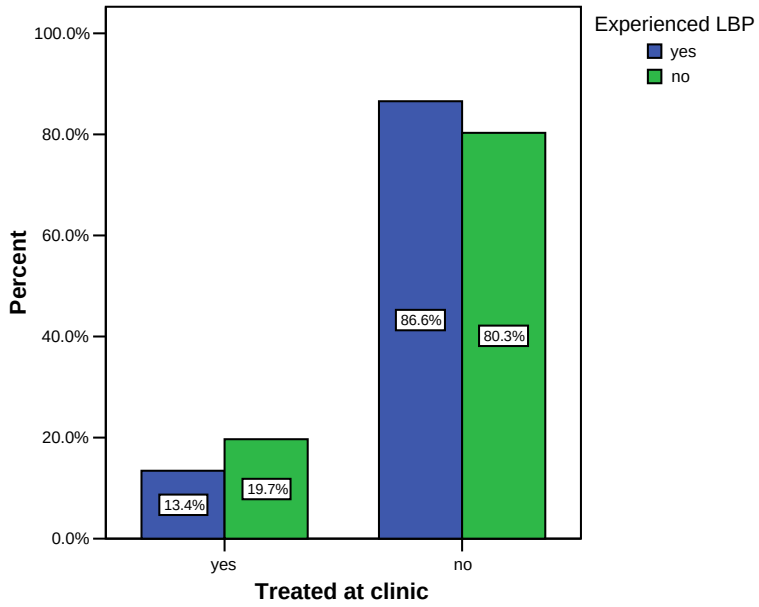


Figure 9: Proportion of participants treated at DIT chiropractic clinic by lifetime incidence of LBP (n=1000)

4.4 Descriptive analysis of Risk Factors for LBP:

4.4.1 Medical Conditions

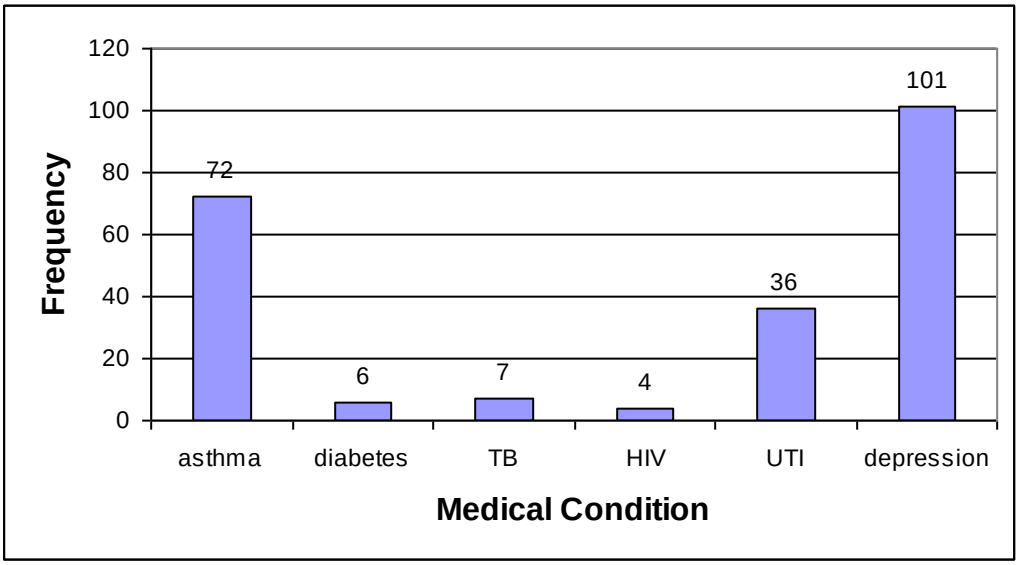


Figure 10: Frequency of reported concurrent medical conditions in study participants (n=1000)

Figure 10 shows that depression was reported by 10.1% of respondents Asthma by 7.2% of respondents and UTI's by (3.6%) of participants. Reported HIV prevalence was low (0.4%).

4.4.2 Study Environment

4.4.2.1 Year of study

The majority of participants (47.9%) were in their second year of study, with 33.3% in first year and the minority (18.2%) in third to sixth year (Table 4).

Table 4: Participant's Year of study (n=1000)

Year of study	Frequency	Percent
First	333	33.3
Second	479	47.9
Third	161	16.1
Fourth and higher	27	2.7
Total	1000	100.0

4.4.2.2 Faculty of study

Most of the students were from Commerce Faculty (56.1%) followed by Engineering and Science Faculties (28.2%) (Table 5).

Table 5: Faculty distribution of participants (n=1000)

Faculty	Frequency	Percent
Health	74	7.4
Engineering and science	282	28.2
Art	83	8.3
Commerce	561	56.1
Total	1000	100.0

4.4.2.3 Study hours

The amount of lecture and practical hours attended weekly is shown in Figures 11 and 12. Most participants spent 21-25 hours seated in lectures per week and 0-5 hours of practicals per week.

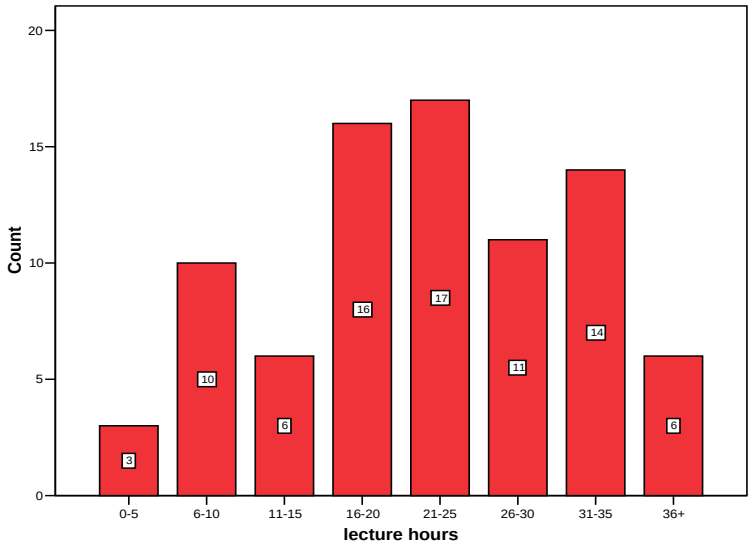


Figure 11: Lecture hours attended by study participants (n=1000)

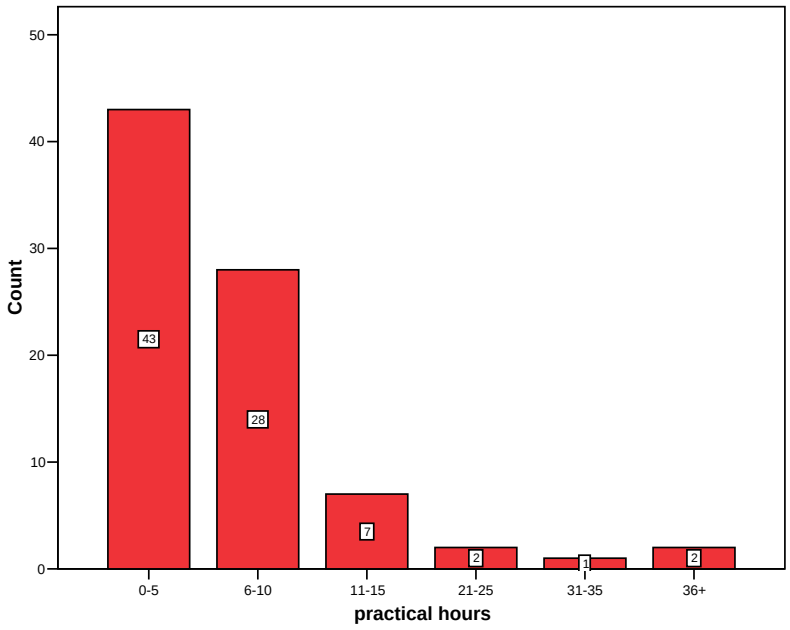


Figure 12: Practical hours attended weekly by study participants (n=1000

4.4.2.4. Ergonomic factors in study environment

Ten point four percent (10.4%) reported that their studying involved heavy lifting, 19.7% reported standing for long periods, and 74.6% said they have to sit for long periods. Nineteen point three percent (19.3%) reported that they have to work in uncomfortable positions (Table 6).

Table 6: Ergonomic factors in study environment (n=1000)

	Frequency	Percent
Heavy lifting	104	10.4%
Standing	197	19.7%
Sitting	746	74.6%
Uncomfortable positions	193	19.3%

4.4.2.5 Level of study enjoyment

The majority of students (54.3%) said they enjoy their studies most of the time (Figure 13).

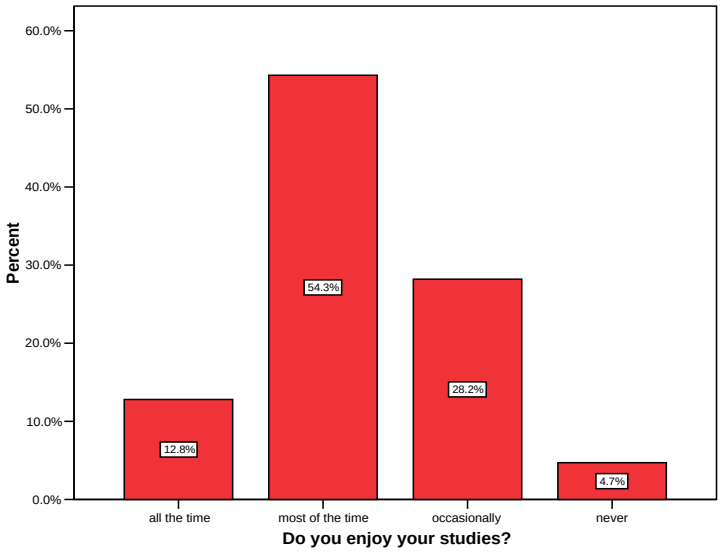


Figure 13: Study participants' enjoyment of their studies at DIT (n=1000)

4.4.3 Lifestyle Factors

4.4.3.1 Sleep hours

Fifty five point five percent of participants slept for 7-9 hours per night, with few (0.9%) sleeping for 0-3 hours or 13+ hours (1.5%).

4.4.3.2 Smoking

The prevalence of smoking was 17.4%, with most smokers smoking 1-5 per day (45.4%), or 6-10 per day (25.9%). There were 94 (9.4%) ex-smokers.

4.4.3.3 Parity

Sixty-eight (15.4%) of the females subjects reported at least one pregnancy. Fifty-one (11.5%) reported having had at least one child. Seventeen (3.8%) females were currently pregnant.

4.4.3.4 Physical exercise

Six hundred and one (60.1%) of participants did some form of physical exercise.

4.4.3.5 Part-time work

One hundred and sixty nine (16.9%) had a part time job. The majority worked 6 - 10 hours per week.

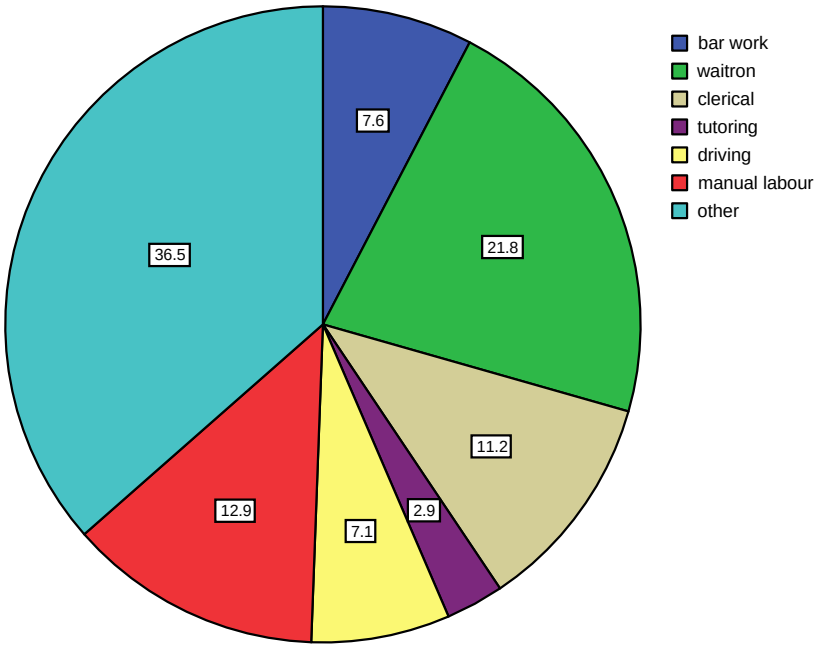


Figure 14: Type of work in study participants who had a part time job (n=169)

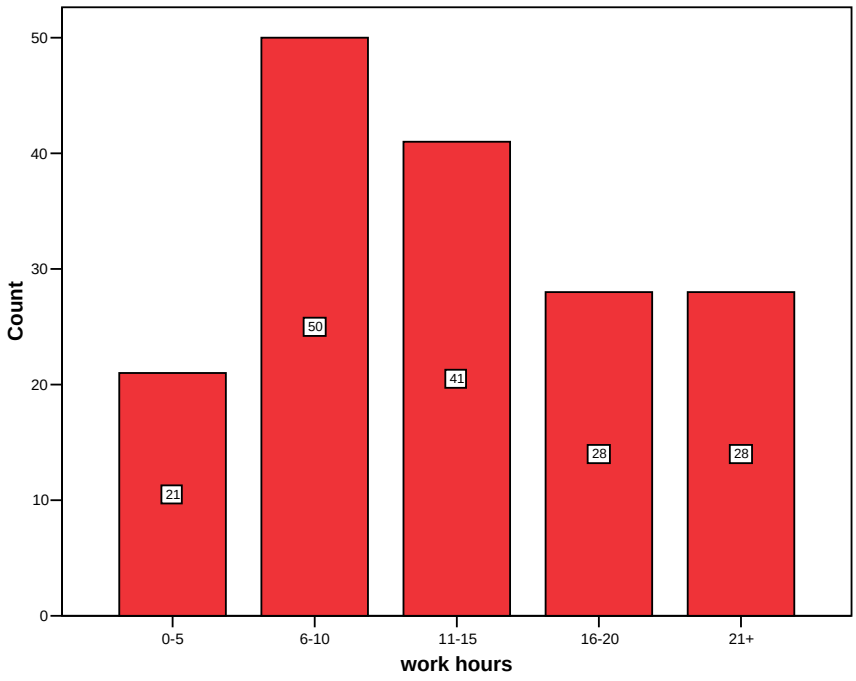


Figure 15: Hours of part time work in participants who had a part time job (n = 169)

4.5 Analytical statistics:

Since the questionnaire only collected information on current behaviours which might be associated with LBP, the outcome of current LBP as opposed to ever having had LBP was used in this section of the results where risk factors are assessed. Thus factors associated with prevalent LBP were assessed. This section presents significant bivariate associations between exposures and the outcome, followed by a multivariate model.

4.5.1 Demographics

Table 7: Bivariate associations between demographic factors and current LBP

Demographic Factors associated with LBP	Explanation	p value
Gender	Females were more likely to have current LBP (31.4% of females vs. 25.1% of males had LBP)	0.028
Race	LBP more prevalent in Asians (38.1%) and Indians (34.9%) compared with whites (32.1%), Coloureds (26.3%) and Blacks (25.3%)	0.068

Current LBP was associated with females and Indians or Asians.

4.5.2 Concurrent Medical Conditions

Table 8: Bivariate associations between medical conditions and current LBP

Medical conditions associated with current LBP	Explanation	p value
UTI (n=36)	Subjects currently experiencing UTI had a higher prevalence of LBP (47.2% vs. 27.2% had LBP)	0.013
Depression (n=101)	Subjects currently experiencing depression had a higher prevalence of LBP (43.6% vs. 26.1%)	<0.001

Table 8 shows that depression and UTI were significantly associated with current LBP. No other medical condition was significantly associated with currently experiencing LBP.

4.5.3 Study Environment

Factors associated bivariately with prevalent LBP are shown in Table 9 below.

Table 9: Bivariate associations between Study environment factors and current LBP

Factors in study environment associated with LBP	**Explanation**	**p value**
Faculty (n=1000)	Highest proportion of LBP in health sciences (39.2%) compared to other Faculties (Eng 23.4%, Art 27.7%, Commerce 28.7%)	0.053
Study year (n=1000)	Highest prevalence in 3rd year students (36% in 3rd year vs. 27.6% in second years, 29.6% in 4th to 6th years and 24.3% in first year)	0.058
Sitting (n=1000)	Higher proportion of those who sat for long periods experienced LBP (30.7% vs. 19.7%)	0.001
Uncomfortable position (n=1000)	Higher prevalence of LBP in people who sat in uncomfortable positions (36.8% vs. 25.8%)	0.003
Enjoy studies (n=1000)	Highest prevalence in those who enjoyed their studies occasionally or never. (32.3% for occasionally and 31.9% for never vs. 17.2% for all of the time)	0.016

4.5.4 Lifestyle Factors

Lifestyle factors associated with current LBP are shown in Table 10. Smokers, women who had had children and those who worked part time were more prone to LBP.

Table 10: Bivariate associations between lifestyle factors and LBP

Lifestyle factors associated with LBP	Explanation	p value
Smoking (n=174)	Smokers were more likely to have current LBP than non smokers (39.1% vs. 25.5%)	<0.001
No. of cigarettes per day	Prevalence of LBP increased as no. of cigarettes smoked increased (36.7% in <5 per day vs. 50% in 30 per day.)	0.022
Years smoked	Prevalence of LBP was highest in those who smoked for the longest (36.7% in >7 years smoked vs. 25.5% in non smokers)	0.006
Pregnancy (n=1000)	Females who had ever been pregnant (36.8%) were more likely than females who had never been pregnant (30.2%) or males (25.3%) to have current LBP.	0.062
Children (n=442)	Having given birth to one or more children was associated with current LBP in females (39.2% vs. 30.2%)	0.046
Part time work (n=169)	Those who worked part time were more likely to have LBP (42% vs. 25%)	<0.001
Type of work (n=169)	Bar workers (53.8%), waitrons (54.1%) and manual labourers (50%) had the highest prevalence of LBP	<0.001
Hours worked	16-20 hours worked had the highest prevalence of LBP (50% vs. 25% in those who did not work part time)	0.001

4.6 Logistic Regression

The logistic regression model was completed in 10 steps. 17 variables were entered on step 1 and 8 variables remained at completion. The variables which remained in the model are shown in Table 11 below. These were: gender (female), UTI, depression, sitting in lectures, working in uncomfortable positions, not enjoying studies, smoking, and working part time. All were independently statistically significantly associated with current LBP and predicted the outcome of current LBP with an accuracy of 72.4%.

The regression model shows the independent odds ratios for risk factors for LBP, controlling for confounding factors. The risk factor with the highest odds ratio was UTI, those with UTI were 2.7 times (95% CI 1.4 to 5.5) more likely to suffer from LBP than those without UTI (p=0.005). Those who enjoyed their studies most of the time were likely to have a 2.1 times higher odds ratio for LBP compared with those who enjoyed their studies all the time. Part time workers were twice as likely to have LBP than those without part time work. Depression also doubled the odds of having LBP. Smoking presented a 1.8 times higher risk of LBP. The remainder of the risk factors in the model presented moderate, although statistically significant risks for LBP. This represents the profile of students who are likely to suffer from self reported current LBP.

Table 11: Logistic regression analysis of risk factors for current LBP

Variable	Wald	df	p value	OR	95.0% C.I. for OR	
					Lower	Upper
Female	7.106	1	0.008	1.510	1.115	2.045
UTI	7.937	1	0.005	2.732	1.358	5.496
Depression	8.795	1	0.003	1.949	1.254	3.030
Sitting	6.940	1	0.008	1.623	1.132	2.328
Uncomfortable position	8.653	1	0.003	1.691	1.192	2.399
Enjoy studies (baseline = all the time)	8.012	3	0.046			
Most of the time	3.610	1	0.057	1.646	0.984	2.753
Occasionally	7.607	1	0.006	2.142	1.247	3.679
Never	1.194	1	0.274	1.572	0.698	3.537
Smoke	9.569	1	0.002	1.809	1.242	2.633
Part time work	13.972	1	<0.001	2.004	1.392	2.885
Constant	73.544	1	<0.001	0.081		

Variable(s) entered on step 1: Gender, race, UTI, Depression, Faculty, study year, sitting, uncomfortable position, enjoy studies, smoke, cigsperday, ever been pregnant, children, part time work, work type, work hours, years smoked.

CHAPTER 5 DISCUSSION

5.1 The lifetime incidence and prevalence of LBP

The lifetime incidence rates of LBP, amongst the student population of DIT, was 55.8%. This is slightly lower than those studies, which were based on general population samples. Studies conducted by Frymoyer et al. (1983); Cassidy and Wedge (1988) reported lifetime incidence rates of 60% to 80%, while Heliovaara (1989) reported that 75% of people in Finland suffered from at least one episode of LBP in their lives.

In South Africa Van der Meulen (1997) found a lifetime incidence rate of LBP among Black South Africans to be 57.6%, while Docrat (1999) found lifetime incidence rates of 78.2%in the Indian population and 76.6% in the Coloured population.

The difference in results may be explained by the fact that this study isolated a specific age group (17-31), with the mean age being 20 and an inter-quartile range of 19-22 years. Therefore the lifetime incidence rate in this sample is slightly lower as one can expect lifetime incidence rates to increase with age.

The point prevalence rate in this study was 27.9% (figure 4). This was in line with other studies on student populations where prevalence rates of 27 to 71% have been reported (Gemmel et al. 1990, Klaber-Moffet et al. 1993, Reis et al. 1996, Lebowski 1997). In a South African study conducted by Docrat (1999) which isolated age specific incidence rates in the Indian and Coloured populations, Docrat found that age specific prevalence of LBP in the Indian community was 17% in the 18-25 year old category and 13% in the 26-30 year old category. Amongst the Coloured population the prevalence of LBP was 12% in the 18-25 year old category, and 10 % in the 26-39% category. The slightly higher

prevalence rates in this study can be explained by the student-specific factors discussed later in this chapter,

5.2 Frequency of LBP

Of those in the prevalence group only 12.9% reported constant LBP (Figure 5). These figures agree with general population studies conducted by Horal (1969), Balague et al. (1995) and Masset and Malchaire (1995) who found that between 4% and 12% of people with LBP experience constant or almost constant LBP

.

The largest group of people reported to suffer from LBP on a weekly basis 41.2% (n = 115), while only 4.7% (n=13) reported annual episodes of LBP.

5.3 Duration of LBP

The current study did not attempt to establish the duration of individual episodes of LBP, but rather to ascertain how long the individual had been experiencing LBP since its initial onset. Of the 279 students (Figure 6) currently experiencing LBP, the majority (41.9%) had been experiencing it for 2-3 years (n=122), while 23.3% had been experiencing it for 4-5 years (n=65) (Figure 6). These results may be influenced by the fact that the majority of students polled were in their second year of study and thus may have been exposed to student-specific risk factors for 2 years.

5.4 Treatment of LBP

Of interest is the fact that of those who had ever had LBP, only 26.5% had received treatment for it. These results compare with other South African studies by Docrat, (1999) and van der Meulen, (1997) where the level of treatment sought by specific population groups was 23% (Indian), 25.5% (Blacks) and 26% (Coloureds). These results did however differ with those of Carey and Evans et

al. (1995) and Deyo and Tsui-Wu (1987) who found that of those affected by low back pain in the USA, between 73% and 84.6% visited a health professional. This may be explained by the lack of accessibility to health care within South Africa when compared to the USA.

5.5 Factors found to be significantly (α=0.05) associated with the presence of LBP

5.5.1 Demographics

5.5.1.1 Gender

Forty five percent of the people in this study were female, with 55% being male (Figure 2). The results showed that females were more likely to experience LBP than their male counterparts (p = 0.028). (Table 7). Upon logistic regression (Table 11) it was found it was found that females were 1.5 times more likely to develop LBP than males.

These results concur with a number of researchers, (Nagi et al. 1973, Reisbord and Greenland 1985, Balagué et al. 1995, Toroptsova et al. 1995, Carey, Evans et al. 1995, van der Meulen 1997, Lebouef-Yde 1998, Docrat 1999, Alcouffe et al. 1999, Grimmer et al. 2000), who suggest that there is a tendency for women to experience LBP more commonly than men.

With females at DIT being 1.5 times more likely to experience LBP, further investigation between females and other significant factors (depression, UTI's, pregnancy) needs to be addressed.

5.5.1.2 Race

This study is the first South African study to investigate race as a risk factor. Past studies (van der Meulen 1997, Docrat 1999) studied individual race groups and prevalence rates of 53% amongst the Black population, 45% amongst the Indian population and 33% amongst the Colored population were ascertained. As in previous studies by Nagi et al. 1973, Reisbord and Greenland 1985, Mijiyawa 1993, no strong association was found between race and LBP. This study however, found a mild association between Indians and Asians and LBP (p=0.068). Figure 3 shows the race distribution of the sample population, this clearly shows that the majority of participants were Black (69.6%), with Indians only comprising 18.6% of the participants. Asians only represented 2.1% of the sample population. As the size of the Indian and Asian samples were relatively small accurate comparison was not possible.

5.5.2 Medical conditions

5.5.2.1 Urinary tract infections

A strong association was found between those reporting urinary tract infections (UTI) and the prevalence of LBP (p=0.013)(Table 8). Upon logistic regression it was discovered that those who suffered from UTI's were 2.7 times more likely to suffer from LBP (Table 11). As UTI's are one of the causes of LBP (Korporaal, 2002), it is difficult to ascertain whether the LBP reported in this study is mechanical or organic in nature. This indicates that those students presenting with LBP should be assessed for the presence of any UTI's.

5.5.2.2 Depression

A strong association was found between those students reporting 'depression' and LBP (p=<0.001)(Table 8). There is evidence suggesting that LBP is reported

more often by people with emotional or psychological disorders (Korporaal, 2002). Upon logistic regression it was found that those students suffering from depression were 1.949 times more likely to suffer from LBP (Table 11). However depression in this study was self-reported and therefore biased by subjectivity. The researcher cannot establish definitive causality as the LBP pain may be a result of the depression or the depression may have begun subsequent to the onset of LBP.

5.5.3 Study environment.

No previous studies of associations between the study environment and LBP exist; therefore comparison between this study and others is not possible.

5.5.3.1 Faculty

Those students currently registered in the health faculty were found to have the highest proportion of LBP (p=0.053) when compared to other faculties (Table 9). This may be accounted for by the fact that a large percentage of the students polled in the health faculty were chiropractic students (37%) and thus would have had a much greater exposure to the treatment of LBP as well as being more aware of health problems and possibly giving a more accurate report of such.

5.5.3.2 Study year

The highest prevalence of LBP was found amongst 3rd year students (p=0.058). As 3rd year students only accounted for 16.1% of all students polled, accurate analysis of this specific population is difficult. Another possibility is that 3rd year students have been exposed to student specific risk factors for a longer period than 1st or 2nd year students and therefore may be found to have a higher prevalence of LBP (36%). This is further reinforced by the results of the 4th year and higher groups recording the second highest level of LBP (29.6%). The slight

decrease in prevalence rates between 3rd year students and 4th year and higher students may be explained by the fact that with 4th year and higher students are more involved in practical work as compared to the prolonged sitting involved with lectures in 1st to 3rd year students.

5.5.3.3 Prolonged sitting and working in uncomfortable positions

Those students who reported having to sit for long periods during the course of their studies were 1.623 times (Table 9) more likely to experience LBP (p=0.001), while those who reported having to work in uncomfortable positions were1.691 times (Table 9) to experience LBP (p=0.003). These findings are extremely interesting as those who reported having to stand for long periods were found to have no increased prevalence of LBP. These results indicate that reducing the length of time students are required to sit or providing frequent rest periods for standing or walking may be beneficial to students.

5.5.3.4 Level of enjoyment of studies

It is interesting to note that most students (54.3%) reported enjoying their studies most of the time. Those students who reported only enjoying their studies occasionally or never had a strong association with the presence of LBP (p=0.016). These results show significant association between a student's level of enjoyment of their studies and the presence of LBP. With a large proportion of students enjoying their studies occasionally (28.7%) or never (5.4%), the increase in LBP within these subgroups may be related to depression. Further investigation is required to ascertain definite links between level of enjoyment of studies and depression.

5.5.4 Lifestyle factors

5.5.4.1 Smoking

Seventeen point four percent of those students polled were smokers. These students were 1.809 times (Table 11) more likely to suffer from LBP ($p<0.001$) than non-smokers (Table 10). This increased prevalence of LBP amongst smokers increased as the number of cigarettes smoked per day increased ($p=0.022$). The prevalence of low back pain further increased amongst those smokers who had smoked for the longest ($p=0.006$)

This study agreed with the findings of other researchers who found that there is strong evidence that smoking, particularly heavy smoking, is associated with an increased prevalence of LBP (Frymoyer et al. 1980, Svensson et al. 1983, Svensson and Andersson 1983, Boshuizen et al. 1993, Leboeuf-Yde et al. 1995, Toroptsova et al. 1995 van der Meulen 1997, Docrat 1999, Feldman 1999, Omokhodion 2002). This study further agrees with Leboeuf-Yde et al. (1995), who reported that abstinence from smoking may be a good primary prevention measure. Effective strategies at DIT should therefore be implemented to reduce student smoking.

5.5.4.2 Parity

Females who had been pregnant before were more likely to have current LBP than females who had never been pregnant ($p=0.062$)(Table10). A strong association was also found between females who had had 1 or more children and LBP ($p=0.046$).

This study unfortunately only assessed the association between 1 or more births and the presence of LBP. Therefore accurate comparison between other studies, which assessed the presence of LBP and number of children, is not possible.

However the researcher agrees with Orvieto, Achiron et al. (1994) who stated that back care advice offered to pregnant women early in pregnancy significantly reduces or prevents low back pain as pregnancy progresses, resulting in less troublesome or severe LBP during pregnancy.

5.5.4.3 Part time work.

Part time work had a strong association with an increased prevalence of LBP ($p<0.001$) (Table 10). In conjunction with this, those who worked 16-20 hours per week had the highest prevalence of LBP ($p=0.001$). Of those who had part time work there was an increased prevalence amongst those employed as bar workers, waitrons and manual labourers ($p<0.001$).

Only 16.9% of those students polled had part time work, with the majority working only 6-10 hours per week. According to Rowe (1969), Nagi et al. (1973), Svensson and Andersson (1983), Reisbord and Greenland (1985), the type of employment may influence the likelihood of developing LBP. Although no information specific to student populations is available, this study found contradictory results to Feldman et al. (2002) who found that adolescents who worked, particularly those with 'white-collar' jobs, were more likely to develop LBP. This study suggests that those students who spend a significant amount of time doing manual work, (waitrons, bar workers and manual labourers), are exposed to additional student-related risk factors are at an increased risk of developing LBP.

5.6 The degree to which the results were representative of the population

The data for this study was collected using the stratified random sampling technique as outlined in Chapter 3. This method was repeated until 1000 students in total had been interviewed. Therefore the sample represented approximately 5% of the total population. The overall percentage of correct

classification of the estimated logistic regression model was 72.4%. The vast majority of people were compliant and a negligible number of students declined to answer the questionnaire. It can therefore be assumed that the data collected from the sample adequately represented the population.

5.7 Limitations of the study

5.7.1 Information bias

The assessment of the outcome (LBP) was self-reported. There may have been a bias in the tendency of participants who were feeling depressed or unhappy to over-report LBP thus creating a false strong association between depression and LBP. Similarly the risk factors were also self-reported.

5.7.2 Causality

One cannot infer causality of any of the risk factors identified here with LBP. This was a cross-sectional study, thus one cannot be sure any of the risk factors were pre-existing before the outcome of LBP. There could even be reverse causality, where for example due to experiencing LBP the subjects started smoking or became depressed. Similarly the subjects may have started not enjoying their studies because of their LBP.

CHAPTER SIX CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The results of this study suggest that LBP occurs commonly among the student population of South Africa, thus providing further evidence that LBP is an international phenomenon commonly affecting all population groups. The lifetime incidence of LBP among students was 55.8%, while the prevalence rate was 27.9%. The prevalence rate of 27.9% however was found to be in line with other international studies conducted upon similar student populations, where prevalence rates of 27-71% were reported (Gemmel et al. 1990, Klaber-Moffet et al. 1993, Reis et al. 1996, Lebowski 1997).

The demographic composition of the sample was representative of the student population with the majority of those polled being Black (69.6%), followed by Indian (18.6%), White (7.8%) and Coloureds (1.9%) forming the minority. This unbalanced distribution, although accurately representative, made accurate comparison of an ethnic nature impossible. It could be argued that the results of this study are most accurately representative of the Black student population.

Risk factors that were found to be significantly associated with current LBP were gender (female), race (Asians and Indians), urinary tract infections, depression, faculty of study (health), year of study (3rd), prolonged sitting or prolonged study in an uncomfortable position, level of enjoyment of study, smoking, increased number of cigarettes smoked per day, increased period of smoking, number of pregnancies, part time work, increased hours of work, as well as those who worked as bar staff, waitrons or manual labourers.

Of interest is the fact that of those who had ever had LBP, only 26.5% had received treatment for it. This indicates a potential gap in health care accessibility or lack of knowledge of low back care options. Education as to the

benefits of correct low back care and accessibility to low back care practitioner needs to be further investigation.

The vast majority of those who sought treatment, were attended to by general practitioners (27.9%) or chiropractors (22.4%). However it should be noted that the DIT has, on its campus, a Chiropractic Clinic. As 57.1% of those polled were aware of the Chiropractic Clinic on campus it must be assumed that the 22.4% who claim to have sought treatment from chiropractors is not representative of other tertiary educational institutions where no Chiropractic Clinic is easily accessible.

6.2 Recommendations

- The sampling method used in this study was a stratified random sampling method. Upon selection an entire class was interviewed. In order to obtain a more accurate representative sample, random sampling from the entire student roll should be used. However this would be extremely time consuming and was therefore not practical in this study.
- It is recommended that in conjunction with a questionnaire, a physical examination of the subject should be used. This will allow objective reporting on the various aspects of LBP.
- A prospective design study is recommended where student subjects are initially LBP free and followed up for the development of LBP. This will help eliminate confusion as to the causality of specific conditions.
- It is recommended that further studies on student population be conducted at other tertiary education institutions. As Durban Institute of Technology is the result of the first successful merger of 2 South African Tertiary Institutions, this study is very useful for further comparisons against future studies of tertiary institutions.

- Specific risk factors identified in this study need to be addressed by academic institutions and if successful changes are made to student lifestyles, reductions in student prevalence rates of LBP may occur.
- It is further recommended that the results of this study are made available to all Chiropractic practitioners. This will enable the entire Chiropractic profession to design an effective preventative and treatment program when dealing with student patients.

REFERENCES

Alcouffe, J.; Manillier, P.; Brehier, M.; Fabin, C.; Faupin, F. 1999. Analysis by sex of low back pain among workers from small companies in the Paris area: Severity and occupational consequences. Journal of Occupational Environmental Medicine. 56(10): 696-701.

Anderson, G.B.J.; Pope, M.H.; Frymoyer, J.W. and Snook, S.H. 1991. Epidemiology and Cost. In Pope, M.H.; Anderson, G.B.J.; Frymoyer, J.W. and Chaffin, D.B. ed. Occupational low back pain: assessment treatment and cost. Pp 95-113. St. Louis: Mosby-Year Book. 320p. ISBN 0-8016-6252-4.

Balagué, F.; Skovron, M.; Nordin, M.; Dutoit, G.; Pol, L. and Waldburger, M. 1995. Low back pain in schoolchildren: a study of familial and psychological factors. Spine. 20(11): 1265-1270.

Biering-Sorenson, F. 1983. A prospective study of low back pain in a general population: occurrence, recurrence and aetiology. Scandinavian Journal of Rehabilitative Medicine. 5:71-79.

Boshuizen, H.C.; Verbeek, H.A.; Broersen, J.P. and Weel, A.N. 1993. Do smokers get more back pain? Spine. 18(1): 35-39.

Carey, T.S.; Evans, A.; Hadler, N.; Kalsbeek; McLaughlin, C. and Fryer, J. 1995. Care-seeking among individuals with chronic low back pain. Spine. 20(3): 312-327.

Cherkin, D.C. and Deyo, R.A. 1993. Nonsurgical hospitalisation for low back pain. Is it necessary? Spine. 18(13): 1728-1735.

Damkot, D.K.; Pope, M.H.; Lord, J. and Frymoyer, J.W. 1984. The relationship between work history, work environment and low-back pain in men. Spine. 9(4): 395-399.

de Girolamo, G. 1991. Epidemiology and social costs of low back pain and fibromyalgia. The Clinical Journal of Pain. 7(Suppl.1): S1-7.

Deyo, R.A. and Tsui-Wu, Y. 1987. Descriptive epidemiology of low back pain and its related medical care in the United States. Spine. 12(3): 264-268.

Docrat, A. 1999. A comparison of the epidemiology of low back pain in the Indian and Coloured communities in South Africa. Masters Degree in Technology: Chiropractic. Dissertation. Technikon Natal, Berea, Durban, South Africa.

Elam, K.C.; Cherkin, D.C. and Deyo, R.A. 1995. How emergency physicians approach low back pain: choosing costly options. The Journal of Emergency Medicine. 13(2): 143-150.

Feldman, D.E.; Rossignol, M.; Shrier, I.; Abenhaim, L. 1999. Smoking. A risk factor for development of low back pain in adolescents. Spine. 24(23): 2492-2496.

Feldman, D.E.; Shrier, I.; Rossignol, M.; Abenhaim, L. 2002. Work is a risk factor for adolescent musculoskeletal pain. Journal of Occupational Environmental Medicine. 44(10): 956-961.

Frymoyer, J.W and Cats-Baril, W.L. 1991. An overview of the incidences and costs of low back pain. Orthopaedic Clinics of North America. 22(3): 263-271.

Garzillo, M.J.D. and Garzillo, T.A.F. 1994. Does obesity cause low back pain? Journal of Manipulative and Physiological Therapeutics. 17(9): 601-604.

Gemmel, H.A.; Jacobsen, B.H. 1990. Incidence of sacroiliac joint dysfunction and low back pain in fit college students. Journal of Manipulative Physiologic Therapeutics. 13(2): 63-67.

Gyntelberg F. 1974. One year incidence of low back pain among male residents of Copenhagen aged 40 to 59. Danish Medical Bulletin. 21(1): 30-36.

Heliovaara, M. Epidemiology of sciatica and herniated lumbar intervertebral disc. Helsinki: Publications of the Social Insurance Institution, Finland, ML76, 1988.

Horal, J. 1969. The clinical appearance of low back pain disorders in the city of Gothenburg, Sweden. Comparisons of incapacitated probands and matched controls. Acta Orthopaedica Scandinavica [suppl]. 118: 11-73.

Hoy, D.; Toole, M.; Morgan, D. and Morgan, C. 2003 Low back pain in rural Tibet. Lancet. 361: 225-226

Hurwitz, E.L. 1994. The relative impact of chiropractic vs. medical management of low back pain on health status in a multispecialty group practice. Journal of Manipulative and Physiological Therapeutics. 17(2): 74-82.

Klaber-Moffat, J.A.; Hughes, G.I.; Griffiths, P. 1993. A longitudinal study of low back pain in student nurses. International Journal of Student Nurses. 30(3): 197-212

Koporaal, C. 2002. Chiropractic Practice and Principles V -- Class notes. Unpublished work.

Leboeuf Yde, C.; Yashin, A. and Lauritzen, T. 1996. Does smoking cause low back pain? Results from a population-based study. Journal of Manipulative and Physiological Therapeutics. 19(2): 99-108.

Lebowski, W.J. 1997. Back pain in teenagers and young adults. Polish Merkuriusz Lek. 2(8): 111-112.

Masset, D. and Malchaire, J. 1994. Low back pain. Epidemiologic aspects and work related factors in the steel industry. Spine. 19(2): 143-146.

Mijiyawa, M. 1993. Rheumatic diseases in black Africa. Revue du Rhumatisme. Edition Francaise. 60(6):451-457

Mohseni-Bandpei M.A., Stephenson R., Richardson B. (1998) Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled trials. Physical Therapy Reviews. 3(4): 185-194.

Mortimer, M.; Wiktorin, C.; Pernol, G.; Svensson, H.; Vingard, E. 2001. Sports activities, body-weight and smoking in relation to low back pain: a population-based case-referent study. Scandinavian Journal of Medical Science Sports. 11(3): 178-184]

Mulimba, J.O. 1990. The problems of low back pain in Africa. East African Medical Journal. 67:250-253

Mundt, D.J.; Kelsey, J.L.; Golden, A.L.; Panjabi, M.M.; Pastides, H.; Berg, A.T.; Sklar, J. and Hosea, T. 1993. An epidemiologic study of sports and

weightlifting as possible risk factors for herniated lumbar and cervical discs. American Journal of Sports Medicine. 21(6): 854-860.

Nagi, S.Z.; Riley, L.E. and Newby, L.G. 1973. A social epidemiology of back pain in general population. Journal of Chronic Diseaeses. 26: 769-779.

Omokhodion, F. 2002 Low back pain in a rural community in South West Nigeria. West African Journal of Medicine. 21(2): 87-90.

Orvieto, R.; Achiron, A.; Ben-Rafael, Z.; Gelernter, I. And Achiron, R. 1994a. Low back pain and pregnancy. Acta Obstetricia et Gynecologica Scandinavia. 73(3): 209-214

Östgaard, H.C. and Andersson, G.B.J. 1991. Previous back pain and risk of developing back pain in a future pregnancy. Spine. 16(4): 432-436.

Östgaard, H.C.; Andersson, G.B.J. and Karlsson, K. 1991. Prevalence of back pain in pregnancy. Spine. 16(5): 549-552.

Porter, S.C, Hanley, E.N. Jr. 2001. The musculoskeletal effects of smoking. Journal of American Academy of Orthopedic Surgery. Jan-Feb;9(1);9-17.

Reis, J.; Flegel, M.; Kennedy, C. 1996. An assessment of lower back pain in young adults: implications for college health education. Journal of American College Health. 44(6): 289-293.

Reisbord, L.S. and Greenland, S. 1985. Factors associated with self reported back pain prevalence: a population based study. Journal of Chronic Diseases. 38(8): 691-702.

Roncarati, A. and McMullen, W. 1988. Correlates of low back pain in a general population sample: A multidisciplinary perspective. Journal of Manipulative and Physiological Therapeutics. 11(3): 158-163.

Rowe, M.L. 1969. Low back pain in industry. A positional paper. Journal of Occupational Medicine. 11(4):161-169.

Salminen, J.J.; Oksanen, A.; Maki, P.; Pentti, J. and Kujala, U.M. 1993. Leisure time physical activity in the young: correlation with low back pain, spinal mobility and trunk strength in 15 year old school children. International Journal of Sports Medicine. 14: 406-410.

Sanderson, P.L.; Todd, B.D.; Holt, G.R. and Getty, C.J. 1995. Compensation, work status, and disability in low back pain patients. Spine. 20(5): 554-556.

Svensson, H.O.; Anderson, G.B.J.; Hagstad, A.; Janson, P. 1990. The relationship of low back pain to pregnancy and gynaecologic factors. Spine. 15(5): 371-375.

Skovron, M.L. 1992. Epidemiology of low back pain. Bailliere's Clinical Rheumatology. 6(3):559-573.

South African statistical bureau. Telephonic conversation. 1 August 2003.

Stapleton, D.; MacLennan, A. and Kristiansson, P. 2002 The prevalence of recalled low back pain during and after pregnancy: a South Australian population survey. Aust. N.Z. Journal of Obstetrics and Gynaecology. 42(5): 482-485.

Toroptsova, M.V.; Benevolenskaya, L.I.; Kayakin, A.N.; Sergeev, I.L. and Erdesz, S. 1995. “Cross-sectional” study of low back pain among workers at an industrial enterprise in Russia. Spine. 20(3): 328-331.

Walsh K, Cruddas M, Coggon D. Low back pain in eight areas of Britain. Journal of Epidemiology and Community Health. 1992(46): 227-230.

Valkenburg, H A, Haanan, H C M. The epidemiology of low back pain. In: White, AA, Gordon, SL. Idiopathic low back pain. St. Louis: CV Mosby, 1982.

Van der Meulen, A.G. 1997. An epidemiological investigation of low back pain in a formal Black South African township. Masters Degree in Technology: Chiropractic. Dissertation. Technikon Natal, Berea, Durban, South Africa.

Volinn, E.; Lai, D.; McKinney S. and Loeser, J.D. 1988. When back pain becomes disabling: a regional analysis. Pain. 33(1): 33-39.

Worku, Z. 2000. Prevalence of low back pain in Lesotho mothers. Journal of Manipulative Therapies. 23(3): 147-154.

Appendix A
Letter of Information

Title of study:
An epidemiological study of low back pain in the student population of a South African tertiary educational institute.

Supervisor: Dr. A.G. van der Meulen (031-2042205)

Research student: Craig Smith (031-2042205)

Institution: Durban Institute of Technology

Dear Sir/Madam,

Welcome to my research project. You have been selected to take part in an epidemiological study into the incidence and prevalence of low back pain in the student population of a South African tertiary educational institute.

Participation is voluntary and refusal to participate will not result in adverse consequences of any kind. The subject may drop out of the study at any stage, without fear of negative consequences.

The results of this study will be made available in the Durban Institute of Technology library in the form of a mini-dissertation.

Procedures:

One thousand students at the Durban institute of Technology will be chosen through a systematic random sampling procedure. The chosen students will then be eligible to take part in the study. Each student will then be given a letter of information and should he/she agree to take part in the study will complete a letter of informed consent. This will be followed by the completion of the research questionnaire. The researcher will be available for the entire duration of the interview to assist with any queries that may arise. The interview will take no more than 15 minutes and all information shall be strictly confidential.

You will be required to complete a 3-page questionnaire on low back pain. All answers are strictly confidential and you are therefore requested to be honest and answer all the questions to the best of your knowledge.

Please don't hesitate to ask any questions on any aspect of this study. Your full co-operation will assist the chiropractic profession in expanding its knowledge of low back pain.

You are free to withdraw from the study at any time without giving a reason.

Confidentiality.
All information is confidential and the results will be used for research purposes only.

Risks/ Discomfort and Cost.
There are no risks/discomfort or cost involved from your participation in the study.

Persons to contact with problems or questions:
Should you have any questions that you may want answered by an independent source you can contact my supervisor on the above number. If you are not satisfied with any aspect of this study, feel free to forward any concerns to the Durban Institute of Technology Research and Ethics Committee

Thank you.

Craig Smith
(Chiropractic intern)

Dr. A.G. van der Meulen.
(Supervisor)

Appendix B
INFORMED CONSENT FORM

Date___/_____/_____

Title of research project:
An epidemiological study of low back pain in the student population of a South African tertiary educational institution.

Name of supervisor: Dr. A.G. van der Meulen (031-2042205)

Name of research student: Craig Smith (031-2042205)

Name of Institution: Durban Institute of Technology

Please circle the appropriate answer

1. Have you read the patient information sheet? YES / NO
2. Have you had an opportunity to ask questions regarding this study? YES / NO
3. Have you received satisfactory answers to your questions? YES / NO
4. Have you had an opportunity to discuss this study? YES / NO
5. Have you received enough information about this study? YES / NO
6. Do you understand your implications of your involvement in this study? YES / NO
7. Do you understand that you are free to withdraw from this study: YES / NO
    a) At any time.
    b) Without having to give a reason.
    c) Without affecting your future health care.
8. Do you agree to voluntary participate in this study? YES / NO

IF YOU HAVE ANSWERED NO TO ANY OF THE ABOVE, PLEASE OBTAIN THE NECCESARY INFORMATION FROM THE RESEARCHER BEFRORE SIGNING.

SUBJECTS Name _____. Signature_____.
(block letters)

WITNESS Name_____. Signature_____.
(block letters)

RESEARCH STUDENT Name_____. Signature_____.
(block letters)

Appendix C

Coded Questionnaire (6 pages)

An epidemiological investigation of low back pain

Please mark appropriate answer by placing an **X** in the relevant answer box.
Questionnaire number _____
Date of interview (_____/_____/_____)

SECTION A. Demographic details.

1. What is your age in years?

17	(_1_)	18	(_2_)	19	(_3_)
20	(_4_)	21	(_5_)	22	(_6_)
23	(_7_)	24	(_8_)	25	(_9_)
26-30	(_10_)	31+	(_11_)		

2. Gender Male (_1_) Female (_2_)

3. Height (in centimeters)

0-100	(_1_)	_____cm
100-125	(_2_)	(please specify)
126-150	(_3_)	
151-175	(_4_)	
176-200	(_5_)	
201 +	(_6_)	

4. Weight (in kilograms)

0-50	(_1_)	91-100	(_6_)	_____kg's
51-60	(_2_)	101-125	(_7_)	(please specify)
61-70	(_3_)	126+	(_8_)	
71-80	(_4_)			
81-90	(_5_)			

5. What is your race? *(for statistical purposes only)*

Asian	(_1_)
Black	(_2_)
Coloured	(_3_)
Indian	(_4_)
White	(_5_)

6. Do you currently suffer from any of the following diseases?

a.) Asthma	Yes	(_1_)	No	(_2_)
b.) Diabetes	Yes	(_1_)	No	(_2_)
c.) Tuberculosis	Yes	(_1_)	No	(_2_)
d.) HIV/Aids.	Yes	(_1_)	No	(_2_)
e.) Urinary tract (Kidney)infections	Yes	(_1_)	No	(_2_)
f.) Depression	Yes	(_1_)	No	(_2_)

g.) Other (Please explain)_____

7. What type of medical care do you receive?

Private medical care	(_1_)
Govt / State hospital care	(_2_)
Community clinic	(_3_)
Pharmacist aid	(_4_)

8. How do you travel to DIT?

By own car	(_1_)	By motorcycle	(_4_)	Other	(_7_)
By taxi	(_2_)	By bicycle	(_5_)	(please specify)	
By bus	(_3_)	On foot	(_6_)	_____	

9. Where do you live?

At home	(_1_)	In residence	(_4_)
Private accommodation	(_2_)	With friends	(_5_)
With family	(_3_)	Other (please specify)	(_6_)
		_____	

10. How do you finance your education?

Student loan	(_1_)	Self-financed	(_4_)
Parental help	(_2_)	Other	(_5_)
Bursary	(_3_)	(please specify) _____	

<u>SECTION B. Study environment</u>.

11. Which faculty are you currently registered with?

Health	(_1_)	Art	(_3_)
Engineering & Science	(_2_)	Commerce	(_4_)

12. What course? and what year? are you currently registered in?

_____.

13. How many hours do you currently spend seated in lectures per week?

0-5 (_1_)	16-20 (_4_)	31-35 (_7_)
6-10 (_2_)	21-25 (_5_)	36 + (_8_)
11-15 (_3_)	26-30 (_6_)	

14. How many hours do you spend in practical subjects each week?

0-5 (_1_)	16-20 (_4_)	31-35 (_7_)
6-11 (_2_)	21-25 (_5_)	36 + (_8_)
11-15 (_3_)	26-30 (_6_)	

15. Does your course involve any of the following?

	Yes	No
A) Lifting heavy objects	(_1_)	(_2_)
B) Standing for long periods	(_1_)	(_2_)
C) Sitting for long periods	(_1_)	(_2_)
D) Working in uncomfortable positions	(_1_)	(_2_)

16. Do you enjoy your studies at D.I.T.

All the time (_1_) Most of the time (_2_) Occasionally (_3_) Never(_4_)

17. On average, how many hours per night do you sleep?

0-3 (_1_) 10-12 (_4_)
4-6 (_2_) 13 + (_5_)
7-9 (_3_)

SECTION C. Lifestyle Factors.

18. Do you smoke? Yes (_1_) No (_2_)

If you answered no to question 18 skip to question 23.

19. How much do you smoke? (cigarettes per day)

1-5 (_1_) 16-20 (_4_)
6-10 (_2_) 21-30 (_5_)
11-15 (_3_) 31 + (_6_)

20. How long have you been smoking? (in years)

1-2 (_1_) 7-10 (_4_)
3-4 (_2_) 11+ (_5_)
5-6 (_3_)

21. If you presently don't smoke but were a former smoker, how many cigarettes per day did you smoke in the past?

1-5 (_1_) 21-30 (_5_)
6-10 (_2_) 31-40 (_6_)
11-15 (_3_) 40 + (_7_)
16-20 (_4_) N/A (_8_)

22. For how long did you smoke before you quit? (in years)

1-2 (_1_) 7-10 (_4_)
3-4 (_2_) 11 = (_5_)
5-6 (_3_) N/A (_6_)

23. How many times have you been pregnant?

0	(_1_)	4	(_5_)
1	(_2_)	5 +	(_6_)
2	(_3_)	N/A (male)	(_7_)
3	(_4_)		

24. How many children have you had?

0	(_1_)	4	(_5_)
1	(_2_)	5 +	(_6_)
2	(_3_)	N/A (male)	(_7_)
3	(_4_)		

25. Are you currently pregnant?

Yes (_1_) No (_2_) N/A (male) (_3_)

26. Do you do any form of physical exercise? Yes (_1_) No (_2_)

If you answered no to question 26 please go straight to question 30.

27.What is the total time spent each week doing physical exercise? (in hours)

less than 1	(_1_)	7-9	(_4_)
1-3	(_2_)	10 +	(_5_)
4-6	(_3_)		

28. How many times per week do you engage in physical exercise?

1	(_1_)	5	(_5_)
2	(_2_)	6	(_6_)
3	(_3_)	7+	(_7_)
4	(_4_)		

29. List the types of exercise that you do most of the time?

1.)_____.

2.)_____.

30. Do you currently work part-time?

Yes (_1_) No (_2_)

If you answered no to question 30 please go straight to question 33.

31. If so, what type of work do you do most of the time?

Bar work (_1_) Driving (_5_)
Waitron (_2_) Manual labor (_6_)
Clerical (_3_) Other (Specify) _____(_7_)
Tutoring (_4_)

32. How many hours per week do you work?

Less than 5 (_1_) 16-20 (_4_)
6-10 (_2_) 21+ (_5_)
11-15 (_3_)

SECTION D. Low back pain.

33. Have you ever experienced low back pain? Yes (_1_) No (_2_)

If you answered no to question 33 please go straight to question 45.

34. Do you presently have low back pain? Yes (_1_) No (_2_)

35. How severe is your low back pain on a scale of 1-100?

No pain 0 100 Most severe pain imaginable

36. How frequently do you experience low back pain?

Constantly (_1_) Daily (_2_) Weekly (_3_) Monthly (_4_) Annually (_5_)

37. How long have you had this low back pain? (in years)

0-1 (_1_) 10-14 (_5_)
2-3 (_2_) 15-19 (_6_)
4-5 (_3_) 20 + (_7_)
6-9 (_4_) N/A (_8_)

38. Have you ever had to stay away from work/study as a result of your low back pain?

Yes (_1_) No (_2_)

39. How long were you away from work? 0-1 day (_1_) 6-7 days (_4_)
2-3 days (_2_) 8-14 days (_5_)
4-5 days (_3_) 15 days + (_6_)

40. Have you ever received treatment for your low back pain?

Yes (_1_) No (_2_)

If you answered no to question 40 please go straight to question 45.

41. Are you currently being treated for low back pain?

Yes (_1_) No (_2_)

42. Where are/ were you receiving treatment for your low back pain?
(Please choose only the main source of your treatment.)

General Practitioner	(_1_)	Reflexologist	(_7_)
Orthopedic/Neurologist	(_2_)	Acupuncturist	(_8_)
Chiropractor	(_3_)	Pharmacist	(_9_)
Physiotherapist	(_4_)	Nursing sister	(_10_)
Homeopath	(_5_)	Masseur	(_11_)
Traditional healer	(_6_)		

43. How long have you been receiving treatment for your low back pain?

Less than one week	(_1_)	3-4 weeks	(_3_)
1-2 weeks	(_2_)	more than 1 month	(_4_)

44. Were you satisfied with the level of care you received?

Yes (_1_) No (_2_)

45. Are you aware that DIT has a chiropractic clinic on campus?

Yes (_1_) No (_2_)

46. Have you ever received treatment from DIT's chiropractic clinic?

Yes (_1_) No (_2_)

Thank you for taking the time to complete this questionnaire.
Your co-operation is appreciated.

Appendix D

Letter of Informed Consent (Vice-Chancellor, academic)

Dear Sir/Madam,

Re: Request to perform research at Durban Institute of Technology (TITLE: An epidemiological study of low back pain in the student population of a South African tertiary educational institution.)

This study will concentrate on the lifetime incidence and prevalence of low back pain in the student population. This research also proposes to investigate the association between certain risk factors and low back pain.

At Durban Institute if Technology, 1000 students, not excluded by the exclusion criteria, will be randomly selected and asked to take part in this study. This will involve the completion of a low back pain questionnaire. Informed consent will be obtained from each student and their confidentiality will be ensured.

The average time for subjects to complete the questionnaire will be 10-15 min. No names or any other form of identification will be present on the questionnaires so as to maintain the anonymous nature of the questionnaires and confidentiality of the subjects. The questionnaires will be stored in a safe place in the Durban Institute of Technology's archives for a period of five years and then shredded.

Participation is voluntary and refusal to participate will not result in adverse consequences of any kind. The subject may drop out of the study at any stage, without fear of negative consequences. The researcher and supervisor may, if requested, inspect any documents pertaining to this study.

If there are any questions do not hesitate to contact myself, Craig Smith or my supervisor Dr A.G. van der Meulen on the below mentioned numbers.

Yours sincerely,

Craig Smith
(6^{th} year chiropractic intern)
083 280 6814

Dr. A.G. van der Meulen
(supervisor)
031-2042205

Name._____. Date._____.

I hereby give permission for Craig Smith to perform abovementioned research on the students at Durban Institute of Technology.

Signed:_____.

Appendix E

Letter of Informed Consent (Lecturer)

Dear Lecturer,

Re: Request to conduct research on students present in your class. (TITLE: An epidemiological study of low back pain in the student population of a South African tertiary educational institution.)

This study will concentrate on the lifetime incidence and prevalence of low back pain in the student population. This research also proposes to investigate the association between certain risk factors and low back pain.

At Durban Institute if Technology, 1000 students, not excluded by the exclusion criteria, will be randomly selected and asked to take part in this study. This will involve the completion of a low back pain questionnaire. Informed consent will be obtained from each student and their confidentiality will be ensured.

The average time for subjects to complete the questionnaire will be 10-15 min. No names or any other form of identification will be present on the questionnaires so as to maintain the anonymous nature of the questionnaires and confidentiality of the subjects. The questionnaires will be stored in a safe place in the Durban Institute of Technology's archives for a period of five years and then shredded.

Participation is voluntary and refusal to participate will not result in adverse consequences of any kind. The subject may drop out of the study at any stage, without fear of negative consequences. The researcher and supervisor may, if requested, inspect any documents pertaining to this study.

If there are any questions do not hesitate to contact myself, Craig Smith or my supervisor Dr A.G. van der Meulen on the below mentioned numbers.

Yours sincerely,

Craig Smith
(6^{th} year chiropractic intern)
083 280 6814

Dr. A.G. van der Meulen
(Supervisor)
031-2042205

Name._____. Date._____.

I hereby give permission for Craig Smith to perform abovementioned research on the students present in my class.

Signed:_____.

Appendix F

LETTER OF INFORMATION
(Focus Group)

Dear Participant,

Welcome to the focus group of my study. Thank you for your interest.

The title of my research project is: An epidemiological study of low back pain in the student population of a South African tertiary educational institution.

Name of supervisor: Dr. A.G. van der Meulen. (031-2042205)
Name of Research Student: Craig Smith (083-2806814)

Name of Institution: Durban Institute of Technology

The purpose of this focus group is to validate the use the low back pain questionnaire in terms of gathering information from the student population. The discussions will focus on the changes that are necessary in order to alter the Questionnaires into a student specific context.

Your participation is much appreciated and it is assured that your comments and contributions will remain confidential. You are at any point permitted to disagree, however if this is the case, please give your reasons for this, as it will assist in the research process. The results of this focus group will only be used for research purposes.

Thank you for your participation,

Yours sincerely,

Craig Smith
(Chiropractic Intern)

Dr. A.G. van der Meulen
(Supervisor)

Appendix G

CONFIDENTIALITY STATEMENT

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

Declaration

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

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

2. The patient files have already been coded and will be kept anonymous, no identification of isolated patient cases will be allowed in the focus group.

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

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

Once this form has been read and agreed to, please fill in the appropriated information on the attached sheet and sign to acknowledge agreement.

Code of Conduct

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

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

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

	Member's full name	Occupation	Signature	Contact details
1	Cardine Jefferys	Student		083 799 1505
2	GARY WOLNO	STUDENT		083 777 9337

3	Hassan Mahomed	Dr [illegible]	[signature]	0822761500
4	Dr. Nick Boden	[illegible]	[signature]	082 325-3012
5	Jono Niemabo	Student	[signature]	0822922239.
6	Tanya Schwarz	Student	[signature]	0835459301
7	Nigel Peek	Chiro Student	[signature]	0837259211
8	Kirsten Dümmer	OT Student	[signature]	0825199279
9	Charmaine Fyfe	Chiro student	[signature]	0829634308
10	[illegible]	Chiro Student	[signature]	0731998577
11	Garrick Haswell	Chiropractor	[signature]	0837821007.
12	Tim Kidgell	Student	[signature]	0834608437
13	Scones Dlamini	Community student.	[signature]	0845119793
14	Olivia Luke	OT student	[signature]	0723708800
15				

Appendix H
INFORMED CONSENT FORM (focus group)

Date 22/09/2003

Title of research project:
An epidemiological study of low back pain in the student population of a South African tertiary educational institution.

Name of supervisor: Dr. A.G. van der Meulen (031-2042205)

Name of research student: Craig Smith (031-2042205)

Name of Institution: Durban Institute of Technology

Please circle the appropriate answer

1. Have you read the patient information sheet? YES / NO
2. Have you had an opportunity to ask questions regarding this study? YES / NO
3. Have you received satisfactory answers to your questions? YES / NO
4. Have you had an opportunity to discuss this study? YES / NO
5. Have you received enough information about this study? YES / NO
6. Do you understand your implications of your involvement in this study? YES / NO
7. Do you understand that you are free to withdraw from this study: YES / NO
   a) At any time.
   b) Without having to give a reason.
   c) Without affecting your future health care.
8. Do you agree to voluntary participate in this study? YES / NO

IF YOU HAVE ANSWERED NO TO ANY OF THE ABOVE, PLEASE OBTAIN THE NECCESARY INFORMATION FROM THE RESEARCHER BEFRORE SIGNING.

WITNESS Name________________________. Signature______________.
(block letters)

RESEARCH STUDENT Name C.D. SMITH. Signature [signature].
(block letters)

Name:	Signature.	Occupation.	Contact no.
1. Tim Kidgell	[signature]	Student	083 4608437
2. AG. V.D. Meulen	[signature]	Chiropractor	083 2332924
3. Zakhele [illegible]	[signature]	CHIRO-STUDENT	0731993577

4. Charmaine Fyfe	[signature]	Chiro. student	0829634308
5. Kirstin Dümmer	[signature]	OT Student.	0825199279
6. NIGEL PEEK	[signature]	Chiro Student	0837259211
7. Tanja Schwarz	[signature]	Homoeopathy Student	083 565930
8. Jono Niemaber	[signature]	Photo Student	082 2922239.
9. HAROUN MAHOMED	[signature]	Orthopaedic Registrar	082 876 1500
10. Nick Boden	[signature]	Chiropractor	0823253012.
11. GARY WOLNO	[signature]	STUDENT	083 777 9337
12. Caroline Jefferys	[signature]	Student	083 799 1505.
13. CATHERINE HASWELL	[signature]	CHIROPRACTOR	0837820007
14. Olivia Luke	[signature]	Final year O.T.	0723708800
15. Scores Dlamini	[signature]	community student	0845118793

APPENDIX I

Letter of assent

Dear participant,

I am conducting research on low back pain among the student population of Durban Institute of Technology. The purpose of this study is to investigate the frequency and nature of low back pain among students and to help identify potential risk factors.

This study will include 1000 students, randomly selected from Durban Institute of Technology across all campuses and faculties. If you agree to participate, you will be required to complete a questionnaire. All the information supplied by you will be treated confidentially and used for research purposes only.

Participation is voluntary and failure to participate will not result in any adverse consequences.

Please feel free to contact Craig Smith (researcher), or my supervisor,
Dr. Anthony van der Meulen if you have any questions.

Thank you very much

Yours sincerely,

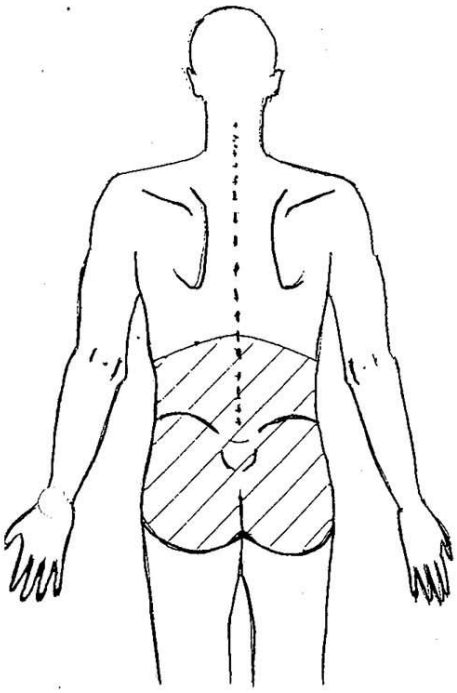
Craig Smith
(Chiropractic Intern)
(031)204 2205 (w) 083 280 6814 (h)

Dr. A. van der Meulen
(Supervisor)
(031) 266 2288

I _____ hereby agree to Participate in the above-mentioned study.

Signature: _____ Date: _____

APPENDIX J



Definition of Low Back Pain

" low back pain" refers to any pain you feel in the shaded area shown on the diagram on the left.

Low back pain is felt from about the last set of ribs at your back , to the lower edge of your buttocks.

If you have felt any pain or discomfort in that area then you will have had "low back pain".

(Ref: Andersson 1991, Svensson et al. 1990)