

**PREDISPOSING FACTORS OF CHRONIC LOW BACK PAIN
(CLBP) AMONG SEDENTARY OFFICE WORKERS (SOW) IN
NAIROBI, KENYA**

BY

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ABSTRACT

Chronic low back pain (CLBP) is a highly prevalent condition in industrialized nations. It is associated with activity limitations, disability, has significant economic impact on society and incurs personal cost. Today's working environment increasingly demands more time spent sitting due to computerization and other advances in technology. Sitting for hours without taking breaks may influence posture, and alignment of the lumbar spine. Therefore, it may influence low back pain (LBP). Kenya as a developing country has an increasing number of people involved in sedentary work. The aim of this study was to identify the predisposing factors of CLBP among sedentary office workers (SOW) in Nairobi. The main objectives were to establish the prevalence of CLBP; to determine the possible predisposing factors of CLBP and to determine the impact of CLBP on work related quality of life among SOW in Nairobi, Kenya. The study design was a cross-sectional analytical descriptive survey with quantitative design. The subjects studied were 196 SOW.

A self administered questionnaire was used to determine the demographic characteristics, prevalence and chronicity, medical history and work influences. Two standardized close-ended validated questionnaires were also used. The Work-related Disability (WL-26) questionnaire (Carole et al, 1995) was utilized to determine the impact of CLBP on work whereas the Roland-Morris (Carole et al, 1995) Low back pain and disability questionnaire was used to determine effects of CLBP on quality of life of sedentary office workers. The data was analysed using excel Relevant themes were extracted. Associations between variables were investigated and interpreted.

Chronic low back pain was predominant at the middle age group between 30 and 49, and at the age of more than 50 years.

Results indicated that these office workers spent most of their working hours seated, many of them using a computer. The majority had been using the same chair for more than 5 years. In addition, majority of the participants were taking a break after only 5 hours or longer. These working conditions in this research have been statistically associated with CLBP. Chronic low back pain was also a cause of their activity limitations. However, CLBP had not a severe impact, and no psychological effects on the office workers. However, there is a need for targeting these predisposing factors of CLBP in order to prevent CLBP among SOW.



DECLARATION

I hereby declare that “**Predisposing Factors of Chronic Low Back Pain among Sedentary Office Workers in Nairobi, Kenya**” is my own work, that it has not been submitted for any degree or examination in any other University, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

KUMUNTU Mukandoli



Signature.....

November 2004-11-20

Mrs. P. Gurie

Witness.....

DEDICATION

To my dear husband **Stephen Karekezi**, whom I am eternally grateful, thank you for providing considerable support throughout the two years of my study, and to my lovely daughter **Munyana** for the happiness and motivation. May **God** continue to bless you.



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TABLE OF CONTENTS

TITLE PAGE	i
ABSTRACT	ii
DECLARATION	iv
DEDICATION	v
ACKNOWLEDGEMENTS	vi
TABLE OF CONTENTS	vii
APPENDICES	xii
LIST OF FIGURES	xiii
LIST OF TABLES	xiv
ABBREVIATIONS	xv

CHAPTER ONE

INTRODUCTION



1.1 INTRODUCTION	1
1.2 BACKGROUND	1
1.3 STATEMENT OF PROBLEM	4
1.4 RESEARCH QUESTIONS	5
1.5 THE AIM OF THE STUDY	5
1.6 SPECIFIC OBJECTIVES	5
1.7 HYPOTHESIS	5
1.8 SIGNIFICANCE OF THE STUDY	6
1.9 MOTIVATION FOR THE STUDY	6
1.10 DEFINITIONS OF TERMS	6

CHAPTER TWO

LITERATURE REVIEW

2.1.	Introduction	9
2.2.	Prevalence of LBP	9
2.3.	Pathophysiology of LBP	11
2.4.	Predisposing factors of CLBP	15
2.4.1	Factors related to workplace environment	16
2.4.2	Factors related to posture	17
2.4.3	Factors related to time spent seated at work	17
2.5	Impact of CLBP	19
2.5.1	Cost effect	20
2.5.2	Psychological effect	21
2.6.	Prevention of CLBP	23



CHAPTER THREE

METHODOLOGY

3.1	INTRODUCTION	26
3.2	RESEARCH SETTING	26
3.2.1	Banks	27
3.2.2	Insurance companies	27
3.3	STUDY DESIGN	28
3.4	STUDY POPULATION AND SAMPLING	28
3.5	STUDY INSTRUMENTS	28
3.6	PILOT STUDY	30
3.7	RELIABILITY AND VALIDITY OF THE STUDY	31

3.8	PROCEDURE	32
3.8.1	QUESTIONNAIRE PROCEDURE	32
3.9	METHODS OF DATA ANALYSIS	34
3.10	ETHICAL CONSIDERATIONS.	34

CHAPTER FOUR

RESULTS

4.1	INTRODUCTION	35
4.2	DEMOGRAPHIC CHARACTERISTICS OF THE PARTICIPANTS	35
4.2.1	Gender distribution of the study sample	35
4.2.2	Age distribution of the participants	36
4.3	PREVALENCE OF LBP	36
4.3.1	Prevalence of LBP among the age group	37
4.3.2	Prevalence of CLBP	38
4.4	WORK-RELATED INFLUENCES	39
4.4.2	Number of hours spent seated in a working day	40
4.4.3	Number of hours spent using a computer continuously	40
4.4.4	Number of years using the same chair	41
4.4.5	Number of hours seated continuously before taking a break	42
4.5	WORK RELATED DISABILITY OF THE PARTICIPANTS WITH CLBP (WL-26).	43
4.5.1	Mild category (scores between 0-17)	43
4.5.2	Moderate category (scores between 18-34)	43
4.5.3	CLBP Disability related to time	44
4.5.4	Disability related to work limitations	45
4.5.5	Psychological factors related to CLBP	45
4.5.6	Disability related to physical demands	46
4.6	EFFECT OF LBP ON PARTICIPANTS' QUALITY OF LIFE (QoL)	48

4.6.1	Mild effect on QoL	48
4.6.2	Moderate effect on QoL	48
4.6.3	Severe effect on QoL	49
4.6.4	Effects of LBP on participants' quality of life	49
4.6.4.1	Limitations of activities of daily living	49

CHAPTER FIVE

DISCUSSION

5.1	INTRODUCTION	51
5.2	PREVALENCE OF CHRONIC LOW BACK PAIN	51
5.2.1	Gender	52
5.2.2	Age	52
5.3	PREDISPOSING FACTORS OF CLBP RELATED TO SEDENTARY OFFICE WORK / WORK RELATED INFLUENCES	53
5.3.1	Years of working in an office	53
5.3.2	Hours of working seated in an office	54
5.3.3	Hours using computer continuously	56
5.3.4	Years using same chair	57
5.3.5	Hours seated continuously before taking a break	58
5.4	WORK RELATED DISABILITY OF THE PARTICIPANTS WITH CLBP (WL-26).	59
5.4.1	Participants' category of disability	59
5.4.2	CLBP Disability related to working time	60
5.4.3	Disability related to work limitations	61
5.4.4	Psychological factors related to CLBP	61
5.4.5	Physical demands	63
5.5	IMPACT OF CLBP ON OFFICE WORKERS' QUALITY OF LIFE (QOL)	64
5.5.1	Severity of CLBP	64

5.5.2	Functional limitations	64
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CHAPTER SIX

SUMMARY, CONCLUSIONS, AND RECOMMENDATION

6.1	INTRODUCTION	66
6.2	SUMMARY	66
6.3	CONCLUSION	67
6.4	LIMITATIONS OF THE STUDY	68
6.5	RECOMMENDATIONS	69
REFERENCES		71



APPENDICES

- APPENDIX A A request to carry out a study
- APPENDIX B Letter from the Ministry of Education, Science and Technology
- APPENDIX C A request to carry out a study to the Banks and Insurance companies
- APPENDIX D Letter from the Human Resource Manager of Barclays bank
- APPENDIX E Letter from the Human Resource Manager of ALICO
- APPENDIX F Letter from the Human Resource Manager of British American Insurance
- 
- APPENDIX G Letter from the Human Resource Manager of Citibank
- APPENDIX H Questionnaire

LIST OF FIGURES

Figure 4.1	CLBP Disability related to time	44
Figure 4.2	Disability related to work limitations	45
Figure 4.3	Psychological factors related to CLBP	46
Figure 4.4	Disability related to physical demands	47
Figure 4.5	Limitations of activities of daily living	50



LIST OF TABLES

Table 4.1	Gender distribution of study sample	35
Table 4.2	Age distribution of the participants	36
Table 4.3	Prevalence of LBP	37
Table 4.4	Prevalence of LBP among the age group	37
Table 4.5	Chronicity of LBP	38
Table 4.6	Length of the time as a sedentary office worker	39
Table 4.7	Number of hours spent seated in a working day	40
Table 4.8	Number of hours spent using computer	41
Table 4.9	Number of years using the same chair	41
Table 4.10	Number of hours seated continuously before taking a break	42
Table 4.11	Mild category (scores between 0-17)	43
Table 4.12	Moderate category (scores between 18-34)	43
Table 4.13	Mild effect on QoL	48
Table 4.14	Moderate effect on QoL	48
Table 4.15	Severe effect on QoL	49

ABBREVIATIONS

CLBP : Chronic Low back pain

LBP : Low back pain

SOW (S) : Sedentary office worker(s)

CTDs : cumulative trauma disorders

MSDs : Musculoskeletal disorders

WHO : World Health Organization

PHS : Public Health Service

ICIDH : International classification of impairments, disabilities, and handicap



PPS : Professional Provident Society

WCA : Workmen's Compensation Association

QoL : Quality of life

WL-26 : Work related disability

CBK: Central Bank of Kenya

CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

This chapter provides the background to the study and highlights the prevalence and consequences of chronic low back pain (CLBP).

The significance of the study, statement of the problem, research questions, aim, objectives, and hypothesis of the study are outlined. This chapter ends with definitions of terms utilized in the study.

1.2 BACKGROUND

Back pain remains pandemic; it permeates all nationalities, all groups and all professions; and in modern times is second only to the common cold as a cause of time off (Key, 2000a). Yes Back problems are the major complaint among young and middle-aged people, and can be a major cause of disability and loss of work or decreased productivity, although most treatments are very effective (Andersson, 1999).

Chronic low back pain (CLBP) is a prevalent condition in industrialized nations with significant economic impact and personal cost. Whether LBP is a chronic condition or a series of repeated acute episodes remains a topic for debate. In addition, the specific cause of LBP cannot always be determined; thus, this category is designed as “non-specific” LBP (Hublely-Kozey, McCulloch and McFarland, 2003).

With high prevalence and recurrence rates, LBP has enormous implications for health-care such as medication, occupational therapy and physical therapy. Furthermore, there appears to be associated increases in chronic incapacity with up to 35% of those with LBP develop a chronic problem which further adds to the

burden of providers and purchasers of health-care. Bardin (2002) supports the claim that LBP is the most common condition treated by physiotherapists.

Occupational health is essentially about the relation between health and work. It is defined as health condition related to physical environment at workplace, and physical environment has long been associated with presence or absence of certain conditions. In occupational health, environmental risk factors are those that are derived from one's physical surroundings at the workplace. Thus, urban industrialized areas are associated with an increased incidence of bronchitis, emphysema, respiratory infections. At the other extreme is the sedentary executive work life in which certain diseases such as chronic low back pain are prevalent (Edelman & Mandle, 1998).

Musculoskeletal disorders have been reported to be the most common clinical problems that occupational physicians currently deal with (Parker, Mackie, 2002). These musculoskeletal disorders (MSDs) such as work related neck, upper limb disorders and work related back disorders are widely recognized for their adverse impact upon employee productivity and well being (Roelofs, Straker 2002). There are a significant number of people who experience LBP as a result of work-related injury; and industrial injuries involving the low back often result in a prolonged absence from work. In addition, considerable financial cost is incurred through workers' compensation claims (Di Fabio, Mackey, Holte, 1995).

Moreover, low back pain is considered to be one of the most common musculoskeletal disorders seen today and many studies of its incidence have revealed that it may occur in as many as 80 percent of the population, with its high prevalence related to work. It is believed that the high prevalence of LBP is due to industrialisation and urbanisation. Unfortunately, as technology advances individuals become more modernized and urbanized (Twomey, Taylor, 1994).

Most of this work involves maintaining a sedentary position. Working in banks, shops, travel agencies, stock-trading or in any other" office" job are examples of sedentary work.

People are required to sit for long hours daily in front of computer and/or use the telephone. Therefore, as work environments have become increasingly automated and computerized, many workers may be living a greater proportion of their lives sitting (Link; Nicholson; Shaddeau; Birch; Grossman, 1990). In light of this, work is considered as a major health determinant; thus, knowledge of people's working conditions greatly contributes to the recognition and prevention of damages to their health and to health promotion (Bertazzi, 2002). Health promotion represents a comprehensive social and political process; it not only embraces actions directed at strengthening the skills and capabilities of individuals, but also action directed towards changing social, environmental and economic conditions so as to alleviate their impact on public and individual health (Nutbeam, 1998).



Although the information on the impact of various workplace factors to the occurrence and etiology of LBP is incomplete (Twomey, Taylor, 1994), in Sub-Saharan Africa, no population studies on LBP have been conducted to date. Therefore, the distribution of clinical patterns of LBP is not known with precision, but hospital-based studies have shown that LBP is the reason for 30 to 40 % of visits to rheumatologists in Sub-Saharan Africa (Mijiyawa, Oniankitan, Kolani & Koriko, 2001). Moreover, occupational injuries constitute a substantial public health problem in both low-industrialized and high-industrialized countries (Lindqvist, Timpka, Schelp & Ahlgren, 1999).

The first International conference of the World Health organisation WHO, the Ottawa charter (1986), emphasized good health to be a major resource for social, economic and personal development and an important dimension of quality of life. Environmental and behavioural factors (among others), can favour

health or be harmful to it. The aim of health promotion therefore, is to make these conditions favourable, by increasingly moving in a health promotion direction beyond clinical and curative services. Health services should support the needs of individuals and communities for a healthier life and open channels between the health sector and broad social, political, economic and physical environmental components (WHO, 1986).

In South Africa, for instance, Public health service (PHS) is committed to achieving the health promotion and disease prevention objectives of “Healthy people 2000”, a Primary Health Service (PHS-led) national activity for setting priority areas including low back pain, classified as a chronic disabling condition (Weinstein, Gordon, 1997). The aim of prevention is to anticipate the precursors and risk factors of a disease and tailor interventions to address these risk factors (Calderon, 1997). In addition, the preventive approach includes measures to prevent the occurrence of diseases, reduce risk factors; and to arrest their progress and reduce their consequences once established (Calderon, 1997). Therefore, evaluating working conditions, correcting ergonomics and maintaining good posture at the workplace have been suggested to prevent the risk factors of CLBP at work (Bertazzi, 2002).

Therefore, in Kenya, there is a need to identify the predisposing factors of CLBP among sedentary office workers with the aim of better managing CLBP.

1.3 STATEMENT OF PROBLEM

The purpose of this study was to explore the prevalence of chronic low back pain (CLBP) and the predisposing factors that contribute to CLBP among sedentary office workers in Nairobi, Kenya.

1.4 RESEARCH QUESTIONS

1. What is the prevalence of chronic low back pain (CLBP) among sedentary office workers (SOW) in Nairobi.
2. What are the predisposing factors that contribute to chronic low back pain (CLBP) among sedentary office workers (SOW) in Nairobi.
3. What is the impact of chronic low back pain (CLBP) on quality of life (QoL) among sedentary office workers (SOW) in Nairobi.

1.5 THE AIM OF THE STUDY

To identify the predisposing factors that contributes to chronic low back pain (CLBP) among sedentary office workers (SOW) in Nairobi, Kenya.

1.6 SPECIFIC OBJECTIVES



- 1.6.1 To establish the prevalence of CLBP among SOW in Nairobi.
- 1.6.2 To determine the predisposing factors of CLBP among SOW in Nairobi.
- 1.6.3 To determine the impact of CLBP among SOW in Nairobi.

1.7 HYPOTHESIS

It was hypothesized that there is a high prevalence of chronic low back pain (CLBP) among sedentary office workers (SOW) in Nairobi. Predisposing factors are likely to include years of working in an office, hours of working seated in a working day, and years using the same chair. In addition it is hypothesized that there will be a significant impact on function.

1.8 SIGNIFICANCE OF THE STUDY

To date, no research has been conducted exploring the prevalence and the predisposing or risk factors of chronic low back pain among SOW in Nairobi, Kenya. Therefore, this information will help the health sector in addressing the health promotion needs in preventing chronic low back pain among office workers in Kenya. The findings of this study will also challenge Kenyan physiotherapists to go beyond the treatment and intervene to promote the preventative measures of chronic low back pain among office workers. The results of this study may also be used by health policy makers to intervene in development of programmes related to improve work productivity and quality of life of office workers in Kenya.



1.9 MOTIVATION FOR THE STUDY

The researcher as a Kenyan physiotherapist has seen many patients suffering from CLBP related to their work conditions. Physiotherapists in Nairobi are challenged to identify the predisposing factors of CLBP among SOW, thus to promote the preventive approaches of CLBP, instead of concentrating on relieving symptoms.

1.10 DEFINITIONS OF TERMS

Low back pain: Low back pain is defined as any pain posteriorly between the ribs and the top of the thigh, from any cause (Loney, Stratford, 1999).

Chronic low back pain: Sustained or recurrent syndromes of LBP of greater than 3 month's duration (Wheeler, 1995).

Sub-acute: back pain which has lasted for 6-12 weeks (Wheeler, 1995)

Acute pain: back pain that lasts for no longer than six weeks (Wheeler, 1995)

Non-specific low back pain: Back pain complaints that the etiology is unknown, occurring without identifiable specific anatomical or neurophysiological causative factors (Hubley-Kozey, McCulloch and McFarland, 2003),

Musculoskeletal disorders (MSDs): is the medical term that refers to health problems affecting muscles, nerves, spinal disc, joints, cartilage, tendons, and ligaments. Many of these disorders occur in the lower back and upper extremities (Vines, 2001).

Occupational health: workplace environment associated with presence or absence of certain conditions (Edelman& Mandle, 1998)



Disability: 1) is the loss of function on an individual level (Jette, 1994)

2) In the context of health experience, is any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being (ICF, WHO 1995)

Ergonomics: the science of arranging and adjusting a work environment, a science of reducing sources of biomechanical stress and resulting injuries by designing a better fit between the physical needs of employees and their workplaces (Radford, 2000; Furlow, 2002). It is a study of considering the worker's abilities and designing the environment to fit his needs, and this field addresses a wide range of cross disciplines, such as, physiology, psychology, sensory, and cognitive abilities (Choe, 2000)

Predisposing factors: aggravating factors, factors which make an illness a bad or unpleasant situation worse, related to certain conditions (Edelman & Mandle, 1998)

Sedentary work: any occupation or work involving little physical activity (Cambridge international dictionary of English, 2002).



CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter discusses critically the review of some studies that described the prevalence of CLBP in both low-industrialised and high-industrialized countries. The pathophysiology, the predisposing factors and the impacts of CLBP among sedentary office workers are also described. Finally, the preventive measures at workplaces to reduce the incidence and impact of occupational injuries are highlighted.

2.2. Prevalence of LBP

Low back pain is one of the oldest occupational health problems in history. It afflicted the ancient Egyptians of 3500 years ago, and it was one of the major concerns of Bernardino Ramazzini, the founder of occupational medicine in the late 1600's (Snook, 1998).

The occurrence of low back pain has therefore been recorded for thousands of years and the rate of incidence has increased in modern times faster than the rate of population growth. Treatment costs have increased more than the rate of inflation (Lester, 2003). About 15% to 35% of the world's population is affected by backache at any time (Anderson, 1999). According to Jayson (1999), some 30 to 40 percent of the population have backache and between 80 and 90 percent experience it at some time in their lives (Loney, Stratford, 1999). It affects both sexes and all ages, from children to elderly people, but is most prevalent in the middle years.

The incidence of work-related injuries increased 3-fold between 1983 and 1992 (Marcoux, Krause, Nieuwenhuijsen, 2000) and several studies have proved that

low back pain (LBP) is among the leading reasons for physician visits in industrialized countries.

Lifestyle prevalence of LBP in industrialized countries has been estimated at nearly 70%. In America for example, 50 to 70 percent of adult population experience repeated episodes of LBP over the course of their lifetime. A study done by Bardin (2002) indicated that 70-80% of people in Western society have at least one episode of LBP in a lifetime.

Therefore, LBP is considered to be an important public health problem in all industrialized nations. Disability resulting from back pain is more common than any other cause of activity limitation in adults aged less than 45 years, and second only to arthritis in people aged 45 to 60 years (Loney, Stratford, 1999).

Frank (1993) reported that in the industrial world, an estimated 2-5 percent of the population have chronic back problems specifically and many are permanently disabled due to them. He also stated that CLBP is the primary cause of limited activity in persons under 45 years of age and the third major cause for activity limitation in person over the age of 45, equally in men and women. In addition, patients with chronic pain have a disproportionate socio-economic impact. Although acute LBP is more common, individuals with chronic back pain account for nearly three times more workdays lost, restricted activity, and disability (Frank, 1993).

Snook (1998), reported that out of 90 percent of patient with single episode of LBP, approximately 70% would still report pain one year later. Although no population studies on LBP have been conducted to date in Sub-Saharan Africa, the most common clinical problems currently dealt with by occupational physicians are musculoskeletal injuries directly related to work (Mijiyawa et al, 2001). For instance, with almost half the United Kingdom's population comprising a working population between 1995- 1996, 1.3 million people reported ill health

attributed to their work (Parker, Mackie, 2002). It was also reported that 60% of referrals on a waiting list in a physiotherapy out-patient department in Britain were patients with LBP (Newton, Waddell, 1991)

In Britain as well as in the United States and in many other countries, low back pain continues to be among the most common occupational disorders, especially in adults of working age (Palmer, Walsh, Bendall, Cooper & Coggon, 2000).

Wegman and Fine (1996), reported that 25% of all workers' compensation claims in the United States, and one third of all compensation costs result from back disorders and that approximately 10% of workers will stop working at a job or change jobs because of low back pain during their working lifetime. Therefore, with the increase in chronic incapacity with up to 35% of those with LBP developing a chronic problem, a preventive approach for effective management of CLBP in physiotherapy is needed (Bardin, 2002).

2.3. Pathophysiology of LBP



Up to 85% of LBP has no definite etiology and is classified as idiopathic or non-specific low back pain. Although there is no known cause of non-specific LBP, there are many theories and opinions (Snook, 1998).

Back pain in general is defined as pain experienced in any portion of the back, caused by back disorders, disc disorders or injuries to the back. Low back pain specifically is any pain posteriorly between the ribs and the top of the thigh, from any cause (Loney, Stratford, 1999). It is considered as a common musculoskeletal symptom that may be either acute or chronic; caused by a variety of diseases and disorders that affect the lumbar spine, namely the first to 5th lumbar vertebrae, or the sacroiliac joint. Low back pain is often accompanied by sciatica, called referred pain, which is pain that involves the sciatic nerve and is felt in the lower back, the buttocks and the back of the thighs, possibly the calves (Loney, Stratford, 1999).

Literature on back pain is ample. However, information about chronic back pain specifically is difficult to find partly because of a lack of agreement around the definition. Chronic back pain is sometimes defined as back pain that lasts for longer than 7-12 weeks (Loney, Stratford, 1999). Frequently recurring back pain is also classified as chronic pain since it intermittently affects an individual over a long period. Others define it as pain that lasts beyond the expected period of healing, and acknowledge that chronic pain may not have well-defined underlying pathological causes (Anderson, 1999).

Cumulative trauma disorders (CTD) take place when a complexity of risk factors occurs repeatedly over a prolonged period to the same muscles group, joint or joint, or tendon. This repeated activity results in cumulative forces that may cause soft tissue micro-tears and trauma. The resulting injury and inflammatory response may lead to tendon synovial disorders, muscles tears, ligaments disorders, degenerative joint diseases, bursitis, or nerve entrapment. (Marcoux, Krause, Nieuwenhuijsen, 2000).



Weinstein and Gordon (1997) classified these causes into three categories: herniated nucleus pulposus, spinal stenosis, and idiopathic LBP. Since the back is a complex system of anatomical structures, and compromising of any of these structures can lead to nervous tissue being impinged resulting in pain. Compromising of the ability of the intervertebral disks to hydrostatically absorb and distribute load forces may result in LBP (Bennett, Gillis, Portney, Romanow & Sanchez, 2003).

Most of low back pain is caused by prolonged overstretching of ligaments and other surrounding soft tissues, resulting in the creep phenomena, which is characterized by a continued deformation at a fixed load; the material continues

to deflect until an equilibrium point is reached. This commonly arises particularly during poor posture habits, in sitting, standing or lying (Hunter, 1998).

People who sit for prolonged periods such as sedentary office workers, will eventually adopt a poor posture, this because when sitting in a certain position for a long period of time resulting hysteresis, which is a phenomenon associated with energy loss exhibited by viscoelastic materials when they are subjected to loading and unloading cycles. Here, the muscles that support the low back, called the local dynamic stabilizers muscles of the lumbar spine, which are: lumbar multifidus, psoas major, quadratus lumborum, iliocostalis, longissimus, transversus abdominis, the diaphragm and the obliquus abdominis internus, become tired and relax (Hunter, 1998).

Thus the body sags and this results in the slouched sitting posture. In addition, slouched posture for long enough causes overstretching of ligaments; and when this posture become a habit, it may also cause distortion of the discs contained in the vertebral joints. Once this occurs, movements as well as positions will produce pain. Therefore, whenever a movement is attempted, the disc bulge increases the strain on the already overstretched surrounding tissues and this causes severe pain in the low back. In addition, the disc bulge may pinch the sciatic nerve which may lead to pain and other symptoms in the leg (McKenzie, 1986).

Furthermore, the pressure inside the disc is higher with sitting than standing or lying; over time discs lose approximately 10 percent of their total fluid. Most of the fluid escapes within the first hour or two of sitting but the discs keep squeezing drier the longer they stay compressed. It can take several minutes before the base of the spine drops down and movement gets easier.

If long hours of sitting are combined with low levels of activity the lowest discs never properly deflate (Key, 2000a).

Lack of movement can also cause the synovial fluid to be inactive, the circulation to slow down, waste products to accumulate in the muscles blood supply to the neural tissue to decrease and the neuromuscular input to be minimal. Pathological changes may take place in muscles, connective tissue of tendons, joints, capsules, and joints, ligaments and muscles imbalance may develop. (Braggins, 2000). These include conditions known as spondylosis, osteoarthritis.

Poor movement also prevents fluid replacement, thus, constant downward pressure causes the lower discs to loose fluid and flatten. The main reason for this is the burden the lower back takes on in supporting the rest of the back. Therefore, discs loose fluid during upright hours, the lower ones faster than the upper ones. With low activity levels our muscles and other soft tissues become less flexible, this makes them less free (Braggins, 2000).

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Thus our overall body stiffness increases compression of the discs and because they are rarely put through their places by day, they are too stiff to let the discs fluid seep in at night. Therefore, in the chronic phase, pain is characterized as deep, aching; stiffness across the low back. Movements such as arching backwards are always awkward and stiff (Key, 2000a).

In addition, prolonged inactivity leads to muscle atrophy, loss of strength and adaptive shortening of soft tissue. Inactivity hinders cartilage and soft tissue nutrition. Thus a sedentary lifestyle leads to poor muscle tone of aerobic fitness, poor posture and a predisposition to osteoporosis (Braggins, 2000). Maintaining a sitting position for long periods of time can result in muscles shortening in the lower back (Kolber, 2002). Thus, prolonged sitting promotes inflexibility and weakness of lower back muscles (Radford, 2000).

Radford (2000) reported that immobility is also a problem for the facet joints of the spinal column; the facet joints link the vertebrae together and give them the

flexibility to move against each other. Movement produces a lubricating fluid that aids that flexibility, thus when there is no motion, there is no fluid. Therefore, for sedentary office workers to perform activities such as typing and writing, that involves prolonged sitting into an unsupported sitting posture especially with forward flexion results in many adverse effects on the back (Bennett et al, 2003).

2.4. Predisposing factors of CLBP

Most mechanical pain is presumed to arise from excessive physical stress on normal spinal structure or normal physical forces acting on abnormal structures (Frank, 1993). The most commonly reported predisposing factors associated with cumulative trauma disorders include repetition, high force, awkward joint posture, direct pressure, vibration, and prolonged static posture, posturally induced muscular imbalances, static muscle loading and muscles fatigue. The more risk factors that are involved and the greater the exposure to each, the higher the likelihood of developing an injury (Marcoux, Krause, Nieuwenhuijsen, 2000).

Breakstone (1999) highlighted three primary workplace predisposing factors for back disorders:

Force: forceful exertions that do not cause harm with one motion, but which can build up micro-trauma over time. For example, the force generated by sitting for extended periods of time without standing to take break or altering position is a risk factor for LBP.

Frequency: too much repetition or too little movement can contribute to micro-trauma. For example, repeated twisting to reach the phone is a risk factor for LBP, as is prolonged sitting with the back bent forward.

Posture: there are certain postures in which we are susceptible to injury, especially at the extremes of our range of motion. For example, twisting and bending forward while sitting are risk factors for LBP.

Lester (2003) also pointed three most likely injuries for office-based workers:

-Back injuries from chairs that are poorly engineered or adjusted and improperly.

-Repetitive motion injuries from doing the same task over and over.

-Neck, shoulder and wrist injuries from improperly positioned screens and keyboards.

Most of the studies have demonstrated that LBP is caused by prolonged sitting postures, as well as improper posture. However, seated posture is affected by both chair design and chair user (Furlow, 2000).

2.4.1 Factors related to workplace environment

A number of vocational factors are associated with mechanical back pain, although individual factors and abnormalities also play a part (Link et al, 1990).

Physical factors have been identified to include the work place environment, equipment layout and furniture characteristics. For instance, the type of the chair may influence alignment of the lumbar spine, and therefore may affect back pain (Link et al, 1990). The type of chair is considered as important in influencing loads on the spine, pushing the body in certain postures that increase back pain by increasing pressure between vertebral discs and by causing increased contraction of back pain (Link, 2003).

The impact of these physical factors may be best summarized through recognizing that constrained body postures can be the product of unsuitable workplace layouts and environmental design, and that constrained body postures are associated with musculoskeletal complains and reports of discomfort by employees (Roelofs, Straker, 2002).

2.4.2 Factors related to posture

Despite improved knowledge and health care resources for spinal pathology, chronic disability resulting from non-specific LBP is rising exponentially. Although the causes of discogenic LBP are multifactorial and complex, sitting posture could increase stresses within the disc and contribute to disc degeneration and pain. Two major occupational risk factors are static muscle load and flexed curvature of the lumbar spine; both are involved in seated work tasks (Makhsous Lin, Ronald, Hendrix, Hepler & Zhang , 2003). However, LBP is more frequent in people with predominantly bent-over work posture (Twomey and Taylor, 1994)

Therefore; poor seating posture may be associated with a higher incidence of low back pain, and various other musculoskeletal complaints. Thus, the workplace plays a considerable role in initiating and exacerbating these complains, which are suggested primarily to be a result of high muscle activation level or high spinal compressive forces during particular postures (Ratzon, Jarus , Baranes, Gilutz, &Erez, 1998). In addition, posture is one area in which a more stressful environment such as an office, users may force their bodies into rigid positions that result in fatigue and muscle strains (Fitzgerald, 2003).

2.4.3 Factors related to time spent seated at work

The work environment increasingly demands more time spent sitting due to computerization and other advices. Thus, people spent most of their working time seated for years, increasing back pain, by increasing pressure between vertebral disks and by causing increased contraction of back muscles combined with poor lumbar stability (Link et al, 1990).

Static work posture is considered one of the main contributing factors of LBP.

Some studies have proved that static posture, with the spine either flexed forward or maintained in some extension, increases the mechanical load placed on the spinal structures, and higher loads have been linked to higher levels of LBP (Bennet, 2003).

Job tasks often repeated and sustained postures over a long period of time can lead to musculoskeletal disorders (Furlow, 2002). Thus, a sedentary lifestyle can predispose to the development of low back disorders, especially if the spine is maintained in flexion for most of the working time. All sedentary office workers occupations such as computer workers function with static vertebral postures maintained for many hours (Braggins, 2000).

Physiologic and epidemiologic studies have demonstrated how prolonged sitting can cause low back pain; and further investigations have shown that those who sit for half of the time or more on their jobs have about 60 to 70% increased risk of developing back pain compared with those who sit for less than half the time (Twomey, Taylor, 2000). For instance, Individuals in sedentary occupations are predisposed to the development of herniated discs, most especially among those aged 35 years and above, and specifically among those who sit for half of the time or more at their job (Twomey, Taylor, 1994). They have attributed this sedentary life-style and associated decreased in movement to the development of muscles imbalances which, they consider, often predispose workers to low back pain (Twomey, Taylor, 2000).

Braggins, (2000) reported that occupations that involve sustained prolonged sitting have a high incidence of LBP, and static posture is particularly provocative especially when asymmetric and awkward. Because of static loading of muscles and joints; even natural postures cause aches, pain or other discomfort after an extended period of time.

In addition, jobs that require repetition of any activity affect the whole body and not merely the part that is involved in the repetitive motion. For instance, computer operators who sit for hours entering data are subjected to strain not only in their wrists and hands, but in particular their low back as well. Therefore, many of these risk factors affect workers who work at computers for prolonged periods of time while simultaneously using a telephone or assuming awkward postures (Marcoux, Krause, Nieuwenhuijsen, 2000). For instance, sitting has been associated with a high incidence of back complains, increased spinal muscular activity and intradiscal pressure when sitting forearms unsupported as compared to standing with the forearms unsupported (Roelofs, Straker, 2002).

Therefore, it has been demonstrated that the incidence of back ailments is extremely high in occupations involving prolonged sitting of longer than 4 hours. If this is repeated frequently and for long periods of time, chronic pain may result (Twomey, Taylor, 1994). Thus, prolonged sitting is a problem not only for the workplace, but also for life-style in general.

2.5 Impact of CLBP

Occupational injuries constitute a substantial public health problem in both low-industrialized and high-industrialized countries (Lindqvist, Timpka, Schelp, & Ahlgren, 1999). As it is well known, the lifetime incident of low back pain is very high, but those who incur the majority of the cost, both financially and personally, are persons who suffer recurrent or chronic pain. It has been reported that 85% of LBP sufferers have intermittent attacks of disabling pain every 3 months to 3 years.

For people with low back pain, sitting is frequently the most uncomfortable position to maintain, and this often has an impact of the quality of life and work productivity. Thus, many people who have LBP are likely to be out of work taking

medication, and probably making demands on both primary and secondary health care as well as the private sector (Frank, 1993).

2.5.1 Cost effect

It has been reported that work related musculoskeletal disorders (MSDs) constitute about one half of all MSDs and account for some 15-22 % of all work place sick leave across industry in general; 44% of compensation cases are for sprains' and strains' and in the United States, these cost an average of \$7,400 per case (Roelofs, Staker, 2002).

Therefore, absenteeism caused by musculoskeletal disorders is a persistent and costly occupational health challenge (Arnetz , Sjogren, Rydehn & Meisel, 2003). In the United States, the direct medical and indirect costs were estimated to be more than \$ US 50 billion per year. In 1991, the cost of LBP to society in the Netherlands was estimated to be 1.7% of the gross national product, and 93% of these costs were caused by work absenteeism and disability (Staal, Hlobil, Tulder, Koke, Smid & Mechelen, 2002).

Statistics on LBP for Kenya are not yet found. Although in South Africa statistics on LBP are limited, it was reported that LBP is a condition that is likely to be responsible for a high percentage of absenteeism and that is accountable for a large portion of medical expenses. Since 1992, the Professional Provident Society (PPS) has paid out 6.2 million of Rand for permanent disability from back problems (PPS statistics, 1998). Costs paid by the Workmen's Compensation Association (WCA) of South Africa are also high for low back conditions and amounted to 38.4 million rand for 1994 (WCA, 1995).

Anderson (1999) also reported similar data from other western countries. Like the United Kingdom estimates place low back pain as the largest single cause of absence from work in 1988-1989, and that it is responsible for about 122.5 of all

sick days. He added that this figure is similar to data from Sweden where, since 1961, 11-19% of all annual sickness absence days are taken by people with a diagnosis of back pain.

In 1999, the latest year for which detailed statistics are available, the Bureau of Labor Statistics in America reported 246,700 cases of cumulative trauma disorders (CTD), also known as musculoskeletal disorders (MSDs), were reported accounting for 66% of workplace illnesses, 128,000 professional and administrative workers missed at least one day of work due to musculoskeletal, or ergonomics-related, injuries (Lester, 2003; Dale, 2004).

Hankin and Killian (2004) also reported that chronic pain has a significant economic impact on society in terms of health care costs, disability compensation, and days lost from work. As a result, everyone loses when workers are injured or disabled for long periods of time. The insurer, employer, and society suffer the economic losses, while the employee suffers the individual loss from time off work, decreased income, and costly medical bills.

Consequently, absenteeism is directly related to work productivity and the cost to the industry is high (Richardson, Jull, Hodges & Hides, 1999).

2.5.2 Psychological effect

LBP has also considerable functional and emotional impacts on the lives of sufferers (Bardin, 2002). Psychological correlates of chronic pain include depression, somatization, and anxiety. Depression is a consequence of rather than an antecedent to chronic. Depression, anxiety, coping strategies, fear-avoidance beliefs, and health locus of control have been linked to chronic disability from LBP (Julie, George, 2002). It is an important consideration for a

person who has chronic pain because it correlates with physical and psychological function.

Pain-related anxiety also correlates with depression, disability, and medication use. Cognitive anxiety specifically, may interfere with a patient's ability to cope with chronic pain. In a study of patients with chronic low pain, high levels of pain-related anxiety are associated with higher predictions of pain and less range of motion when performing a task involving painful movement (Hankin, Killian, 2004).

Studies have demonstrated that 80 per cent of acute episodes of LBP resolve within 6 weeks, but are often recurrent, and most patients with a history of acute episodes eventually have more chronic symptoms. Also, persons who seek medical attention for LBP are thought to be at risk for chronic pain and disability (Biewen, 1999). These include the distress of patients and their families and consequences for employers in terms of sickness absence and for society as a whole in terms of welfare benefits and lost productivity (Main, Amanda, de Williams, 2002).

In addition to the pain, depression and long-term disability for the individuals with musculoskeletal disorders are significant societal losses. Insomnia and anxiety, which might be a manifestation of depression, are common complaints of people suffering from chronic low back pain. Over time, however, psychosocial and behavioral factors may serve to maintain and exacerbate the level of pain, influence adjustment, and contribute to excessive disability (Kirkaldy-Willis, Bernard, 1999; Twomey, Taylor, 2000). These include lost work-days, increased costs of medical care and increased costs for workers' compensation benefits (Marcoux, Krause, Nieuwenhuijsen, 2000).

Therefore, LBP, in particular chronic or recurrent low back pain is a growing problem that places increasing demand on health budgets.

The increasing Chronicity of CLBP has even raised questions about the validity of current management of this disorder (Bardin, 2002), including physiotherapy.

2.6. Prevention of CLBP

The prevalence of and costs associated with occupational low back pain (LBP) have made prevention an important research goal (Julie, George, 2002).

Given the impact of LBP, there is a need for effective treatment interventions in occupational healthcare that aim at the prevention of chronic disability and the realization of return to work (Staal et al, 2002). Therefore, the early identification of patients who are at risk for prolonged work absence and disability, could allow for targeted interventions within the acute phase that may reduce costs and the likelihood of chronic disability (Julie, George, 2002).

Ergonomics, the science of arranging and adjusting a work environment has numerous physical benefits (Radford, 2000). It aimed at identifying and reducing sources of biomechanical stress and resulting injuries by designing a better fit between the physical needs of employees and their workplaces.

These prevention strategies in the workplace can reduce the incidence and impact of musculoskeletal injuries, illnesses, and disorders. Therefore, employers can reduce occupational injuries and absenteeism while improving productivity and work quality by designing safe, comfortable workplaces for employees (Furlow, 2002).

Design of the workstation and the surrounding office could make a difference in comfort and reduce injuries. Workplace layout or design fundamentally determines ergonomic injury rates (Ellis, 2003). Sedentary office workers have been identified as having high levels of discomfort, and this may be caused by arrangement of the office space. Due to arrangement of furniture, computer and

supplies, awkward postures are at times necessary to perform job duties. Therefore, layout and working conditions predispose these workers to musculoskeletal disorders (Fisher, Konkel, Harvey, 2004)

Several studies have examined the relationship between various chair characteristics and sitting posture to determine which factors contribute most to stress reduction and, thereby, to low back comfort. Key, (2001) reported that poor designed chairs such as those with a completely straight back at right angles to a completely straight can cause awkward position, by pushing the whole upper body forward, in front of the line of gravity, making the low back slump and the muscles work overtime to stop the upper body crumpling completely forward. After a while, the muscles start to fatigue and resulting in low back pain.

Unfortunately, most people sit badly because it is impossible to sit well in a poorly designed chair, and the design of the available chairs contributes to people's poor posture, rarely giving adequate support to the low back and, unless a conscious effort is made to sit correctly, people are more or less forced to sit badly that predispose them to develop low back problem.

Therefore, ergonomics should allow each worker to adjust his or her equipment, such as chairs and computer monitors for the person's particular needs (Furlow, 2003).

Evaluating working conditions greatly contributes to the recognition and prevention of low back pain. However, correcting ergonomics must be complemented with maintaining good posture. While seated upright, a chair should have good lumbar support to enable the individual to maintain an erect spine (Bertazzi, 2002). Ergonomically designed chairs that are intended to preserve the neutral anterior curve have been demonstrated to help maintaining good posture while sitting (Link et al, 2003).

Nevertheless, even people who maintain ideal posture and make use of appropriate devices need to take breaks as preventive measures. Even if we are one hundred percent correct, our bodies were not meant to sit for long periods (Fitzgerald, 2003). Thus, postural variation has been proved to be effective in reducing the experience of musculoskeletal discomfort for total body, back, lower limb and upper limb areas and that the duration for which a posture is maintained affects the experience of musculoskeletal discomfort experienced by sedentary office workers (Roelofs, Straker, 2002).

To prevent these discomforts, office workers should move away from constrained work posture and toward the introduction of systematic postural variation (Roelofs, Straker, 2002), or pause exercises.

Scientifically based prevention efforts can be effective in the workplace, substantially reducing the risk of job-related musculoskeletal disorders. Thus, knowledge of people's working conditions greatly contributes to the recognition and prevention of damages to their health and to health promotion (Bertazzi, 2000).

In conclusion, an important role is for the physiotherapists to work with management in developing training programs, ergonomics programs, and policies, and practices that have been shown to be effective in reducing low back problems (Snook, 1998).

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

This chapter describes and explains the rationale for the selected research setting. Description of the study design, population, sampling method and instrumentation are also given. The method is presented and the data collections in which a self-administered questionnaire survey are explained. The study design and data collection are also described. The pilot study and data analysis are also explained. This chapter ends with ethical considerations during the process of collecting data.



3.2 RESEARCH SETTING

The study was carried out in Nairobi, the capital city of Kenya. The study was based at four selected institutions; two banks and two insurance companies. Nairobi is an industrialized city and it is the economic hub of the Eastern and central African countries and serves as the headquarter of various organizations. Therefore, most of the work is in the offices using advanced technology; and this includes banks and insurance companies.

Banks and insurances companies were selected as the research setting because of their considerable number of sedentary office workers usually using computers and telephones most of their time of working hours (Breakstone, 1999).

Kenya is constituted by eight provinces: Nairobi, Coast, North Eastern, Eastern, Central, Rift Valley, Nyanza and Western. In 2003, an economic survey data

2002 indicated that Nairobi province has the largest share of wage employment in the country (Central Bureau of Statistics, 2003). The selected institutions for this study are the following: Barclays bank, City bank, ALICO, and British-American Insurance companies. They were selected through simple random sampling method from 47 Insurance companies (Kenya postal directories and Yellow pages Telcom Nairobi, 2004) and 41 Banks (Yellow pages Telcom Nairobi, 2004; CBK Weekly bank review, 2005) operating in Nairobi.

In simple random sampling, the sample should have approximately the same characteristics as the population relevant to the research in question (Annemie de Vos, 2002). In simple random sampling, the researcher develops an accurate sampling frame (Neumann, 2000) and each individual case in the population theoretically has an equal chance to be selected for the sample (Annemie de Vos, 2002).

3.2.1 Banks



Barclays Bank is an international bank which has several branches in the 8 provinces of Kenya, the headquarter with 4 departments has the largest number of employees, 194, which is located in the center of Nairobi province.

City Bank is also an International bank, the headquarter located in the center of Nairobi has 152 employees, and one branch in Mombasa the second commercial city of the country, with about 54 employees

3.2.2 Insurance companies

ALICO a national Insurance company has 392 employees, and is located in the center of Nairobi city.

British-American is also a national insurance company with 228 in 4 branches, one in the Westland, about 5 km of Nairobi center, two in the centre of Nairobi and the headquarter located approximately 2 km from the centre of Nairobi.

3.3 STUDY DESIGN

The study was a cross-sectional descriptive survey with a quantitative design.

3.4 STUDY POPULATION AND SAMPLING

Two hundred and fifty sedentary office workers in the branches of the selected institutions were given the questionnaires.

Inclusion criteria were sedentary office workers men and women, aged between 20-55 years and those with more than one year of work experience in the selected institutions. This period of work experience has been estimated from experience, considering CLBP that is defined as a low back pain which lasts longer than three to six months.

Exclusion criteria for the sampling were SOW who had LBP as a result of an accident, any other trauma and congenital problems. Participants who had less than one year of work experience as a SOW were also excluded from the study.

3.5 STUDY INSTRUMENTS

The study utilized the quantitative method of data collection, using three self-administered closed-ended questionnaires distributed by the researcher and research assistants to the participants to be filled in. One of the questionnaires was a non-standardized instrument and the two were standardized instruments. Appointments were made for collecting the questionnaires. If participants

experience some difficulties with the questionnaires they could clarify the matter with the researcher and research assistants on their return.

Three different questionnaires, sections A, B and C were used (Appendix H). Instructions were provided at the beginning to explain how to fill in the questionnaire, and those instructions were again repeated orally, during the distribution of the questionnaires, by the researcher and researcher assistants to ensure the clarity of the questionnaire and how to fill them in.

Section A: is a non standardized instrument; the two first questions covered two demographic characteristics which are gender and age. The next two questions covered prevalence and chronicity characteristics. The rest of the questions requested information on medical history and work influences that could determine some of the predisposing factors of CLBP among the SOW. It also assist the inclusion criteria.



Section B: Work related disability (wl-26) questionnaire (Amick et al, 2000), a standardized instrument, was utilized to determine the impact of CLBP on work.

The WL-26 work-related disability questionnaire contained three possibility responses which were coded as, for each question, the response was either 1 for “none of the time”, 2 for” half of the time”, and 3 for “all of the time”.

Its’ measurement has been modified from the 2000 WHO classification of diseases, and has been scored as followed:

Each question received, a 2 for a response of “All of the time” or none of the time” when this means “exposing the participants to aggravate LBP”, a 0 for a response of “All of the time” or “none of the time” opposing the previous response, (if a response “All of the time” received a 2, the response “none of the time” for the same question, received a 0 and vice versa), and all the responses of “Half of the time” received a 1. The total response was the sum of the number assigned to each category. The higher score being a 2, the possible total responses was 52.

It has been decided that participants work related disability to be categorized according to criteria described as followed:

Mild disability: participants with a score of the number assigned to category between 0 and 17.

Moderate disability: participants with a score of the number assigned to category between 18 and 34.

Severe disability: participants with a score of the number assigned to category between 35 and 52.

Section C: The Roland-Morris Low Back Pain and Disability, a standardized instrument (Carole et al, 1995) was used to determine effects of CLBP on quality of life of sedentary office workers.

This questionnaire has been scored without being modified. Where the participants agreed with the statement, a score of 1 is given and 0 to a negative response. The score was the number of agreements with the statements expressed as a total calculated out of a possible worst score of 24 questions.

This questionnaire was decided to be categorized as follows :

Mild effect was classified between: 0- 8

Moderate effect was classified between: 9-16

Severe effect was classified between: 17-24

The two sections B and C have been designed to give information as to how CLBP affects SOW ability to manage activities of daily living.

3.6 PILOT STUDY

A pilot study was conducted to measure the appropriateness of the questionnaire and the time taken to complete it, for better understanding and clarity, and to offer the researcher the opportunity of testing the effectiveness of the questionnaires (Annemie De Vos, 2002). The procedure of the pilot studies was

carried out in two institutions, one bank and one insurance company that did not participate in the study. Five SOW from those two institutions that had the same characteristics as the participants in the main study were selected by convenience sampling and the instruments were pre-tested for two days. Participants were allowed to ask questions for any clarification of the questionnaire.

The questionnaire was completed in two days and collected from the participants by the researcher and research assistants.

No complaint or change was requested concerning the questionnaire from the participants, but some lessons were learnt during the pilot procedure:

- Prior authorization arrangements in collaboration with the human resources managers to access into the institutions were necessary for the success of the exercise.
- Clarity of questionnaire by the researcher and research assistants was important to the respondents for better understanding.
- It was necessary to let participants fill in the questionnaire at their own convenient time.

3.7 RELIABILITY AND VALIDITY OF THE STUDY

It is essential to consider reliability and validity in all measurements, and according to Mouton (2001), when using an existing instrument it is fundamental that information is also available about the construct validity and reliability.

The survey questionnaire was in English, the educational language used in Kenya. The research assistants were physiotherapists with more than three years work experience.

The adapted questionnaires, section B and C were relevant to be applied to the population of Nairobi, Kenya a sub-Saharan African country; which is considered as an urban and industrialized city.

There is some evidence of the validity of the WL-26 questionnaire in capturing information on an injured worker's ability to manage the behavioral aspects of the workplace and his/her responsibilities within it. There is little published on the reliability of responses to date (Carole et al, 1995).

3.8 PROCEDURE

The procedure started with research assistants training for 3 days to clarify the questionnaire and to explain their role in the study, the aim of the study, the research topic and the ethics of the study.

All the four research assistants were  qualified physiotherapists, thus were skilled to assist the study professionally.

A research permit was required to allow the researcher to conduct the study in the country; which was obtained from the Ministry of Education, Sciences and Technology (Appendix B).

A copy of research permit was given to human resources managers in the institutions of the study to get authorization when to start the procedure.

A written consent aimed to explain and assure respect and confidentiality during the process was requested.

The study utilized self-administered questionnaires for data collection.

3.8.1 QUESTIONNAIRE PROCEDURE

On the first day, research assistants were introduced to the participants to distribute the questionnaire.

The questionnaire was in English because English is a national educational language, and all office workers are assumed to have an educational level which allows them to understand, to write and express themselves in English.

The questionnaires were distributed to the participants by the research assistants or by a person delegated by the institution authority.

Two hundred and fifty (250) questionnaires were conveniently distributed into the branches of the four selected institutions. Seventy (70) questionnaires were distributed in the Barclays bank, forty (40) in City bank, fifty (50) in British-American, and ninety (90) in ALICO. The number of questionnaires to be distributed in each institution was decided by the authority of the institution. Participants requested to fill in the questionnaire on their own convenient time; therefore, the questionnaires were completed between 3 to 5 days, contrarily to the same day of distribution planned by the researcher.

This demanded the research assistants to collect the completed questionnaires every day and to remind those who had not completed until they get all of them or those which were filled in (Sarantakos, 1997).

Research assistants were also required to make an appointment with the authority of the institutions, in collaboration with the participants about the day and the time to distribute the questionnaire.

This was time consuming because most of the researchers were not close to the institutions.

In order to get accurate information, during the distribution of the questionnaires, the researcher and assistants repeated the instructions verbally to the participants on how to complete the questionnaire and explained the purpose of the study, to ensure clarity and better understanding.

Out of 250 questionnaires, 196 were filled in and returned, 54 were either misplaced or not filled in.

3.9 METHODS OF DATA ANALYSIS

Excel was used to analyze the data, and relevant themes were extracted. Associations between variables were investigated. The data are presented in form of tables and charts.

3.10 ETHICAL CONSIDERATIONS.

A research permit to conduct the study in Kenya was obtained from the Ministry and Education, Sciences and Technology, approved by the National Resource Council (Appendix B). Application letters addressed to the human resources managers of the different Banks and insurance companies requesting permission to conduct the study in those institutions was arranged (Appendix C). Permission to carry out the study into the selected institutions used in the study was sought out from the human resources managers (Appendix D,E,F,G).

The researcher assured those institutions, which participated in the study that the results of the study would be made available to them. Confidentiality of the individual results was maintained and ensured.

CHAPTER FOUR

RESULTS

4.1 INTRODUCTION

This chapter presents the demographic characteristics of the study population. The prevalence of low back pain and chronic low back pain is presented. The characteristics of the participants' symptoms such as Chronicity and severity are described. In addition, work-related habits such as time spent sitting in a working day are described. Work-related disability among the participants with LBP, the effects of LBP on participants' quality of life are also presented.

4.2 DEMOGRAPHIC CHARACTERISTICS OF THE PARTICIPANTS

4.2.1 Gender distribution of the study sample

Two hundred and fifty (250) questionnaires were administered, of which one hundred and ninety six (196) were properly filled in. This yielded a 78% response rate. Fifty four (54) were misplaced or not returned. Ninety five (95) were males (48.47%) and one hundred and one (101) were females (51.53%).

Variables	Characteristics	Number of participants	% of total participants
Gender	Males	95	48.47
	Females	101	51.53

Table 4.1 Gender distribution of study sample (n=196)

4.2.2 Age distribution of the participants

Table 2 shows the age distribution among the 196 participants. Thirty seven participants were between the age group of 20-29. Ninety nine participants were in the age group of 30-39, while 52 were between 40-49. Eight participants were older than 50 years of age.

Age-groups	Total number	% of the total
20-29 years	37	18.88
30-39 years	99	50.51
40-49 years	52	26.53
Older than 50 years	8	4.08

Table 4.2 Age distribution of the participants (n=196)

4.3 PREVALENCE OF LBP

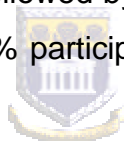
Of the 196 participants, 150 (76.53%) had LBP. Of this group, more than half were females, 82 (54.67%), and 68 males (45.33%). The results show a higher proportion of all female participants who had LBP compared to all male participants.

	Males	%	Females	%	Total
LBP	68	45.33	82	54.67	150
NO LBP	27	18	19	12.67	46

Table 4.3 Prevalence of LBP (n=150)

4.3.1 Prevalence of LBP among the age group

The highest prevalence of LBP was in the oldest age (more than 50 years) with all participants experiencing LBP, followed by the age group 40-49, with 98.08%. In the 30-39 year age group 82.83% participants had LBP. In the youngest age group (20-29) 24.3% had LBP.



Age-group	Total of LBP	%
20-29 years	9	24.3
30-39 years	82	82.83
40-49 years	51	98.08
Greater than 50 years	8	100

Table 4. 4 Prevalence of LBP among the age group (n=150)

4.3.2 Prevalence of CLBP

CLBP was classified as having experienced low back pain for more than three months. One hundred and twenty four participants (82.67%) fulfilled these criteria.

Among the age groups, half of the participants, 62 (50%) presenting with CLBP were aged between 30 -39, with 22 (17.74%) males, 40 (32.26%) females, followed by 51 (41.13%) participants aged between 40-49, with 29 (23.39%) males and 22 (17.74%) females.

The chi-square test indicated that there was no significant association between gender ($p=0.3$), and chronic low back pain. However, a significant association was found between the age and chronic low back pain. A p value of 0.0001 was yielded.



Age group	CLBP	%	Males	%	Females	%
20-29	3	2.42	1	0.8	2	1.6
30-39	62	50	22	17.74	40	32.26
40-49	51	41.13	29	23.39	22	17.74
More than 50	8	6.45	5	4.03	3	2.42

Table 4.5 Chronicity of LBP (n=124)

4.4 WORK-RELATED INFLUENCES

4.4.1 Length of the time as a sedentary office worker.

This table shows that the majority of participants, 70 (56.45%) with chronic low back pain (CLBP) have been working in an office for more than 10 years. Among them, 38 were males and 32 were females. Forty participants had been working for 5- 10 years. Seventeen of them were males and twenty three were females.

A chi-square test was done to determine a correlation between chronic low back pain and length of time spent as a sedentary office worker. Results showed that there was a significant association between chronic low back pain and number of years working as a sedentary office worker (p value=0.0001). Therefore, the longer a person works as a sedentary office worker, the more predisposed to developing CLBP.



Years of working	CLBP	%
1-5 years	14	11.29
5-10 years	40	32.26
More than 10 years	70	56.45

Table 4. 6 Length of the time as a sedentary office worker (n=124)

4.4.2 Number of hours spent seated in a working day

The majority of participants, (91.94%) with CLBP, have been working continuously for more than 5 hours in a seated position. Among them, 53 were males and 61 were females. It was shown that there was a significant association between daily working hours (p value=0.0001) and chronic low back pain. Therefore, the longer the participant spent hours seated, the more predisposed to developing CLBP.

Hours of working seated	CLBP	%
Less than 1 hour	0	0
1-3 hours	2	1.61
3-5 hours	8	6.45
More than 5 hours	114	91.94

Table 4.7 Number of hours spent seated in a working day (n=124)

4.4.3 Number of hours spent using a computer continuously

A high proportion of participants, (95.1%), who had CLBP, had been using a computer for more than 8 hours a day. Of these participants, 56 were males and 62 were females. There was a significant association between number of hours spent using a computer and CLBP (p value=0.0001).

Hours using computer	CLBP	%
Less than 1 hour	0	0
1-3 hours	0	0
4-7hours	6	4.84
More than 8 hours	118	95.16

Table 4.8 Number of hours spent using computer (n=124)

4.4.4 Number of years using the same chair

The majority of participants, (47.5%) had been using the same chair for 3-5 years and longer. It was shown that there was a significant association between years using the same chair (p value=0.0001) and chronic low back pain.

Years using the same chair	CLBP	%
Less that one year	1	0.81
1-3 years	20	16.13
3-5 years	59	47.58
More than 5years	44	35.48

Table 4.9 Number of years using the same chair (n=124)

4.4.5 Number of hours seated continuously before taking a break

When participants were asked: "After how long do you take breaks", a high number, 120(96.77%), changed position every 5 hours or more.

This indicates that participants spend a considerable length of time seated without taking a break. There was a significant association between length of time spent seated before taking a break (p value=0.0001) and chronic low back pain.

Hours seating continuous	CLBP	%
20-30 minutes	0	0
1 hour	0	0
Every 1-3 hours	4	3.23
From 5 hours and above	120	96.77

Table 4.10 Number of hours seated continuously before taking a break (n=124)

4.5 WORK RELATED DISABILITY OF THE PARTICIPANTS WITH CLBP (WL-26).

4.5.1 Mild category (scores between 0-17)

For the participants with mild disability, 13(8.67%) had sub-acute low back pain, and 28(18.67%) had chronic low back pain.

CATEGORY	LBP DURATION	FREQUENCY	%
Mild disability: 0-17	Sub-acute LBP	13	8.67
	Chronic LBP	28	18.67

Table 4.11 Mild category (scores between 0-17) (N=150)



4.5.2 Moderate category (scores between 18-34)

Fourteen participants (9.33%) had sub-acute low back pain, whereas 95(63.33%) had chronic low back pain. Therefore, the majority of the participants who presented with CLBP showed a moderate level of disability due to CLBP. None of the participants presented with severe disability.

CATEGORY	LBP DURATION	FREQUENCY	%
Mild disability: 0-17	Sub-acute LBP	13	8.67
	Chronic LBP	28	18.67

Table 4.12 Moderate category (scores between 18-34) (N=150)

A further analysis of the questions in WL-26 questionnaire was divided into four groups: Those related to time loss, limitations to work, psychological effects, and physical demands. Each question stated: “Because of your back pain, in the last four weeks, how often did the following things occur?”

4.5.3 CLBP Disability related to time

As presented in figure 4.5.3., it is interesting to note that more than half of participants with CLBP 68 were able to get to work on time, 74 could work their required number of hours and 76 could finish their work on time.

Half of the time, a good number 91 could stick to a schedule without having to reassign their work tasks and, the majority (114) could work without taking frequent rests because of CLBP.

These items confirm that the CLBP was not severely disabling.

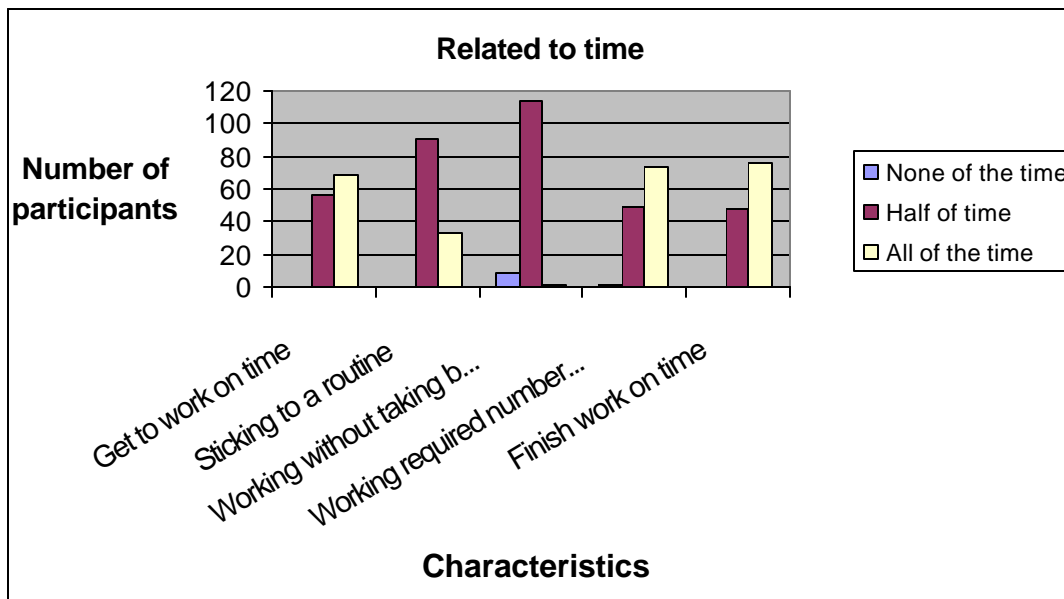


Figure 4.1 CLBP Disability related to time (n=124)

4.5.4 Disability related to work limitations

This figure shows that only half of the time 107 of the participants, were able to handle demanding work, 91 could handle the workload, 100 could do more than one task at the same time and 98 could help other people to do the work. This also confirms that work was not affected due to CLBP.

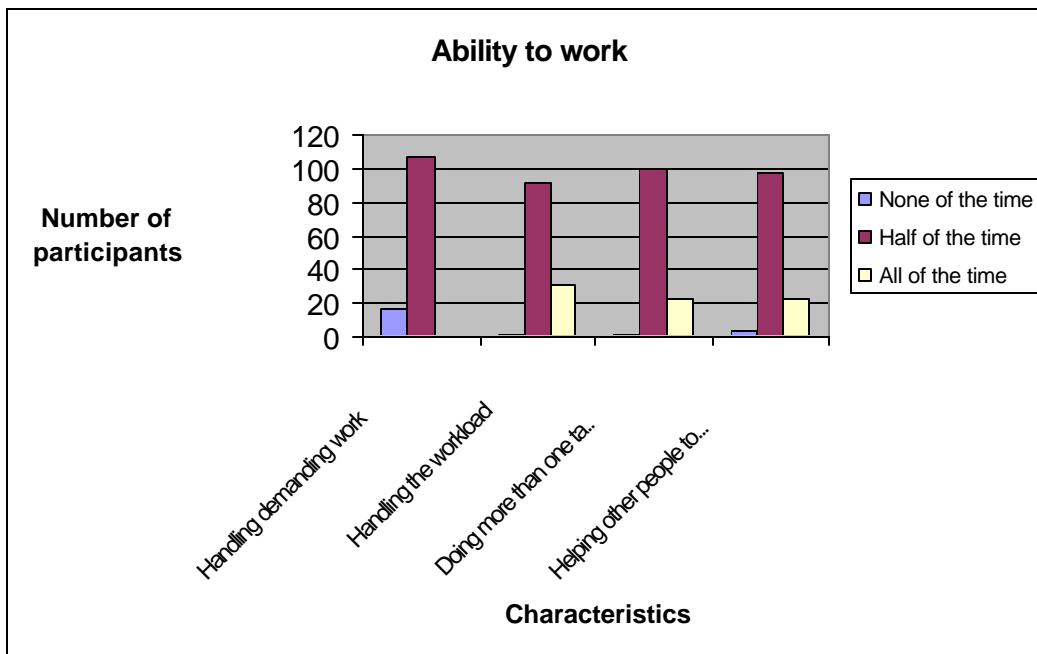


Figure 4. 2 Disability related to work limitations (n=124)

4.5.5 Psychological factors related to CLBP

Psychological effects were considered to be effects on a person's mind, related to the person's behavior or character (emotion, feelings, thinking, intelligence, self control, memory), as a result of CLBP

It is interesting to note that despite having CLBP, the majority of the participants could accomplish their work without being affected psychologically. The majority of participants (93) were able to keep their mind on their work, 86 could satisfy people who judge their work, and 103 remembered things to do with their work.

However, half of the time, 109 the majority could not control irritability or anger toward people when working, 100 could do their work without being tense or frustrated, 83 were not feeling sense of accomplishment, and 84 could not talk with people in person in a meeting or on the phone.

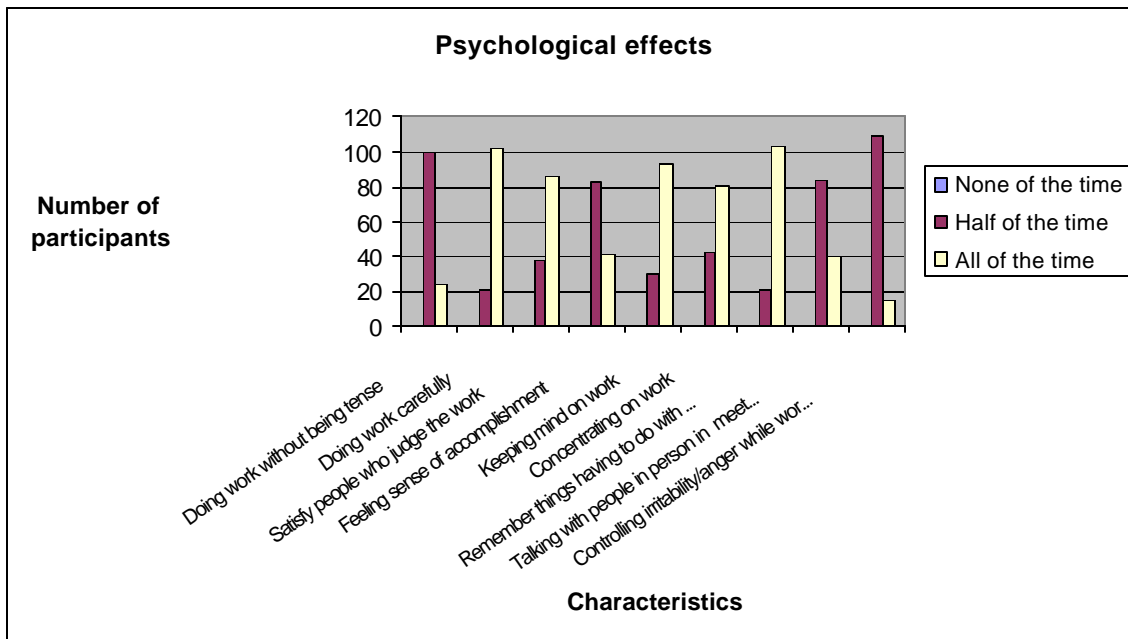


Figure 4.3 Psychological factors related to CLBP

4.5.6 Disability related to physical demands

Physical demands were considered as physical activities which are body movements that are produced by the contraction of skeletal muscles, which

substantially increase energy expenditure (Grundy, Black, Burn, Higgins, Lauer, Perri, & Ryan, 1999) and produces progressive health benefits (Prochaska, Sallis, Sarkin & Calfas, 2000)

The majority of participants (121) could stay in one position or longer than 15 minutes while working. One hundred and fourteen could use hands-operated tools or equipment, 104 could use upper body to operate tools or equipment.

Half of the time, 70 could lift, carry or move objects at work weighing 5kg or less. Seventy nine could walk in more than one block or climb up or down one flight of stairs while working and 71 could bend, twist, or reach while working; whereas 104 could not lift, carry or move objects at work weighing more than 5kg.

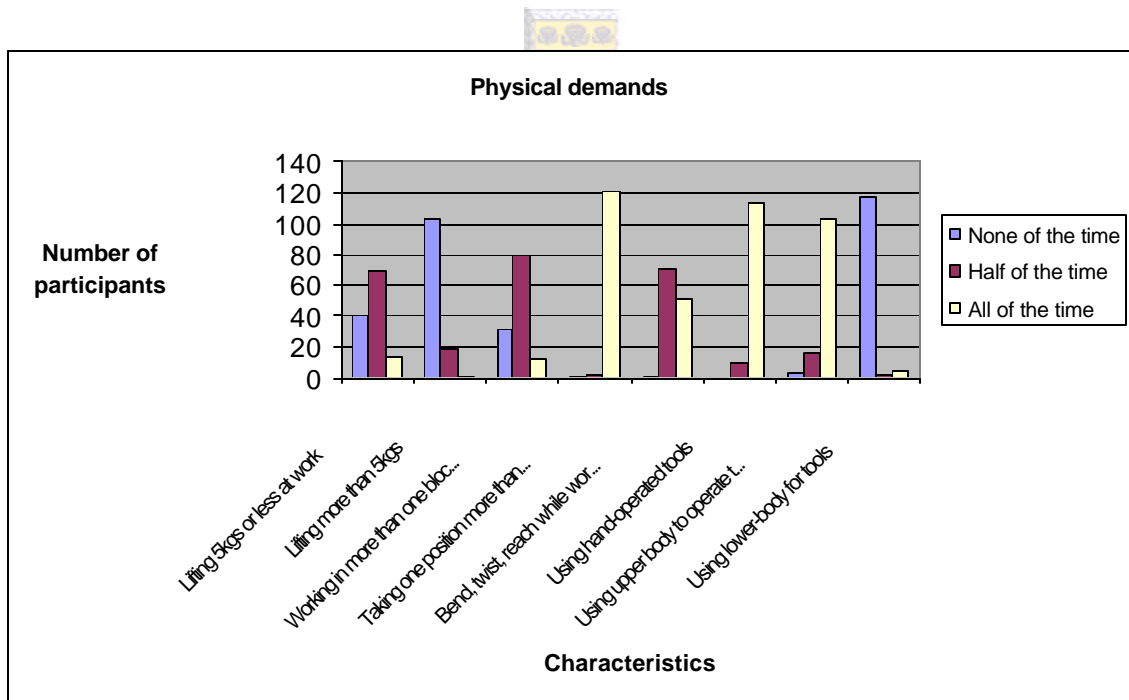


Figure 4. 4 Disability related to physical demands (124)

4.6 EFFECT OF LBP ON PARTICIPANTS' QUALITY OF LIFE (QoL)

The Roland- Morris Low Back Pain and Disability questionnaire

4.6.1 Mild effect on QoL

The proportion of participants with CLBP, 31(20.67%), was almost twice as much as those 15 (10%), who had LBP for less than three months.

CATEGORY	LBP DURATION	FREQUENCY	%
Mild effect: 0-8	Sub-acute LBP	15	10
	Chronic LBP	31	20.67

Table 4.13 Mild effect on QoL (n=150)



4.6.2 Moderate effect on QoL

Eleven participants, (7.33 %) with LBP for less than 3 months, and fifty three (35.33%) with LBP for more than tree months fell into this category.

CATEGORY	LBP DURATION	FREQUENCY	%
Moderate effect: 9-16	Sub-acute LBP	11	7.33
	Chronic LBP	53	35.33

Table 4.14 Moderate effect on QoL (n=150)

4.6.3 Severe effect on QoL

There was no participant with sub-acute LBP in the category, while forty participants (26.67%) have had CLBP in this category. It is therefore apparent that CLBP has affected the majority of participants either moderately or severely.

CATEGORY	LBP DURATION	FREQUENCY	%
Severe effect: 17-24	Sub-acute LBP	0	0
	Chronic LBP	40	26.67

Table 4.15 Severe effect on QoL (n=150)

4.6.4 Effects of LBP on participants' quality of life



Figure 5 illustrates the limitations of activities of daily living of CLBP on participants

4.6.4.1 Limitations of activities of daily living

One hundred and ten participants were reported trying not to bend or kneel down because of LBP; One hundred and twenty participants avoided jobs around the house, and 108 had trouble putting socks or stockings. One hundred and thirteen could stand for a short period of time, while 105 had to sit down most of the day because of CLBP, seventeen participants were reported to have low back pain most of the time,

However, a good number (100) did not need to hold on to anything to stand from sitting, 133 did not need to stay at home, 114 could get dressed without any help, 100 did not stay in bed most of the time, 111 were reported to have good appetite and 70 did not have a problem to sleep.

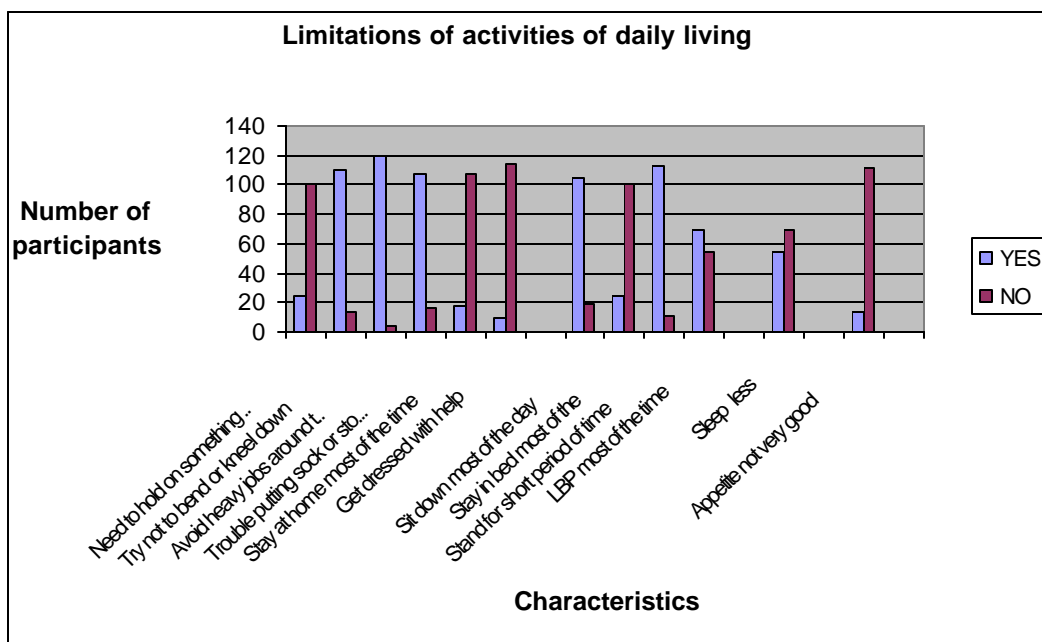


Figure 4. 5 Limitations of activities of daily living (n=124).



CHAPTER FIVE

DISCUSSION

5.1 INTRODUCTION

The main objective of this study was to identify the predisposing factors of CLBP among the sedentary office workers in Nairobi, Kenya. The prevalence of CLBP amongst sedentary office workers was established. A self-administered questionnaire was then administered to identify the possible predisposing factors to CLBP. In addition, two questionnaires relating to work disability and quality of life were administered to determine the impact of CLBP. The discussion presents the findings of this study in lines with these objectives.

5.2 PREVALENCE OF CHRONIC LOW BACK PAIN



The findings of the current study reported a high prevalence of chronic low back pain. The majority of these participants had CLBP.

Anderson (1999) reported data from some western countries as being similar. For instance, the United Kingdom estimates low back pain as the largest single cause of absence from work in 1988-1989, and that it is responsible for about 12.5 of all sick days. He added that this figure is similar to data from Sweden where, since 1961, 11-19% of all annual sickness absence days are taken by people with a diagnosis of back pain. Only in 1987, 14.8 million workdays were lost in Sweden because of back pain, which constitutes about 13.5% of all reported sick days (Anderson, 1999). However, statistics on LBP for Kenya were not found while in South Africa statistics of LBP are limited (PPS statistics, 1998).

5.2.1 Gender

The study found that there was no association between gender and chronic low back pain (CLBP). Elders, Burdorf (2004); Anderson (1999) reported that LBP as a common health condition in working populations affects almost everyone in life, men and women equally.

In this study there was not substantial difference in the number between females and males affected by CLBP among the participants, even though, more females participated in the present study sample. However, Guistina (1998), said that women are more commonly reported to suffer from back pain after age sixty

5.2.2 Age

The participants' ages ranged between 20 and 55 years. This is the average working age in Kenya.



Studies have shown that low back pain occurs most often in those between the ages of 20 to 50; an age group that corresponds to the largest component of workers (Kirkaldy-Willis, Bernard 1999). In Britain, the United States and in many other countries, low back pain continues to be among the most common occupational disorders, especially in adults of working age (Palmer et al, 2000).

The findings in the current study have shown that there was an association between age and chronic low back pain. Chronic low back pain was predominant at the middle age group between 30 and 49, and at the age of more than 50 years. Therefore, the occurrence of chronic low back pain increased with increasing age. This could influence disc degeneration resulting of the normal aging process.

5.3 PREDISPOSING FACTORS OF CLBP RELATED TO SEDENTARY OFFICE WORK / WORK RELATED INFLUENCES

5.3.1 Years of working in an office

A high number of participants with chronic low back pain were those who have been working as sedentary office workers for more than 10 years. This is in agreement with other studies, such as Francis, Good, Johnson, Lathrop, Ryan, Prost, Shaw, Moyers, Beebe, (2004) who reported that the ageing would put older workers at a greater risk of developing lumbar disorders. Therefore, age-related changes, coupled with an increased use of static posture and repetitive movements, place older workers at risk for back injury.

Furthermore, physiologic and epidemiologic studies have demonstrated how prolonged sitting can cause low back pain; and further investigations have shown that those who sit for half of the time or more on their jobs for years, have about 60 to 70% increased risk of developing back pain compared with those who sit for less than half the time. They have attributed this sedentary life-style and associated decreased in movement to the development of muscle imbalances which, they consider, often predispose workers to low back pain (Twomey, Taylor, 2000).

Unfortunately, sedentary office workers tend to spent most of their working time sitting for long periods that causes fatigue of lower back muscles and pushes the workers into a poor sitting posture. As a result, these workers lose the lumbar lordosis by sitting poorly. McKenzie (1986) said that after years, this will eventually lose ability to restore it, which will cause a flattened low back that is frequently associated with chronic low back pain.

In light of these findings, it becomes important for the physiotherapists to ensure that seating, good posture and pause exercises as preventive measures established and enforced at the workplace.

5.3.2 Hours of working seated in an office

Sedentary life-style refers to the amount of time a person holds a static position to perform a given task. The longer the same muscle or muscle group is used, the greater the likelihood of both localized and general fatigue (Twomey, Taylor, 2000).

In this study, the findings reported that the majority of the participants, who had been suffering from LBP, were those who had been working in a sitting position for more than 5 hours a day. A study done by Ratzon, Yaros, Mizlik & Kanner, (2000) among dentists, reported that dentists who work in sitting position have more severe low back pain than those who alternate between sitting and standing.



In addition, although the critical factor is the length of time the position is maintained, as it has been also reported previously, any static posture is detrimental, but sitting badly for long periods is more abusive than sitting well (Braggins, 2000). For instance, sitting in a kyphotic posture has been reported resulting in more back pain, where by, poor postural habits allow adaptive shortening of certain structures. The result is a gradual reduction of mobility with aging (Twomey, Taylor, 2000). Thus, faulty posture over a long period will chronically strain the skeleton and ultimately cause low back pain (Key, 2001).

As a result, muscles tension caused by static or fixed positions for a long period will fatigue more easily, circulation will decrease, the body will feel uncomfortable, and a poor posture will result. Body postures determine which joints and muscles are used in an activity, as well as the amount of force exerted.

Therefore, poor postures place unusual or excessive forces on components of the body. These kinds of awkward positions create undue stresses at the wrists, shoulders, neck or back (Vaughn, Kowahl, 2003).

For instance, muscles that support the lower back in sitting position for hours become tired and relax, the body sags and this result in the slouched sitting posture. If a slouched sitting posture is maintained for long enough, it will cause overstretching of spinal ligaments.

Once the slouched sitting posture has become a habit and is maintained most of the time, it may cause distortion of the discs contained in the vertebral joints. Once this occurs, movements as well as positions will produce low back pain (McKenzie, 1986).

Generally, a good posture is defined as a position in which the different parts of the body are held in such a way as to minimize the strain on all the parts (Routledge, Hastings, 1999).



. Although good posture is different for different people because of having different skeletons, normal spine has a form of an “S” curve, with the cervical spine curves slightly inward (lordosis), the thoracic curves out ward (kyphosis), and the lumbar curves inward (lordosis) (Routledge, Hastings, 1999).

This structure helps a healthy spine to withstand all kinds of stress; thus, each segment relies upon the strength of the others to function properly, even though the lower portion of the spine holds most of the body’s weight (Routledge, Hastings, 1999).

Individuals in sedentary occupations are predisposed to the development of herniated discs, most especially among those aged 35 years and above, and specifically among those who sit for half of the time or more at their job (Twomey,Taylor,1994). The lumbar disc, in the lower back, is under

approximately three times the pressure sitting as it is in standing position (Routledge, Hastings, 1999). As a result, sitting may increase back pain by increasing pressure between vertebral discs and by causing increased contraction of back muscles combined with poor lumbar stability (Link et al, 1990). Lumbar segmental stability is provided by osseous, ligaments and muscles restrains. In normal posture, the muscles system in its function of stability, provides, protection to particular structures. It helps to minimize unwanted joint displacement, aid stress absorption and generally prolong the cartilage serving time (Richardson, Jull, 1995). While the seated position is a functional position and imperative to carry out normal duties, the importance of encouraging pause exercises to detrain muscles.

5.3.3 Hours using computer continuously

In the present study, the majority of participants who had CLBP, had been working on a computer for more than 8 hours a day. Tasks which entail heavy daily computer use, force workers, such as those who work at bank and insurance companies to maintain a sitting position for hours. This is possibly due to high information processing demands and electronic monitoring performance. Breakstone (1999) reported that the stationary positions necessary for office workers from computer programming or typing to telephone stock trading can have cumulative negative effects on low back for both young and aged people.

The current findings are similar to other research with office workers, which showed that prolonged static posture affects office workers, particularly those who sit and work at computers for prolonged periods of time. Therefore, those office workers who use computers sitting for hours entering data, while simultaneously using a telephone in awkward postures, have been reported to be subjected to strain not only in their wrists and hands, but in particular, in their neck, shoulders and lower back as well (Choe, 2000). A similar study on bank tellers, reported that they are a group accustomed to working within constrained posture and using technological equipment. This limits opportunity for tellers to

move away from their work stations during working hours, consequently, tellers are required to maintain constrained postures for prolonged periods. Thus tellers are required to lean forward when assuming a sitting posture, causing them to assume unsupported sitting posture for long periods throughout the day. Learning forward in a sitting posture increases the kyphotic curve in the spine column and is associated with high tensile stresses in the soft tissue structures within the back. This increased intradiscal pressure and static loading of the lumbar muscles. This may explain the experience of discomfort by subjects in the lower back when sitting (Roelofs, Straker, 2002).

5.3.4 Years using same chair

The findings reported that among the participants who had CLBP, a good number had been using the same chair for 3 to 4 years and for 5 years and more. Statistically, there was a significant association between years using the same chair and CLBP. The longer people use the same chair the more risk of getting CLBP.

Even though the best chair will not prevent low back disorders because people might use these chair improperly from sitting poorly, however, several studies have examined the relationship between various chair characteristics and sitting posture to determine which factors contribute most to stress reduction and, thereby, to low back comfort (Key, 2001). It was reported that poor designed chairs such as those with a completely straight back at right angles to a completely straight seat can cause awkward position, by pushing the whole upper body forward, in front of the line of gravity, making the low back slump and the muscles work overtime to stop the upper body crumpling completely forward. After a while, the muscles start to fatigue, resulting in low back pain (Key, 2001).

Unfortunately, most people sit badly because it is impossible to sit well in a poorly designed chair, and the design of the available chairs contributes to

people's poor posture, rarely giving adequate support to the low back. Unless a conscious effort is made to sit correctly, individuals will usually sit badly (McKenzie, 1986; Braggins, 2000).

A good chair should be designed for comfort, to maintain the correct position; it should provide a proper support to the body and a healthy sitting posture (Braggins, 2000; Key, 2001).

5.3.5 Hours seated continuously before taking a break

A study done by Breakstone (1999) reported that the force generated by sitting for extended periods of time without standing to take a break or altering position is a risk factor for LBP. It has also been reported that the incidence of back ailments is extremely high in occupations involving prolonged sitting of longer than 4 hours. If this is repeated frequently and for long periods of time, chronic pain may occur (Twomey, Taylor, 1994).

Thus normal tissues can become painful in everyday life by the application of prolonged stresses commonly appearing during static postural loading conditions, such as prolonged sitting, standing, or bending (Twomey, Taylor, 1994).

In the current study, a high percentage of participants interrupted their sitting position while working, but this was done only after every 5 hours or more. In addition, all participants were seated while using the phone. This was an indication that participants of the study spent a considerable length of time seated. Fitzgerald (2003) reported that even people who maintain ideal posture and make use of appropriate devices need to take breaks often as a preventive measure. Even if we are hundred percent ergonomically correct, the human body was not meant to sit for long periods. However, this modern lifestyle with new technology requires people to spend hours seated for most of working time. Therefore, it has been suggested that frequent short pauses, if possible before the sensation of fatigue become pronounced, are beneficial than infrequent long

rests while working seated for long hours to the point of exhaustion (Braggins, 2000).

Therefore, where a constrained sitting posture can be identified as having a concentrated impact upon the low back when maintained for prolonged periods, an alternating sit/stand work posture provides opportunity to reduce this impact throughout the day. Thus, alternation between two postures allows for increased rest intervals, and reduces potential for the adverse impact of risks factors commonly associated with the development of lower back problems development. In addition, frequent rest intervals can assist in reducing the perception of sitting posture discomfort, offering further support to the notion that postural variation and break away from constrained sitting posture can be effective in reducing or delaying the experience of low back discomfort (Roelofs, Straker, 2002).

In USA, the National Institute for Occupational Safety and Health (NIOSH) recommends a ten minute rest after two hours of continuous sitting position, a fifteen minute rest every hour for work that is repetitive (Ellis, 2003), while in a study of bank tellers by (Roelofs, Straker, 2002), the workers were encouraged to stand from sitting for 15 minutes every hour of work.

5.4 WORK RELATED DISABILITY OF THE PARTICIPANTS WITH CLBP (WL-26).

5.4.1 Participants' category of disability

The results of the present study have found that the majority of participants presented with moderate disability of CLBP. This means that participants were not severely affected by CLBP.

However, in some third-world countries like Kenya, low back pain is accepted as a natural event in life, and not recognized as a potentially compensable problem arising from work.

However, in most industrialized countries, work-related low back injuries continue to increase, with the resultant escalating economic consequences.

Moreover, people who have persisting back pain appear to account for most of the rapidly increasing medical, social, and industrial costs associated with back pain (Kirkaldy-Willis & Bernard, 1999)

5.4.2 CLBP Disability related to working time

Generally the report from the current study showed that most participants who were suffering from CLBP could not always stick to their tasks for the required time of their work because of the pain. Some had to reassign their work tasks; others could not finish on time or work the required number of hours because of the discomfort from sitting. For people with low back pain, sitting is frequently the most uncomfortable position to maintain, and this often has an impact on the quality of life and work productivity. Thus, many people who have CLBP are likely to be out of work taking medication, and probably making demands on both primary and secondary health care as well as the private sector (Frank, 1993).

A study carried out in the state of Quebec, Canada, in 1981 on workers, (Andersson, 1999), reported that 6.7% of the sample were absent from work after 6 months suffering from LBP, which accounted for 68% of work days lost and 76% of the total compensation cost for low back pain. When the cumulative absence was calculated over 3 years, 9.7% of workers were absent for 6 months or longer, which illustrates the current nature of back pain.

Therefore, in most industrialized countries, work-related low back injuries continue to increase, with the resultant escalating economic consequences. On the total claim for a work-related low back injury, medical charges constitute one

third, and disability from time lost at work represents two thirds (Kirkaldy-Willis, Bernard, 1999).

5.4.3 Disability related to work limitations

Disability related to work limitation has been considered as inability to perform the basic tasks of daily life and to fulfill one's social and occupational roles (Maluf, Sahrman, Dillen, 2000). Disability resulting from back pain has been reported to be more common than any other cause of activity limitation in adults aged less than 45 years (Loney and Stratford, 1999)

A study done by Main, Amanda de Williams, (2002) showed that any pain complaints are usually self limiting, but if they become chronic, such as CLBP, the consequences are serious. These include the distress of patients and their families and consequences for employers in terms of sickness absence and for society as a whole in terms of welfare benefits and lost productivity. Therefore, absenteeism is directly related to work productivity and the cost to the industry is high as a consequence of persons who suffer recurrent or chronic pain (Richardson et al, 1999).

However, results of the present study have shown that the majority of participants were able to handle demanding work, they could also handle the workload, and they could do more than one task at the same time as well as help other people to do the work. This also confirms that work was not affected due to workers with CLBP.

5.4.4 Psychological factors related to CLBP

Psychological and behavioral responses to pain has been reported to be the main determinants of chronic pain disability (Main, Amanda de Williams, 2002)

The results of the study reported that half of the time, at work, participants suffering from CLBP were able to keep their mind on their work, could also satisfy people who judge their work, and remembered things to do with their work. However, those participants could not control irritability or anger toward people when working, they could not accomplish their work without being tense or frustrated, they were also not feeling sense of accomplishment, and could not talk with people in person in meeting or on the phone. This is an indication that participants were affected psychologically because of chronic low back pain.

It has been reported that people who experience chronic back pain feel frustrated, demoralized and depressed. From 40% to 50% of chronic pain patients suffer from depression, and 53% from anger (Twomey,Taylor, 2000). It has been noted that internalization of angry feelings was strongly related to measures of pain intensity, perceived interference, and reported frequency of pain behaviors (Kirkaldy-Willis, Bernard, 1999). In addition, not only those who complain of chronic low back pain are frustrated, but also families and employers, and these people with chronic low back pain confront not only the stress of pain but also other kind of problems such as financial and familial that compromises all aspects of their lives. Frustrations related to persistence of symptoms, limited information on etiology, and repeated treatment failures along with anger toward employers, insurances, the health care system, family members, and themselves, all contribute to the general dysphoric mood of these sufferers (Kirkaldy-Willis, Bernard, 1999; Twomey,Taylor, 2000).

They also reported that insomnia and anxiety, which might be a manifestation of depression, are common complaints of people suffering from chronic low back pain. Over time, however, psychosocial and behavioral factors may serve to maintain and exacerbate the level of pain, influence adjustment, and contribute to excessive disability.

Therefore, depression, anxiety, coping strategies, fear-avoidance beliefs, and health locus of control have been linked to chronic disability from LBP (Julie, George, 2002).

These factors themselves could be seen as a possible predisposing factor with chronic pain.

Following from this view, back pain that persists over time should not be viewed as solely physical or solely psychological; the experience of pain is maintained by an interdependent set of biomedical, psychosocial, and behavioral factors (Twomey & Taylor, 2000).

Because of industrialization and improvement of advanced technology nowadays in most of developing countries like Kenya, people are required to sit more at work, coupled with limitation of physical activities. The Health and Safety at Work, need to take action to reduce occupational injuries and absenteeism while improving productivity and work quality, thus quality of life of office workers.

5.4.5 Physical demands

The findings of the study reported that most of the participants were able to handle some of the physical loads such as staying in one position for longer than 15 minutes while working, they could use hands-operated tools or equipment, and could use upper body to operate tools or equipment. Some of these participants could also lift, carry or move objects at work weighing 5kg or less, they could also go up or down stairs while working; they could also bend, twist, or reach while working. However, few of them could lift, carry or move objects weighing more than 5kg because of CLBP.

This shows that work related to physical loads was not affected by CLBP among the participants.

Moreover, many back problems develop during lifting. Heavy lifting, particularly a poorly executed lift in the workplace is one of the factors that influence back problem (Key, 2001). However, there are no rules about the maximum weight that can be lifted safely; much depends on the circumstances, the position that is required, the size, shape and weight of the object and on personal physical strength and health (Jayson, 1999).

5.5 IMPACT OF CLBP ON OFFICE WORKERS' QUALITY OF LIFE (QOL)

5.5.1 Severity of CLBP

Generally, any chronic pain causes personal distress, decreased quality of life, and significant personal economic losses (Hankin, Killian, 2004). The complexity of the pain is especially evident when it persists over extended periods of time and interacts with psychological, social and economic factors.

The employee with work-related low back pain has two immediate problems: the medical aspects of the low back pain and the effects of the medical condition on work status. In addition to the medical condition, work-related low back pain may be complicated by social, employment, economic, legal, and psychological factors. (Kirkaldy-Willis, Bernard, 1999).

However, the findings of the current study showed that CLBP had not a severe impact on the participants.

5.5.2 Functional limitations

Chronic low back pain has been also reported as the primary cause of limited activity in persons under 45 years of age and the third major cause for activity limitation in person over the age of 45, equally in men and women (Frank, 1993).

As it has been reported by Kirkaldy-Willis, Bernard (1999); Twomey, Taylor, (2000), that chronic low back pain interferes with participation in recreational, occupational and social activities. It also limits the sufferers to participate into activities that could build flexibility, endurance, and strength without the risk of pain or injury. The findings of a study done by Andersson (1999) reported that in USA, low back pain is the most common cause of activity limitation in people younger than 45 years.

Therefore, the consequence of chronic pain is that the psychological factors are high levels of distress, misunderstandings about pain and its implications, limitation and avoidance of activities associated with fear of making pain worse (Main, Amanda de Williams, 2002)

There are two types of sufferers, one who avoid activities and others who cope with pain. Those who cope with pain know that the pain will get better and do not fear the future, and continue normally. They deal with the pain by being positive, staying active at work or at home. However, the avoiders fear the pain and worry about the future. They are afraid of doing anything that may cause further damage, and they rest a lot and wait for the pain to get better (Main, de Williams, 2002). Thus, people are affected from chronic low back pain in different ways, and this depends on how people react to the pain and what they do about it.

The findings of the present study found that participants were limited to accomplish their usual activities, such as working around their houses because of low back pain; sometimes participants were not able to handle demanding work or to accomplish more than one task at the same time and also most of the time they could not help other people to do their work like before because of the low back pain.

Therefore, chronic low back does not only affect work, but also may affect the quality of life among office workers in general.

CHAPTER SIX

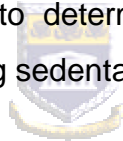
SUMMARY, CONCLUSIONS, AND RECOMMENDATION

6.1 INTRODUCTION

In this chapter, a summary of the study is provided. Details of the major findings of the study are underlined in the conclusion, and finally, recommendations emerging from the study are proposed.

6.2 SUMMARY

The purpose of this study was to identify the predisposing factors of CLBP among sedentary office workers in Nairobi, Kenya. The study specifically identified the predisposing factors of CLBP related to work, to establish the prevalence of CLBP, and finally, to determine the impact of CLBP on work productivity and quality of life among sedentary office workers.



This study was carried out on the motivation that there had been an increased in number of CLBP sufferers in Nairobi, as a result of sedentary work due to advancement in technology, such as computers and telephones, which has modernized the working environment of Kenyan office workers.

Therefore, office workers spend most of their working time in sitting position that predispose them to CLBP. Despite the improvement of the Kenyan health sector, few or no programmes have addressed issues to prevent the work related diseases, such as CLBP. Thus, CLBP sufferers, particularly those with work-related CLBP, are left to face major challenges of managing their quality of life with little or no help from physiotherapists.

Two banks and two insurance companies in Nairobi were used as the research setting, and a questionnaire, was used to assess the demographic influences on

CLBP, the work-related influences, and the impact of CLBP. The age range of the sample population was 20 to 55 years. Of one hundred and ninety six participants, 76.53% were suffering from LBP while 82.67% of them had CLBP.

Excel was used to investigate the associations between different variables. Chronic low back pain seemed to increase with age, although more women participated in the study compare to males, a higher percentage of female was affected than males. Number of years working as a sedentary office worker and hours spent seated in a working day, hours spent using a computer at work, and hours seated continuously before taking a break were positively associated with CLBP. For work-related disability, the results reported that participants' quality of life was moderately affected.

6.3 CONCLUSION

Chronic low back pain appears to be increasingly prevalent and has been found to be associated with time lost at work, disability, and economical costs.

It was found that a good number of sedentary office workers in Nairobi were suffering from CLBP, and the majority were middle aged, increasing with age, almost equally for both gender.

Because of industrialization in Nairobi, Kenya like in most of the cities in developing counties, people are required to spend hours seated at work, using advanced technology, such as computers and telephones. These working conditions, coupled with awkward posture, have been reported to be one of the possible predisposing factors of CLBP among sedentary office workers. Therefore, intervention to target these predisposing factors of CLBP need to be developed, thus to prevent CLBP in this modern time.

The findings of the current study indicate that office workers who had been suffering from CLBP, were spending most of their working time in sitting position, majority of them using computer, and were not taking breaks as it is recommended. This may result in some consequences on individuals, and society, such as work-related disability and effect on workers' quality of life.

Therefore, this is a challenge to health care in Kenya, particularly to physiotherapists, to target prevention measures of CLBP, such as frequent pauses during hours seated, posture, workstation design; and rehabilitation of sufferers from CLBP, thus to help them to return to their normal activities of daily living both at work and home, thus to improve they quality of life and productivity.

6.4 LIMITATIONS OF THE STUDY

As it has been done in most of the previous similar studies, this study used a cross-section design, and a self administrative questionnaire was used. However, the study did not include ergonomics at workstations, and postural stresses. This information could be useful in targeting these possible predisposing factors of CLBP, thus to prevent CLBP among SOW.

Although the response rate was high; the study was conducted in the busiest institutions, banks and insurance companies, which caused a problem for the assistants to access to meet the participants, since there was no particular break time, therefore questions were filled in during working hours without any supervision from the researcher assistants. This could not minimize chances for the questionnaire to be displaced or to be wrongly filled in.

Population of sedentary office workers was taken from Nairobi, which initially had been only one city in Kenya, additionally, in only two types of institutions, two banks and two insurance companies. To what degree this represents the population of sedentary office workers in Kenya is not clear. However, the predisposing factors of chronic low back among sedentary office workers were comparable with those found in other studies.

Although the WL-26 and The Roland-Morris are common used to measure work-related disability of LBP, they could not indicate whether the participants with CLBP were on any treatment, or had been on sick-leave or had just slowed down their speed of work.

Despite the limitations, the study had strengths that contributed to the understanding of the possible predisposing factors of CLBP among sedentary office workers since the prevalence of CLBP and the response rate of the participants was high. In addition, a number of potentially significant findings do emerge, as for association between age, working position, period of time working and chronic low back pain with sedentary office workers.

6.5 RECOMMENDATIONS

Based on the findings of this study, the following recommendations are given for future actions, thus development of a health promotion programs and future research on predisposing factors of CLBP among sedentary office workers.

1. Health carers, particularly physiotherapists, instead of concentrating on relieving the symptoms, should promote the preventive approaches of CLBP, in work places for the sedentary workers. For instance, they have an obligation to set up health promotion interventions aimed at increasing awareness of factors related to injuries at work, such as prolonged sitting and poor posture. In addition

patients who have LBP episodes must be adequately screened before returning to work.

Therefore, physiotherapists should advise sedentary workers to sit correctly and taking short breaks at regular intervals between working hours, or if possible, changing tasks to decrease prolonged static postures, and thereby reduce the risk of injury.

2. It is recommended that the practitioners should work with the employees who have CLBP, the employers, and other professionals towards the common goal of helping those employees to continue living their life unaffected, thus reduce absenteeism while improving work productivity and work quality by designing safe, comfortable workplaces for employees.

3. It is recommended that further investigation of predisposing factors of CLBP should be done, such as chair ergonomic and office layout.



4. Because employers are the most favourable position to reduce the incidence of work-related back injuries by injury prevention, work safety, and risk management programs. Therefore, it is recommended that employers should work with such as furniture designers, and personnel manager, together with new employees who are at pre-existing of low back conditions to provide an ergonomic approach to employees placement, which should prevent injury and aggravation of pre-existing conditions, thus to improve job productivity.

5. It is recommended that health policy makers should establish a policy particularly for sedentary workers that prevent and protect these workers from work-related injuries, by promoting conditions of working environment.

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