INFLUENCE OF SEDENTARY LIFESTYLE, WORK-RELATED AND SOCIO-DEMOGRAPHIC CHARACTERISTICS ON LOW BACK PAIN AMONG BANK EMPLOYEES IN NAIROBI CITY COUNTY, KENYA

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SEPTEMBER 2024

DECLARATION

I declare this is my original work and has not been presented in any other university/ institution for the award of degree or any other award.

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DEDICATION

This thesis is dedicated to my children, Fabian, Fidel, Adrianna, Brianna, and dear husband Augustine for prayers and financial support during the entire process.

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ABBREVIATIONS AND ACRONYMS

BMI	Body Mass Index
LBP	Low Back Pain
MSDS	Muscular Skeletal Disorders
NHWS	National Health Welfare Systems
NIH	National Institute of Health
NSBP	Non-Specific Back Pain
ODI-T	Oswestry Disability Index Test
RCT	Randomized Controlled Trial
US	United States
VAS	Visual Analogue Scale for low back pain
WBV	Whole Body Vibration
WHO	World Health Organization

OPERATIONAL DEFINITION OF TERMS

Awkward Posture - Postures such as sitting/standing that have stooping positions.

Banker - Persons working in a bank. They include tellers, customer service personnel, secretaries, back-office staff, head office staff, and managers.

Immutable - Something that cannot be changed by human actions or circumstances such as age or gender.

Low Back Pain - pain localized below the costal margin and above the inferior gluteal folds with or without leg pain.

Musculoskeletal Pain - Injuries on muscles, tendons, ligaments, discs as well as the nerves due to prolonged sitting leading to lower back pain

Paunch - Large protruding belly that can occur due to pregnancy or fat deposits on the abdominals.

Prevalence – Proportion of the population with reported cases of pain in the lower back for a given duration of time.

Physical activity- Bodily movement produced by skeletal muscles that results in energy expenditure.

Related Factors - Refers to those aspects that may lead to pain in the lower back such as age, gender, physical inactivity, and occupational hazards including long hours of sitting and standing postures.

Sedentariness - Physical inactivity where an individual is engaged in activities such as sitting/standing for long durations without considering sleep time.

Work ergonomics - Adapting the work environment to fit the bank employees to prevent health risks.

Work-Related Low Back Pain – Nonspecific pain occurring on the lumbar region of the back that may be a result of occupation-related activities such as long hours of computer use, prolonged standing or sitting, and the duration of an individual's employment.

ABSTRACT

Low Back Pain (LBP) is a common public health problem in the world. It is one of the causes of activity limitation thus leading to low productivity of employees in organizations. Occupations entailing many hours of sitting and use of computers for extended durations such as bank employees are more likely to encounter low back pain. This study therefore adopted a cross-sectional analytical survey design that sought to establish the influence of sedentary lifestyle, work-related and socio-demographic characteristics on low back pain among bank employees in Nairobi City County. The study was guided by the following objectives which were the prevalence of LBP and the severity of pain, the association between socio-demographic characteristics, sedentary lifestyle, work-related factors, and disability index, and how each is associated with low back pain among bank employees in Nairobi City County. Low back pain intensity was determined by use of the Pain Intensity Numeric Scale. LBP prevalence was judged by the use of the modified Nordic and Oswestry Disability Index Questionnaire to determine the disability level that was caused by low back pain. Sedentary lifestyle was tested by use of a modified Global Physical Activity Questionnaire. Stratified, purposive, and simple random sampling techniques were used to select banks under study where 211 bank employees participated in the study. Descriptive statistics such as frequencies and percentages were used to present the findings of the socio-demographic characteristics. The Hypothesis was tested using Chi-square and Spearman Rank Correlations at a significance level of 0.05. The chi-square measure of association was used to determine the sedentary lifestyle characteristics that may lead to Low Back Pain. Spearman Rank Correlation analysis was used to determine the relationship between working experience and daily working hours while the Kruskal-Wallis test was used to measure whether there were significant differences between the dependent and independent variables of the study. Findings indicated that the prevalence of LBP was 54%. Females reported the highest prevalence at 60.8% compared to males at 48.2%. The chi-square test indicated no significant relationship between age and LBP X^2 (3, N=211) =6.3, p .098. The chi-square results showed a significant association between gender and LBP X^2(1, N=211) =3.3, P=.045. The occurrence of LBP was significantly associated with working hours X^2 (3, N=211) =6.0 p=.049. Work absenteeism and low back pain indicated a significant association X^2 (1, N=211) =62.89, p=.000 while age and disability index indicated a significant association X^2 (9, N=211) 20.71, p=.014. Results also indicated that disability index due to low back pain contributed to work absenteeism X^2(3, N=211) =13.11, p=.004. Spearman rho indicated that the age of the participant was significantly related to discomfort level caused by LBP r_s .229, P.001. Kruskal Wallis H test showed that there was a significant difference between working hours and LBP (H (2) =5.995, p .050. The study recommends that regular breaks be incorporated in banking institutions so as to mitigate the high prevalence of low back pain among bank employees.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study.

Low back pain is the pain and discomfort that is localized underneath the costal margin and over the glute fold. Causes of low back pain are multi-factorial because it can be a result of strain, tension, or injury (Wáng, Wáng, & Káplár, 2016). Daily activities that involve repetitive movements, and awkward postures such as bending with improper form, twisting movements, lifting heavy objects, stooping positions when using a computer straining the neck and lower back predispose one to LBP (Das, 2015).

Low back pain is a very frequent musculoskeletal condition and one of the main causes of activity limitation (Edomwonyi & Ogbue, 2018). The epidemiology of low back pain is said to be rising, though most of the studies are confined to high-income countries hence this bringing out that little information on the epidemiology in the rest of the world. It is approximated that 80% of the population in the world experience LBP at a particular time in their life whereby, 15%-30% of the population develop the condition in adulthood leading to low productivity at work and thus a low quality of life (Ye, Jing, Wei, & Lu, 2017).

Globally, the mean prevalence of LBP regardless of the period is said to be 31%. In developed countries such as the USA and Australia, the prevalence ranges from 26.4% to 79.2%. In African countries, the annual prevalence is 33% in adolescents and 50% in adults (Kanyenyeri, Asiimwe, Mochama, Nyiligira, & Habtu, 2017). A study conducted in Nairobi, Kenya among teachers in the University of Nairobi reported an annual prevalence of 64% (Yaya, Diallo, Mweu, Mbuya, & Mwanthi, 2019). The situation is said to be worse in developing countries with unacceptable working

conditions and also the absence of ergonomic awareness in workplaces thus leaving a significant number of the active population with activity limitation due to low back pain (Downing & Elias, 2016).

Tanui (2015) conducted a study in Mombasa to assess work-related Musculoskeletal disorders (MSD) among nurses and found that out of the 76.9% of reported cases of MSD, 70.9% had LBP. This was attributed to working in a similar position for a long duration of time. Another study conducted in Webuye County on primary school teachers on the annual prevalence of LBP was reported to be 64.9% (Downing & Elias, 2016) which falls within the estimated range of LBP prevalence of 14%-72%. A study done in Kericho county among tea plantation staff reported an annual prevalence of 45.4% among tea pickers and 35.9% among non-tea pickers (Lang'at Charles Kiprotich, 2016). Low back pain is a major concern in various occupations with employees working in the bank not being left out. The urbanization of Nairobi City County has resulted in substantial productivity gains with a high number of banks; thus providing a significant target for this study. Prolonged sitting, sedentary behavior, physical inactivity, and poor posture in the working environment expose an individual to LBP (Boughattas et al., 2017).

The most important symptom of non-specific low back pain is pain and disability (Owen et al., 2020). Although most people appear to recover quickly from episodes of low back pain, disability resulting from an episode of low back pain is more common than any other cause of activity limitation (Heuch, Heuch, Hagen, & Zwart, 2017). Low back pain is said to be the leading cause of activity limitation due to its disabling nature. Low back pain is a common disabling chronic condition that burdens individual families and societies (J. S. Williams et al., 2015).

Due to the nature of work, bank employees are exposed to long hours seated as well as using computers. This exposes them to improper alignment of the upper and lower back because of the slouching positions and poor sitting postures which may later result in stiffness and compression of the lower back muscles hence causing lower back pain (Ye *et a*l., 2017). Since LBP is said to be a world public health problem (Wang et al., 2017), it's, therefore, an alarming health condition that needs to be given attention in Kenya to be able to prevent the situation from occurring, and if it does, early diagnosis and treatment procedures to prevent the condition from becoming worse.

Studies on musculoskeletal injuries such as neck pain, wrist pain, and back pain have been done among various populations such as nurses and teachers in Nairobi City County. However, few studies have been done on low back pain among office workers such as bank employees whose working stations are multifaceted requiring them to rotate their body and trunk continuously while working. Therefore, this study assessed factors that may have contributed to low back pain among bank employees in Nairobi City County.

1.2 Statement of the Problem

Low back pain is one of the steering causes of activity limitation that is threatening human function, and mental health and even affecting the quality of life (Hanna, Daas, El-shareif, & Al-marridi, 2019). It has affected the majority of human beings, and thus, emerged as the third world's biggest health problem (Gordon & Bloxham, 2016). Approximately 540 million people globally have experienced low back pain at a particular point in their life and therefore, it has been discovered as the main cause of work disability. Low back pain is reported to be one of the common conditions that

makes people seek medical healthcare (Kisilu, 2018). High rates of absenteeism, and sick leaves have led to a tremendous decrease in work productivity in most industries (Yang, Haldeman, Lu, & Baker, 2016). Kenya is a developing country, and many people are exposed to a working environment that entails repetitive lifting, and sitting for a long duration leading to awkward postures, which later can lead to strain or injury to the muscles or tendons of the back hence attributing to low back pain.

Too much sitting with repetitive motions, and awkward postures associated with the task in banks predisposes bank employees to a high risk of developing LBP (Elias, Downing, & Mwangi, 2019). Need to meet targets at their place of work makes them spend most of their time seated, long working hours with no breaks to either stand or walk around to stretch or engage in any other physical activity exposes them to LBP. In addition, growth in technology such as the use of computers for long duration contributes to poor work ergonomics, and sitting for long hours has also exposed people to physical inactivity (Ali, Ahsan, & Hossain, 2020). Though bank employees are in danger of exposure to LBP, few studies have been done to investigate the influence of factors such as sedentary lifestyle, and work-related and sociodemographic characteristics on LBP among bank employees. This research therefore aimed to investigate the influence of those factors on low back pain among bank employees and also find out which of them predisposes them more to the condition. The findings may help come up with interventions that will help prevent more severe cases of LBP and also mitigate the causes of low back pain. This will help minimize the potential damage that can later lead to activity limitations.

1.3 Purpose of the Study

The purpose of this study was to determine the influence of sedentariness, socio-demographics, and work-related characteristics on low back pain among bank employees in Nairobi City County, Kenya.

1.4 Research Questions

1. What is the prevalence of low back pain and pain severity among bank employees in Nairobi City County?

1.5 Research Null Hypothesis

H_{01}: There is no significant association between socio-demographic profile and low back pain among bank employees in Nairobi City County.

H_{02}: There is no significant association between sedentary lifestyle traits and low back pain among bank employees in Nairobi City County.

H_{03}: There is no significant association between work-related factors and low back pain among bank employees in Nairobi City County.

$H_{04:}$ There is no significant association between disability index and low back pain among bank employees in Nairobi City County.

1.6 Objectives of the Study

The study was guided by the following objectives

1.6.1 General objective

1. To determine the prevalence of low back pain and severity of pain among bank employees in Nairobi City County.

1.6.2 Specific Objectives

1. To determine the association between socio-demographic characteristics and low back pain among bank employees in Nairobi City County in relation to;

2. To examine the association between sedentary lifestyle and low back pain among bank employees in Nairobi City County

3. To assess the association between work-related factors and low back pain among bank employees in Nairobi City County.

4. To assess the association between disability index and low back pain among bank employees in Nairobi City County.

1.7 Delimitations and Limitation of the Study

The study was delimited to work-related low back pain among bank employees in Nairobi City County such as working hours, sitting and standing postures. Other causes such as previous injuries were excluded from this study.

Some cases of low back pain may be a result of other underlying conditions such as injuries of the back muscle outside the banker's working environment. To avoid these bank employees who had underlying conditions such as arthritis were excluded from the study. Since the study relied on self-reported data from the bank employees on the experiences of low back pain and its severity if at all, the respondents might over or under-report the situation. To curb this, the researcher requested the respondents to be honest and truthful in their responses and emphasized the importance of the research to them.

1.8 Assumptions of the Study

This study was based on the assumption that low back pain is prevalent among bank employees, and thus sedentary lifestyle, work-related, and socio-demographic characteristics had an influence on low back pain. The study also assumed that bank employees did not have underlying conditions that would contribute to low back pain in their area of work. Lastly, the study assumed that the participants provided truthful information in the questionnaires and that all participants were able to interpret the questionnaires appropriately.

1.9 Conceptual Framework

The cause of LBP is said to be multifactorial meaning that it is caused by various factors i.e. the cause is nonspecific (Wáng et al., 2016). The realization of these widespread effects on a person's life has led to the biopsychosocial model of LBP and the strategies to be put in place to help bring out the management of various aspects of the disorder (Lall & Restrepo, 2017). The biopsychosocial model conceptualized by George Engel proposed that; an individual health and well-being are influenced by a combination of factors. These factors include biological factors, social factors, cultural norms, socioeconomic status, and physical health. All these factors play a significant role in shaping an individual's overall health and outcome. This model has become dominant in the conceptualization of the etiology and prognosis of low back pain leading to the development of testing and interventions to delay or treat LBP (L. Williams, Pincus, Kent, Pransky, & Hartvigsen, 2013). Despite the pain, the biopsychosocial model suggests that LBP should be broadly understood because, for the majority, the main problem lies within them such as avoidance of physical activity (O'Sullivan, Smith, Beales, & Straker, 2011). The biopsychosocial model therefore in this study will aim at

demonstrating how factors such as sedentariness, work-related, and socio-demographic characteristics influence LBP. A sedentary lifestyle involving the use of cars, buses, and motorcycles to and from work are some of the factors that encompass inactivity (Hanna et al., 2019). Lack of physical activity can lead to an increase in weight, therefore leading to excessive exertion on the lower back which can cause lower back pain. Factors such as work-family imbalance, exposure to hostile environment, and pressure at work may lead to stress hence, resulting to LBP (Yang et al., 2016). Different age categories and working experience may lead to varying prevalence and severity of LBP. Other risk factors that may contribute to low back pain include work-related factors such as prolonged standing/ sitting, use of computers for long hours which encourages stooping, and whole-body vibrations that predispose an individual to LBP (Kanyenyeri et al., 2017).

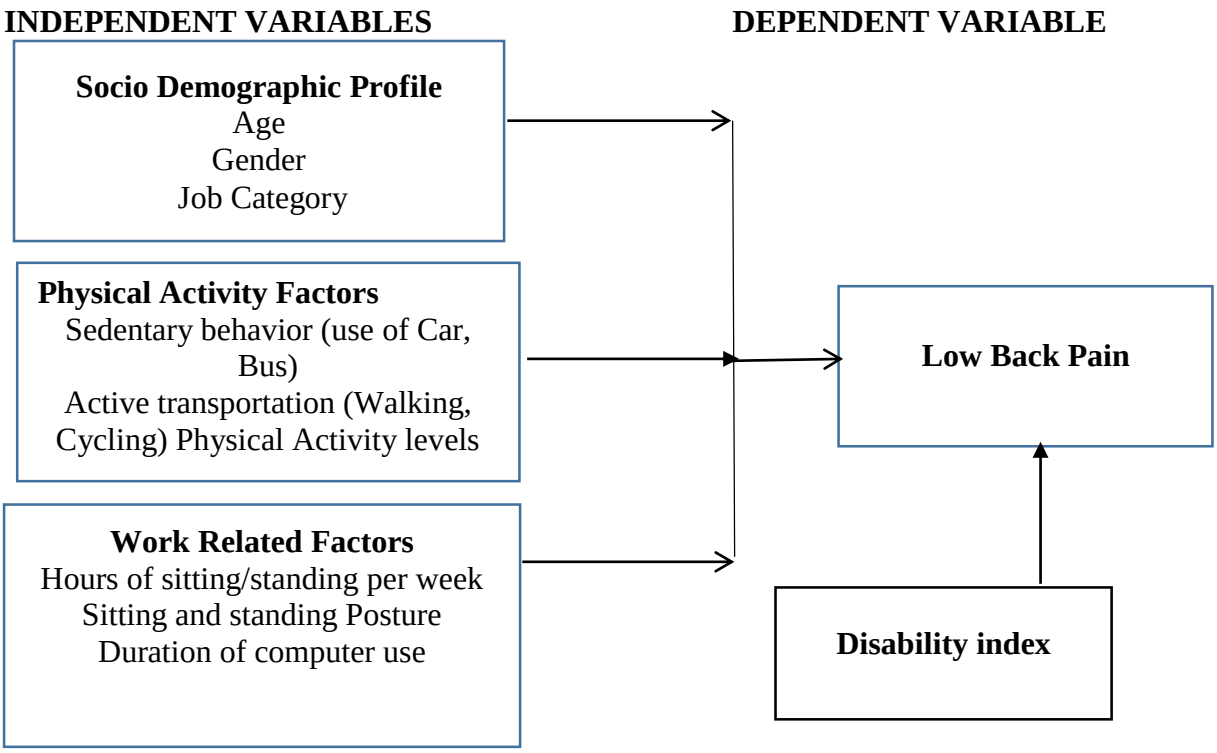

Figure 1.1: Conceptual framework

Adapted From The Biopsychosocial Model (Lall & Restrepo, 2017)

Figure 1.1 illustrates how factors such as sedentariness, work-related as well as sociodemographic characteristics may contribute to LBP. Though some of the causes are non-modifiable such as age, the onset of the LBP occurrence can be delayed. This can therefore be achieved by ensuring that physical activities such as stretching exercises are included in the place of work as well as enforcing/ teaching proper sitting and standing postures among bank employees to minimize cases of low back pain.

1.10 Significance of the Study

The results of this study may inform policy interventions that may help prevent LBP among bank employees such as changing work routines by alternating sitting and standing posture. The findings may guide the bank employees regarding proper sitting posture, work ergonomics as well as exercises and stretches that can be done at the place of work to curb LBP. This may therefore reduce hospital expenditures and increase work productivity due to reduced absenteeism. Finally, the findings of this study may also be used as reference materials for future research on LBP in other related fields.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction to Low Back Pain

Low back pain refers to recurring pain at the lumbar region of the back that intermittently affects an individual over a long period (Simsek, Yagci, & Senol, 2017). The pain is classified by duration as acute if it only lasts for 2-4 weeks, sub-acute if it lasts for 12 weeks and chronic if it lasts for over 12 weeks (Compare, Marchettini, & Zarbo, 2016). The conditions may further be classified by the underlying cause as either mechanical, non-mechanical, or referred pain (Edomwonyi & Ogbue, 2018). Low Back Pain is a common health problem in workplaces. It has either a directly or indirectly profound impact on individuals, families, and industries due to the affected seeking medical attention for treatment as well as management (Yang et al., 2016).

Low Back Pain is a common occupational disorder worldwide and therefore ranked the third disease by the Disability-Adjusted Life in the year 2010 in the USA, after heart disease and chronic obstructive pulmonary disease respectively (Chen, Shaparin, & Gritsenko, 2017) . Low back pain is the leading cause of activity restriction in most of the industries (Gordon & Bloxham, 2016). It has led to a tremendous increase in medical expenditure in seeking treatment (Kanyenyeri et al., 2017) and also low work productivity due to the increasing number of absenteeism in many industries.

The etiology of low back pain is said to be multifactorial indicating that physical and psychosocial factors can contribute to its development and persistence (Ali et al., 2020). A sedentary lifestyle such as physical inactivity due to too much sitting may contribute to low back pain (Yaya et al., 2019). Occupational factors which entail sitting in one position for a longer duration, poor ergonomics, awkward postures as well as long hours

of computer use may contribute to the onset of LBP (Ali et al., 2020). Psychosocial factors such as high stress, low social support, and low job satisfaction also have increased the occurrence of LBP(Simsek et al., 2017).

2.2 Prevalence of Low Back Pain

Low back pain is a highly frequent musculoskeletal pain that affects nearly everyone at a particular time of life (Williams et al, 2015). World Health Organization states that LBP affects approximately 540 million (80-85%) people over their lifetime. Globally, work-related LBP is estimated to account for 37% of the population (Koyanagi et al., 2015) . A systematic review of epidemiological studies across Africa reported a pooled adult prevalence of 32% with an average lifetime prevalence of 62% (Doualla, M. Aminde, J., Aminde, L.N. et al, 2019). Low back pain is reported as the main contributor to activity limitation, work absenteeism, and low productivity leading to a low quality of life (Cougot et al., 2015). Globally, LBP was ranked to be the condition with the many years lived with disability (YLDs), (Downing & Elias, 2016). Low back pain is a major cause of musculoskeletal disorders and activity limitation among young working individuals (Simsek et al., 2017). Low back pain is more frequent in high income countries with approximately 2-5% of workers suffering from chronic LBP (Koyanagi et al., 2015).

Females seem to report a higher percentage of LBP as compared to men. A study conducted in Uganda reported the incidence of LBP in women and males showing 84% and 50% prevalence respectively (Mehrdad, 2016). Females are also exposed to working on bent positions especially when doing their house chores such as cleaning

unlike men (Al-hadid et al., 2020). However, after menopause (49-50 years) lumbar discs in females degenerate at a higher rate than in males (Wáng et al., 2016) Low back pain has been reported as one of the workers threat, in Kenya LBP prevalence among secondary school teachers reported that 63.6% out of 158 participants had low back pain (Waganjo, 2019). A study conducted at Webuye on the prevalence of LBP and contributing factors among primary school teachers in rural Kenya reported an annual prevalence of NSLBP of 64-98% (Downing & Elias, 2016). Both Waiganjo, 2019 and Downing, 2016, addressed the prevalence of the profession in which the workplace involves standing for a long duration while this study will address bank employees in Nairobi County who are exposed to long hours of sitting and computer use due to the nature of their job. Even though teachers also spend part of their time at work seated, bank employees spend almost the entire time of their day at work seated. This study will therefore examine the prevalence of LBP as a result of socio-demographics, sedentariness, and work-related factors in the banking institution.

2.3 Occupational Factors Causing Low Back Pain

Working conditions are presumed as major factors that contribute to the etiology of low back pain (Coenen et al., 2018). This is because most occupations are associated with working postures which include bending of the trunk, bend and twisted posture for long working hours (Burström, Nilsson, & Wahlström, 2015). With this kind of repetitive movements of the trunk, postures tend to misalign the spinal cord hence predisposing an individual to LBP.

The banking industry subjects employees to a lot of physical demands and prolonged standing/ sitting postures (Compare et al., 2016). Sitting for long hours slouching

forward or having poor ergonomics increases the risk of LBP (Simsek et al., 2017). This is by putting too much strain on the disc i.e. the fluid-filled cushion that protects the vertebrae from rubbing against one another. When too much pressure is exerted on the disc it becomes herniated and, thus, pushed out of its normal space. This therefore puts strain on the spinal cord and the nerves that are in the surroundings causing LBP (Janwantanakul, Pensri, Moolkay, & Jiamjarasrangsi, 2011). This study mainly focused on sitting, without considering other work-related factors such as work satisfaction, and hours of computer use which leads to awkward movements such as stooping positions that could lead to LBP. Individuals with LBP sat uninterrupted for longer periods and showed more flexed and relaxed sitting postures such as stooping and slouching as compared to the pain-free individuals (Baradaran Mahdavi, Riahi, Vahdatpour, & Kelishadi, 2021). This suggests that sitting habits may be related to LBP although causal links are still unclear.

Prolonged standing also leads to strain of the muscles of the lower back (Coenen et al., 2018). This strain may later on result in LBP. In addition, standing for a long duration may result in spinal stenosis in the lower back (narrowing of the spine) (Philip, 2017), in his study, he looked at the quality of life lived by patients with chronic LBP, this did not give out clear information on the cause of the pain or rather the profession of these patients. This study will overcome this weakness by focusing on bank employees who are exposed to sitting for long hours at the workplace.

Prolonged computer use has become a routine practice in present-day to day work environments (Ye et al., 2017). Banks are one of the industries with high use of information and communication technology. Frequent use of computer-related

activities is one of the risk factors for LBP (Odebiyi, Akanle, Akinbo, & Balogun, 2016). Use of computers for more than five hours a day is reported to be a threshold for LBP (Yang et al., 2016). This is because it exposes the individual to long hours of sitting in awkward postures, whole-body vibrations, or working in stooping positions (Das, 2015). Sitting for a long duration leads to an increase in intradiscal pressure that can finally result in LBP (Lis, Black, Korn, & Nordin, 2007).

Postures in place of work such as the banking industry predispose one to LBP (Coenen et al., 2018). A study conducted in Mombasa on work-related musculoskeletal disorders emphasized on work postures which entailed working postures which entailed heavy lifting, use of protective equipment as well as working hours (kisilu, 2018) .This study focused more on bankers whose job entails more sitting/standing, postures, hours spent while sitting/standing, and also the duration of computer use.

2.4 Socio-Demographic Profile and Low Back Pain

The episode of LBP is subdivided into specific and non-specific. Though some causes may be prevented, other causes are said to be non-amenable such as age and gender. The risk of LBP is said to differ between demographic categories (Ye et al., 2017), in his study, he included marital status, Body Mass Index (BMI), and level of education as factors that may contribute to LBP unlike in this study which will only emphasize age, gender, job category, and working experience as the only socio-demographic characteristics.

A study conducted in sub–Saharan Africa showed that for most working-age adults and adolescents, the prevalence of LBP seemed to be increasing. World Health

Organization also reported that LBP seemed to be the main disabling condition among the aged population who were 50 years old and above. Edomwonyi and Ogbue, (2018) focused specifically on bank employees who are 20 years and above with over one year of work experience and above. (Wáng et al., 2016) looked at various professions such as drivers, farmers, and students in his study, he found out that an increase in age was associated with increasing risk of musculoskeletal disorders such as spinal disc degeneration which later on may lead to LBP.

Female sex hormones are said to play a very vital role in the etiology and pathophysiology of various musculoskeletal disorders (Odebiyi et al., 2016). Post menopause women show an increase in disc degeneration due to deficiency of estrogen hence causing LBP (Wáng et al., 2016). Females are more involved in household chores thus having limited leisure and less physical activity. In addition, during pregnancy, the inward curve of the spine (Lordotic curve) tends to become more pronounced changing how expectant mothers bend due to an increase in weight at the tummy (Edomwonyi & Ogbue, 2018). This posture makes it difficult for the spine to recover its normal curve, exerting abnormal stress on the spine and the surrounding tissue hence leading to LBP.

Though various studies have reported females to be more prevalent, they did not indicate whether they were exposed to the same type of work i.e., working in or under similar terms/organization or not. The current study will also give clear information about genders in Kenya who are at higher risk of suffering disc degeneration. (Kanyenyeri et al., 2017) In his study, the inclusion of socio-demographic characteristics included education level as well as marital status, unlike this study which will only look at age, gender, and work experience. This study will also be guided by

previous studies' demographic characteristics such as age and gender. In addition, job categories in the banks will be included to examine which category is at more risk of developing low back pain. This will help in knowing comparisons on the variables.

2.5 Low Back Pain and Sedentary Lifestyle

The impacts of LBP are said to be multifactorial and thus, affect several areas of people's life (Zewudie et al., 2021). People with LBP may at many times experience career burdens depending on the nature of work as well as experience financial burdens as they seek medical health care (Compare et al., 2016). The main causes of low back pain are nonspecific accounting for more than 90% of the cause of LBP. Some of the causes are the anatomical structure of the spine, osteoarthritis, infections, and intervertebral disc herniation (Mehrdad, 2016). A sedentary lifestyle has become omnipresent as an increasing number of individuals spend most of their time in a seated position at work as well as during their leisure time (Bontrup et al., 2019). Sedentariness is a major risk factor of LBP, whereby individuals who are not engaged in any physical activity are more vulnerable to developing LBP as compared to those involved in P.A (Heuch et al., 2017).

Modes of transport such as moving from one place to another may predispose one to sedentariness in cases where means of transport entail the use of car or buses (Kresal, Roblek, Jerman, & Meško, 2015). Physical inactivity is termed a risk factor for chronic low back pain (Gordon & Bloxham, 2016). An inactive person spends most of the time seated, or in work that needs little expenditure of energy. Though occupations can affect the amount of P.A., it does not necessarily affect or have a direct influence on the P. A one does during leisure time (Noda et al., 2015).

The banking industry is one of the areas where employees spend most of their time seated due to the nature of their work, thus less energy is spent. This exposes them to the risk of weight increment. This weight increase may then lead to exertion of pressure on the spinal region resulting in disc herniation resulting in LBP (Koyanagi et al., 2015). In addition, bone health is affected by inactive populations. This leads to low bone mineral density that can therefore result in LBP (Kanyenyeri et al., 2017) in lifestyle traits, he looked at variables such as alcohol consumption and smoking. This study looked at modes of transport such as the use of cars, buses, or walking to and from work which may contribute to physical inactivity. Due to physical inactivity, skeletal muscles go through adaptive reduction remodeling which results in the loss of muscle mass (atrophy) (Ye et al., 2017). Lack of exercise leads to Para spinal muscle atrophy together with an increase in fat content resulting in LBP (Deyo et al., 2014).

In a study conducted among shipyard workers on factors associated with prevalence and low back pain absence, on lifestyle traits, he emphasized drinking habits, sleeping hours, weight gain as well as exercise habits (Watanabe, Takahashi, Takeba, & Miura, 2018). This study looked at the mode of transport which is the use of cars, buses, or walking while going and coming from work on a typical day.

2.6 Psychosocial Factors and Low Back Pain

Psychosocial factors in work are reported to contribute to LBP. They include stress, work demands, decision latitudes, and exposure to hostile environments. Most bank employees experience stress from their bosses, pressure to meet work expectations due to high demand, and pressure from customers (Simsek et al., 2017). This muscle tension is the reflex reaction to stress (Abdul Rahman, Abdul-Mumin, & Naing, 2017). When

these muscles are tensed and stretched for a longer period, this may trigger various reactions in the body that lead to stress-related disorders such as LBP (Noda et al., 2015).

2.7 Disability index caused by low back pain

Low back pain is a common cause of musculoskeletal pain leading to reduced working hours as well as an increased need for rehabilitation services(Samad, Abdullah, Moin, Tamrin, & Hashim, 2010). Low back pain is ranked among the risk factors of years lived with disability in the world placing a burden on both health care and family (Philip, 2017). Although low back pain patients recover in a short period, some people develop chronic low to moderate pain and intermittent**.** Low back pain has led to increased disability limiting teachers from performing their daily duties (Elias et al., 2019). The current study is targeting bank employees in Nairobi City County. Oswestry disability index questionnaire will therefore be adapted to determine how low back pain has led to activity limitation among bank employees in Nairobi City County.

2. 8 Summary of Literature Review

Musculoskeletal disorders such as LBP in workplaces are caused by various factors such as; exposure to long hours of static activity with awkward postures such as repetitive movements, (Watanabe et al., 2018). According to Lis et al., (2007), with a good understanding of the risk factors of LBP, health practitioners can be in a position to develop some safety measures and programs such as encouraging workers in the workplace to sit less, and thus stand and be on the move at times, for these are potential exercises that help in mitigating the prevalence of LBP among individuals.

Studies on LBP have been conducted in Kenya, such as the quality of life for patients

with chronic low back pain in Kenyatta National Hospital (Philip, 2017), and low back pain prevalence in secondary school teachers (Waiganjo, 2019). Occupational factors for low back pain among tea harvesters in Kericho County, nurses in Kenyatta Hospital and Mombasa County have also been done. The influence of related factors which entail the sociodemographic, work-related, and lifestyle characteristics among bank employees in Nairobi County has not been captured in either. Low back pain affects an individual's general health hence causing disability that influences work performance among bank employees (Simsek et al., 2017). The current study will provide data on the prevalence and severity of pain. It will also look at the workplace environments of the banking institutions if it exposes them to low back pain. Physical activity will also be assessed on bank employees to see their level of activity and if it may or may not expose them to LBP. This information will guide bank employees on various strategies that they need to put in place of work to minimize cases of LBP.

CHAPTER THREE: METHODOLOGY

3.1 Research Design

This study employed a cross-sectional analytical survey design to assess the influence of socio-demographic characteristics, sedentary lifestyle, and work-related factors on low back pain among bank employees in Nairobi City County. This study design is useful for establishing relationships between variables. It therefore enabled the researcher to gather information on the demographics of respondents, physical activity level, and work-related factors that could have contributed to LBP. This type of design was also suitable for determining the prevailing characteristics in a population at a given point in time (Maninder singh setia, 2016) and therefore the information gathered enabled the researcher to make inferences about possible relationships based on the study.

3.2 Variables

The study focused on the following independent and dependent variables.

3.2.1. Independent variables

The independent variables were: work-related factors (working hours, hours of sitting in a day, sitting/ standing postures, and computer use) were measured by use of an ordinal scale. Socio-demographic characteristics age and job category were measured by use of an ordinal scale while gender was measured at a nominal scale. Sedentariness means of transport such as the use of cars, buses, walking was measured at a nominal scale while physical activity levels were measured at an ordinal scale. The disability index due to low back pain was measured at an ordinal scale.

3.2.2. Dependent variable

The dependent variable was the prevalence of low back pain which was measured at a nominal scale.

3.3 Location of the Study

The study was conducted in Nairobi City County owing to the presence of many banking institutions in the city. The study was conducted in the 17 sub-counties in Nairobi which include Ruaraka, Roysambu, Kasarani, Langata, Embakasi Central, Dagoretti South, Dagoretti North, Westlands, Embakasi South, Embakasi North, Kibra, Embakasi West, Makandara, Kamukunji and Starehe. Banks were randomly selected for study in each sub-county. This was also necessitated by the high population of residents in the city, most of whom are customers seeking services in the banks (Lall & Restrepo, 2017) and could have an impact on the employee's working environment. In addition, the large number of banks in Nairobi provided a relatively large number of bank employees from where the study drew a fair representation of the study population.

3.4 Study Population

The study targeted 5,000 bank employees in Nairobi City County with over one-year working experience in the banking industry (Otiso, 2017). This is because physiological changes and body mechanics of a person are likely to be experienced after a year of exposure to the predisposing factors (Maakip, Keegel, & Oakman, 2015) For instance, in this study working hours, sitting postures, and hours spent using the computer in a day.

3.4.1 Inclusion Criteria

The respondents included; tellers, customer service officers, secretaries, head office staff, back office staff, and managers who had worked in the banking industry for more than one year.

3.4.2 Exclusion Criteria

Employees who reported any of the conditions below were excluded from the study:

i. Pregnant women or female employees who have a baby younger than six months.
ii. Bank employees with previous surgical history
iii. Bank employees with any history of back injury or any other spinal injury caused by accident.
iv. Bank employees with any history of joint or bone disorder or prolapse lumbar intervertebral disk.
v. Any history of chronic inflammatory pain such rheumatoid arthritis.

These employees were excluded because they could have caused lower back pain and therefore interfered with the investigation.

3.5 Sampling Techniques and Sample Size

3.5.1 Sampling Technique

Stratified sampling was used to divide Nairobi City County into sub-counties, for this study yielding 17 sub-counties. The purpose of this was to have an equal representation of banks in each sub-county. Banks selected by use of purposive sampling were; Co-operative Bank, Kenya Commercial Bank, Equity Bank, KWFT, and I&M Bank. Specific bank branches where the respondents were selected from were identified by use of stratified sampling. A letter to the respective bank managers was sent for

permission to be granted to conduct the study. A list of all bank staff in each branch was obtained from the branch manager and names were arranged in alphabetical order. Respondents were therefore selected randomly and all even numbers participated in the study. Consent was obtained from the participants.

3.5.2 Sample Size

Cochran's formula was applied to get the sample size for the study population. Bank employees are a large population and therefore this formula was appropriate in sample size determination.

$$n_o = \frac{Z^2PQ}{d^2}$$

n refers to the desired sample size, z represents the standard normal deviation (1.96) for a 95% confidence level, p represents the percentage of picking a choice expressed as decimals (0.5), q (1-p) while d is the desired level of accuracy, or the sampling error (0.05). This therefore gives a sample size of 384 participants for a population of more than 10,000 (Polonia, 2013). Modification of Cochran's formula for a lesser population when applied, gave a total of 256 respondents where all the job categories were represented.

$$\frac{(1.96)^2(0.5)\ (0.5)}{(0.05)^2} = \mathbf{384}$$

Modification of Cochran's formula

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

=256

Over 300 questionnaires were distributed to the respondents only 211 questionnaires were filled and returned. This gave a percentage of 82%. G Power allows researchers

to determine statistical power based on a variety of tests such as chi-square to be used for the study if it quantifies to over 70% (El Maniani, Rechchach, El Mahfoudi, El Moudane, & Sabbar, 2016).

3.6 Data Collection Tools /Instruments

The study used the following tools to collect the required data.

3.6.1 Questionnaires

The study used a structured self-administered questionnaire which was structured as follows;

Section 1: socio-demographic characteristics of the participants designed specifically for this study, this section sought information on gender, age, and work category of the participants such as whether tellers, managers, customer service, head office, or back office. Section 2: Adapted Modified Nordic Back Pain questionnaire used to assess the prevalence of LBP, work-related information gathered included hours spent seated in a day, working hours, standing hours (less than 5 hours, 5-10 hours, more than 10 hours (measured in ordinal scale), absenteeism due to Low Back Pain as well as treatment after experiencing LBP (norminal scale). Section 3: WHO guidelines on physical activity to interpret the physical activity/inactivity levels and how they spend their leisure time (measured in ordinal scale). Section 4: Adapted 0-10 Numeric Pain Rating Scale was used to identify the intensity/severity of LBP (this was measured in ordinal scale with the highest score in the scale reporting severe pain) and lastly, Section 5: the Adapted Oswestry questionnaire to determine the disability index caused by low back pain (in this section, the participants reported on whether they can do their daily

activities without straining such as walking, standing all this was measured on ordinal scale.

3.7 Pre-Testing

The research instruments which entailed; a modified Nordic questionnaire, numeric pain rating scale, adapted global physical activity questionnaire, and the adapted oswestry low back pain disability questionnaire were pretested by the researcher and two trained data research assistants who were graduates in the field of exercise science and physical education. The pretesting of the instrument was carried out in two selected bank branches which were equity and Kenya commercial banks in Kasarani constituency which met the inclusion criteria based in Nairobi City County. This was to prevent bias in response (n=20). This was done to ensure the explicitness of the questionnaire items. The reliability of the instruments was determined during the pretest.

3.7.1 Validity

For the validity of the instruments, subject experts in the field of exercise science and physical education were used to determine the content validity of the tools. The researcher utilized the suggestions to improve the research tools to ensure content validity.

3.7.2 Reliability

The test re-test method was used to determine the reliability of instruments over a two-week interval. Pearson's product-moment correlation was used to determine the correlation between the two sets of data. The numeric pain rating scale generated a

correlation coefficient of r=0.80, the modified Nordic back pain questionnaire r=0.82, while the modified Oswestry low back pain disability questionnaire had a coefficient of 0.84. According to Mugenda (2003), a correlation coefficient of 0.80 and above indicates a high degree of reliability of the collected data hence, high reliability of research instruments All the coefficients were significant at $p<0.05$.

3.8 Data Collection Techniques

The researcher made a formal application to the management of the selected banks namely; Cooperative Bank, Kenya Commercial Bank, Equity Bank, KWFT, and I&M Bank for authorization to conduct research. Permission was granted on an agreement that the confidentiality of the employees would be taken care of. In this case, numerals were used in identifying the participant's code. The respondents were then briefed on the overview of the research and requested to participate. Those who met the inclusion criteria in the study were then requested to sign the consent form. Physical questionnaires were distributed to the respondents after the official working hours and requested to complete them and given one week (5 working days and a weekend), after which the research assistants would come to pick them up after filling. Respondents who preferred the online questionnaire were also given the same period to fill out the questionnaire after which they would submit it once done. The respondents were briefed to contact the researcher or the research assistants in case of any questions or clarifications on any arising issue.

3.9 Data Analysis

Data collected was analyzed using the Statistical Package for The Social Sciences (SPSS) version 22. Descriptive statistics such as means, percentages, and medians were

used to summarize the data. The chi-square test was used to determine the relationship between the characteristics of bank employees and the factors that may influence the occurrence of low back pain which included; a sedentary lifestyle, work-related factors, and sociodemographic characteristics. Spearman rank correlation analysis was used to determine the relationship between working experience and daily/weekly working hours. All hypotheses were tested at a significance level of 0.05. The Kruskal-Wallis test was used to see if there was any significant difference between low back pain and factors that may be attributed to it such as working hours, hours of computer use, physical activity levels, and disability index due to low back pain was also tested.

3.10 Logistical and Ethical Consideration

Study clearance was obtained from the Kenyatta University Graduate School (Appendix VII) and the Kenyatta University Ethical Review Committee (KUERC) (Appendix IX). Thereafter, a research authorization and permit were obtained from the National Council of Science, Technology and Innovation (NACOSTI) (Appendix X). Research authorization from the branch managers was also sought before data collection. On a date agreed upon by the managers and the researcher, the research team visited the banks and introduced themselves and the study to the participants. Participants who voluntarily accepted to participate in the study were asked to sign the consent form (Appendix B) and submit it to the manager in addition to information on the importance of the research. Confidentiality of the participants was assured whereby the questionnaires did not bear personal information and the data collected was only used for the study by the primary researcher.

CHAPTER FOUR: RESULTS

4.1. Introduction

This chapter presents findings from 211 questionnaires completed by bank employees in Nairobi City County. The purpose of this study was to determine the influence of socio-demographic characteristics, work-related factors, and sedentary lifestyles on low back pain among bank employees in Nairobi City County.

Two visits to the banking institutions were made after permission to conduct the research was granted for the physical questionnaire while for the online questionnaire, one visit was made. The first visit was to give a detailed explanation of the research and an overview of the questionnaire whereby those willing to take part in the study were randomly selected to sign the consent form and questionnaires given to them to fill given one week (five working days and a weekend) after which they were collected. For the online questionnaire, only one visit was made. This was to explain the research, consent forms were issued to those who met the study inclusion criteria, and an online link was sent to them for filling.

A total of two hundred and eleven (211) questionnaires were completed. Data from the questionnaires was analyzed using SPSS.

4.2: Socio-demographic Characteristics of the Participants

The study investigated sociodemographic characteristics of the participants and the results are presented in table 4.1.

Table 4.1: Socio-Demographic Information

Gender	**Frequency**	**Percent**
Female	97	45.96
Male	114	54.04
Total	211	100.0
Age in years		
20-29	45	21.3
30-39	108	51.2
40-49	50	23.7
50 and Above	8	3.8
Total	211	100.0
Work Categories		
Teller	93	44.1
Secretary	7	3.3
Manager	33	15.6
customer service	63	29.9
Back-office staff	7	3.3
Head office staff	8	3.8
Total	211	100.0

As indicated in Table 4.1, a total of 211 participants representing 82% response rate took part in the study. Out of these participants, 114 (54.04%) were male while 97 (45.96 %) were female. The age categories of the participants ranged from 20-29 years to more than 50 years. Some proportion of the participants (45,21.3%) were 20-29 years old, 108 (51.2%) were 30-39 years old, 50 (23.7%) were 40-49 years old and only 8 (3.8%) participants were 50 years and above. The table also shows that out of the 211 participants, 93 (44.1%) were tellers, 7 (3.3%) were secretaries, 33 (15.6%) were managers, 63(29.9%) customer service, 7 (3.3%) back-office staff while 8 (3.8%) were head office staff.

4.3. Prevalence and Severity of Low Back Pain

The study investigated the prevalence and severity of LBP of the participants and the results are presented in table 4.2.

Table 4.2: Prevalence and Severity of Low Back Pain among the Participants

Low back pain	**Frequency**	**Percent**
No	97	46.0
Yes	114	54.0
Low back pain under treatment	**Frequency**	**Percent**
No	164	77.7
Yes	47	22.3
Duration of treatment	**Frequency**	**Percent**
less than 3 months	19	9.0
3 to 6 months	13	6.2
6 to 12 months	8	3.8
more than 12 months	6	2.8
No medication	165	78.2
Pain intensity scale	**Frequency**	**Percent**
0(no pain)	60	28.4
1(no pain)	2	.9
3(less pain)	26	12.3
5(moderate pain)	1	.5
6(more pain)	24	11.4
8(much pain)	50	23.7
10(severe pain)	48	22.7

As indicated in Table 4.2, the majority of bank employees 114 (54%) had experienced or been diagnosed with low back pain while 97 (46%) had never experienced low back pain. Those undergoing treatment were 47 (22.3%), while those who did not seek treatment were 164 (77.7%). The results also showed that of the bank employees who have experienced or been diagnosed with low back pain, 19 (9%) have been under treatment for less than three months, 13 (6.2%) have been under treatment for a duration

of three to six months, while 8 (3.8%) have been on treatment for six to twelve months. Of those who have been on treatment for more than a year 6 (2.8%) while 165 (78.2%) did not indicate the duration in which they have been under treatment. The participants indicated their discomfort level due to low back pain and the results showed that 62 (29.3%) didn't experience any pain, 26 (12.3%) experienced less pain, and only 1(.5%) experienced moderate pain. In addition, 24 (11.4%) of the participants experienced more pain, 50 (23.7%) much pain and 48 (22.7%) reported severe pain.

4.4: Work-Related Characteristics of the Participants

The study investigated the work-related characteristics of the participants and the results are presented in Table 4.3

Table 4.3: Work-Related Characteristics

Duration of work per day	**frequency**	**percent**
Less than 5 hours	5	2.4
5-10 hours	172	81.5
more than 10 hours	34	16.1
Sitting hours per day		
less than 5 hours	22	10.4
5 to 10 hours	186	88.2
more than 10 hours	3	1.4
Hours spent on computers		
less than 5 hours	22	10.4
5 to 10 hours	184	87.2
more than 10 hours	5	2.4
Sitting posture		
leaning forward	62	29.4
leaning back	46	21.8
good posture	103	48.8
Hours spent standing at work		
less than 5 hours	147	69.7
5 to 10 hours	40	19.0
more than 10 hours	24	11.4

Table 4.3 shows that the majority of the participants 172 (81.5%) worked for 5 to 10 hours a day. In addition, 34 (16.1%) worked for more than 10 hours a day while 5 (2.4%) of them worked for less than 5 hours per day. Similarly, the table indicated that 22 (10.4%) of the respondents spent less than five hours while seated during their working hours, 186 (88.2%) who were the majority spent most of the working hours seated, and only 3 (1.4%) spent over ten hours seated. Findings also revealed that the majority of the bank employees 184 (87.2%) spent 5 to 10 hours using a computer, 22 (10.4%) spent less than 5 hours using a computer while only 5 (2.4%) spent more than 10 hours a day using the computer. Results also show that 62 (29.4%) of the bank employees leaned forward when sitting, 46 (21.8%) sat while leaning backward while the majority 103 (48.8%) indicated good sitting posture. The majority of bank employees spent less than five hours in a day standing (147, 69.7%), 40 (19%) spent five to ten hours standing while only 24 (11.4%) spent their time at the workplace standing.

4.5: Sedentary Lifestyle among the Participants

The study also sought to establish the prevalence of a sedentary lifestyle among the participants and the data is presented in Table 4.4.

Table 4.4: Sedentary lifestyle among the participants

Physical activity	**Frequency**	**Percent**
No	31	14.7
Yes	180	85.3
Total	211	100.0
Level of physical activity		
75-150 min moderate-intensity aerobic physical activity(less)	103	48.8
150-300 min moderate-intensity aerobic physical activity	74	35.1
75-150 min vigorous-intensity aerobic physical activity	34	16.1
Leisure time engagement	Frequency	Percent
Watching television	80	37.9
Driving	1	.5
Playing computer/ mobile games	46	21.8
Visiting friends	8	3.8
Household chores	11	5.2
Recreational adventures	22	10.4
Visiting religious centers	1	.5
Sports activities	42	19.9

Table 4.4 indicated that 31 (14.7%) of the participants did not take part in any physical activity while the majority 180 (85.3%) took part in physical activity. The table also shows that, for those who took part in physical activity, 71 (33.6%) did not meet the required guideline as per WHO while 108 (51.2%) met the WHO guidelines. For leisure time engagement, 80 (37.9%) of the participants engaged in watching television, 1 (.5%) driving, 46 (21.8%) spent their leisure time playing computer/mobile games, 8 (3.8%) visiting friends, 11 (5.2%) doing household chores, 22 (10.4%) spent their leisure time doing recreational activities, 1 (.5%) visit religious centers while 42 (19.9%) spent their leisure time doing sports activities.

Table 4.5: Prevalence of Low Back Pain among Bank Employees in Relation to Age

Age	Have you ever experienced or have been diagnosed with Low Back Pain?				Total	
	No	%	Yes	%	Total	%
20-29	24	53.3%	21	46.7%	45	100.0%
30-39	53	49.1%	55	50.9%	108	100.0%
40-49	19	38.0%	31	62.0%	50	100.0%
50 and above	1	12.5%	7	87.5%	8	100.0%
Total	97	46.0%	114	54.0%	211	100.0%

Table 4.5 shows that bank employees in the age category of 50 years and above had the highest percentage occurrence of low back pain 7 (87.7%) followed by 40-49 years 31 (62.0%), 30-39 years 55 (50.9%) and 20-29 years 21 (46.7%). To establish if the observed differences were significant, the chi-square test of independence was computed and the results were presented in Table 4.6.

Table 4.6: A Cross tabulation of Low Back Pain and Age

Chi-Square Tests				
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	6.288[a]	3	.098	.096
Likelihood Ratio	6.836	3	.077	.085
Fisher's Exact Test	6.161			.100
N of Valid Cases	211			

a. 2 cells (25.0%) have an expected count of less than 5. The minimum expected count is 3.68.

Chi-square results as presented in Table 4.6 indicate that there was no statistically significant relationship between the occurrence of low back pain and the age of the participants. Owing to the chi-square results X^2 3 (3, N = 211) = 6.3, p= .098 the null

hypothesis that there is no significant relationship between age and low back pain among bank employees in Nairobi County was not rejected.

Table 4.7: Prevalence of Low Back Pain among Bank Employees in Nairobi City County in Relation to Gender

Gender	Have you ever experienced or have been diagnosed with Low Back Pain?				Total	%
	No	%	Yes	%		
Female	38	39.2%	59	60.8%	97	100%
Male	59	51.8%	55	48.2%	114	100%
Total	97	46.0%	114	54.0%	211	100%

Table 4.7 shows that more female bank employees experienced low back pain 59 (60.8%) compared to those who did not 38 (39.2%). Male employees who reported to have experienced or been diagnosed with low back pain were 55 (48.2%) while those who did not experience low back pain were 59 (51.8%).

Table 4.8: Cross Tabulation of Low Back Pain and Gender

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.339[a]	1	.068	.073	.045
Continuity Correction[b]	2.852	1	.091		
Likelihood Ratio	3.352	1	.067		
Fisher's Exact Test					
N of Valid Cases	211				

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 44.59.
b. Computed only for a 2x2 table

Chi-square results as presented in Table 4.8 indicate that there was a statistically significant association between the occurrence of low back pain and gender of the participants. This study showed that females are exposed to low back pain compared to males. Owing to the chi-square results $X^2(1, N=211) = 3.3$, $p= .045$ the null hypothesis

that there is no significant association between gender and low back pain among bank employees in Nairobi County was rejected.

Table 4.9: Prevalence of Low Back Pain in Relation to their Mode of Transport

		Have you ever experienced or have been diagnosed with Low Back Pain					
		No	%	Yes	%	Total	%
Main mode of transport to and from work	Car	24	42.1%	33	57.9%	57	100%
	Bus	52	49.5%	53	50.5%	105	100%
	walking	18	46.2%	21	53.8%	39	100%
	Cycling	1	33.3%	2	66.7%	3	100%
	Motorbike	2	28.6%	5	71.4%	7	100%
Total		97	46.0%	114	54.0%	211	100%

Table 4.9 shows that bank employees using motorcycles for transport 5 (71.4%) reported the highest cases of Low Back Pain, followed by cyclists 2 (66.7%) cars 33 (57.9%), walking 21 (53.8%), then those using bus 53 (50.5%).

Table 4.10: Cross Tabulation on Low Back Pain in Relation to Modes of Transport

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	1.923[a]	4	.750	.752
Likelihood Ratio	1.964	4	.742	.747
Fisher's Exact Test	1.951			.771
N of Valid Cases	211			

a. 4 cells (40.0%) have an expected count of less than 5. The minimum expected count is 1.38.

Chi-square results as presented in Table 4.10 indicate that there was no statistically significant difference between occurrences of low back pain in relation to the mode of transport of the participants. Owing to the chi-square results $X^2(4, N=211) = 1.9$, $p= .750$ the null hypothesis that there is no significant difference in the occurrence of low

back pain in relation to mode of transport among bank employees in Nairobi County was not rejected.

Table 4.11: Relationship between Physical Activity and Low Back Pain

		Have you ever experienced or have been diagnosed with Low Back pain					
		No	%	Yes	%	Total	%
Do you engage yourself in any Physical activity?	No	14	42.2%	17	54.8%	31	100.0%
	Yes	83	46.1%	97	53.9%	180	100.0%
Total		97	46.0%	114	54.0%	211	100.0%

Table 4.11 shows that bank employees who do not take part in physical activity 14 (42.2%) did not experience or don't have lower back pain, while 17 (54.8%) reported experiencing or having low back pain. For those who are active in physical activity, 83 (46.1%) have never experienced low back pain while 97 (53.9%) have experienced low back pain.

Table 4.12: Chi-Square Test of Significance on Low Back Pain in Relation to Physical Activity

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.010[a]	1	.922	1.000	.540
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.010	1	.922		
Fisher's Exact Test					
N of Valid Cases	211				

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 14.25.
b. Computed only for a 2x2 table

Chi-square results as presented in Table 4.12 indicate that there was no statistically significant difference in the occurrence of low back pain in relation to physical activity of the participants. The chi-square results $X^2(1, N=211) = .01$, $p = .922$ the null

hypothesis that there is no significant relationship between physical activity and low back pain among bank employees in Nairobi County was not rejected.

Table 4.13: Relationship between Low Back Pain and Physical Activity Levels

	Have you ever experienced or have been diagnosed with Low Back Pain					
	No		Yes		Total	
75-150 min moderate-intensity aerobic physical activity(less)	34	47.9%	37	52.1%	71	100.0%
150-300 min moderate-intensity aerobic physical activity	36	48.6%	38	51.4%	74	100.0%
75-150 min vigorous-intensity aerobic physical activity	12	35.3%	22	64.7%	34	100.0%
Total	82	45.8%	97	54.2%	179	100.0%

Table 4.13 presents LBP and physical activity levels. Among the employees who did not meet the WHO guidelines, that is moderate physical activity of 75-150 minutes a week, 37 (52.1%) experienced low back pain while 34 (47.9%) did not experience low back pain. For bank employees who exercised for 150-300 moderate physical activity, those who had low back pain were reported 38 (51.4%) and those without LBP 36 (48.6%). For vigorous physical activity 75-150 minutes a week, 22 (64.7%) reported to have experienced low back pain while 12 (35.3%) did not experience low back pain.

Table 4.14: Cross Tabulation of Low Back Pain on Physical Activity Levels

Chi-Square Tests				
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	1.878[a]	2	.391	.406
Likelihood Ratio	1.908	2	.385	.398
Fisher's Exact Test	1.863			.406
N of Valid Cases	179			

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 15.58.

Chi-square results as presented in Table 4.14 indicate that there was no statistically significant relationship between the occurrence of low back pain and physical activity levels of the participants. Owing to the chi-square results $X^2(2, N=211) = 1.9$, $p= .391$ the null hypothesis that there is no significant relationship between physical activity levels and low back pain among bank employees in Nairobi County was not rejected.

Table 4.15: Relationship Between Leisure Time Activity and Low Back Pain

	Have you ever experienced or have been diagnosed with Low Back Pain					
	No	%	Yes	%	Total	%
watching television	33	42.2%	47	58.8%	80	100.0%
driving	1	100.0%	0	0.0%	1	100.0%
playing computer/ mobile games	18	39.1%	28	60.9%	46	100.0%
visiting friends	5	62.5%	3	37.5%	8	100.0%
household chores	3	27.3%	8	72.7%	11	100.0%
recreational adventures	11	50.0%	11	50.0%	22	100.0%
visiting religious centers	0	0.0%	1	100.0%	1	100.0%
sports activities	26	61.9%	16	38.1%	42	100.0%
Total	97	46.0%	114	54.0%	211	100.0%

Table 4.15 presents data on leisure time activity and low back pain. It is clear that of those who watched television 33 (42.2%) did not experience low back pain while 47 (58.8%) experienced low back pain, participants who spent time driving 1, (100%) did not encounter with low back pain. Of those who spent their leisure time playing computer / mobile games 18 (39.1%) did not have low back pain while 28 (60.9%) had low back pain. Visiting friends, 5 (62.5%) did not have low back pain while 3 (37.5%) had low back pain. Participants who spent their leisure time doing household chores, 3 (27.3%) did not experience low back pain while 8 (72.7%) had encountered lower back pain. Of those who spent their free time doing recreational activities 11 (50%) did not have low back pain same as those who had low back pain (11, 50%). Those who took

part in sports activities 26 (61.9%) did not have low back pain with a lesser number having reported to have low back pain 16 (38.1%).

Table 4.16: Cross Tabulation of Low Back Pain in Relation to Leisure Time Activities

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	10.476[a]	7	.163	.132
Likelihood Ratio	11.323	7	.125	.143
Fisher's Exact Test	10.218			.135
N of Valid Cases	211			

a. 6 cells (37.5%) have an expected count of less than 5. The minimum expected count is .46.

Chi-square results as presented in table 4.16 on the occurrence of low back pain and leisure time activities of the participants. Owing to the chi-square results $X^2(7, N=211) = 10.48$, $p= .163$ indicating that no significant association between leisure time activities and low back pain among bank employees in Nairobi City County

Table 4.17: Relationship between Low Back Pain and Job Category

Job category	Have you ever experienced or have been diagnosed with Low Back Pain					
	No	%	Yes	%	Total	%
Teller	47	50.5%	46	49.5%	93	100.0%
Secretary	4	57.1%	3	42.9%	7	100.0%
Manager	12	36.4%	21	63.6%	33	100.0%
customer service	25	39.7%	38	60.3%	63	100.0%
Back-office staff	4	57.1%	3	42.9%	7	100.0%
Head office staff	5	62.5%	3	37.5%	8	100.0%
Total	97	46.0%	114	54.0%	211	100.0%

Table 4.17 shows that tellers reported the highest number of employees who experienced low back pain 46 (49.5%), followed by customer service 38 (60.3%),

managers 21 (63.6%), secretaries 3 (42.9%), back-office staff 3 (42.9%) and head office staff 3 (37.5%).

Table 4.18: Chi-Square Tests of Significance of Low Back Pain across Job Category

Chi-Square Tests				
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	4.594[a]	5	.467	.478
Likelihood Ratio	4.619	5	.464	.495
Fisher's Exact Test	4.674			.463
N of Valid Cases	211			

a. 6 cells (50.0%) have an expected count of less than 5. The minimum expected count is 3.22.

Chi-square results as presented in Table 4.18 indicate that there was no statistically significant difference in the occurrence of low back pain in relation to the job category of the participants. Owing to the chi-square results $X^2(5, N=211) = 4.6$, $p= .467$ the null hypothesis there is no significant association between job category and low back pain among bank employees in Nairobi County was not rejected.

Table 4.19: Low Back Pain and Working Hours in a Day

How many hours on average do you work in a day	Have you ever experienced or have been diagnosed with Low Back Pain					
	No	%	Yes	%	Total	%
Less than 5 hours	5	100.0%	0	0.0%	5	100%
5-10 hours	77	44.8%	95	55.2%	172	100%
more than 10 hours	15	44.1%	19	55.9%	34	100%
Total	97	46.0%	114	54.0%	211	100%

Table 4.19 shows the relationship between low back pain and duration of working hours in a day. Bank employees who have been working for 5-10 hours a day reported the highest number of individuals with low back pain 95 (55.2%), followed by those who

worked for more than 10 hours a day 19 (55.9%). Those who worked for less than 5 hours a day did not report low back pain.

Table 4.20: Cross Tabulation of Low Back Pain In Relation to Working Hours

Chi-Square Tests				
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	6.024[a]	2	.049	.053
Likelihood Ratio	7.919	2	.019	.037
Fisher's Exact Test	5.868			.053
N of Valid Cases	211			

a. 2 cells (33.3%) have an expected count of less than 5. The minimum expected count is 2.30.

Chi-square results as presented in table 4.20 indicate that there was a statistically significant relationship $X^2(3, N=211) = 6.0$, $p= .049$ between occurrence of low back pain and duration of work among the participants. Therefore, the null hypothesis that there is no significant association between working hours and low back pain among bank employees in Nairobi County was rejected.

Table 4.21: Relationship of Low Back Pain and Sitting Hours in a Day

Sitting hours	Have you ever experienced or have been diagnosed with Low Back Pain					
	No		Yes		Total	
less than 5 hours	14	63.6%	8	36.4%	22	100.0%
5 to 10 hours	81	43.5%	105	56.5%	186	100.0%
more than 10 hours	2	66.7%	1	33.3%	3	100.0%
Total	97	46.0%	114	54.0%	211	100.0%

Table 4.21 shows that bank employees working between 5-10 hours 105 (56.5%) reported the highest number with low back pain followed by those working for less than 5 hours 8 (36.4%) then those working for over 10 hours 1 (33.3%).

Table 4.22: Chi-Square Tests of Low Back Pain across Sitting Hours

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	3.721[a]	2	.156	.187
Likelihood Ratio	3.731	2	.155	.319
Fisher's Exact Test	3.754			.143
N of Valid Cases	211			

a. 2 cells (33.3%) have an expected count of less than 5. The minimum expected count is 1.38.

Chi-square results as presented in Table 4.22 indicate that there was no statistically significant association between the occurrence of low back pain and sitting hours of the participants. Owing to the chi-square results $X^2(2, N=211) = 3.7$, $p= .156$ the null hypothesis there is no significant association between sitting hours and low back pain among bank employees in Nairobi City County was not rejected.

Table 4.23: A Cross Tabulation of Low Back Pain and Sitting Posture

Sitting postures	Have you ever experienced or have been diagnosed with Low Back Pain					
	No	%	Yes	%	Total	%
Leaning forward	33	53.2%	29	46.8%	62	100.0%
Leaning back	15	32.6%	31	67.4%	46	100.0%
Good posture	49	47.6%	54	52.4%	103	100.0%
Total	97	46.0%	114	54.0%	211	100.0%

Table 4.23 shows that those employees who sat leaning back indicated the highest percentage of low back pain 31 (67.4%), followed by those sitting in good posture 54 (52.4%) then those who sat leaning forward 29 (46.8%).

Table 4.24: Chi-Square Tests of Low Back Pain across Sitting Posture

Chi-Square Tests				
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	4.727[a]	2	.094	.092
Likelihood Ratio	4.813	2	.090	.092
Fisher's Exact Test	4.721			.092
N of Valid Cases	211			

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 21.15.

Chi-square results as presented in Table 4.24 indicate that there was no statistically significant association between the occurrence of low back pain and sitting posture of the participants. Owing to the chi-square results $X^2(2, N=211) = 4.7$, $p= .094$ the null hypothesis there is no significant association between sitting posture and low back pain among bank employees in Nairobi City County was not rejected.

Table 4.25: Hours of Computer Use and Low Back Pain

Average hours spent using a computer in a day	Have you ever experienced Low Back Pain					
	No	%	Yes	%	Total	%
less than 5 hours	13	59.1%	9	40.9%	22	100.0%
5 to 10 hours	83	45.1%	101	54.9%	184	100.0%
more than 10 hours	1	20.0%	4	80.0%	5	100.0%
Total	97	46.0%	114	54.0%	211	100.0%

Table 4:25 indicates the relationship between low back pain and hours of computer use in a day. Bank employees who spent more than 10 hours using a computer recorded the highest percentage of low back pain 4 (80%), followed by those who spent 5-10 hours recording 101 (54.9%). Those who recorded the lowest number of low back pain were those who spent less than 5 hours using computer recording 9 (40.9%).

Table 4.26: Chi-Square Tests of Low Back Pain in Relation to Computer Use

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.938[a]	2	.230
Likelihood Ratio	3.051	2	.217
N of Valid Cases	211		

a. 2 cells (33.3%) have an expected count of less than 5. The minimum expected count is 2.30.

Chi-square results as presented in Table 4.26 indicate that there was no statistically significant relationship between the occurrence of low back pain and hours of computer use of the participants. Owing to the chi-square results $X^2(2, N=211) = 2.9$, $p= .230$ that the null hypothesis there is no significant association between hours of computer use and low back pain among bank employees in Nairobi City County was not rejected.

Table 4.27: Results of Low Back Pain and Work Absenteeism

Have you ever absented yourself from work due to low back pain?	Have you ever experienced or have been diagnosed with Low Back Pain					
	No	%	Yes	%	Total	%
No	90	66.2%	46	33.8%	136	100%
Yes	7	9.3%	68	90.7%	75	100%
	97	46.0%	114	54.0%	211	100%

Table 4.27 shows that 46 (38.8%) have reported not absent themselves from work despite having lower back pain while 68 (90.7%) have reported to absent themselves from work due to lower back pain.

Table 4.28: A Cross Tabulation of Low Back Pain and Bank Employees Absenteeism

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	62.887[a]	1	.000	.000	.000
Continuity Correction[b]	60.619	1	.000		
Likelihood Ratio	70.568	1	.000		
Fisher's Exact Test					
N of Valid Cases	211				

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 34.48.
b. Computed only for a 2x2 table

Chi-square results as presented in Table 4.28 indicate that there was a statistically significant relationship between the occurrence of low back pain and work absenteeism among the participants owing to the chi-square results $X^2(1, N=211) = 62.89$, $p<.001$. Therefore, the hypothesis that there is no significant relationship between low back pain and work absenteeism was rejected.

Table 4.29: Discomfort Level Due to Low Back Pain

		Frequency	Percent
Discomfort level	0(no pain)	52	24.6
	1(no pain)	1	.5
	3(less pain)	28	13.3
	6(more pain)	24	11.4
	8(much pain)	54	25.6
	10(severe pain)	52	24.6
	Total	211	100.0

Table 4.29 indicated that the majority of bank employees experienced much and severe pain based on the discomfort level scale. The results were; much pain 54 (25.6%), severe pain 52 (24.6%), more pain 24 (11.4%), less pain 28 (13.3%), no pain 1 (0.5%), and 52 (24.6%).

Table 4.30: Results on Age and Discomfort Level of Bank Employees in Nairobi City County

		Discomfort level due to low back pain.					
		0(no pain)	3(less pain)	6(more pain)	8(much pain)	10(severe pain)	Total
Age	20-29	17 (37.8%)	4(8.9%)	4(8.9%)	9(20.0%)	11(24.4%)	45(100.0%)
	30-39	30(27.8%)	19(17.6%)	15(13.9%)	24(22.2%)	20(18.5%)	108(100.0%)
	40-49	6(12.0%)	4(8.0%)	4(8.0%)	19(38.0)	17(34.0%)	50(100%)
	50 and Above	0(0.0%)	1(12.5%)	1(12.5%)	2(25.0)	4(50.0%)	8(100.0%)
	Total	53(25.1%)	28(13.3%)	24(11.4%)	54(25.6%)	52(24.6%)	211(100.0%)

Table 4:30 shows that participants who are 50 years and above reported the highest severity of low back pain 4 (50.0%), followed by those who were between the age brackets of 40-49 years 17(34.0%), 20-29 years 11 (24.4%) with those between the age of 30-39 years reporting the lowest 20(18.5%).

Table 4.31: Chi-Square Test of Pain Severity Across Age Among Bank Employees

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	22.732[a]	12	.030
Likelihood Ratio	24.485	12	.017
Fisher's Exact Test	.[b]		
Linear-by-Linear Association	12.471	1	.000
N of Valid Cases	211		

Chi-square results presented in Table 4:31 indicate that there was a statistically significant relationship between age and severity of pain caused by low back pain. Owing to the chi-square results x^2 (12, N=211) =22.73, p=.030.

Table 4.32: Spearman Rank-Oder Correlation between Age and Discomfort Level of Bank Employees in Nairobi City County

Spearman's Rho **Correlations**			Discomfort level due to low back pain.
Age	Correlation Coefficient	1.000	.229**
	Sig. (2-tailed)	.	.001
	N	211	211
Discomfort level due to low back pain.	Correlation Coefficient	.229**	1.000
	Sig. (2-tailed)	.001	.
	N	211	211

**. Correlation is significant at the 0.01 level (2-tailed).

The result of the Spearman Rho test shows that there is a significant positive relationship between age and discomfort level due to low back pain (r_s is .229) and this is statistically significant (p= .001).

Table 4.33: Association of Duration of Sitting Hours and Discomfort Level of Bank Employees in Nairobi City County

		Discomfort level due to low back pain.					Total
		0(no pain)	3(less pain)	6(more pain)	8(much pain)	10(severe pain)	
Sitting hours	less than 5 hours	8(36.4%)	5(22.7%)	3(13.6%)	4(18.2%)	2(9.1%)	22(100.0%)
	5 to 10 hours	45(24.2%)	23(12.4%)	20(10.8%)	48(25.8%)	50(26.9%)	186 (100.0%)
	more than 10 hours	0(0.0%)	0(0.0%)	1(33.3%)	2(66.7%)	0(0.0%)	3(100.0%)
Total		53(25.1%)	28(13.3%)	24(11.4%)	54(25.6%)	52(24.6%)	211(100.0%)

Table 4:33 on the association of sitting hours and pain severity showed that bank employees who spend 5 to 10 hours seated reported the highest percentage of discomfort level due to low back pain 50(26.9%) then followed by those who spent less than 5 hours seated reporting 2(9.1%). Bank employees who spent more than 10 hours

seated did not report experiencing severe pain though they reported the highest number 2 (66.7%) with much pain.

Table 4.34: Chi-square Test of Results on Pain Severity and Sitting Hours

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	11.084[a]	8	.197	.189
Likelihood Ratio	12.260	8	.140	.159
Fisher's Exact Test	10.385			.129
Linear-by-Linear Association	5.272[b]	1	.022	.021
N of Valid Cases	211			

Table 4:34 on the chi-square test of results showed that there was no significant relationship between pain severity and hours spent while sitting. Owing to the chi-square results x^2(8 N=211) =11.084, p= .197.

Table 4.35: Spearman Rank-Oder Correlation between Duration of Sitting Hours and Discomfort Level among Bank Employees in Nairobi City County

Spearman's Rho Correlations		Discomfort level due to low back pain.	Sitting hours
Discomfort level due to low back pain. (Severity of pain)	Correlation Coefficient	1.000	.156*
	Sig. (2-tailed)	.	.023
	N	211	211
Sitting hours	Correlation Coefficient	.156*	1.000
	Sig. (2-tailed)	.023	.
	N	211	211

*. Correlation is significant at the 0.05 level (2-tailed).

The result of the Spearman Rho test shows that there is a significant positive relationship between sitting hours and discomfort level due to low back pain (r_s is 0.156) and this is statistically significant (p=.023).

Table 4.36: Relationship between Discomfort Level and Sitting Posture

		Discomfort level due to low back pain.					Total
		0(no pain)	3(less pain)	6(more pain)	8(much pain)	10(severe pain)	
Sitting posture.	leaning forward	22 (35.5%)	12(19.4%)	6(9.7%)	9(14.5%)	13(21.0%)	62(100%)
	leaning back	8(17.4%)	5(10.9%)	9(19.6%)	17(37.0%)	7(15.2%)	46(100.0%)
	good posture	23(22.3%)	11(10.7%)	9(8.7%)	28(27.2%)	32(31.1%)	103(100.0%)
Total		53(25.1%)	28(13.3%)	24(11.4%)	54(25.6%)	52(24.6%)	211(100.0%)

Table 4:36 on sitting posture and discomfort level showed that bank employees who have good posture reported the highest numbers of pain severity 32 (31.1%), followed by those whose posture indicated leaning forward 13 (21.0%) with those whose posture indicated leaning back reporting the lowest pain severity 7 (15.2%).

Table 4.37: Chi-square Test of Significance across sitting Posture and pain severity

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	19.133[a]	8	.014
Likelihood Ratio	18.808	8	.016
Fisher's Exact Test	.[b]		
Linear-by-Linear Association	6.698[c]	1	.010
N of Valid Cases	211		

Table 4:37 on the chi-square test of significance showed that there was a significant association between discomfort level and sitting posture. Owing to the chi-square results that x^2 (8, N=211) =19.133, p=.014.

Table 4.38: Spearman Rank-Oder Correlation between Discomfort Level and Sitting Posture

Spearman's rho **Correlations**		Discomfort level due to low back pain.	Sitting posture.
Discomfort level due to low back pain.	Correlation Coefficient	1.000	.170*
	Sig. (2-tailed)	.	.013
	N	211	211
Sitting posture.	Correlation Coefficient	.170*	1.000
	Sig. (2-tailed)	.013	.
	N	211	211

*. Correlation is significant at the 0.05 level (2-tailed).

The result of the Spearman Rho test shows that there is a significant positive relationship between sitting posture and discomfort level due to low back pain (r_s is 0.170) and this is statistically significant (p=.013). We therefore reject the hypothesis that says that there is no significant relationship between low back pain and work-related factors of bank employees in Nairobi City County.

Table 4.39: Disability Index among the Participants

	Frequency	Percent
0-20 Minimal Disability	120	56.9
21-40 Moderate Disability	87	41.2
41-60 Severe Disability	3	1.4
81-100 Bed Bound/ Exaggerating	1	.5
Total	211	100.0

Based on the Oswestry disability index, the maximum participants had Minimal disability 120(56.9%), moderate disability reported the second 87(41.2%) while severe and bed-bound disability reported the minimum 3 (1.4%) and 1 (0.5%) respectively.

Table 4.40: A Cross Tabulation of Age and Disability Index Due to Low Back Pain

		0-20 Minimal Disability	21-40 Moderate Disability	41-60 Severe Disability	81-100 Bed Bound/ Exaggerating	Total
Age	20-29	27(60.0%)	18 (40.0%)	0(0.0%)	0(0.0%)	45(100%)
	30-39	72(66.7%)	34(31.5%)	1(0.9%)	1(0.9%)	108(100%)
	40-49	20(40.0%)	28(56.0)	2(4.0%)	0(0.0%)	50(100%)
	50 and Above	1(12.5%)	7(87.5%)	0(0.0%)	0(0.0%)	8(100%)
Total		120(56.9%)	87(41.2%)	3(1.4%)	1(0.5%)	211(100%)

Table 4:40 shows age categories and disability index due to low back pain among bank employees. Among the bank employees in the age category of 20-29 years, 27 (60%) reported minimal disability and 40% reported moderate disability due to low back pain. 30-39 years reported 72 (66.7%) minimal disability, 34 (31.5%) moderate disability, 1 (0.9%) reported having a severe disability and finally, bank employees within the same age category reported 1 (0.9%) bed-bound due to low back pain. Within the age category of 40-49 years, 20 (40%) reported minimal disability, 28 (56%) moderate disability, and the highest number with severe disability of 2 (4%). Bank employees within the age category of 50 years and above 1 (12.5%) minimal disability, 7 (87.5%) moderate disability, and 0 (0%) reported severe disability due to low back pain.

Table 4.41: Chi -square Test of Significance on Disability Index in Relation to Age

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.708[a]	9	.014
Likelihood Ratio	21.522	9	.011
Linear-by-Linear Association	8.037	1	.005
N of Valid Cases	211		

a. 10 cells (62.5%) have an expected count of less than 5. The minimum expected count is .04.

Chi-square results presented in Table 4.41 show that there was a statistically significant relationship between age and disability index owing to the chi-square results x^2 (9, n=211) =20.71, p=.014. Therefore, the hypothesis that there is no significant relationship between low back pain and sociodemographic profile was rejected.

Table 4.42: A Cross Tabulation of Disability Index and Work Absenteeism Due to Low Back Pain

		0-20 Minimal Disability	21-40 Moderate Disability	41-60 Severe Disability	81-100 Bed Bound/ Exaggerating	Total
Absent from work due to low back pain	No	89(64.4%)	46(33.8%)	1(0.7%)	0(0.0%)	136(100.0%)
	Yes	31(41.3%)	41(54.7%)	2(2.7%)	1(1.3%)	75(100.0%)
Total		120(56.9)	87(41.2%)	3(1.4%)	1(0.5%)	211(100%)

Table 4.42 shows the absenteeism of bank employees from work due to disability index caused by low back pain. The findings show that 41, (54.7%) of bank employees who absented themselves from work had moderate disability, then 31, (41.3%) of bank employees' absenteeism had minimal disability as a result of low back pain 2, (2.7%)

bank employees absenteeism had severe disability due to low back pain and finally only 1, (1.3%) bank employees absented from work had severe/ bed bound disability.

Table 4.43: Chi-square Test of Results of Disability Index and Work Absenteeism Due to Low Back Pain

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.115[a]	3	.004
Likelihood Ratio	13.366	3	.004
N of Valid Cases	211		

a. 4 cells (50.0%) have an expected count of less than 5. The minimum expected count is .36.

Chi-square results presented in Table 4.43 show that there was a statistically significant relationship between absenteeism and disability index owing to the chi-square results x^2 (3, n=211) =13.11, p=.004. The hypothesis that there is no significant association between work absenteeism and disability index due to low back pain was rejected.

Table 4.44: Comparing Low Back Pain across Age Category

Ranks						
	1. Age	N	Mean Rank	Chi-square	df	Asymp sig.
Low Back Pain	20-29	45	113.77	6.258	3	.100
	30-39	108	109.27			
	40-49	50	97.59			
	50 and Above	8	70.69			
	Total	211				

Kruskal Wallis H-test was conducted to establish whether there was a difference for various subscales of age and low back pain among bank employees. The results in Table 4:44 indicated that there was no significant difference between low back pain and age (H (3) =X 6.258, P=.100). The mean ranks were 113.77 for the age category 20-29

years, 109.27 for age 30-39 years, 97.59 for age 40-49 years and 70.69 for age 50 and above years. This means that there was no significant difference between age and low back pain.

Table 4.45: Comparing Low Back Pain to Sitting Postures

	Ranks Sitting posture.	N	Mean Rank	Chi-square	df	Asymp sig
Low Back Pain	leaning forward	62	114.15	4.604	2	.100
	leaning back	46	92.40			
	good posture	103	107.17			
	Total	211				

Kruskal-Wallis H-test was conducted to establish whether there was a difference in the various sitting postures and low back pain among bank employees. The results in Table 4.45 indicated that there was no significant difference between low back pain and sitting postures (H (2) =4.604, P=.100) The mean ranks were 114.15 for bank employees whose sitting posture indicated leaning forward, 92.40 for leaning back, and 107.17 for good sitting posture.

Table 4.46: Comparing Low Back Pain across Sitting Hours

	Ranks Sitting hours	N	Mean Rank	Chi-square	df	Asymp sig
12. Have you ever experienced or have been diagnosed with Low Back Pain?	less than 5 hours	22	120.34	2.455	2	.293
	5 to 10 hours	186	103.94			
	more than 10 hours	3	128.33			
	Total	211				

The comparison of low back pain across sitting hours among the participants showed that there was no difference in the various hours spent while seated. The results in Table 4.46 indicated that there was no significant difference between low back pain and sitting

hours (H (2) =2.455, p.293) the mean ranks were 120.34 for bank employees who spent less than 5 hours seated, 103.94 for those who spent 5-10 hours seated and 128.33 for bank employees who spent more than 10 hours seated.

Table 4.47: Comparison of Low Back Pain across Working Hours

	Ranks					
	Average working hours in a day	N	Mean Rank	Chi-square	df	Asymp sig
Low Back Pain	Less than 5 hours	5	163.00	5.995	2	.050
	5-10 hours	172	104.73			
	more than 10 hours	34	104.04			
	Total	211				

Kruskal-Wallis H-test was conducted to establish whether there was a difference between different working hours and low back pain among bank employees. The results in Table 4.47 indicated that there was a significant difference between low back pain to working hours (H (2) =5.995, P.050). The mean ranks were 163.0 for participants who worked for less than 5 hours, 104.73 for those who worked for 5-10 hours, and 104.04 for those who worked for more than 10 hours.

Table 4.48: Comparison of Low Back Pain and Hours of Computer Use

	Ranks					
	Hours of computer in a day	N	Mean Rank	Chi-square	df	Asymp sig.
Low Back Pain	less than 5 hours	22	115.55	2.039	2	.369
	5 to 10 hours	184	105.59			
	more than 10 hours	5	79.10			
	Total	211				

The Kruskal-Wallis H test was conducted to assess if there was a significant difference in the various hours of computer use as a contributor to low back pain

among bank employees. The results in Table 4.48 indicated that there was no significant difference between low back pain and hours spent on computer use (H (2) =2.039, P.369) the mean ranks were 115.55 for participants who spent less than 5 hours using a computer, 105.59 for those who spent 5 to 10 hours and 79.10 for than those who used a computer for more than 10 hours a day.

Table 4.49: Comparison of Physical Activity and Low Back Pain

	Ranks					
	Hours spent doing physical activity	N	Mean Rank	Chi-square	df	Asymp sig.
Low Back Pain	75-150 min moderate-intensity aerobic physical activity(less)	71	93.62	2.861	2	.239
	150-300 min moderate-intensity aerobic physical activity	74	91.83			
	75-150 min vigorous-intensity aerobic physical activity	34	78.46			
	Total	179				

Kruskal-Wallis H-test was conducted to establish whether there was a difference in the physical activity levels. The results in Table 4.49 showed that there was no significant difference between low back pain and physical activity levels (H (2) =2.861, P.239). The mean difference was 93.62 for 70-150 min moderate-intensity aerobic physical activity, 91.83 for 150-300 min moderate-intensity aerobic physical activity, and 78.46 for 75-150 min vigorous-intensity aerobic physical activity. This means the hypothesis there is no significant difference in low back pain and physical activity level was not rejected.

Table 4.50: Comparing Low Back Pain to Discomfort Level

	Ranks					
	Discomfort level due to low back pain.	N	Mean Rank	Chi-square	df	Asymp sig.
Low Back Pain	0(no pain)	52	140.68	36.710	5	.000
	1(no pain)	1	163.00			
	3(less pain)	28	114.02			
	6(more pain)	24	92.67			
	8(much pain)	54	86.81			
	10(severe pain)	52	91.99			
	Total	211				

Kruskal-Wallis H-test was conducted to establish whether there was a difference in various discomfort levels that were caused by low back pain. The results in Table 4.50 indicated that there was a significant difference between low back pain and pain severity (H (5) =36.710, P.000). The mean ranks were 140.68 representing 0 (no pain), 163.00 1(no pain), 114.023 (less pain), 92.676 (more pain), 86.818 (much pain) and 91.991 0(severe pain).

CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1. Discussion

This study aimed at assessing the prevalence of low back pain and associated factors. According to this study, the prevalence of low back pain among bank employees in Nairobi City County was 54%. This study revealed that bank employees are at higher risk for developing low back pain. The finding is consistent with other studies that reported 55% prevalence in Japan among office workers and 58.1% in Ethiopia among housekeepers.

The associated factors that this study investigated include the influence of a sedentary lifestyle, work-related and socio-demographic characteristics on low back pain among bank employees. The study was carried out in banks in Nairobi city county, Kenya. The study sample comprised 211 bank employees; 97 (45.96%) were male and 114(54.04%) were female. The age category of the participants ranged from 20-29 years to 50 and above years. Of the participants, 45 (21.3%) were 20-29 years old, 108 (51.2%) were 30-39 years, 50 (23.7%) were 40- 49 years and 8 (3.8%) were 50 years and above. The study used questionnaires as the main instrument for data collection.

5.1.1 Sociodemographic Characteristics of Bank Employees

The study sampled 211 bank employees for the survey where 114 (54.04%) were male bank employees and 97 (45.96%) were female bank employees. The participants were also categorized by the work category where the majority 93 (44.1%) were tellers. The age categories of the participants ranged from 20-29 years to above 50 years with the majority 108 (51.2%) of the participants being 30-39 years old.

With low back pain, the results of this study showed that participants who are within the age brackets of 50 years and above reported being at a higher risk of low back pain at 87.5% with those within the age brackets of 20-29 years reporting the lowest percentage of low back pain of 46.7%. This study concurred with a study done at the University of Nairobi in the Department of College of Health Sciences on the prevalence of LBP (Mweu, Mbuya, & Mwanthi, 2019), the university staff indicated that the older ones were at a higher risk of lower back pain. This indicates that individuals who have been working in the bank for a longer duration are at higher risk of low back pain as compared to those who have been working in the bank for a shorter duration. The study also agrees with other studies that low back pain increases as age increases (Hoy et al., 2012).

The gender of the participants was not evenly distributed showing that more males took part in the study 54.04 % compared to female employees 45.96%. Females reported having the highest experience of low back pain at 60.8% compared to male participants at 48.2%. The findings of this study agreed with a study conducted in China by Wang, 2017 on pain intensity, sleep disturbance, and motion in patients with non-specific low back pain that states that females are at high risk of low back pain as compared to males with prevalence of 60.8% and 45.96% respectively. The study also concurs with (Ogunbode, Adebusoye, & Alonge, 2013), who reported female employees to be at higher risk of suffering from low back pain as compared to male gender during his study on the prevalence of low back pain and associated risk factors among his participants. This may be attributed to the anatomical differences where the female pelvis is said to be wider than that of the male counterparts which alters the alignment and stress distribution of the lumber spine. The study concurs with a study done by Al-hadid

(2020) in Doha on the prevalence of LBP among female hospital staff at childbearing age where he reported a high prevalence of 67.5% among female office staff.

Though tellers were reported to have the highest prevalence of low back pain, the work category in this study did not indicate any significant association with low back pain p=.750. Therefore, this study concluded that the work category did not influence low back pain among bank employees in Nairobi City County.

5.1.2 Prevalence of Low Back Pain

Low back pain is still a persistent public health challenge around the globe that substantially affects the quality of life hence causing disability to the working population (Mweu et al., 2019). This study concurred with a study done by (Chiwaridzo, Makotore, Dambi, Munambah, & Mhlanga, 2018) on work-related musculoskeletal disorders among registered general nurses in Zimbabwe where he reported a higher prevalence of above 50% for chronic low back pain. A study done among primary school teachers in rural Kenya on Low back pain prevalence and contributing factors by Ntuli 2015 reported that LBP has become a threat to the working population, the results were similar to this study where he reported a prevalence of 64.9%.

Previous studies have reported a higher prevalence of low back pain in low-income countries as compared to high income countries (Ali et al., 2020). A study done in Bangladesh on the prevalence of low back pain and associated factors showed that the prevalence of employment-related low back pain was found to be high in different job settings the results were similar to the current study that established LBP prevalence of 54% as shown in table 4.4. These findings were similar to those of (Downing & Elias,

2016) where by prevalence of low back pain was reported to lie between 14-72% among primary school teachers in Webuye.

In this study, the female gender reported a higher prevalence (60.8%) as compared to the male gender (48.2%) this concurred with a study done by Al-hadid 2020, on the prevalence of LBP among female staff, this may be due to exposure to poor posture which causes unnecessary strain in the spine and muscles in the back.

Results of the current study indicated that pain severity among bank employees was also associated with age as well as duration of employment. Pain severity across ages indicated that there was a significant relationship (x2(12, N=211) 22.73, p=0.030). The reason was that there was increased pain severity with an increase in age whereby those with 50 years and above reported 87.5%, 40-49 years 62.0%, 30-39 years 50.9%, and those within the age brackets of 20-29 years of age reporting the lowest severity of 46.7 %. This may be attributed to loss of bone strength and muscle elasticity as well as tone decrease with age (Ali et al., 2020). With the increase in age, intervertebral disc begins to lose fluid and flexibility decreasing their ability to cushion the vertebrae hence causing low back pain. This current study concurred with a study done by(Yaya et al., 2019) on the prevalence and risk factors of LBP among university teaching staff which found out working for long hours in the same position and continuing with the same job for many years predisposes bank employees to low back pain. Thus, the odds of getting low back pain for bank employees aged 50 years and above are high as compared to those with fewer years.

5.1.3. Sedentary Lifestyle and Low Back Pain

Sedentary behavior is defined as an activity with less energy expenditure that is performed in a resting position (Baradaran Mahdavi et al., 2021). It is believed to be a

predictor of metabolic risk independent of physical inactivity and therefore a substantial risk factor for a variety of chronic diseases (Baradaran Mahdavi et al., 2021). Health concerns associated with sedentariness are not just attributable to lack of movement, but also other simulations such as leisure of work, screen time activities such as television watching, cellphone use, playing video games as well as computer and internet use, this study was not in agreement with the study done by Bontrup 2019 on relationship with sitting behavior among office workers in Switzerland since it did not find any relationship between LBP and leisure time activities.

Aerobic exercise increases the flow of blood and nutrients to the soft tissues of the back. This helps in improving the healing process by reducing the stiffness that can result in low back pain the current study did not agree with this study done by Owen (2020), for it did not show any association between low back pain and physical activity/ inactivity. This study showed that 31, (14.7%) of bank employees did not take part in physical activity while 180, (85.3%) took part. Avoidance of activity weakens the core stabilizing muscles and thus, this makes LBP unbearable which forces individuals to avoid more activities that require movements. Bank employees who did not take part in physical activity, 54.8% experienced low back pain. For those who took part in physical activity 53.9% of bank employees experienced low back pain. This showed a relatively small difference in low back pain experience between those who took part in physical activity and those who did not. Though data shows that physical inactivity may predispose bank employees to low back pain, there was no significant relationship between low back pain and physical activity $x^2(1, N=211) =0.1, p =0.922$.

With the mode of transport to and from work, most bank employees reported using cars and buses compared to walking. This study did not show any significant difference

between low back pain and mode of transport to and from work. This study differed from the study done by Kresal 2015 on Lower Back Pain and Absenteeism among Professional Public Transport Drivers, where his study found that modes of transport such as the use of cars to and from work predispose individuals to LBP.

Bank employees usually spend a long proportion of their time seated during their working hours. A strong association between sitting with increased risk of various long-term health problems exists with low back pain not excluded. This study differed from a study done by Gordon and Bloxham (2016) on a systematic review of the effects of exercise on non-specific low back pain whereby in his findings, physical inactivity was found to be a risk factor for low back pain, in this study, there was no association between physical activity and LBP. He further noted that too much or too little physical activity can be associated with low back pain and therefore, a variety of moderate-intensity exercises was effective in reducing low back pain. The finding of the study also differed with Heuch (2017) on the relationship between physical activity and low back pain whereby engaging in heavy domestic and recreational physical activity was associated with an increased probability of low back pain.

5.1.4. Work-Related Factors and Low Back Pain

Occupation-related factors are inextricably associated with low back pain. Though other factors are associated with low back pain, such as socio-demographic characteristics and a sedentary lifestyle, it is estimated that 37% of low back pain is due to risk factors at work around the world. Bank employees spend a long proportion of their time seated during working hours. Low back pain is a well-recognized cause of morbidity and its occurrence is reported in the general population and occupational settings (Zewudie et al., 2021). Even though the association between sitting duration

and low back pain seems to be controversial, other aspects of sitting behavior might be critical links to LBP among bank employees. This study differed from a study done by Bontrup 2019 on sitting behavior being a risk factor for LBP. Low back pain associated with occupational risk factors indicates that 11%-80% of them is a result of ergonomic factors which entails, sitting for a longer duration and awkward postures such as bending and twisting (Kresal et al., 2015). The current study differed from a study done by Simsek 2017 on the association between sedentary behavior and LBP showed that poor postures entailing leaning back and stooping positions predisposed bank employees to lower back pain. Both sitting and standing posture did not indicate any significant association with low back pain. Long-term sitting and no exercise are significantly associated with low back pain (Owen et al., 2020). This study was not in agreement with the current study since hours of sitting did not indicate any association with LBP.

Table 4:20 indicated that bank employees who work for more than 10 hours a day reported the highest percentage of low back pain experience 55.9%. The findings of this study indicated that working in the same position for a longer duration predisposes bank employees to low back pain ($p<0.049$). The findings concurred with those of Janwantanakul (2011) on the development of risk scores for low back pain in office workers in his study he found out that, long working hours exposed workers to low back pain.

Table 4:22 on sitting duration and low back pain shows that bank employees who sit with the hour brackets of 5-10 hours, reported the highest percentage of low back pain at 56.5%. This may be attributed to poor posture while seated. This is because sitting in a slouched position puts strain on the discs hence leading to low back pain. These

findings differed from those of Coenen (2018) in his study on the association of office workers' objectively assessed occupational sitting, standing, and stepping time with musculoskeletal symptoms. In his study, he found out that low back pain was associated with sitting duration among office workers. These findings were not in agreement with the current study for it reported no significant difference between low back pain and sitting hours among bank employees in Nairobi City County.

This study also sought to look at the association between hours of computer use and low back pain among bank employees. Table 4:25 shows that bank employees who have been using computers for 10 hours or more reported the highest percentage of low back pain 80%. This may be a result of sitting in the same position for a longer duration as well as not placing the monitor on the front position. The findings differed from those of Yang 2018 during his study on risk factors of non-specific low back pain on computer using office workers where in his study he found out that, 10 hours and more of computer use is past the threshold and thus, it can lead to low back pain. Another study done by Ye 2017 found that not having a computer monitor located in front of the operator is a risk factor for lower back pain. This differed with the current study for it didn’t show any association between low back pain and hours of computer use.

The study also sought to investigate whether low back pain among bank employees in Nairobi City County could lead to work absenteeism. The findings reported that bank employees who experienced low back pain, 80% absented themselves from work. Therefore, a significant relationship was found between low back pain and work absenteeism among bank employees ($p<0.001$). The findings concurred with those of Odebiyi (2016) on the prevalence and impact of work-related musculoskeletal disorders on the job performance of call center operators in Nigeria. In his study, he found out

that employees absented themselves from work due to musculoskeletal disorders with low back pain being among them. Therefore, high absenteeism reported among bank employees was due to LBP but not any other cause.

5.1.5. Disability Index Due to Low Back Pain

The low back pain disability index in this study was designed to determine the aspect of bank employees that was disrupted by low back pain. The items in the Oswestry low back disability questionnaire helped the researcher know how much pain could prevent the participants from doing their daily normal activities. Standing and walking for a long duration, especially with an awkward posture may alter the spine and pelvic alignment. This places stress on muscle ligaments that are responsible for standing which may later lead to LBP. The study concurred with other studies on disability due to LBP for it reported a significant relationship between disability index due to low back pain across age groups p= 0.014. The results indicated that there was a positive relationship between low back pain and absenteeism among bank employees. This therefore concludes that the big percentage of absenteeism is due to the disability index that was reported by bank employees. The study concurred with the study done by (Downing & Elias, 2016) among teachers wherein the study found that high absenteeism was due to the disability caused by low back pain. Due to LBP, the core muscles stabilization decreases the ability to maintain the spine hence making them unable to stand or walk for a longer duration.

5.2 Conclusion

The purpose of this study was to investigate the influence of sedentariness, socio-demographic and work-related factors on lower back pain. To achieve this, a total of 211 bank employees responded to the questionnaire were more females participated in the study as compared to males. The majority of the bank employees were in the age category of 30-39 years of age.

A large proportion indicated that they have suffered low back pain and therefore, this has resulted in the majority of them being absent from work. Despite them experiencing low back pain, the findings showed that only a few reported to have sought medical attention. The current study reported that females had a higher incidence occurrence of low back pain compared to males although there was a significant relationship between gender and low back pain $p=0.045$.

Bank employees who have been working for a longer duration and of older age reported the highest prevalence of low back pain. Bank employees who reported to have spent 5-10 hours seated reported the highest prevalence of low back pain. This is because of working in a sedentary environment which attributed them to low back pain. With sitting posture, bank employees who sat while leaning back reported the highest prevalence of low back pain. Bank employees who spent more than 10 hours using computers reported the highest prevalence of low back pain although the findings showed that there was no statistically significant relationship between low back pain and hours of computer use.

The study also reported that bank employees who have been engaging in physical activity, and individuals who engaged in exercise for 75-150 minutes of vigorous intensity reported the highest prevalence of low back pain. This may be a result of poor

form when performing exercises or a lack of stretching the muscles after working out. With leisure time activities, bank employees who involved themselves in household chores reported the highest prevalence of low back pain. This may be attributed to too much bending, and standing such as when doing laundry and also cleaning. Bank employees who spend time doing sports activities reported the lowest experience of low back pain.

This study concludes that the prevalence of low back pain among bank employees in Nairobi City County was 54%. The findings of this study showed that age significantly influenced low back pain among bank employees. The study also concluded that gender had a significant influence on low back pain thus females are at higher risk compared to males. The high prevalence of low back pain reported concurred with other studies done in East Africa among office workers. The occurrence of low back pain was associated with sitting for a longer duration.

The study concludes that long working hours play a significant role in developing lower back pain. Therefore, the duration of working hours should be taken into account in the prevention of low back pain among bank employees in Nairobi City County. The need also to adjust working hours to minimize and manage cases of low back pain should be considered.

The study also concludes that physical activity does not influence low back pain although the researcher did not ask about the routine of exercise. Bank employees who also engaged themselves in household activities reported the highest prevalence of low back pain with those who engaged themselves in sporting activities reporting the lowest experience.

The findings of this study showed that absenteeism at the workplace has been attributed to low back pain. This has also been reported by many studies whereby a high rate of absenteeism in the workplace due to low back pain has led to a decrease in work productivity. The study also concluded that, despite the high rate of absenteeism, only a few bank employees who had low back pain sought medical assistance.

The Chi-square test indicated that there was a significant relationship between the prevalence of low back pain and pain severity p.000, therefore the hypothesis (H_{01}) there is no significant relationship between prevalence of low back pain and severity of pain was rejected.

To test on hypothesis, age, gender, and job category were tested at significance .05. The Chi-square test on age, gender, and job category did not indicate a significant relationship to low back pain, the p-value was; p=.098, p=.045 and p.467 respectively, therefore, the hypothesis that there is no significance relationship between socio-demographic relationship and low back pain, gender had a significant relationship.
Physical activity levels and mode of transport among bank employees did not indicate any significant relationship p=.922 and p=.750 respectively, their p-value was greater than .05. Therefore, the hypothesis that there is no significant relationship between sedentary lifestyle and low back pain among bank employees was not rejected.

The chi-square test was done to investigate whether there is a significant relationship between work-related factors and low back pain. Tested variables were sitting hours, sitting postures, hours of computer use, working hours, and work absenteeism. Sitting hours p.156, sitting postures p=.094, computer use p=.230, showing no significant relationship with low back pain. While working hours, the p=.049, and work

absenteeism p=.000 indicated that there was a significant relationship between work-related factors and low back pain p-value was less than .05.

Spearman rho test was conducted to assess if there was any association between the pain intensity (discomfort level) caused by low back pain among the participants. Age showed a significant relationship to discomfort level p= 0.030. Though sitting duration did not indicate any relationship to the discomfort level caused by low back pain, p= 0.197, sitting posture indicated a significant relationship to discomfort level p=0.014. The degree of disability due to low back pain indicated a significant relationship across age groups p=0.014 and also showed to have led to work absenteeism among bank employees at a significant p=0.004.

Kruskal-Wallis H-test was conducted to establish whether there was a significant difference among factors that may contribute to low back pain the results indicated that there was a significant difference between low back pain and; working hours p= 0.050 and discomfort level p=0.000.

5.3. Recommendation

5.3.1. Recommendation from the Study

The occurrence of low back pain among bank employees in Nairobi City County has been reported and the findings showed that the prevalence is quite high.

Based on the findings of the study, the researcher makes the following recommendations for policy and practice in the area of mitigating low back pain among bank employees.

1. There is a need to guide employees to alternate sitting with standing during work as the study reported that bank employees who spent most of their time sitting had a high prevalence of low back pain.
2. This study will advise the banking industry to revise work ergonomics. The reason is that working hours reported a significant relationship to low back pain among bank employees in Nairobi City County.
3. The study reported a significant relation between low back pain prevalence and severity of pain. Therefore, the banking industry needs to come up with ways of mitigating the high prevalence that was reported in this study such as regular breaks that will help bank employees be able to change the sitting routine.
4. There is a need for the bank employees to have proper training programs as well as guided physical activities so that they may be able to manage as well as prevent the occurrence of low back pain.

5.3.2. Recommendation for Further Research

Based on the findings of this study, the following recommendations were made:

- Based on the findings, a study to investigate the types of physical activity that bank employees engage in should be done to be able to rule out why bank employees who took part in physical activity experienced low back pain proper exercise techniques need to be highly factored in.
- This study focused on low back pain among bank employees in Nairobi City County, a study to investigate further the number of participants who experience chronic low back pain compared to acute low back pain is highly recommended.
- Majority of bank employees who experienced low back pain did not seek medical attention therefore, a study to investigate the reason for that should be

done so that easier ways of managing low back pain may be put in place. This will help to reduce the days of absenteeism reported by the participants.

- A longitudinal study on low back pain among bank employees and physical activity levels should be done to find out if it can have an impact on managing low back pain.
- This study used the WHO guidelines to see if the participants met the physical activity levels on a recall basis, more advanced gadgets such as the ACTi graphs are highly recommended to measure activity levels and their relation to low back pain among bank employees.

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APPENDICES

Appendix I: Adapted Nordic and Oswestry Low Back Pain Questionnaire

INFLUENCE OF SEDENTARY LIFESTYLE, WORK-RELATED AND SOCIO-DEMOGRAPHIC CHARACTERISTICS ON LOW BACK PAIN AMONG BANK EMPLOYEES IN NAIROBI CITY COUNTY, KENYA.

Introduction Letter

Hello, my name is Mary Muthini Mutua Masters student from Kenyatta University taking part in a research on **influence of work related, sedentary lifestyle and socio-demographic characteristics on low back pain**. The study involves bank employees in Nairobi City County. This questionnaire consists of socio demographic information, work related information, sedentary information and low back pain information where you are supposed to fill all questions. The questionnaire will take approximately six minutes.

All the information you shall provide will be kept strictly and confidential and will only be accessed by the research team. Participation in the study is voluntary.

Lead researcher: Mary Muthini Mutua (BSC Exercise and sport science)

Address : P.O Box 43843-00100, Nairobi

Kenyatta University,

Department of physical Education, Exercise and Sport Science.

Cell phone: 0713 385 858

Respondent code. .....

A.) **SOCIO-DEMOGRAPHIC INFORMATION**

(tick where applicable)

1. Age: 20-29 [ ] 30-39[ ] 40-49[ ] above 50 years [ ]
2. Gender: 1. Male [ ] 2. Female [ ]
3. Job category Head office [ ] back office [ ]Teller[ ] secretary [ ] customer service[ ] Manager[ ]

A. OCCUPATIONAL /WORK RELATED INFORMATION

4. What is your main mode of transport to and from work?
   Car [ ] buses [ ] walking [ ] cycling [ ] Motorbike [ ]
5. How many hours on average do you work in a day?

   Less than 5 hours [ ] 5 to10 hours [ ] more than 10 hours [ ]

6. Please indicate hours spend in a day while:

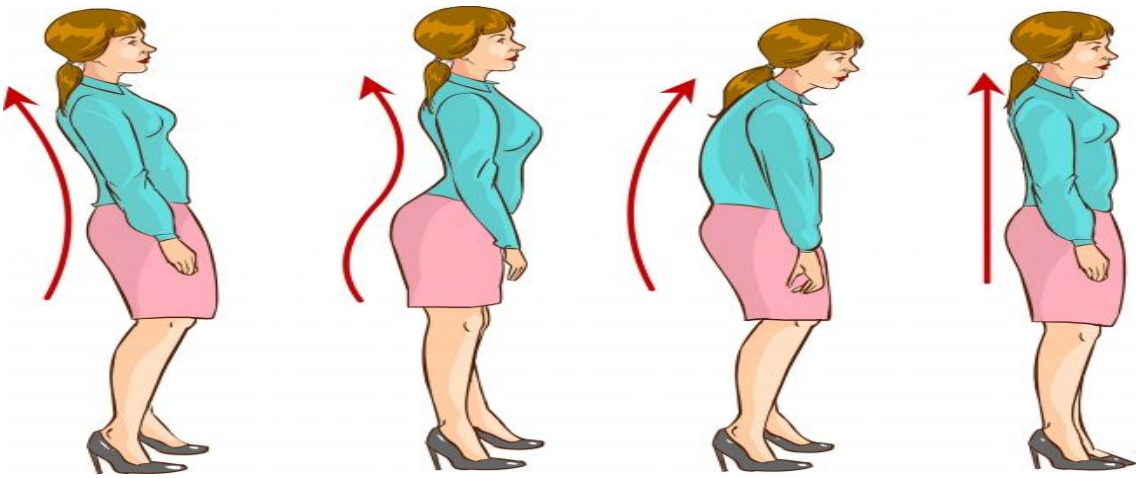
i) Sitting hours

Less than 5 hours [ ] 5 to10 hours [ ] more than 10 hours [ ]

a) Please **circle one** posture that resembles or is close to your sitting posture.

Standing hours…….. Less than 5 hours [ ] 5 to10 hours [ ] more than 10 hours [ ]

a) Please circle one posture that resembles or is closest to your standing posture



7. How many hours on average do you spend using computer in a day?..... Less than 5 hours [ ] 5 to10 hours [ ] more than 10 hours [ ]

C) SEDENTARY BEHAVIOUR

8. Do you engage yourself in any physical activity **[ ] Yes [ ] No**
   If yes, for how many hours per week?.....

[ ] 75-150 min moderate intensity aerobic physical activity
[ ] 150-300 min moderate intensity aerobic physical activity
[ ] 75-150 min vigorous intensity aerobic physical activity

9. Which types of physical activity do you engage in? walking/Running [ ] Gym exercises [ ] Cycling [ ] Other[ ]
10. What do you do during your Leisure time? sports activities[ ] watching TV [ ] playing computer games[ ]

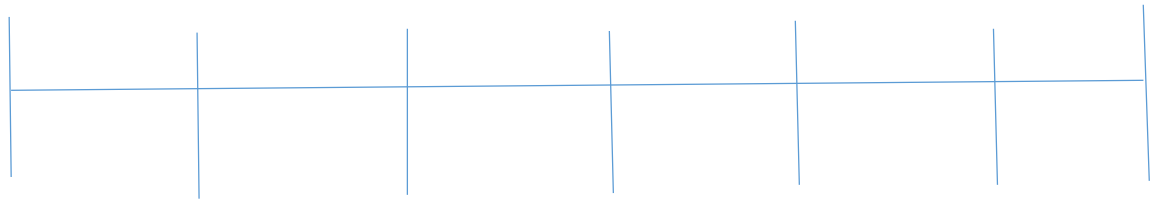
D) LOW BACK PAIN

11. Have you ever experienced or have been diagnosed with Low Back Pain? [ ]Yes [ ]No
    If **YES**, for how long?
    Less than 3 months [ ] 3-6 months [ ] 6-12 Months [ ] 12 Months and above [ ]

12. Are you under treatment? Yes [ ] No[ ]
    If **Yes** for how long have you been undergoing treatment?
    Less than 3 months [ ] 3-6 months [ ] 6-12 Months [ ] 12 Months and above [ ]

PAIN INTESITY SCALE (DISCOMFORT LEVEL)

13. Please **circle** a number which fits your discomfort level due to low back pain.



0 1 3 5 6 8

10

14. Have you ever absented yourself from work due to low back pain? [ ] Yes [ ]No

SECTION 2

Pain Intensity		***Tick one in each section***
1	I can tolerate the pain I have without using pain killers	
2	The pain is bad but I manage without taking pain killers	
3	Pain killers give complete relief from pain	
4	Pain killers give moderate relief from pain	
5	Pain killers give very little relief from pain	
6	Pain killers have no effect on the pain and I do not use them	
Walking		
7	Pain does not prevent me walking any distance	
8	Pain prevents me from walking more than 1 mile	
9	Pain prevents me from walking more than ½ mile	
10	Pain prevents me from walking more than ¼ mile	
11	I can only walk using a stick or crutches	

12	I am in bed most of the time and have to crawl to the toilet	
Sitting		
13	I can sit on my chair as long as I like	
14	I can only sit on my favorite chair as long as I like	
15	Pain prevents me from sitting more than 1 hour	
16	Pain prevents me from sitting more than ½ hour	
17	Pain prevents me from sitting more than 10 minutes	
18	Pain prevents me from sitting at all	
Standing		
19	I can stand as long as I want without extra pain	
20	I can stand as long as I want but it gives me extra pain	
21	Pain prevents me from standing for more than 1 hour	
22	Pain prevents me from standing for more than ½ hour	
23	Pain prevents me from standing for more than 10 minutes	
24	Pain prevents me from standing at all	

SCORING THE OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE

For each section the total possible score is 5; if the first statement is marked, the section score = 0; if the last, the score = 5; etc.

If all sections are completed the score is calculated as follows: if one section is missed or not applicable the score is calculated:

Example: 16 (total scored)/ 50 (total possible score) x 100 = 32%

Example: 16 (total scored)/ 45(total possible score) x 100 = 35.5%

Grouping of the scores are as follows:

0-20%: minimal disability

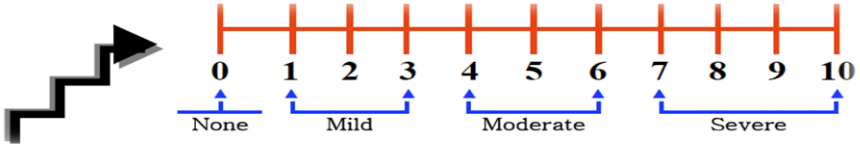
20-40%: moderate disability

40-60%: severe disability

60-80%: crippled

80-100%: bed-bound or exaggerating

Pain Intensity Interpretation Scale



Appendix II: Informed Consent Form

Dear Banker,

My name is Mary Muthini Mutua. I am a Post Graduate student currently taking a M.Sc. Degree, in Physical Education at Kenyatta University, School of Public Health and Applied Human Sciences. I am required to carry out a research study as part of the requirements for me to fulfil in order to graduate. The topic of my research is **"INFLUENCE OF SEDENTARY LIFESTYLE, WORK-RELATED AND SOCIO-DEMOGRAPHIC CHARACTERISTICS ON LOW BACK PAIN AMONG BANK EMPLOYEES IN NAIROBI COUNTY, KENYA."** You have been chosen as part of 320 bankers drawn from the five banks in Nairobi County. The results of the study will provide a new information that will help in coming up with interventions that will prevent occurrence and severe damage to the bankers as a result of Low Back Pain.

Study Procedures

In this study, trained research assistants and I will provide a self-administered questionnaire to you for you to answer. Your Participation in this study is voluntary and you will be required to fill the questionnaire by ticking the most appropriate answer that represents you. You may ask questions related to the study at any time. You may also stop being in the study at any time without any consequences.

Discomforts and Risks

There will be no risks involved during research process since the questionnaires will be self-administered and only those who request to be assisted will be helped out by the research assistants.

Benefits

If you participate in this study, the information got will help us know the influence of the various factors such as socio demographic characteristics, lifestyle traits as well as work related factors to low back pain. This information will therefore guide in formulating policies in work place which will help minimize the risk factors as well as minimize severe damage to low back pain.

Confidentiality

The data collected through this study will be held confidential and will only be used for research this study. Do **NOT** write your name anywhere on the questionnaire. The questionnaires will be kept in a locked cabinet for safe keeping and the information you will give will be kept confidential. Do not hesitate to ask any question in case there is anything unclear to you. Your responses in this study are very important and you are highly encouraged to participate.

Contact Information

If you have any questions you may contact Dr. Luka Waiganjo on 0723 812 849 or Dr. Edwin Boit on 0706 807 219 or the Kenyatta University Ethical Review Committee Secretariat on chairman.kuerc@ku.ac.ke, secretary.kuerc@ku.ac.ke, ercku2008@gmail.com

Participant's Statement

The above information regarding my participation in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand that my records will be kept private and that I can leave the study at any time. I also understand that there is no payment for participating in this study.

Code of Participant……..…

_____ _____

Signature or Thumbprint Date

Investigator's declaration

I, the undersigned, have explained to the participant in a language he/she understands the procedures to be followed in the study and the risks and benefits involved.

Name of the researcher……..

Researcher signature..... Date.....

Appendix III: Introduction Letter and Consent to The Branch Manager

Kenyatta University

Department of Physical Education, Exercise and Sport Science

P.O. Box 43844-00100

Nairobi.

The Branch Manager

Dear Sir/ Madam,

RE: **REQUEST FOR RESEARCH DATA COLLECTION**

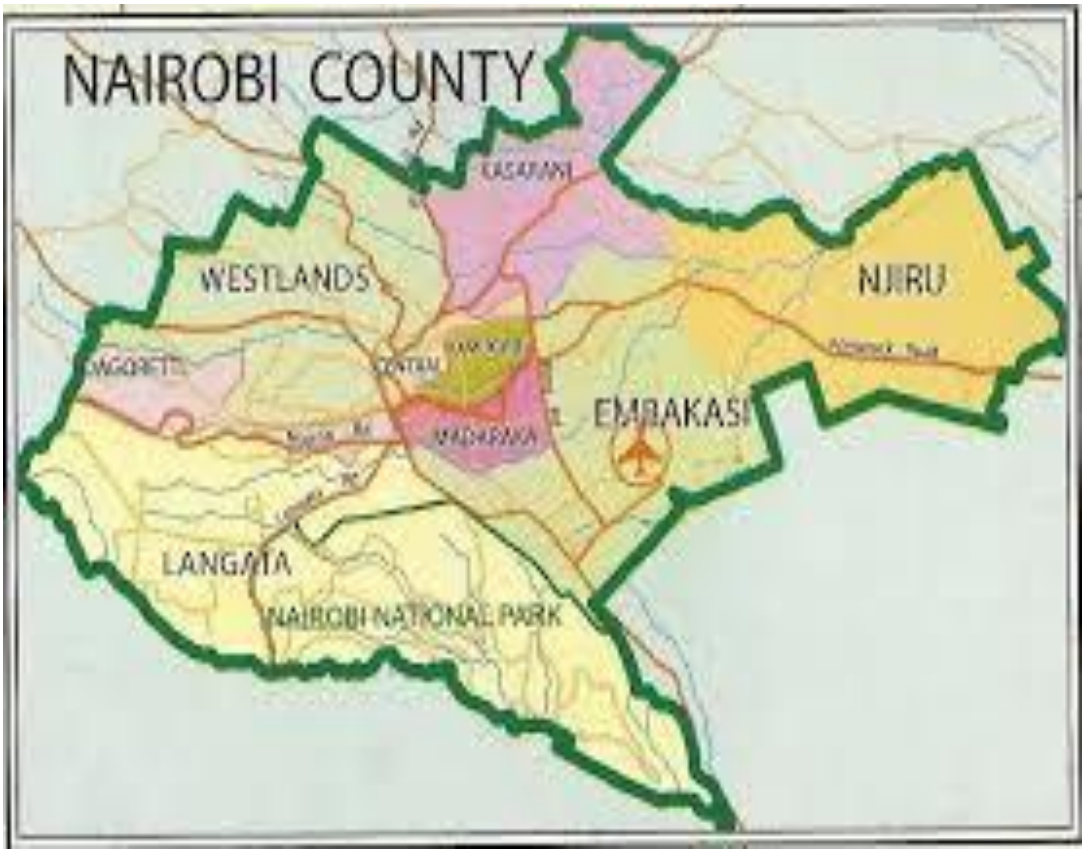
I am a postgraduate student taking Masters of Science Physical Education in the Department of Physical Education, Exercise and Sport Science. My research topic is "**INFLUENCE OF SEDENTARY LIFESTYLE, WORK-RELATED AND SOCIO-DEMOGRAPHIC CHARACTERISTICS ON LOW BACK PAIN AMONG BANK EMPLOYEES IN NAIROBI COUNTY, KENYA.**" I therefore kindly request for your permission to allow me use your staff enable me collect data through responding to the questionnaires which I will administer to them. All information that will be collected will be used for this research only and confidentiality will be highly considered.

Thanks in advance.

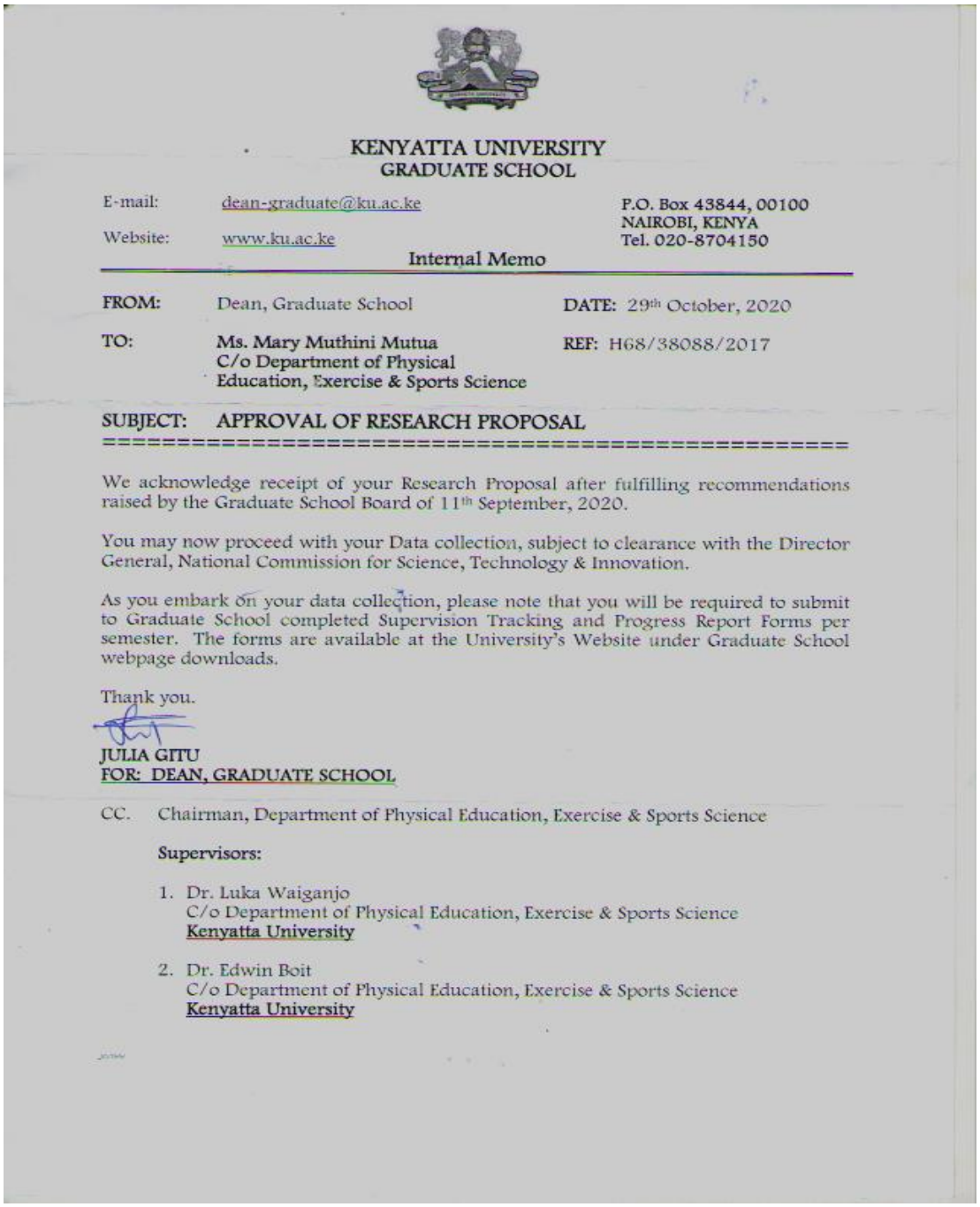
Yours faithfully,

Mary Mutua.

Appendix IV: Nairobi County Map



Appendix V: Approval of Research Proposal



KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Internal Memo

FROM: Dean, Graduate School

DATE: 29th October, 2020

TO: Ms. Mary Muthini Mutua
C/o Department of Physical
Education, Exercise & Sports Science

REF: H68/38088/2017

SUBJECT: APPROVAL OF RESEARCH PROPOSAL

We acknowledge receipt of your Research Proposal after fulfilling recommendations raised by the Graduate School Board of 11th September, 2020.

You may now proceed with your Data collection, subject to clearance with the Director General, National Commission for Science, Technology & Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking and Progress Report Forms per semester. The forms are available at the University's Website under Graduate School webpage downloads.

Thank you.

JULIA GITU
FOR: DEAN, GRADUATE SCHOOL

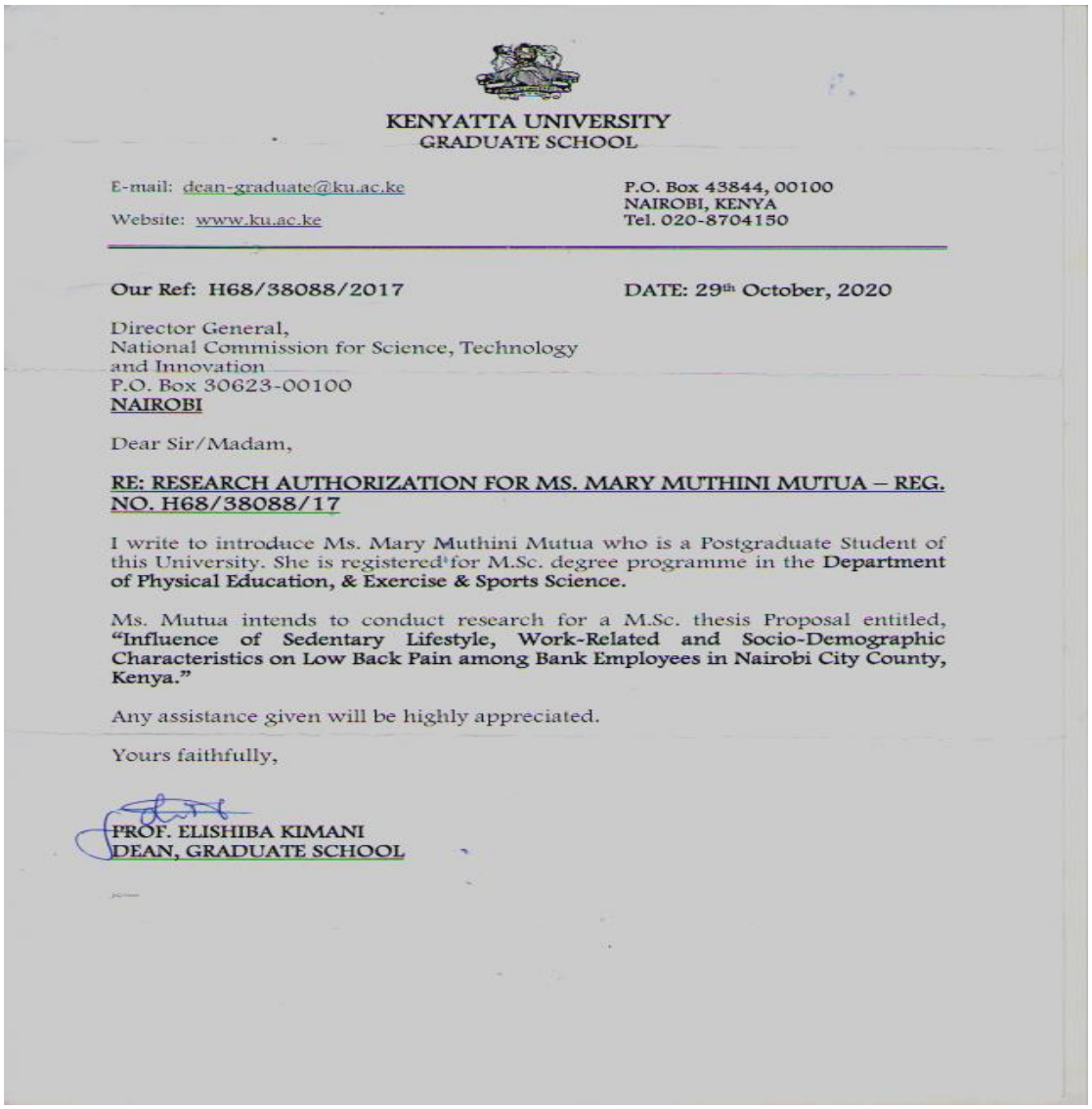
CC. Chairman, Department of Physical Education, Exercise & Sports Science

Supervisors:

1. Dr. Luka Waiganjo
   C/o Department of Physical Education, Exercise & Sports Science
   Kenyatta University

2. Dr. Edwin Boit
   C/o Department of Physical Education, Exercise & Sports Science
   Kenyatta University

Appendix VI: Research Authorization



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P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Our Ref: H68/38088/2017

DATE: 29th October, 2020

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR MS. MARY MUTHINI MUTUA – REG. NO. H68/38088/17

I write to introduce Ms. Mary Muthini Mutua who is a Postgraduate Student of this University. She is registered for M.Sc. degree programme in the **Department of Physical Education, & Exercise & Sports Science.**

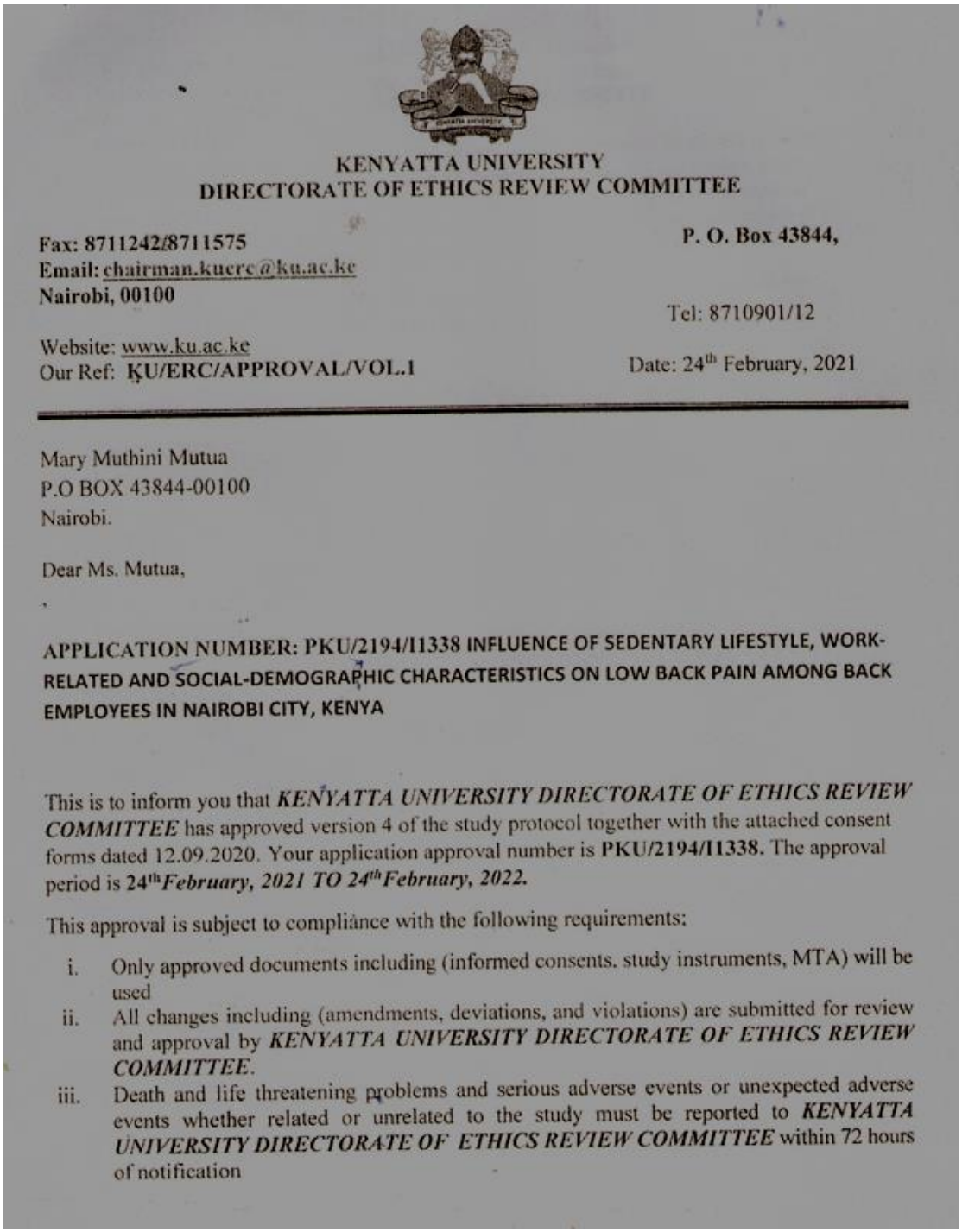
Ms. Mutua intends to conduct research for a M.Sc. thesis Proposal entitled, **"Influence of Sedentary Lifestyle, Work-Related and Socio-Demographic Characteristics on Low Back Pain among Bank Employees in Nairobi City County, Kenya."**

Any assistance given will be highly appreciated.

Yours faithfully,

PROF. ELISHIBA KIMANI
DEAN, GRADUATE SCHOOL

Appendix VII: Kenyatta University Ethics Review Approval



KENYATTA UNIVERSITY
DIRECTORATE OF ETHICS REVIEW COMMITTEE

Fax: 8711242/8711575
Email: chairman.kuerc@ku.ac.ke
Nairobi, 00100

P. O. Box 43844,

Tel: 8710901/12

Website: www.ku.ac.ke
Our Ref: KU/ERC/APPROVAL/VOL.1

Date: 24th February, 2021

Mary Muthini Mutua
P.O BOX 43844-00100
Nairobi.

Dear Ms. Mutua,

APPLICATION NUMBER: PKU/2194/I1338 INFLUENCE OF SEDENTARY LIFESTYLE, WORK-RELATED AND SOCIAL-DEMOGRAPHIC CHARACTERISTICS ON LOW BACK PAIN AMONG BACK EMPLOYEES IN NAIROBI CITY, KENYA

This is to inform you that ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE*** has approved version 4 of the study protocol together with the attached consent forms dated 12.09.2020. Your application approval number is **PKU/2194/I1338.** The approval period is **24th *February, 2021 TO 24th February, 2022.***

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents. study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE.***
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE*** within 72 hours of notification

iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE*** within 72 hours

v. Clearance for export of biological specimens must be obtained from relevant institutions.

vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.

vii. Submission of an executive summary report within 90 days upon completion of the study to ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE***.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely

KENYATTA UNIVERSITY
OFFICE OF THE CHAIRMAN
24 FEB 2021
ETHICS REVIEW COMMITTEE
P.O. BOX 43844 - 00100 NAIROBI

Prof. Judith Kimiywe

DIRECTOR- KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE.

Appendix VIII: Research License

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 790885

Date of Issue: 02/March/2021

RESEARCH LICENSE

This is to Certify that Ms. Mary Muthini Matus of Kenyatta University, has been licensed to conduct research in Nairobi on the topic: INFLUENCE OF SEDENTARY LIFESTYLE, WORK-RELATED AND SOCIO-DEMOGRAPHIC CHARACTERISTICS ON LOW BACK PAIN AMONG BANK EMPLOYEES IN NAIROBI COUNTY, KENYA. for the period ending: 02/March/2022.

License No:NACOSTI/P/21/9217

790885

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY &
INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.