SOCIO-DEMOGRAHIC FACTORS AND LEVELS OF PAIN AND DISABILITY IN PATIENTS WITH SOMATIC AND NEUROGENIC LOW BACK PAIN AT MBAGATHI SUB-COUNTY HOSPITAL IN NAIROBI CITY COUNTY, KENYA

JOSHUA NYAMWEYA OGENDI

MASTER OF SCIENCE

(Epidemiology)

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Socio-Demographic Factors and Levels of Pain and Disability in Patients with Somatic and Neurogenic Low Back Pain at Mbagathi Sub-County Hospital in Nairobi City County, Kenya

Joshua Nyamweya Ogendi

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

Signature……..Date……..

Joshua Nyamweya Ogendi

This thesis has been submitted for examination with our approval as University Supervisors.

Signature……..Date……..

Prof. Peter Mwaniki, PhD (Deceased)

JKUAT, Kenya

Signature……..Date……..

Dr. Peter Wanzala, PhD

KEMRI, Kenya

Signature……..Date……..

Dr. Daniel Nyamongo, PhD

JKUAT, Kenya

DEDICATION

I dedicate this work to my beloved wife, Lucy Nyambunde for always being there for me, our children for the love and support, my mum, Mary Kemunto for her prayers and inspiration, my late dad, Simeon Ogendi for material and moral support to ensure I become the best that I can be.

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ABBREVIATIONS AND ACRONYMNS

CT	Computerized Tomography
COHES	College of Health Sciences
DALYs	Disability Adjusted Life Years
ERC	Ethics Review Committee
IQR	Inter Quartile Range
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KEMRI	Kenya Medical Research Institute
KNH-UON	Kenyatta National Hospital-University of Nairobi
LBP	Low Back Pain
MRI	Magnetic Resonance Imaging
MSDS	Musculoskeletal Disorders
MOMS	Ministry of Medical Services
NCHS	National Centre for Health Statistics
NPS	Neuropathic Pain Scale
ODI	Oswestry Disability Index
SD	Standard Deviation

PTs	Physiotherapists
S-LANSS	Self-Complete Leeds Assessment of Neuropathic Symptoms and Signs
UK	United Kingdom
VAS	Visual Analogue Scale
WHO	World Health Organization

ABSTRACT

Low Back Pain (LBP) is a problem of public health importance in developed countries as well as developing ones including Kenya. It is sub-categorized into neurogenic and somatic pain. Low back pain causes suffering, discomfort, and disability whose levels remain unknown. The main objective of this study was to determine the levels of pain and disability and their association with selected socio-demographic characteristics in patients with neurogenic and somatic LBP at Mbagathi Sub-county Hospital. This was a cross-sectional study design where 176 patients of 18 years and above were sampled using systematic random sampling. A Semi-structured questionnaire, adapted Oswestry Disability Index (ODI) and Self- complete Leeds Assessment of Neuropathic Symptoms and Signs (S-LANSS) were administered by research assistants to study subjects. The questionnaire captured information on selected socio-demographic characteristics and adapted S-LANSS information on pain intensity and type/category while the adapted ODI was used to measure levels of disability. Ethical considerations in regard to approval of the study, privacy of participants, confidentiality of information and voluntary participation by participants was observed. Majority (72.7%) suffered from somatic LBP compared to 27.3% that had neurogenic LBP. Out of 176 participants, females were more (63.1%) than males (36.9%). The mean age was 41.1(12.6) SD, median age in years was 40 and IQR 32-48. On Visual Analogue Scale (VAS), 55.7 %(n=98) reported moderate pain and severe pain was 44.3 % (n=78). On ODI, 60.8% had minimal disability, 33.5% moderate disability and 5.7% had severe disability. Chi-square test of association showed no relationship between levels of pain and disability and selected socio-demographics ($P>0.05$). Multivariate logistic regression showed significant association between severe pain and moderate and severe disability ($P<0.001$, OR=7.2, 95% CI, 2.6-20.2). Neurogenic pain was also significantly associated with severe and moderate disability ($P=0.006$, OR=14.1, 95% CI, 2.2-92.5). From the study it was found that patients with neurogenic LBP had a higher risk of severe and moderate disability compared to somatic LBP. Therefore special attention is required in LBP diagnosis to identify this sub-category to be able to effectively address the severe and moderate disability.

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Low back pain is defined as pain, tension in a muscle, or localized stiffness below the costal margin and above the inferior gluteal folds, with or without sciatica, and it is described as chronic when it lasts for more than 12 weeks (Wáng, Wáng, & Káplár, 2016; Chou, 2011). Low back pain can be acute lasting less than 6 weeks, sub-acute (6-12 weeks), or chronic (more than 12 weeks) (Chen, Shaparin, & Gritsenko, 2017). The actual cause of LBP remains unclear; however, several risk factors are associated with the onset of LBP. These include mechanical (posterolateral prolapsed disc, osteoarthritis (OA) facet and joints, spondylosis and spinal stenosis), congenital conditions (severe scoliosis and kyphosis), non-mechanical (tumors), infection (vertebral osteomyelits and HIV/AIDS)**,** inflammatory arthritis (rheumatoid arthritis and ankylosing spondylitis) and visceral disease (Kalichman, Kim, Li, Guermazi, & Hunter, 2010; Suri, Hunter, Rainville, Guermazi, & Katz, 2013). Low back pain is categorized into two types, namely somatic or nociceptive and neurogenic pain. Somatic is defined as pain arising from actual or threatening damage to non-neural tissue and is due to the activation of nociceptors (Group, 2011). It involves tendons, muscles, ligaments and joints (Kreiner et al., 2014; Malanga & Cruz Colon, 2010; Schilder et al., 2014). It is also defined as pain attributable to the activation of the peripheral receptive terminals of primary afferent neurons in response to noxious chemical, mechanical, or thermal stimuli. It's dull, difficult to locate and show no neurological signs of root compression (Smart, Blake, Staines, Thacker & Doody, 2012). Neurogenic pain is defined as pain caused by a primary lesion or disease of the somatosensory nervous system. It is characterized by paraesthesia, muscle weakness and loss of reflexes (Group, 2011). Low back pain is one of the most common health problems affecting people and every person will at least once in his or her lifetime suffer from LBP (Zhu et al., 2005; Chen et al., 2017). Low back pain affects the economic, social and public health sectors globally and therefore

increasing the cost incurred in medical expenses each year (Louw, Morris, & Grimmer-Somers, 2007). Low back pain is associated with substantial financial costs, loss of quality of life and it is the main source of temporary disability affecting population aged below 45 years (Roupa & Vassilopoulos, 2008). Worldwide, LBP is the most common reason for functional disability and it affects 90% of universal population (Brennan, Shafat, Donncha, & Vekins, 2007). Low back pain affects individuals as well as nations through medical expenditure and reduced productivity of workers (Crow & Willis, 2009).

In the United Kingdom (UK) ,the prevalence of chronic pain from 7 studies, ranged from 35.0% to 51.3%, moderate-severely disabling chronic pain based on 4 studies, ranged from 10.4% to 14.3% and based on 2 studies, chronic neuropathic pain as 8.2% to 8.9% (Fayaz, Croft, Langford, Donaldson, & Jones, 2016). In South Africa 80% of the workforce suffers from severe discomfort and disability due to LBP at some point in their working life (Cilliers & Maart, 2013). Kenya faces the same dilemma of LBP as other countries where an estimated 60% of all employees suffer from LBP at some point in their employment and the most prevalent musculoskeletal condition in rural communities (Langat, Bii, Opondo, & Mbakaya, 2015). A study done in rural Nigeria on peasant farmers (n=310) indicated that LBP is prevalent health condition (Birabi, Dienye, & Ndukwu, 2012). In Uganda, a study showed that the prevalence of LBP is 20 % (Galukande, Muwazi, & Mugisa, 2005), and that it is a major cause of disability and absenteeism at work (Galukande, Muwazi, & Mugisa, 2006). In Kenya, 60% of tea pickers suffer from LBP and it is highly prevalent among terminal tractor drivers in the port of Mombasa (Hassan & Mburu, 2013). Previous study on self-reported pain and outcomes revealed that there exists an association between LBP and disability and therefore it is considered a public health problem of clinical, social and economic importance (Bishop, Horn, George, & Robinson, 2011).

1.2 Statement of the Problem

Low back pain is a condition afflicting many Kenyans. Majority of patients attending physiotherapy treatment at Mbagathi Sub-County Hospital complain of low back pain. These patients experience certain LBP related challenges. It affects people of different social classes. People visiting the hospital for treatment leave their places of work un-attended and spend long hours waiting because of the big volumes of patients seeking physiotherapy care. There is loss of productive time while waiting to be served as well as the issue of the high cost of physiotherapy services and medications. Overall, productivity is reduced through the man hours lost by being away from work. These patients experience participation restrictions and limitations in carrying out certain activities of daily living as a result of pain. The extent to which these patients are afflicted is unknown and varies among patients. Lack of accurate measurement of pain and disability levels has consistently resulted in poor correlations between pain and disability. Patients attending physiotherapy for LBP present with pain and disability whose levels are not known further complicating how it is managed. The purpose of this research study was to determine the relationship between socio-demographic factors and levels of pain and disability in patients with somatic and neurogenic LBP at Mbagathi Sub-County Hospital in Nairobi City County.

1.3 Justification

Low back pain is considered to be a leading cause of disability, hence a public health concern. It affects people in different cultures and interferes with their quality of life and work. It is the most common reason for seeking medical attention. Patients with LBP comprise the largest cohort of patients seeking out-patient physiotherapy care at Mbagathi Sub-County Hospital. The findings from the study may have the potential to improve the understanding of LBP management, contribute to the effort to improve health care and the information provided on disability and pain may assist in the review of treatment programs and approaches. The results of this study may therefore be useful in policy formulation, designing of programs, diagnosis and treatment of patients. The

information gathered in this study may further provide physiotherapists and other clinicians with valuable knowledge on LBP management.

1.4 Research Questions

a). What is the proportion of patients with somatic and neurogenic low back pain at Mbagathi Sub-county Hospital in Nairobi City County?

b).What is the level of pain in patients with Neurogenic and Somatic low back pain at Mbagathi Sub-county Hospital in Nairobi City County?

c).What is the level of disability in patients with Neurogenic and Somatic low back pain at Mbagathi Sub-county Hospital in Nairobi City County?

d).What is the relationship between levels of pain and disability in patients with somatic and neurogenic low back pain at Mbagathi Sub-county Hospital in Nairobi City County?

e). What is the relationship between selected socio-demographic factors and disability in patients with neurogenic and somatic low back pain at Mbagathi Sub-county Hospital in Nairobi City County?

1.5 Objectives

1.5.1 Broad Objective

To determine the relationship between selected socio-demographic factors and levels of pain and disability in patients with neurogenic and somatic LBP at Mbagathi Sub-county Hospital in Nairobi City County, Kenya.

1.5.2 Specific Objectives

a). To determine the proportion of patients with somatic and neurogenic LBP at Mbagathi Sub-County Hospital in Nairobi City County.

b). To determine the levels of pain in patients with Neurogenic and Somatic LBP at Mbagathi Sub-county Hospital in Nairobi City County.

c). To determine the levels of disability in patients with Neurogenic and Somatic LBP at Mbagathi Sub-county Hospital in Nairobi City County.

d). To determine the relationship between levels of pain and disability in patients with neurogenic and somatic LBP at Mbagathi Sub-county Hospital in Nairobi City County.

e). To determine the relationship between selected socio-demographic factors and disability in patients with neurogenic and somatic LBP at Mbagathi Sub-county Hospital in Nairobi City County.

CHAPTER TWO

LITERATURE REVIEW

2.1 Impact of LBP

Low back pain is one of the leading causes of physical limitation in the USA and a chief source of incapacitation, suffering and expenses and was ranked third among all other diseases in disability-adjusted life-years in 2010 (Chen et al., 2017). In Canada, Finland, and USA, LBP causes more disability as a musculoskeletal disorder than any other group of diseases (Punnett et al., 2005). World-wide, 60-90% of individuals experience low back pain during the course of their life, while 10% are unable to work and about 20% has persistent symptoms at one year (Chou, 2011). Factors such as prolonged 90° trunk flexion , manual handling, load carriage, and lifting have been associated with LBP among workers (Van Vuuren, Van Heerden, Becker, Zinzen & Meeusen, 2007). The costs, healthcare-use and disability attributed to LBP are expected to rise in both low and middle income countries in future (Hartvigsen et al., 2018). Indirect costs for chronic LBP are significantly higher than the direct costs, which include pharmaceuticals, medical visits, physiotherapy, and hospitalization (Richard. Deyo, Jarvik & Chou, 2014; Gore, Sadosky, Stacey, Tai, & Leslie, 2012). It is apparent that as the condition continues, cost increases exponentially, which can be reduced by limiting the chronic nature of LBP (Hanney, Kolber, & Beekhuizen, 2009). In the USA and Australia, LBP is one of the most common problems treated in the health care system affecting 2 – 5% of the population at any one time, 26- 27% over any 3 month period and 70 – 80% over the course of their life time (Deyo, Mirza, Turner & Martin, 2009; Walker, Muller, & Grant, 2004; Strine & Hootman, 2007).

An estimated £ 9,090 million was lost in the U.K in 1998 in LBP-related costs (Wynne-Jones, Dunn, & Main, 2008). There has been a rise in LBP costs over the past twenty years (Freburger et al., 2009). Low back pain affects work performance and social responsibilities (Manchikanti, Singh, Falco, Benyamin, & Hirsch, 2014). Chronic nature

of the condition leads to disability and participation restrictions, leading to reduced quality of life (Hanney et al., 2009 ; William et al., 2007 ; Van Vuuren et al., 2007). Due to the initial severe/high pain intensity and pain at multiple body regions the risk of disabling LBP increases (Hartvigsen et al., 2018). Low back pain is the most prevalent musculoskeletal condition and common cause of disability in developed nations; though it is assumed that it is lower in Africa but on the rise (Louw et al., 2007). Studies have shown that the economic impact of LBP exceeds the costs of rheumatoid diseases, stroke and diabetes (Hanney et al., 2009 ; Van Vuuren et al., 2007). Low back pain causes temporary disability to people aged below 45 years in America (Roupa & Vassilopoulos, 2008), and the leading cause of years lost to disability worldwide (Buchbinder et al., 2018). In Switzerland, it is the leading cause of reduced work productivity and disability (Wieser et al., 2011). Indirect costs for chronic LBP are significantly higher than the direct costs, which include pharmaceuticals, medical visits, physiotherapy, and hospitalization (Richard, Deyo, Jarvik, & Chou, 2014; Gore et al., 2012; Wieser et al., 2011). It is apparent that as the condition continues, cost increases exponentially, which can be reduced by limiting the chronic nature of LBP (Hanney et al., 2009).

2.2 Prevalence of LBP

The prevalence of LBP in the UK and Germany in general working population is 40% and 58.9% respectively (Naidoo & Coopoo, 2012; Schneider, Schmitt, Zoller, & Schiltenwolf, 2005) whereas in Africa, a one year prevalence is 72% and a life time prevalence is 74% (Louw et al., 2007). Previous studies indicate that 20-30% of patients with LBP suffer from a neuropathic component, chronic lumbar radicular pain being the most common neuropathic pain syndrome (Smith & Torrance, 2012; Freynhagen & Baron, 2009) while large epidemiological studies show that 20% to 35% of patients with back pain suffer from a neuropathic pain component (Smith & Torrance, 2012). The prevalence of chronic LBP is about 23%, and it is highly prevalent in Western societies (Balague, Mannion, Pellise, & Cedraschi, 2012; Freynhagen & Baron, 2009). Neurogenic pain presents with higher levels of pain, disability, anxiety, depression and reduced quality of life compared to somatic LBP (Beith, Kemp, Kenyon, Prout &

Chestnut, 2011; Smart et al., 2012). The prevalence of neuropathic pain varies between 19-80% (Harrisson, Stynes, Dunn, Foster & Konstantinou, 2017). In Africa, the mean point prevalence of LBP in adolescents is 12% whereas among adults is 32%. The average one year prevalence of LBP in adolescents is 33% and among adults is 50%. The average lifetime prevalence of LBP among the adolescents was 36% and among adults was 62% (Louw et al., 2007). Prevalence of LBP among the bank staff in Kigali, Rwanda is 45.8% (Kanyenyeri, Asiimwe, Mochama, Nyiligira, & Habtu, 2017). A study done in specialized hospitals in Nigeria and Ethiopia showed LBP prevalence among female nurses as 67.5% while in male nurses it was 32.5% (Sikiru & Shmaila, 2009). A study on prevalence of LBP among peasant farmers in Nigeria revealed that LBP was more prevalent in people aged between 31-40 yeas (49.04%), the non-obese (68.95%), and farmers who had done the farming for a long time (Birabi et al., 2012). The prevalence of LBP in Kenya among tea pickers is estimated to be 45.4% and 39.5% in non-tea pickers (Langat et al., 2015).

2.3 Assessment and Diagnosis

There are many options of evaluation and management of LBP; however, there is no consensus between specialties on appropriate evaluation and management. Numerous studies show unexplained and large variations in diagnostic tests and evaluation (Chou, 2011). Low back pain is attributed to a specific pain generator and therefore identifying the pain generator is key (Allegri et al., 2016). History taking and clinical examination are part of most diagnostic measures but the use of MRI should be restricted (Balague, Mannion, Pellise, & Cedraschi, 2012) The assessment and diagnostic tests include plain radiography, magnetic resonance imaging (MRI) and computerized tomography (CT) scanning (Last & Hulbert, 2010; Cline, 2008). Other assessment and diagnostic measures are plain roentgenograms, bone scanning and physiologic assessment whereby bone scanning is requested when radiographs are normal but clinical findings are suspicious of osteomylitis and nerve conduction studies to differentiate peripheral neuropathy from radiculopathy or myopathy (Cline, 2008). Other diagnostic tests include sensory, motor, tendon reflex, and neuro-dynamic tests of the lumbo-sacral spine

(Tawa, Rhoda, & Diener, 2017). Pain and disability screening tools such as S-LANSS and ODI (Bennett, Smith, Torrance, & Potter, 2005; Brodke et al., 2017).

2.4 Management Options

Unlike somatic pain, several management regimes for patients with nerve related LBP exist. These include surgery for lumbar disc herniation and spinal stenosis, 2-3 days of bed rest in supine position for patients with acute radiculopathy, physical therapy modalities (such as superficial heat, ultrasound, cold packs and manual therapy), corsets, traction, spinal mobilizations, exercises, counseling and education (Farber & Wieland, 2016; Chou et al., 2007). Patient education and reassurance, analgesic medicines, non-pharmacological therapies, and timely review (Maher, Underwood, & Buchbinder, 2017). Decrease pain by improving posture and level of activity, teach basic body mechanics, advice on selections of furniture with back, neck and arm support, instruct person on concepts of energy conservation, use creative crafts, music to improve persons self concept, leisure activities and encourage good work posture (Casazza, 2012)

2.5 Pain and Disability

Pain is considered a complex, multidimensional, individual and subjective perceptive experience that can only be quantified indirectly (Swieboda, Filip, Prystupa, & Drozd, 2013; Acapo , & Seyres , 2017). Pain intensity in nerve related LBP is severe. Low back pain is among the disabling musculoskeletal disorders that has a negative impact to an individual as well as to a nation both in the high and low income countries (Galukande et al., 2006). Low back pain was ranked as the condition with the highest number of years lived with disability (YLDs) and sixth in terms of (overall burden) disability-adjusted life years (DALYs) in the 2010 study on global burden of disease (Hoy, Brooks, Blyth, & Buchbinder, 2014 ; Murray et al., 2012). Low back pain causes more global disability than any other condition (Hoy et al., 2014). Age, female gender, educational status, levels of income, work load, work position/occupation, perceived

work stress and heavy lifting have been associated with LBP among hospital staff (Karahan, Kav, Abbasoglu, & Dogan, 2009; Andini, 2015).

Factors found in population studies to be associated with neuropathic pain include older age, female sex, manual occupation, being unable to work, living in a rural area or council-rented accommodation, and lower educational attainment (Smith & Torrance, 2012). Studies have found out that LBP is attributed to compensational days sought by workers and disability in modern industrialized societies (Yilmaz & Dedeli, 2012). Findings of a study conducted in India on severity of disability in elderly patients with LBP showed a gradual increase of pain scores in both males and females, the increment of the score being more in females (Koley, Singh, & Sandhu, 2008). Individuals at greatest risk of developing LBP includes people with physically demanding jobs, physical and mental comorbidities, smokers, and obese individuals (Hartvigsen et al., 2018). Patients with LBP with pain referral to the legs are more severely affected than those with localized LBP and patients with signs of nerve involvement are the most severely affected (Kongsted, Kent, Albert, Jensen & Manniche, 2012). A study on classification of low back-leg related pain to establish whether sub-groups differ in disability and psychological factors found out that those in peripheral nerve sensitization subgroup had severe disability compared to other subgroups and greater fear avoidance beliefs about physical activity compared with central sensitization (Walsh & Hall, 2010). A study on LBP and disability among women (n=542) has shown that seven percent of women reported a high level of disability and 16% reported high-intensity pain. It further showed that women with higher levels of disability were more likely to have a higher body mass index, not employed outside the home, drink alcohol, and have current pain (Urquhart, Shortreed, Davis, Cicuttini, & Bell, 2009). A study on patients with LBP found out that severe pain resulted in poor health related quality of life, severe / heavier disability, depression and anxiety in patients with neurogenic pain (Smart et al., 2012). Low back pain disability is estimated to increase in low and middle income countries due to scanty resources (Clark & Horton, 2018). Studies have shown that neuropathic pain is a major contributor to chronic LBP (Freynhagen & Baron, 2009). Studies have

also shown that chronic LBP can cause high pain intensity, greater/severe disability and a worse quality of life especially in female patients and in patients with high levels of chronic (Stefane, Munari, Santos, Marinovic & Hortense, 2013).

A general population survey done on epidemiology of chronic pain of predominantly neuropathic origin revealed that respondents with this chronic neuropathic pain were significantly more likely to be female, slightly older, no longer married, living in council rented accommodation, unable to work, or have no educational qualifications (Smith & Torrance, 2012). It further showed that respondents with this type of pain also reported significantly greater pain intensity, higher scores on the neuropathic pain scale (NPS), higher levels of expressed need, and longer duration of pain (Smith & Torrance, 2012). A cross-sectional survey done on the burden of neuropathic pain showed that these patients make more visits to physicians frequently and they report substantial pain, most of them reporting severe or moderate pain (McDermott, Toelle, Rowbotham, Schaefer, & Dukes, 2006). A study on severity of disability in elderly patients with LBP (n=300) in Punjab, India shows females have a higher mean pain scores as compared to their male counterparts and a gradual increase in pain score with age in both sexes, the increment being more in females (Koley et al., 2008). Disability is predicted by pain intensity, work status, sex and presence of leg pain and it is also reported that pain intensity, back disability and physical health are worse in neurogenic LBP (Bishop et al., 2011; Soer, Koke, Speijer, Vroomen, Smeets, Coppes, & Reneman, 2015).

A higher prevalence of chronic pain with neuropathic characteristics is said to be associated with middle age (50–64 years), manual professions and those living in rural areas. The pain is said to be located in the lower limbs frequently, severe in intensity and of higher duration compared to chronic pain without neuropathic features (Bouhassira, Lantéri-Minet, Attal, Laurent, & Touboul, 2008). While disability is driven measures of pain and fear avoidance beliefs (Cai, Pua, & Kian, 2007), severe pain results in poor health related quality of life, severe disability, depression and anxiety in patients with neurogenic LBP (Bair, Wu, Damush, Sutherland & Kroenke, 2008).

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study Site

The study was conducted at Mbagathi Sub-county Hospital in Nairobi City County. The study site is situated at Kenyatta Golf course location, Dagoretti district in Nairobi City County. Figure 3.1 shows the location of the study site. Nairobi City County has 17 constituencies. It borders Kibera Division. It is a well equipped Sub-County hospital in the County. It has a capacity of 200 beds. People seeking treatment at Mbagathi Sub-county Hospital come from all over Nairobi County. The hospital has a fully equipped outpatient physiotherapy clinic that attracts referral of the target population. Figure 3.1 shows a map of Kenya indicating location of the study site, Mbagathi Sub county Hospital.

Figure 3.1: Map of Kenya showing location of study site

(Source-www.mapsofworld.com)

3.2 Study Design

This was a Cross-sectional study design.

3.3. Study Variables

3.3.1 Dependent Variables

Disability (mild, moderate, severe).

3.3.2 Independent Variables

Somatic and neurogenic LBP.

3.3.3 Effect modifiers and/possible confounders

The modifying variables were age, gender, religion, marital status, employment status, residence monthly income, and education status.

3.4 Study Population

The number of new adult patients with LBP attending physiotherapy out-patient clinic at Mbagathi District Hospital was estimated to be 157 per month according to the records obtained from the physiotherapist in-charge at Mbagathi Sub-county Hospital. During the study period which lasted 3 months, an average of 471 patients with LBP attended the clinic. The participants were primarily recruited from Mbagathi Sub-county Hospital. However, participation was open to non-Mbagathi patients referred for physiotherapy at the clinic provided they met the inclusion criteria. This included patients that had not seen a doctor but were LBP sufferers seeking physiotherapy treatment at Mbagathi Sub-county Hospital. The participants were diagnosed as having LBP, and therefore presented to the department with or without a referral sheet to seek for physiotherapy treatment.

A flow chart on how subjects were recruited from the study population is as represented in figure 3.2.

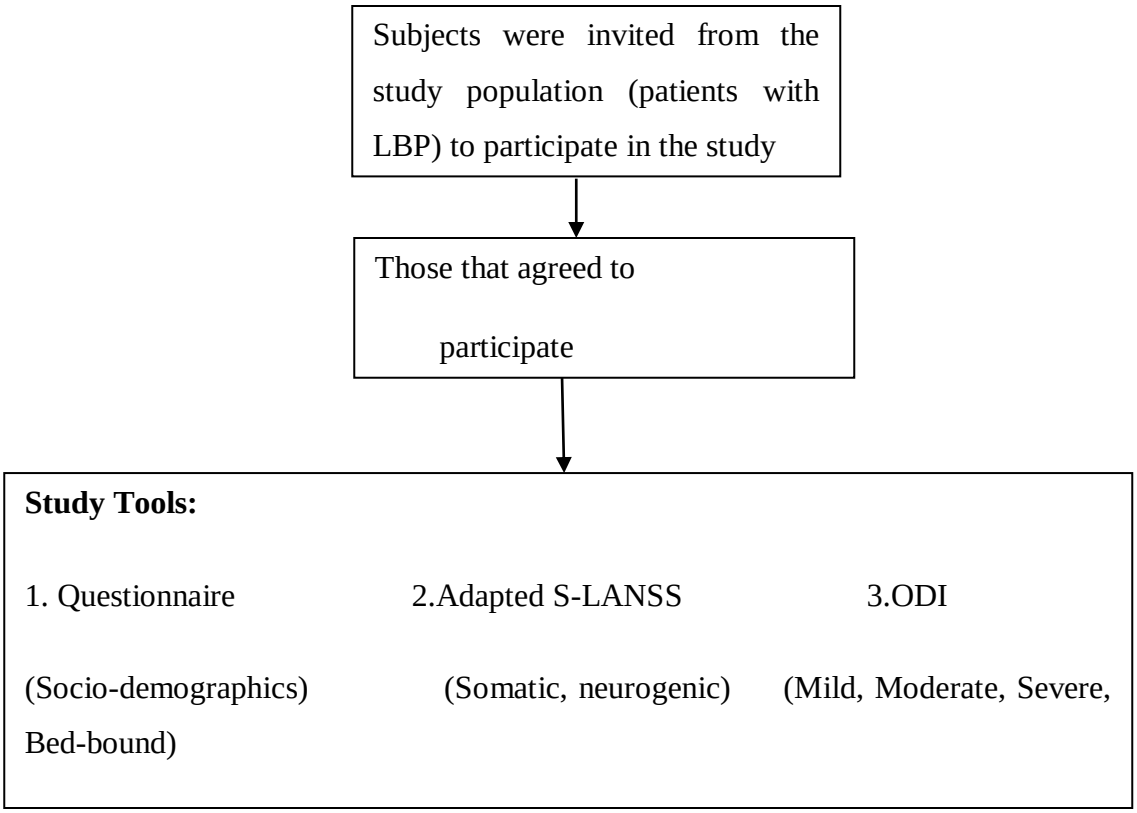

Figure 3.2: Subject recruitment flow

3.4.1 Inclusion Criteria

New patients with LBP, repeat visits and those that gave consent to participate were included. Those that were referred with a diagnosis of LBP as well as those that had no referral sheet but were suffering from LBP were enrolled. Those that were above 18 years were also recruited.

3.4.2 Exclusion criteria

Those patients who did not give consent to participate in the study were left out. This group also excluded patients with cancer, repeat visits, pregnancy as well as those individuals that were under 18 years of age.

3.5. Sampling Procedures

The physiotherapy clinic at Mbagathi Sub-County Hospital runs for 5 days in a week from 8am to 5pm.An average of 157 new patients suffering from LBP was expected to be served per month and an average of 8 patients per day. The study subjects were recruited using systematic random sampling with a sampling interval of 2.6(471/178). The sampling was done until 178 subjects were recruited. The choice of the first patient was done randomly so that every 3rd subject was selected.

3.6 Sample Size Determination

On average, the number of new patients with LBP attending physiotherapy out-patient at Mbagathi Sub-County Hospital was 157 patients per month. This was as per the statistics obtained from the office of the in-charge physiotherapy clinic of May 2014 to April 2015. Therefore the monthly study population was estimated to be 157 LBP patients.

The sample size was calculated using the formula for cross-sectional studies (Torgerson & Miles, 2007),

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

Where;

n – Expected sample size

Z – Standard deviation units for the desired level at 95% CI (Z value = 1.96

P – Estimated prevalence (proportion of the population with the characteristic under investigation) of neuropathic LBP = 20-35% (Freynhagen & Baron, 2009)

Q – 1-P

d – The minimum expected error (P value = 0.05)

$$n = \frac{(1.96)^2(0.20)\,(1-0.20)}{(0.05)^2}$$

n=245.8624

Since n were less than 10,000, the sample size was adjusted for finite population (nf) using the formula:

nf= n/(1+n/N),where N is the study population size.

nf = 245.86/1+ (245.86/471)

nf =161.538

The sample size was adjusted for spoilt / missing data questionnaire by 10%.

110% of 161.538=177.68

The adjusted sample size was **178** study subjects.

3.8 Data Collection

The main tools for collecting data were a questionnaire (Appendix II), the adapted S-LANSS (Appendix III) and ODI (Appendix IV). For the purpose of this study, an adapted Kenyan version of the S-LANSS (appendix III) which is a local validated version of the original S-LANSS was used.

The original S-LANSS had been used in other diagnostic studies in Turkey and Brazil (Koc & Erdemoglu, 2010; Schestatsky et al., 2011). Quantitative data was collected using the questionnaires and standard tools (appendix II, III and IV). The S-LANSS was used to sub-categorize patients with pain of predominantly neurogenic origin (with a score of ≥12) and somatic pain (with a score of ≤11). After ascertaining the diagnosis (LBP), the study subjects were informed of the purpose of the study, its objectives, risks and benefits. Voluntary informed consent in writing was sought from those who had met the inclusion criteria and were willing to participate in this study. It was estimated that it would take each participant 15-20 minutes to complete the interview. The subjects were interviewed in designated private cubicles where treatment normally took place. Their privacy was also maintained by ensuring each was interviewed individually and assuring them that the information was not going to be revealed to anybody other the research team. The data collection tools were self-administered (appendices II, III and IV). However due to the fact that some participants could not read and/or write, the tools were administered by trained research assistants whose qualifications were a Bachelor's degree in physiotherapy. Any doubts that may have arisen while filling out the tools by subjects that were able to read and write was clarified by the research assistants as and when they occurred. The research assistants also ensured that the tools were filled out properly. The questionnaire consisted of 7 socio-demographic questions; the S-LANSS had a diagram to indicate the area of pain, visual analogue scale (VAS), five items for description of system and two items for clinical examination. Clinical examination was done as a self-assessment whereas the VAS on the S-LANSS assessed the severity of pain (Bennett et al., 2005). The ODI had 10 sections on the degree to which back or leg trouble had affected the ability to manage activities of everyday life.

3.9 Research Instruments

3.9.1 Leeds Assessment of Neuropathic Symptoms and Signs

Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) was the first tool developed to discriminate neurogenic with somatic pain. The original LANSS was developed in a sample of 60 patients with chronic somatic or neuropathic pain and validated in a further sample of 40 patients. The LANSS has subsequently been tested and validated in several settings (Spanos, Lachanas, Chan, Bargiota, & Giannoukas, 2015; Schestatsky et al., 2011; Bennett et al., 2005) showing an accuracy of 82-91% sensitivity and specificity of 80-94% when compared to clinical diagnosis. The S-LANSS has also been validated in the community setting as a self-report tool (Weingarten et al., 2007). It showed an accuracy of 85% sensitivity and 80% specificity when compared to expert clinical assessment (Bennett et al., 2005).

3.9.2 Oswestry Disability Questionnaire

Oswestry LBP disability questionnaire was used to assess function. It is a condition-specific measure of low back pain disability that focused on pain intensity and functional limitations. The disability index was calculated by dividing the total score (each score work 1-6) by the number of sections answered and multiplying by 100. Since its publication in 1980, It is the most used and recommended (Alcántara-Bumbiedro, Flórez-García, Echávarri-Pérez, & García-Pérez, 2006). The ODI consists of 10 items assessing the level of pain and its interference with several physical activities (activities of daily living), sleeping, lifting, personal care, walking, standing, travelling, social life, and sex life for LBP patients (Davidson, 2008). This tool has undergone various modifications in different countries where it has been used. Several different versions have been developed such as ODI version 2, modified by the American Academy of Orthopedic Surgeons (AAOS), and the ODI Chiropractic Version (Smeets, Köke, Lin, Ferreira, & Demoulin, 2011).

3.9.3 Reliability and Validity of Research Tools

Piloting of the research tools was done at Ngong Sub-county hospital. The validity and reliability of S-LANSS in a Kenyan sample of patients showed perfect internal consistency of 91%, and was therefore ideal for research use in the Kenyan clinical setting (Tawa et al., 2017). A modified ODI version 2 was used in this study, consisting of 10 sections of pain intensity, lifting, personal care, walking, sitting, employment life/Home making, standing, social life, sleeping, and travelling. Each item was measured on a 6 point ordinal scale that ranges from the best scenario to the worst possible scenario. Since the section on sex life has an option of "if applicable", an alternative version replaced it with Employment life/Home-making/Housework (Smeets et al., 2011). Oswestry Disability Index is easy to administer, score, valid and reliable since it has high internal consistency and adequate content validity since it covers activities of daily living (ADLs) experienced by LBP patients (Vianin, 2008). It is a valid and reliable tool with a Cronbach's α of 0.71-0.87 and Correlation Coefficient, r of 0.83 (Viani, 2008; Mannion, Junge, Fairbank, Dvorak, & Grob, 2006). At the pilot stage 10 questionnaires on selected socio-demographic characteristics, S-LANSS and ODI were distributed to ten LBP patients who were attending physiotherapy clinic at Ngong Sub-county Hospital to test their adequacy by identifying ambiguities and questions that might have been unclear / difficult. Minimal adjustments were done on the questionnaire while no changes were done on the S-LANSS and ODI. The same patients were informed that they were to complete the same questionnaires after seven days which was done. The repeat was purely for re-testing purpose. The two sets of data were coded and entered into SPSS version 21. Scale test for reliability analysis was carried out to determine the correlation of the two sets of data. The Cronbach's Alpha coefficient of 0.708 was obtained which indicated that the tool was (acceptable) reliable. The same questionnaires were translated into the Kiswahili language by a lecturer of linguistics and the test-retest was repeated with patients at Ngong sub-county hospital. The same process of analysis led to a Chronbach's Alpha coefficient of 0.576, reliability being poor compared to the English version. Test re-test was not done. Questionnaires in

English were used. Those patients who could not understand English language were assisted by the principal investigator or the assistant researchers.

3.10 Conceptual Frame-work

This consisted of independent (somatic and neurogenic LBP) and dependent (disability levels) variables as well as the possible confounders as illustrated in **figure 3.3**.

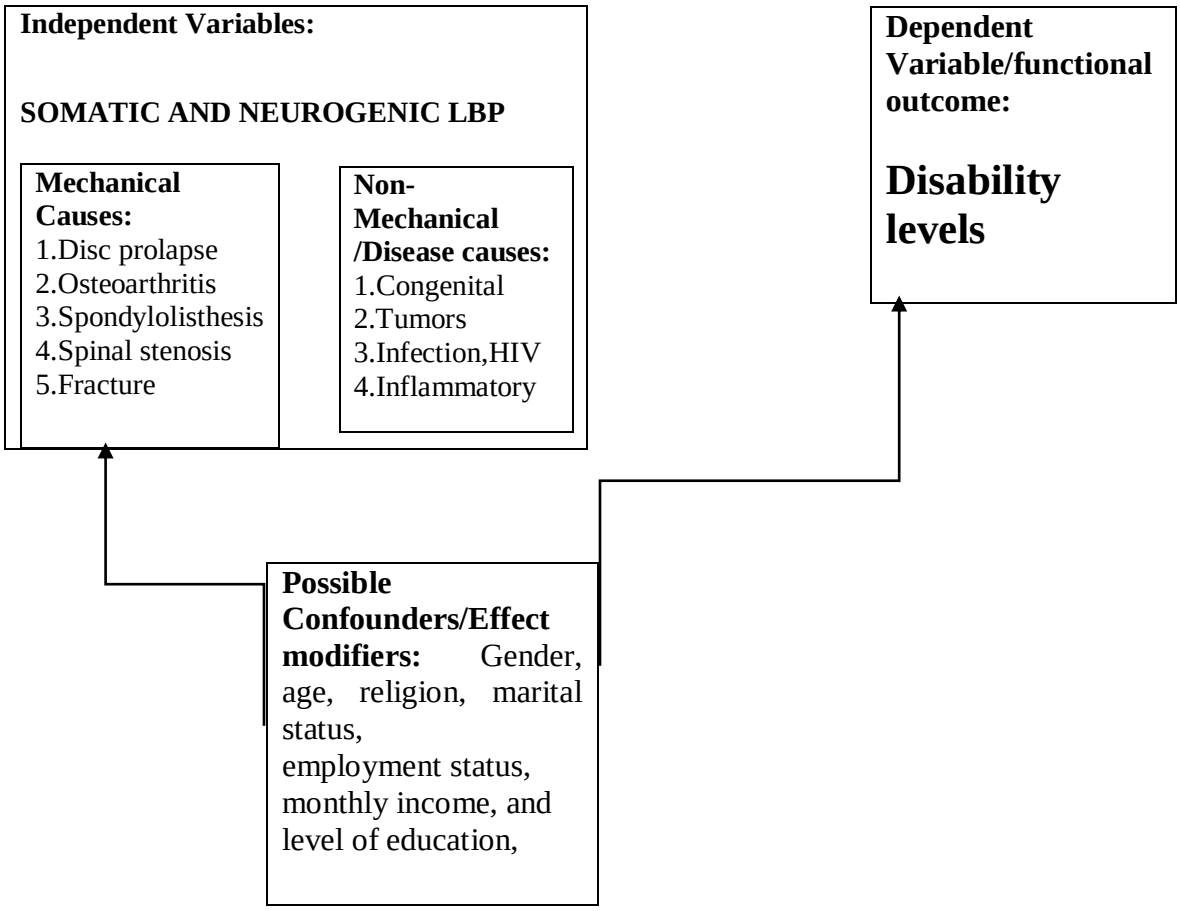

Figure 3.3: Conceptual framework

The specific denominator was the symptom "LBP" and not the diagnoses such as herniated disc, spondylolisthesis, osteoarthritis, fracture or HIV/AIDS. Disability variable in this study was a functional outcome. The functional outcome was captured

by the Oswestry disability questionnaire. The total score of the sections assessed were multiplied by 100% to give the level of disability. The various levels of disability were interpreted as minimal or no disability (0- 20%), moderate disability (21- 40%), severe disability (41- 60%), crippled (61- 80%), or bed bound or exaggerating the symptoms (81-100%).

3.11 Data Management

Participants' information was coded using subject identifier codes. All data was coded and entered into Microsoft excel sheet in a computer where passwords were used. Each entry was assigned a unique subject identifier which could not be linked to the subjects' personal data. A back up was created and updated as data entry progressed using a flash disk and kept away from the original data. The backed- up copy was tested from time to time and at the end of the study, the original data was stored for future use.

3.12 Data Analysis

Data was exported from Microsoft Excel to a computer-aided statistical package of social sciences (SPSS) version 21.0 for statistical analysis. The VAS on S-LANSS was rated as: No pain (0), Moderate pain (5), severe pain as it could be (10). Pain intensity of ≤ 5 was graded as moderate whereas a score of ≥ 6 was graded as severe pain. An S-LANSS score of 12 or more was interpreted as pain predominantly of neuropathic or neurogenic origin while a score of ≤ 11 was interpreted as somatic pain origin. The ODI scores of study subjects were interpreted as: having minimal or no disability (0- 20%), moderate disability (21- 40%), severe disability (41- 60%), crippled (61- 80%), or bed bound or exaggerating the symptoms (81-100%). Data was presented in form of tables and frequencies to give a general description of the participants. Descriptive statistics analysis was done on selected socio-demographics using mean, median, standard deviation (SD) and interquartile range (IQR). The association between selected socio-demographic factors (age, gender, marital status religion, employment status, monthly

income and education level) and levels of pain and disability was done using chi-square test.

Multivariate logistic regression modeling was done to find out the association between independent variables (somatic pain and neurogenic pain) and dependent variables (minimal, moderate and severe disability). Association between levels of pain and disability level (minimal, moderate and severe) stratified by selected socio-demographic factors, Fisher's exact test and Mantel-Haenszel test were also carried out. This was aimed at controlling for confounding / effect modification. Odds ratio and P-value at 95% confidence interval was used for interpretation of results. Further analysis between levels of pain (pain type) and disability adjusting for age above and below median was done. A P-value of <0.05 was considered to be statistically significant.

3.13 Ethical Consideration

Ethical clearance (Appendix V) was sought from KNH-UON ERC. Clearance from the Medical Superintendent Mbagathi Sub-County Hospital (Appendix 6) was also sought. Since the target population was made up of patients scheduled for treatment, they were allowed to attend the clinic first then on exit they were requested to participate in the study. The study subjects were informed of the purpose of the study and that there were no anticipated risks since questionnaires were being used. They were also informed that participation was voluntary and that they were free to withdraw any time. The ones that agreed to participate signed an informed consent form while those that were unable to sign used a thumb print.

The study subject's information was protected and was not exposed to any other person apart from purposes of the study by the researchers. The questionnaires that contained the study subject's data were assigned serial numbers and did not bear their names or any form of identity that would be linked to them. This was to safeguard on privacy and confidentiality. The data collected was kept under lock and key.

3.14 Study Limitations

The population comprised of a selected cohort of patients who may afford to come to the clinic excluding many poorer patients who may have had other patterns of pain and disability.

There may have been patients who were referred for physiotherapy but may have not turn up because of logistic and socio-economic reasons like lack of transport and fees for the physiotherapy treatment.

The settings in developed countries are not similar to the local settings, a factor that may have affected the comparisons in this study. However, such was controlled by using research assistants in cases where participants could not read and write in data collection.

Cultural differences may have interfered with the results since some people are reluctant to seek medical care unless the pain is acute and therefore other patterns of pain and disability especially chronic stages of pain may have been excluded.

CHAPTER FOUR

RESULTS

4.1 Socio-demographic characteristics of the study participants

A total of 178 participants with LBP aged 18 years and above were enrolled into the study. Out of the 178 interviewed participants, 1.1% (n=2) questionnaires were spoilt leading to 98.9 % (n=176) response rate. The variables investigated in this study were gender, age group, religion, marital status, employment status, monthly income and education status.

4.1.1 Gender distribution

Majority of patients, 63.1 % (n= 111) were female while the males comprised of 36.9 % (n=65).

4.1.2 Age distribution

The median age in years of patients with LBP was 40 (32-48) interquartile range (IQR). This means that 50% of the population was aged between 32-48 years old, 40 years being the median age. The overall mean age in years of the participants was 41.1(12.6) Standard Deviation (SD). Majority, 34.1 % (n=60) of the participants were aged between 30-39 years. Those that were aged between 40-49 years comprised of 26.7 %(n=47). Almost equal proportions of 14.8 (n=26) and 14.2 %(n=25) were made up of those that were aged between 18-29 years and 50-59 years respectively. The smallest proportion (10.2%, n=12) constituted those aged ≥60 years old.

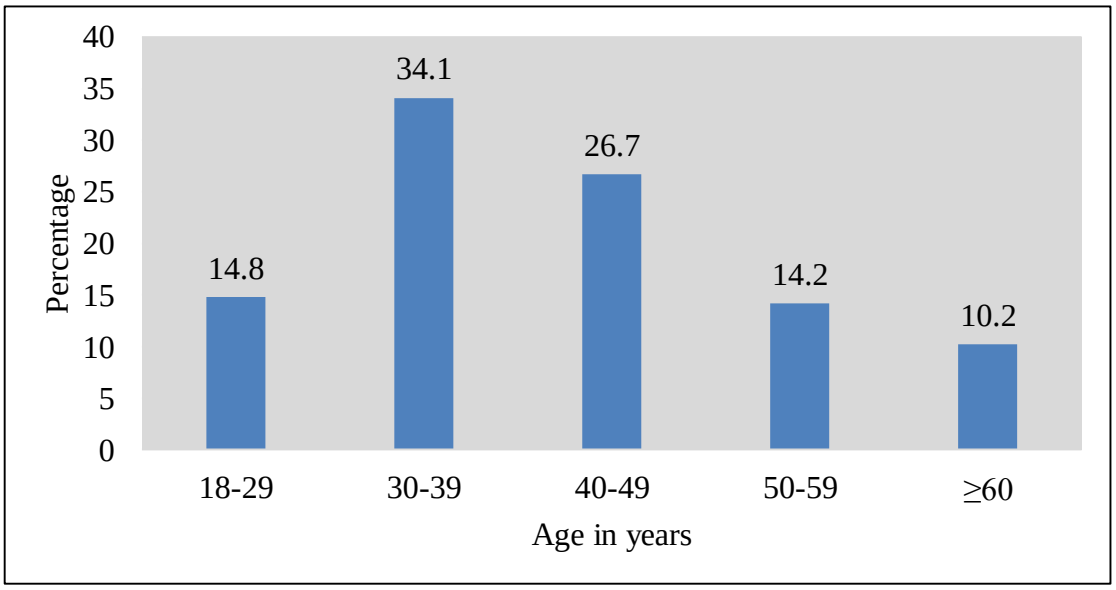

Figure 4.1: Age distribution

4.1.3 Religion

Majority of the participants, 95.5 %(n=168) were Christians while 4.5% (n=8) were Muslims.

Table 4.1: Religion of the respondents

Variable	Frequency (%)
Christians	168(95.5)
Muslim	8(4.5)

4.1.4 Marital status

Majority of those that were interviewed, 75.6%(n=133) were married and the remainder comprised of those that were never married,22.7%(n=40),widowed,1.1%(n=2) and divorced,0.6%(n=1) (Figure 4.2).

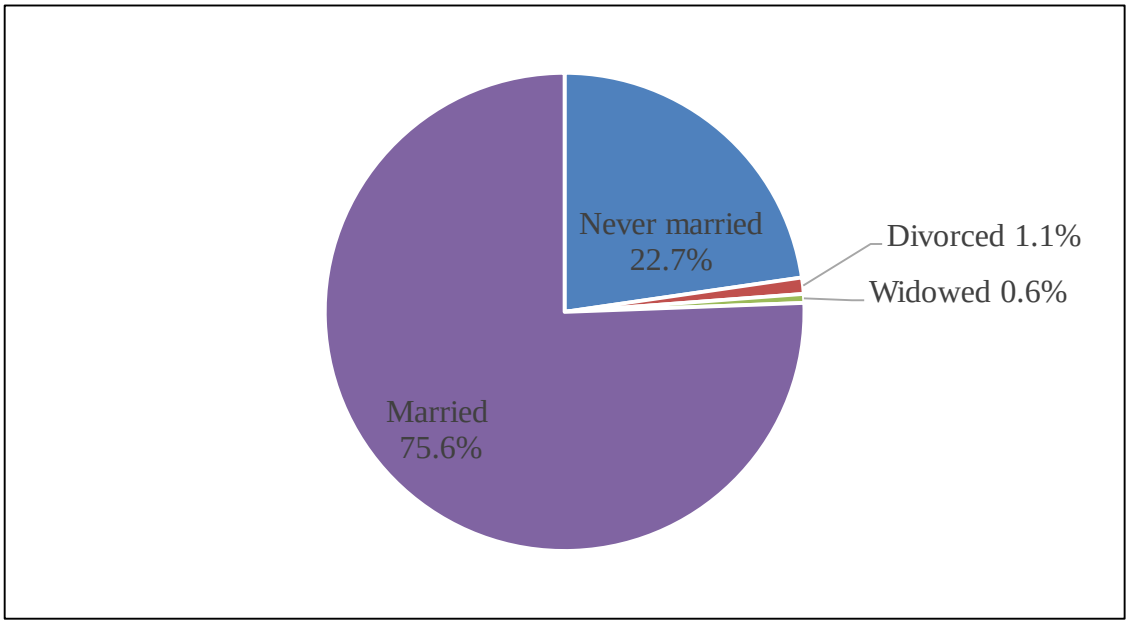

Figure 4.2: Marital status

4.1.5 Employment status

More than half of the study subjects, 55.1 %(n=97) were in informal employment (manual laborers, housework, farmers), 35.8 %(n=63) were in formal employment (sedentary work, teachers, hoteliers). A small proportion of 9.1 % (n=16) represented those that were not working comprising the retired, jobless and students (Table 4.1).

Table 4.2: Employment status of respondents

Variable	Frequency (%)
Not working	16 (9.1)
Informal employment	97 (55.1)
Formal employment	63 (35.8)

4.1.6 Monthly income

The results showed that out of the 176 participants, the proportion that earned an income of between KES.10, 000-19,999 comprised of 29.5 %(n=52) and KES.20, 000-29,999(28.4%, n=50) respectively, was almost equal. This was followed by 24.4 %(n=43) of the participants that earned between KES.30, 000-50,000. Least earners of <KES.10, 000 comprised of 17.6 % (n=31) of the population **(Table 4.3).**

Table 4.3: Monthly income of the respondents

Variable	Frequency (%)
<10,000	31 (17.6)
10,000-19,999	52 (29.5)
20,000-29,999	50 (28.4)
30,000-39,999	25 (14.2)
40,000-49,999	15(8.5)
≥50,000	3(1.7)

4.1.7 Education status

Majority of the respondents, 87.5 %(n=154) had attained post-secondary education (secondary school completed/not completed, college, University) while 12.5% (n=22) had primary level education (completed, not completed and not attended school at all) (**Table 4.4).**

Table 4.4: Educational status of the respondents

Variable	**Frequency (%)**
Primary education	22 (12.5)
Post-secondary education	154 (87.5)

4.2 Distribution of the S-LANSS scores

The variables investigated in the S-LANSS were area of pain, pins and needles, skin color changes, skin sensitivity, electric shocks, burning pain and discomfort in the painful area. Out of 176 participants, 128(72.7%) had pain localized in the lumbar region and an S-LANSS score of ≤11 while 27.3 %(n=48) had both lumbar and leg pain and an S-LANSS score of ≥12 (**Table 4.5**).

Table 4.5: Distribution of the S-LANSS scores

Variable	Frequency (%)
≤11	128 (72.7)
≥12	48 (27.3)

Key: ≤11, somatic pain origin; ≥12 neurogenic pain origin

Respondents that reported pins and needles comprised of 32.5%, skin color changes 9.1%, electric shocks 53.4%, sensitive skin 23.3%, burning sensation 72.2%, painful area discomfort 82.4% and numbness in the pain area was 42%. **Table 4.6** shows participants' responses.

Table 4.6: Respondents' characteristics on S-LANSS

Variable	Frequency (%)
Area of pain	
Lumbar	128 (72.7)
Lumbar + Leg pain	48 (27.3)
Pins and needles	62 (35.2)
Skin color change	16 (9.1)
Sensitive skin	41 (23.3)
Electric shocks	94 (53.4)
Burning pain	127 (72.2)
Painful area discomfort	145 (82.4)
Numbness in pain area	74 (42.0)

4.3 Distribution of the ODI scores

Oswestry Disability questionnaire (Appendix IV) was testing on pain intensity and functional activities limitations (personal care, lifting, walking, employment/home making, standing, sleeping, sitting, social life and travelling. One hundred and seven respondents (n=107) had an ODI score of ≤20%, fifty nine participants had an ODI score of 21-40% while ten participants scored 41-60% as shown in **Table 4.7.**

Table 4.7: Distribution of ODI scores

Variable	Frequency (%)
0-20%	107(60.8)
21-40%	59(33.5)
41-60%	10(5.7)

Key: 0-20%, minimal disability; 21-40%, moderate disability; 41-60%, severe disability

In personal care, 38.1% reported that they could look after themselves but it was painful, 37.5% could lift if load was conveniently placed, 31.8% could not walk more than 2 Kilometers (KMs), and 37.5% were able to do more but not most homemaking/employment activities (**Table 4.8**).

Table 4.8: Respondents' characteristics on Oswestry Disability Questionnaire-Part (i)

Variable	Frequency (%)
Pain Intensity	
No pain	0
Mild pain	23 (13.1)
Moderate	75 (42.6)
Fairly severe	52 (29.5)
Very severe	25 (14.2)
Worst imaginable	1 (0.6)
Personal care	
Can look after self	9 (5.1)
Can look after self but very painful	49 (27.8)
Painful to look after self	67 (38.1)
Need some help	33 (18.8)
Need help everyday	18 (10.2)
Lifting	
Can lift heavy weights	2 (1.1)
Can lift but cause extra pain	19 (10.8)
Can lift if conveniently placed	66 (37.5)
Prevents heavy weight lifting	54 (30.7)
Can only lift light weights	29 (16.5)
Can't lift anything at all	6 (3.4)
Walking	
Does not prevent walking	33 (18.8)
Prevents walking more than 2 Kilometers	56 (31.8)
Prevents walking more than 1Kilometres	47 (26.7)
Prevents walking more than 500Meters	29 (16.5)
Can only walk with a stick	11 (6.3)
Employment/homemaking	
Does not cause pain	1 (0.6)
Increase pain that can do the required	58 (33.0)
Can do more but not most	66 (37.5)
Can only do duties	28 (15.9)
Prevents doing even light duties	21 (11.9)
Prevents doing any job	2 (1.1)

Key: Scores: A=0, B=1, C=2, D=3, E=4, F=5

In standing 39.8% would stand but it caused extra pain,43.2% had occasional sleep disturbance,43.8% were unable to sleep for more than one hour,50.6% had a normal social life but it increased the pain, and 40.9% were able to manage a journey of more than 2 hours. Functional activities limitations responses on standing, sleeping, sitting, social life and travelling as reported on ODI (**Table 4.9).**

Table 4.9: Respondents' characteristics on Oswestry Disability Questionnaire-Part (ii)

Variable	Frequency (%)
Standing	
Can stand without extra pain	9 (5.1)
Can stand causing extra pain	70 (39.8)
Prevents standing for more than 1hour	63 (35.8)
Prevents standing more than 30min	7 (4.0)
Prevents standing more than 10mins	23 (13.1)
Prevents standing at all	4 (2.3)
Sleeping	
Never disturbed by pain	15 (8.5)
Occasionally disturbed	76 (43.2)
Sleeps less than 6 hours	56 (31.8)
Sleeps less than 4 hours	12 (6.8)
Sleeps less than 2 hours	17 (9.7)
Sitting	
Can sit any chair as long as wishes	9 (5.1)
Can sit on favorite chair as long as wishes	40 (22.7)
Prevents sitting for more than 1 hour	77 (43.8)
Prevents sitting for more than 30 min	31 (17.6)
Prevents sitting for more than 10 min	18 (10.2)
Prevents sitting at all	1 (0.6)
Social Life	
Normal	12 (6.8)
Normal but increases pain	89 (50.6)
Has no significant effect on social life	27 (15.3)
Has restricted social life	21 (11.9)
Social life restricted to home	22 (12.5)
No social life	5 (2.8)
Travelling	
Can travel anywhere without pain	1 (0.6)
Can travel anywhere but gives extra pain	37 (21.0)
Manages journeys over 2hours	72 (40.9)
Pain restricts to journey of less than 1 hour	38 (21.6)
Restricts journey of less than 30 min	21 (11.9)
Prevents travelling except to receive treatment	7 (4.0)

4.4 The proportion of patients with somatic and neurogenic LBP at Mbagathi Sub-county Hospital in Nairobi City County

The proportion of patients with somatic LBP was 72.7 %(n=128) compared to 27.3 %(n=48) that had neurogenic LBP. This is shown in **Table 4.10**.

Table 4.10: The proportion of patients with somatic and neurogenic LBP at Mbagathi Sub-County Hospital in Nairobi City County

Pain type	Frequency (%)	95% CI
Somatic	128 (72.7)	66.5-79.0
Neurogenic	48 (27.3)	21.0-33.5

4.5 The levels of pain in patients with somatic and neurogenic LBP at Mbagathi Sub-County Hospital in Nairobi City County.

More than half, 55.7 % (n=98) of the participants had pain intensity of moderate level while the remainder, 44.3 % (n=78) presented with severe pain level as represented in **Table 4.11.**

Table 4.11: The levels of pain in patients with somatic and neurogenic LBP at Mbagathi Sub-county Hospital in Nairobi City County.

Pain intensity	Frequency (%)	95% CI
Moderate	98 (55.7)	48.3-63.1
Severe	78 (44.3)	36.9-51.7

4.6 The levels of disability in patients with somatic and neurogenic LBP at Mbagathi Sub county Hospital in Nairobi City County.

Most respondents, 60.8 % (n=107) had minimal disability, 33.5 % (n=59) moderate disability and 5.7 % (n=10) severe disability (**Figure 4.3**). Severe and moderate disability were combined translating to 39.2 %(n=69) with severe & moderate disability **(Table 4.12).**

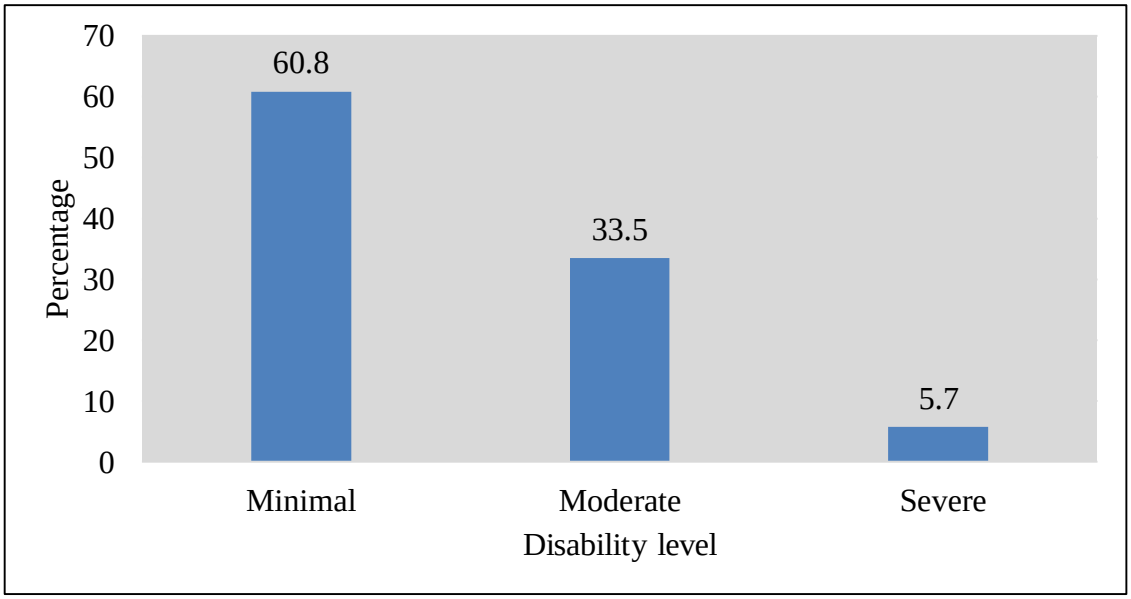

Figure 4.3: Levels of disability

Table 4.12: The levels of disability in patients with somatic and neurogenic LBP at Mbagathi Sub-county Hospital in Nairobi City County.

Disability level	Frequency (%)	95% CI
Minimal	107 (60.8)	53.4-68.2
Moderate & Severe	69 (39.2)	31.8-46.6

4.7 Relationship between levels of pain and disability in patients with somatic and neurogenic LBP at Mbagathi Sub-county Hospital in Nairobi City County

Majority of participants with severe pain, 70.5 % (n=55) had severe and moderate disability compared to 29.5% with minimal disability. Out of ninety-eight respondents with moderate pain, 85.7 % (n=84) had minimal disability compared to 14.3% that had severe and moderate disability. This test revealed that severe pain (OR=14.3; 95% CI: 6.8-30.2; P<0.001) was significantly associated with severe and moderate disability) as demonstrated by **Table 4.13.**

Table 4.13: Relationship between pain intensity and the levels of disability in patients with somatic and neurogenic LBP at Mbagathi Sub-county Hospital in Nairobi City County

Variable	Level of disability		OR (95% CI)	P value
	Severe and moderate	Minimal		
Pain intensity				
Moderate	14 (14.3)	84 (85.7)	1.0	
Severe	55 (70.5)	23 (29.5)	14.3 (6.8-30.2)	**<0.001***

***significant p≤0.05**

4.8 Relationship between pain type and levels of disability in patients with LBP at Mbagathi Sub-County Hospital in Nairobi City County

Neurogenic pain was significantly associated with moderate and severe disability with P<0.001, (OR=20.9, 8.5-51.7, 95% CI) as shown in **Table 4.14.**

Table 4.14: Relationship between pain type and levels of disability in patients with LBP at Mbagathi Sub-County Hospital in Nairobi City County

	Disability level		OR (95% CI)	P value
	Severe and moderate	Minimal		
Pain type				
Somatic	28 (21.9)	100 (78.1)	1.0	
Neurogenic	41 (85.4)	7 (14.6)	20.9 (8.5-51.7)	**<0.001***

***Significant p≤0.05**

4.9 Relationship between level of disability (severe and moderate disability combined) and socio-demographic characteristics in patients with LBP at Mbagathi Sub-county Hospital in Nairobi City County.

Analysis of socio-demographic factors by level of disability on plain cross-tabulation using chi-square test of association revealed that there was no association (P>0.05) between disability level and age, gender, religion, marital status, employment status, income and education status as shown in **Table 4.15.**

Table 4.15: Relationship between level of disability (severe & moderate combined) and socio-demographic factors in patients with LBP at Mbagathi Sub-county Hospital in Nairobi City County

Variable	Severe and moderate n (%)	Minimal n (%)	df	χ^2	P value
Gender					
Male	22 (33.8)	43 (66.2)	1	1.242	0.266
Female	47 (42.3)	64 (57.7)			
Age group					
18-39	32 (37.2)	54 (62.8)	2	1.027	0.598
40-59	28 (38.9)	44 (61.1)			
≥60	9 (50.0)	9 (50.0)			
Marital status					
Unmarried	19 (44.2)	24 (55.8)	1	0.592	0.442
Married	50 (37.6)	83 (62.4)			
Religion					
Christian	65 (38.7)	103 (61.3)	1	0.410	0.713
Muslim	4 (50.0)	4 (50.0)			
Employment status					
Not working	7 (43.8)	9 (56.3)	1	0.171	0.918
Informal employment	38 (39.2)	59 (60.8)			
Formal employment	24 (38.1)	39 (61.9)			
Monthly income					
<10,000	10 (32.3)	21 (67.7)	1	1.476	0.688
10,000-19,999	20 (38.5)	32 (61.5)			
20,000-29,999	19 (38.0)	31 (62.0)			
30,000-50,000	20 (46.5)	23 (53.5)			
Education status					
Primary education	9 (40.9)	13 (59.1)	1	0.031	0.861
Post-secondary	60 (39.0)	94 (61.0)			

4.10 Relationship between level of disability (severe & moderate combined) and socio-demographic factors in patients with LBP at Mbagathi Sub-county Hospital in Nairobi City County.

Further tests of association between socio-demographic factors and levels of disability reporting on odds ratios revealed no risk and P-values were >0.05 (**Table 4.16**).

Table 4.16: Relationship between level of disability and socio-demographic factors in patients with LBP at Mbagathi Sub-county Hospital in Nairobi City County

Variable	Severe and moderate n (%)	Minimal n (%)	OR (95% CI)	P value
Gender				
Male	22 (33.8)	43 (66.2)	0.7 (0.4-1.3)	0.266
Female	47 (42.3)	64 (57.7)	1.0	
Age group				
18-39	32 (37.2)	54 (62.8)	0.6 (0.2-1.7)	0.316
40-59	28 (38.9)	44 (61.1)	0.6 (0.2-1.8)	0.394
≥60	9 (50.0)	9 (50.0)	1.0	
Marital status				
Unmarried	19 (44.2)	24 (55.8)	1.3 (0.7-2.6)	0.442
Married	50 (37.6)	83 (62.4)	1.0	
Religion				
Christian	65 (38.7)	103 (61.3)	0.6 (0.2-2.6)	0.713
Muslim	4 (50.0)	4 (50.0)	1.0	
Employment status				
Not working	7 (43.8)	9 (56.3)	1.3 (0.4-3.8)	0.679
Informal employment	38 (39.2)	59 (60.8)	1.1 (0.6-2.0)	0.891
Formal employment	24 (38.1)	39 (61.9)	1.0	
Monthly income				
<10,000	10 (32.3)	21 (67.7)	0.6 (0.2-1.4)	0.220
10,000-19,999	20 (38.5)	32 (61.5)	0.7 (0.3-1.6)	0.430
20,000-29,999	19 (38.0)	31 (62.0)	0.7 (0.3-1.6)	0.408
30,000-50,000	20 (46.5)	23 (53.5)	1.0	
Education status				
Primary education	9 (40.9)	13 (59.1)	1.1 (0.4-2.7)	0.861
Post-secondary	60 (39.0)	94 (61.0)	1.0	

4.11 Multivariate regression model for socio-demographic characteristics, pain intensity, and pain type versus level of disability

Logistic regression modeling was carried out to control for confounding. It showed significant associations in neurogenic pain (p=0.006, OR=14.1, 2.2-92.5; 95% CI) and severe pain (p<0.001, OR=7.2, 2.6-20.2; 95% CI). This is illustrated in **Table 4.17.**

Table 4.17: Multivariate regression model for socio-demographic characteristics, pain type and pain intensity versus level of disability

Variable	Severe and moderate n (%)	Minimal n (%)	Adjusted OR (95% CI)	P – value
Median age				
Below 40	54 (63.5)	31 (36.5)	1.0 (0.3-3.4)	0.981
40 and above	53 (58.2)	38 (41.8)	1.0	
Gender				
Male	22 (33.8)	43 (66.2)	0.4 (0.1-1.1)	0.071
Female	47 (42.3)	64 (57.7)	1.0	
Religion				
Christian	65 (38.7)	103 (61.3)	0.1 (0.0-0.9)	**0.042***
Muslim	4 (50.0)	4 (50.0)	1.0	
Marital status				
Unmarried	19 (44.2)	24 (55.8)	1.2 (0.3-5.3)	0.795
Married	50 (37.6)	83 (62.4)	1.0	
Employment status				
Not working	7 (43.8)	9 (56.3)	9.8 (1.3-75.0)	**0.028***
Informal employment	38 (39.2)	59 (60.8)	2.8 (0.7-11.4)	0.141
Formal employment	24 (38.1)	39 (61.9)	1.0	
Monthly income				
Below 21000	53 (63.1)	31 (36.9)	0.4 (0.1-1.6)	0.206
21000 and above	54 (58.7)	38 (41.3)	1.0	
Education				
Primary	9 (40.9)	13 (59.1)	2.6 (0.5-13.4)	0.241
Secondary and above	60 (39.0)	94 (61.0)	1.0	
Pain type				
Neurogenic	28 (21.9)	100 (78.1)	14.1 (2.2-92.5)	**0.006***
Somatic	41 (85.4)	7 (14.6)	1.0	
Pain intensity				
Moderate	14 (14.3)	84 (85.7)	1.0	
Severe	55 (70.5)	23 (29.5)	7.2 (2.6-20.2)	**<0.001***

***Significant p≤0.05

4.12 Association between pain type and disability level stratified by socio-demographic characteristics

This analysis was carried out to control for confounding and this was done for the selected socio-demographic characteristics. In gender, neurogenic pain in both male and female had a significant association with severe and moderate disability ($p<0.001$) but the 95% CI were overlapping. In age groups apart from ≥60 years that was not significant ($p>0.069$), the rest were statistically significant ($p<0.05$) in neurogenic pain with severe and moderate disability level though the strata were also overlapping. Being 40-59 years old revealed a higher risk (OR=24.2) of severe and moderate disability in patients with neurogenic pain compared to somatic pain. Other strata that were significant are religion (Christians), Marital status (married and unmarried), employment status (informal and formal), all income categories, and post- secondary education were statistically significant ($P<0.05$) and therefore associated with level of disability as shown in **Table 4.18.** In this analysis neurogenic pain was consistently significant.

Table 4.18: Association between pain type and disability level stratified by socio-demographic characteristics

Variable		Pain type	Disability level		OR (95% CI)	Fishers Exact test P value	Mantel-Haenszel test	
			Severe and moderate	Minimal			OR (95% CI)	P value
Gender	Male	Somatic	9 (18.4)	40 (81.6)	1.0		21.0 (8.5-52.3)	<0.001*
		Neurogenic	13 (81.3)	3 (18.8)	19.3 (4.5-82.0)	<0.001*		
	Female	Somatic	19 (24.1)	60 (75.9)	1.0			
		Neurogenic	28 (87.5)	4 (12.5)	22.1 (6.9-71.1)	<0.001*		
Age group	18-39	Somatic	12 (19.0)	51 (81.0)	1.0		20.6 (8.2-51.8)	0.001*
		Neurogenic	20 (87.0)	3 (13.0)	28.3 (7.2-111.1)	<0.001*		
	40-59	Somatic	13 (23.6)	42 (76.4)	1.0			
		Neurogenic	15 (88.2)	2 (11.8)	24.2 (4.9-120.2)	<0.001*		
	≥60	Somatic	3 (30.0)	7 (70.0)	1.0			
		Neurogenic	6 (75.0)	2 (25.0)	7.0 (0.9-56.9)	0.069		
Religion	Christian	Somatic	25 (20.7)	96 (79.3)	1.0		22.4 (8.6-56.2)	<0.001*
		Neurogenic	40 (85.1)	7 (14.9)	21.9 (8.8-54.8)	<0.001*		
	Muslim	Somatic	3 (42.9)	4 (57.1)				
		Neurogenic	1 (100.0)	0	-	0.285		
Marital status	Not married	Somatic	8 (25.8)	23 (74.2)	1.0		21.4 (8.6-53.2)	<0.001*
		Neurogenic	11 (91.7)	1 (8.3)	31.6 (3.5-285.3)	<0.001*		
	Married	Somatic	20 (20.6)	77 (79.4)	1.0			
		Neurogenic	30 (83.3)	6 (16.7)	19.3 (7.0-52.6)	<0.001*		
Employment status	Not working	Somatic	5 (35.7)	9 (64.3)			23.5 (9.2-59.7)	<0.001*
		Neurogenic	2 (100.0)	0	-	0.086		
	Informal employment	Somatic	16 (22.5)	55 (77.5)	1.0			
		Neurogenic	22 (84.6)	4 (15.4)	18.9 (5.7-62.9)	<0.001*		
	Formal employment	Somatic	7 (16.3)	36 (83.7)	1.0			
		Neurogenic	17 (85.0)	3 (15.0)	29.1 (6.7-126.8)	<0.001*		
Monthly Income	>10,000	Somatic	5 (20.0)	20 (80.0)	1.0		21.1 (8.5-52.6)	<0.001*
		Neurogenic	5 (83.3)	1 (16.7)	20.0 (1.9-211.9)	0.003*		
	10,000-19,999	Somatic	9 (23.1)	30 (76.9)	1.0			
		Neurogenic	11 (84.6)	2 (15.4)	18.3 (3.4-98.4)	<0.001*		
	20,000-29,999	Somatic	7 (20.0)	28 (80.0)	1.0			
		Neurogenic	12 (80.0)	3 (20.0)	16.0 (3.5-72.6)	<0.001*		
	30,000-50,000	Somatic	7 (24.1)	22 (75.9)	1.0			
		Neurogenic	13 (92.9)	1 (7.1)	40.9 (4.5-370.5)	<0.001*		
Education status	Primary	Somatic	5 (27.8)	13 (72.2)			22.3 (8.8-56.1)	<0.001*
		Neurogenic	4 (100.0)	0	-	0.008*		
	Post-secondary	Somatic	23 (20.9)	87 (79.1)	1.0			
		Neurogenic	37 (84.1)	7 (15.9)	19.1 (7.5-48.4)	<0.001*		

***significant, p≤0.05**

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion

The proportion of somatic pain in a population of patients with LBP was 72.7% with 27.3% of the study participants having neurogenic LBP. More participants (55.7%) reported moderate pain on VAS, while the rest reported severe pain. These findings were similar to a study done by McDermott et al. (2006) on the burden of neuropathic pain which showed that patients with high neuropathic pain score on VAS (≥6) reported severe or moderate pain. Another study on neurogenic pain reported significantly greater pain intensity and higher scores on the neuropathic pain scale (Smith & Torrance, 2012).

More patients had minimal disability (60.8%) followed by 35% that had moderate disability. The least had severe disability (5.7 %). These findings were similar to those by Stefane et al. (2013) and Smart et al. (2012). However maximum disability was noted in patients with severe and moderate pain in another study in Punjab, India (Koley et al., 2008). These differences in proportions could be attributed to differences in pain thresholds among races/tribes. It could also be due to cost and therefore patients with other pain patterns may have not come to seek for any medical attention and therefore instead stayed at home. Also, the fact that some these patients had a history of LBP for ≥2weeks and were on pain medications and physiotherapy, the pain may have been controlled. A higher proportion of patients reported minimal disability (60.8%) followed by a 33.5% that reported moderate disability and 5.7% reported severe disability. These findings were similar to those by Stefane et al. (2013) and Smart et al. (2012). However maximum disability was noted in patients with severe and moderate pain in another study in Punjab, India (Koley et al., 2008). These differences in proportions could be attributed to differences in pain thresholds among races / tribes. It could also be due to

cost and therefore patients with other pain patterns may have not come to seek for any medical attention and therefore instead stayed at home. Also, the fact that these patients had a history of LBP for ≥2weeks, the pain levels may have been controlled.

Chi-Square test of association between levels of disability and age group, gender, marital status, religion, employment status, income and education status showed no association since the P>0.05.

Although none of the of the socio-demographic factors were significant in this study, one previous study showed that, factors such as age groups, being female and low education status were associated with LBP disability (Smith & Torrance, 2012). A study done in Turkey on risk factors for LBP and its relationship with pain related disability and depression showed that age, female gender, low socio-economic status and living in rural settings were associated with LBP disability (Tucer et al., 2009). Other studies have shown that more females suffer from LBP than males (Stefane et al., 2013 ; Birabi et al., 2012).

Previous studies have revealed different findings that LBP increases with age (Knauer, Freburger, & Carey, 2010; Jacobs, Hammerman-Rozenberg, Cohen, & Stessman, 2006). Other studies with different findings showed that female sex, lower education, lower wealth were significantly associated with LBP disability (Williams et al., 2015; Donald & Foy, 2004) and it was elicited by lifting, pushing and carrying heavy objects in elderly men (Cecchi et al., 2006) . The explanation for this is not clear, although it is suggested that this may be due to reporting of pain, effect modification, greater sensitization to pain, and differences in response to painkillers in females. Risk factors associated with LBP have been identified as poor postures, bending, lifting and physical strenuous work (Watanabe, Takahashi, Takeba, & Miura, 2018; Langat et al., 2015). This could be due to the nature of work in the informal employment where poor techniques/biomechanics are used in carrying out duties that are purely manual in nature. In this study participants with post-secondary and those that were earning <Kshs.30, 000 were the most affected. These findings were similar to a previous correlation study

between LBP associated factors which revealed that subjects with less than high school education did not have a high rate of low back pain compared with the college graduates. The same study showed that, hard manual work/jobs, and work that requires sitting for long periods of time (white collar jobs) were relevant risk factors (Kwon et al., 2006). This concurs with previous study in Rwanda which showed factors like sitting in un-upright position with back twisted, and having no breaks during working time as independently associated with LBP among bank staff (Kanyenyeri et al., 2017). These results are not similar to other studies whose findings showed that the patients with LBP had low education and were poorly paid (Smith & Torrance, 2012; Tucer et al., 2009; Stefane et al., 2013). The explanation for these results could be that as a result of good monthly income (earnings), participants had enough to spend on food and leisure leading to poor lifestyle such as alcohol abuse and obesity which lead to LBP. Studies have indicated that LBP disability in workers is associated with modifiable lifestyle, physical and psychosocial factors such as interpersonal stress, depression job dissatisfaction, support from supervisors, past history of LBP, previous sick leave due to LBP and family history of LBP (Matsudaira, Konishi, Miyoshi, Isomura, & Inuzuka, 2014; Mitchell et al., 2009; Kawaguchi et al., 2017). Working conditions such as sitting, manual handling, type of work and work capacity have been found to be contributing factors to LBP disability (Harrianto, Samara, Tjhin, & Wartono, 2009; Inoue et al., 2015; S.M. Chen, Liu, Cook, Bass, & Lo, 2009; Junqueira et al., 2014), while sedentary lifestyle by itself is not (Chen, Liu, Cook, Bass, & Lo, 2009). Lower physical activity, age, job satisfaction, smoking, higher body mass index, living in smaller communities, being less educated have been associated with LBP disability (Björck-van Dijken, Fjellman-Wiklund, & Hildingsson, 2008; Mohseni-Bandpei et al., 2011; Shiri, Karppinen, Leino-Arjas, Solovieva, & Viikari-Juntura, 2010).

Results from this study indicated that there exists an association between pain intensity (severe pain) and levels of disability (moderate and severe). There were similar results in a previous study of Korean adults with a mean age of 40 years, which found that the degree of disability from LBP was influenced by pain intensity/severity (Kim, Yi, &

Cynn, 2015). Respondents who experienced high intensity LBP (severe) had considerably greater disability, compared with those with low intensity (moderate). This is demonstrated in the risk whereby those patients with severe pain were at higher risk of getting severe and moderate disability compared to those that had moderate pain. Findings from this study showed a significant association between pain type (neurogenic pain) and disability level (moderate and severe). Similar findings were reported in Korea where the degree of disability was reported to be influenced by pain type (Kim et al., 2015). Multivariate logistic regression results remained generally consistent in revealing significant association between pain type (neurogenic pain) and disability level (severe and moderate) where it showed the highest risk (OR=14.1) of severe and moderate disability compared to somatic LBP. In establishing association between pain type and disability level, stratified by socio-demographic characteristics, neurogenic pain remained the one with the highest risk of moderate and severe disability in every stratum other than in religion and employment status strata. The reason for this could be the few Muslims (n=8) and not working (n=16) population that were interviewed. It was noted that once the same sample was subdivided (strata) the risk of suffering moderate and severe disability in neurogenic pain was higher whereby female gender, unmarried, 18-39 age group, formal employment, higher income and post-secondary education were at higher risk. These findings were similar to previous studies where female gender, being unmarried and informal employment were associated with moderate and severe disability (Tucer et al., 2009; Jacobs et al., 2006; Cecchi et al., 2006). The disappearance of the effect before the sub-divisions (strata) could be attributed to gender compositions and the fact that males are much less likely than females to have neurogenic LBP.

While results from this study showed a higher risk of suffering moderate and severe disability in participants with severe pain intensity, studies have shown that individuals with neurogenic pain reports more severe pain and disability (Ghanei et al., 2014), while work situation, low self-efficacy and depression are associated with disability (Salvetti, Pimenta, Braga, & Corrêa, 2012). The explanation for all participants whose total score was 12 or more, and reported as positive for neurogenic pain was perhaps due to

peripheral nerve sensitization and central sensitization (Campbell & Meyer, 2006; Jensen & Finnerup, 2009). In neurogenic pain, there is no transduction, the prognosis is worse and the pain is more refractory to conventional analgesics (Cohen & Mao, 2014). Chemical mediators play a role in sensitizing and stimulating nociceptors and their central synaptic targets leading to plasticity, causing neurogenic pain (Ellis & Bennett, 2013). It has also been observed that in neurogenic pain glial cells (astrocytes and microglia) form interactions with neurons and thus may modulate nociceptive transmission (Zhuo, Wu, & Wu, 2011). A study on sub-classification of low back-related leg pain showed that patients with peripheral nerve sensitization had greater disability compared to those that had central sensitization and denervation which were both moderate (Schäfer, Hall, & Briffa, 2009; Walsh & Hall, 2010). The peripheral sensitization is caused by a series of events in primary afferents in a peripheral nerve which leads to increased responsiveness in the central neurons, central sensitization (Jensen & Finnerup, 2009). Induced neuroplastic changes in different parts of the brain following injury to peripheral nerves causes peripheral nerve injury-induced neuropathic pain (Jaggi & Singh, 2011). It is injury to a peripheral nerve that leads to sensitization and excitation of the primary afferent neurons resulting to central events and plasticity (Stein et al., 2009). The damage to the nerve creates potentially irreversible changes in the structure and function of the central nervous system (Max Zusman, 2008).

Severe and moderate disability in patients with neurogenic pain can be attributed to cortical and sub cortical reorganization which plays a key role in LBP chronification process (Roussel et al., 2013). A clear lack of standard chronic LBP definition has played a role in misdiagnosis (Meucci, Fassa, & Xavier Faria, 2015), leading to variations in diagnosis and management of LBP and as a result an increase in disability and chronicity (O'Sullivan, Caneiro, O'Keeffe, & O'Sullivan, 2016). The fact that chronic LBP has got both nociceptive and neuropathic components, neuropathic pain is as a result unrecognized and therefore undertreated (Baron et al., 2016). While opiods only seem to offer short term analgesic effects to chronic LBP (Richard A. Deyo, Von Korff, & Duhrkoop, 2015), lack of consensus on outcome measures which capture

chronic LBP intervention effectiveness (Maughan & Lewis, 2010), evidenced based treatment (Forster, Mahn, & Baron, 2012) and LBP care costs have equally contributed to chronicity (Freburger et al., 2009). The use of biomedical model, an outdated approach to chronic pain management instead of the biopsychosocial model which looks at the physiological, psychological and socials factors that affect patient's clinical condition is one of the contributing factors for chronic LBP (Edwards, Dworkin, Sullivan, Turk, & Wasan, 2016; Gatchel, 2013). Studies have indicated that dysregulation in descending pain modulation, which can be either facilitatory or inhibitory results in chronic pain states (Ossipov, Morimura, & Porreca, 2014; Bee & Dickenson, 2009). Whereas pain chronification has been associated with functional and structural abnormalities of the neural structures (Coluzzi, Fornasari, Pergolizzi, & Romualdi, 2017), maladaptive neuroplastic mechanisms involving peripheral sensitization, central sensitization and descending modulation processes play a key role in transition from acute to persistent pain (McGreevy, Bottros, & Raja, 2011).

5.2 Conclusions

The proportion of patients with somatic LBP was 72.7 %(n=128) compared to 27.3 %(n=48) that had neurogenic LBP.

The level of pain in respondents with somatic pain was moderate while that with neurogenic pain was severe.

Most respondents, 60.8 %(n=107) had minimal disability, 33.5 %(n=59) moderate disability and 5.7 %(n=10) severe disability**.**

The study found out that severe pain was significantly associated with moderate and severe disability.

From the findings, it was also revealed neurogenic pain was associated with moderate and severe disability.

The results also revealed that there was no association between socio-demographic factors and level of disability.

5.3 Recommendations

5.3.1 Action recommendations

1. From the study it was found out that patients with neurogenic LBP present a higher risk of severe and moderate disability. For this reason special attention/care needs to be taken to identify this sub-category/subgroup so as to address the severe and moderate disability

2. Proper diagnosis/pain screening of LBP has been recommended to enable the application of specific interventions for specific sub-categories of disability. This shall ensure effective treatment.

3. It is believed that with the aid of LBP screening tools such as S-LANSS and ODI, the clinician shall be able to sub-categorize LBP types for appropriate and effective intervention.

5.3.2 Recommendation for further studies

Further studies with bigger sample size are recommended on impact of S-LANSS and ODI as diagnostic tools in evaluation of nerve-related LBP patients in public health institutions to help in policy formulation because of the high cost of medical care due to severe disability.

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APPENDICES

Appendix I: The Informed Consent Form- Version 4.0

Title of the study: Socio-demographic factors and levels of pain and disability in patients with somatic and neurogenic Low Back Pain at Mbagathi Sub-county Hospital in Nairobi City County,Kenya.

Principal Investigator and Institutional affiliation

Joshua Nyamweya Ogendi, Master of Science in Epidemiology, College of Health Sciences, Jomo Kenyatta University of Agriculture and Technology.

Co-investigators and Institutional affiliation

1. Prof. Peter Mwaniki, COHES, JKUAT (Deceased)

2. Dr. Peter Wanzala, CPHR, KEMRI

3. Dr. Daniel Sagwe Nyamongo, COHES, JKUAT

PART A

Introduction:

You are invited to participate in this study to help us with information on Low Back Pain. This is because majority of people seeking treatment in physiotherapy clinic are suffering from Low Back Pain. I therefore intend to assess the levels of pain and disability in patients with Low Back Pain. Information gathered may be useful in diagnosis, treatment and designing programmes for Low Back Pain.

Purpose of the study

The aim of this study is to determine the levels of pain and disability in patients with somatic and neurogenic LBP attending physiotherapy treatment at Mbagathi District Hospital, Nairobi. Information gathered may assist clinicians and the government in diagnosis, treatment and to design programmes and policies in Low Back Pain Management.

Study procedure

For you to participate you must be over 18 years. If you agree to take part in this study, you shall be interviewed on age, gender, marital status, occupation, level of education and the pain that you are experiencing in your lower back. It shall take about 20-30minutes.

Risks of participation

We do not expect any risks to you. You shall be requested to avail yourself for interview. Your privacy and confidentiality shall be protected. The interview will take place in private and there shall be no harm to you**.**

Research benefits

You may not benefit directly but your answers will help in understanding more about the extent of your low back pain. The results of this study may benefit you in future because the results will be used to make policies.

Study cost

You shall not incur any cost and you will not be paid in order to take part in this study.

Confidentiality

All the information you shall give shall be kept confidentially. The questionnaire will not bear your names. Your names shall not appear in any publication. KNH-UON Ethics Review Committee and JKUAT may check your records though.

Participation Information

Participation is voluntary. You can withdraw any time without fear. You shall not be penalized for withdrawal.

Contacts and Questions

In case you have a question regarding this study, contact

Ogendi Joshua Nyamweya,

P.O Box 73516-00200, Nairobi

Mobile number 0722411911,

E-mailaddress:jp.nyamweya@gmail.com

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), you are encouraged to contact,

The Secretary, KNH-UON ERC

P.O BOX 19676-00202

TEL.2726300 Ext 44102

e-mail: uonknh_erc@uonbi.ac.ke

Or,

Director, ITROMID, JKUAT

P.O BOX 62000-00200, Nairobi

Tel-067 52711

e-mail-itromid@nairobi.mimcom.net

PART B: Participant Consent Form.

Please read this information in PART A or have it ready to you carefully before completing this consent form. If you have any question, please ask the investigator prior to signing the consent form.

Participant Statement

I Mr./Mrs./Miss……do hereby give consent to Ogendi Joshua Nyamweya to include me in the proposed study" Socio-demographic factors and levels of pain, and disability in patients with somatic and neurogenic low back pain at Mbagathi Sub-county hospital in Nairobi City County."

I have read the information sheet, I understand the objectives of the study and what is required of me if I take part in this study. The risks and benefits if any have been explained to me. Any questions I have concerning the study have been adequately answered .I understand that I can withdraw at any time if i so wish without any consequences. I realize I will be interviewed once. I agree voluntarily to participate in this study.

Study subject Signature or Thumb Print……. Date……

Name of person taking Consent……

Signature……..Date…….

Appendix II: Questionnaire

Questionnaire Number ____

Date Of interview dd/mm/yy ___/___/___

Demographic Data

1. Gender

Male…….1

Female……2

2. What is your age in years……..

3. What is your religion?

No religion……..0

Christian……1

Muslim……2

Other……..3

4. What is your marital status?

Never Married…….1

Married…….2

Widowed…….3

Divorced……..4

5. What is your employment status?

Not working……0

House work…….....1

Informal employment…….…2

Formal employment…….....3

Retired…….4

Other (Please specify)……..... 5

6. What is your monthly income?

Below 10,000…….……1

10,000-19,999…….……2

20,000-29,999……..……3

30,000-39,999…….…..4

40,000-49999…….5

50,000 and above……..6

7. What is your highest level of education?

No formal education……..….0

Primary school not completed…….1

Primary school completed……...…2

Secondary school not completed…….3

Secondary School completed……..4

College……..…5

University…….6

Other (specify)…….7

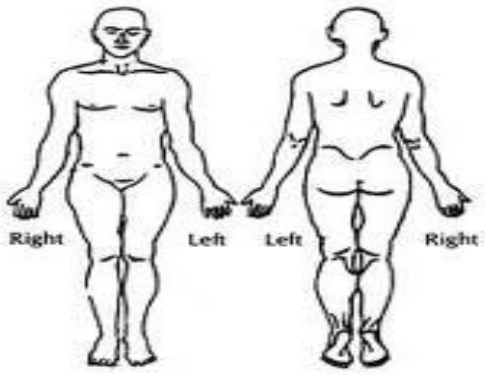
Appendix III: Adapted Self-complete Leeds Assessment of Neuropathic Symptoms and Signs (S-LANSS)

(Wordings slightly adapted after focus group discussions with Kenyan experts in the field).

NAME (Initials)…… DATE……

This questionnaire can tell us the type of pain you may be experiencing. This can help in deciding how to best treat it.

Please mark on the diagram below where you feel your pain. If you feel pain in more than one area, only shade in the one main area where your worst pain is



On the scale below, please indicate how severe your pain (the one you have shown on the above diagrams) has been in the last one week where:

0=means no pain, 5=means moderate pain, and 10=means pain as severe as it could be

NO PAIN 0 1 2 3 4 5 6 7 8 9 10 **SEVERE PAIN**

On the other side of the page are 7 questions about your pain (the one in the diagrams)

Think about how the pain that you showed in the diagrams has felt over the last week. Please circle the descriptions that best match your pain. These descriptions may or may not match your pain no matter how severe it feels.

Only circle the responses that describe your pain. Please turn over.

1. In the area(s) where you have pain, do you also feel pricking, tingling, pins and needles sensations?

a) NO – My pain doesn't really feel like this..... (0)

b) YES – I get these sensations quite often..... (5)

2. Does the painful area(s) change color (spotted or perhaps looks more red) when the pain is particularly severe

a) NO – My pain doesn't affect the colour of my skin..... (0)

b) YES – The pain does make my skin look different from normal..... (5)

3. Does your pain make the affected skin abnormally sensitive to touch? Getting unpleasant sensations when lightly stroking the skin, or getting pain when wearing tight clothes might describe this.

a) NO – My pain doesn't make my skin abnormally sensitive in that area…. (0)

b) YES – My skin seems abnormally sensitive to touch in that area..... (3)

4. Does your pain come on suddenly and in bursts for no apparent reason when you're at rest? Words like electric shocks, jumping and bursting describe these sensations.

a) NO – My pain doesn't really feel like this..... (0)

b) YES – I get these sensations quite often..... (2)

5. In the area(s**)** where you have pain, does your skin feel unusually hot like burning pain?

a) NO – I don't really have burning pain..... (0)

b) YES – I get burning pain quite often..... (1)

6. Gently rub the painful area(s) with your index finger and then rub a non-painful area (for example, an area of skin further away or on the opposite side from the painful area).How does the painful area feel when rubbed?

a) The painful area feels no different from the non-painful area……(0)

b) I feel discomfort like pins and needles, tingling or burning in the painful area…..(5)

7. Gently press on the painful area(s) with your finger tip then gently press in the same way onto a non-painful area (the same non-painful area that you chose in question 6).How does the painful area feel when pressed?

a).The painful area does not feel different from the non-painful area……...(0)

b).I feel numbness or tenderness in the painful area that is different from the non-painful…. (3)

TOTAL SCORE……/**24(Maximum**)

Scoring: A score of 12 or more suggests pain of predominantly neuropathic origin

Appendix IV: The Oswestry Disability Questionnaire

ANSWER EACH SECTION BY CIRCLING THE ONE CHOICE THAT BEST DESCRIBES YOU AT PRESENT

SECTION 1-Pain Intensity A. I have no pain at the moment. B. The pain is very mild at the moment. C. The pain is moderate at the moment. D. The pain is fairy severe at the moment. E. The pain is very severe at the moment. F. The pain is worst imaginable at the moment.	**SECTION 4-Walking** A. Pain does not prevent me walking any distance. B. Pain prevents me walking more than 2 kilometers C. Pain prevents me walking more than 1 kilometer. D. Pain prevents me walking more than 500 meters. E. I can only walk while using stick or crutches. F. I am in bed most of the time and I have to crawl to the toilet.
SECTION 2- Personal care A. I can look after myself normally without causing extra pain. B. I can look after myself normally but it is very painful. C. It is painful to look after myself and I am slow and careful.	**SECTION 5Employement/Homemaking** A. My normal homemaking/job activities do not cause pain. B. My normal homemaking/job activities increase my pain, but I can still perform all that is required of me.

D. I need someone to help but manage most of my personal care. E. I need help everyday in most aspect of self- care. F. I do not get dressed, wash with difficulty, and stay in bed.	C. I can perform most of my homemaking/job duties but pain prevents me from performing more. D. Pain prevents from doing anything but light duties. E. Pain prevents me from doing even light duties. F. Pain prevents me from doing any job or home making chores.
SECTION 3-Lifting A. I can lift heavy weights without extra pain. B. I can lift heavy weights but it causes extra pain. C. Pain prevents heavy weights off the floor but I can manage it if they are conveniently positioned, e.g on the table. D. Pain prevents me from lifting heavy weights but I can manage to light to medium weights if they are conveniently positioned. E. I can only lift very light weights. F. I can lift or carry anything at all.	**SECTION 6-Standing** A. I can stand as long as I want causing extra pain. B. I can stand as long as I want without causing extra pain. C. Pain prevents me from standing for more than one hour. D. Pain prevents me from standing for more than half an hour. E. Pain prevents me from standing for more than 10 minutes. F. Pain prevents me from standing at all.

SECTION 7-Sleeping A. My sleep is never disturbed by pain. B. My sleep is occasionally disturbed by pain. C. Because of pain I have less than 6 hours sleep D. Because of sleep I have less than 4 hours sleep. E. Because of pain I have less than 2 hours sleep. F. Pain prevents from sleeping at all.	**SECTION 9-Social Life** A. My social life is normal and causes me no extra pain. B. My social life is normal but increases the degree of my pain. C. Pain has no significant effect on my social life apart from limiting my more energetic interests' e.g sports etc. D. Pain has restricted my social life and I don't go out as often. E. Pain as restricted my social life to my home. F. I have no social life because of pain.
SECTION 8-Sitting A. I can sit in any chair as long as I like B. I can sit on my favorite chair as long as I like. C. Pain prevents from sitting more than one hour.	**SECTION 10-Travelling** A. I can travel anywhere without pain B. I can travel anywhere but gives me extra pain. C. Pain is bad but I manage journey over 2hours. D. Pain restricts me to journey of less than 1 hour. E. Pain restricts me to short journey

D. Pain prevents me from sitting for more than half an hour. E. Pain prevents me sitting for more than 10 minutes. F. Pain prevents me from sitting at all.	less than 30 minutes. F. Pain prevents me from travelling except to receive treatment.

A=0; B=1; C=2; D=3; E=4; F=5 SCORE OUT OF 50……

INTERPRETATION OF SCORES

0% to 20%: minimal disability:	The patient can cope with most living activities. Usually no treatment is indicated apart from advice on lifting sitting and exercise.
21%-40%: moderate disability:	The patient experiences more pain and difficulty with sitting, lifting and standing. Travel and social life are more difficult and they may be disabled from work. Personal care, sexual activity and sleeping are not grossly affected and the patient can usually be managed by conservative means.
41%-60%: severe disability:	Pain remains the main problem in this group but activities of daily living are affected. These patients require a detailed investigation.
61%-80%: crippled:	Back pain impinges on all aspects of the patient's life. Positive intervention is required.
81%-100%: Bed bound	These patients are either bed-bound or exaggerating their symptoms.

Appendix V: Ethical approval

Appendix 5: Ethical Approval

UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
Tel:(254-020) 2726300 Ext 44355

KNH-UON ERC
Email: uonknh_erc@uonbi.ac.ke
Website: http://www.erc.uonbi.ac.ke
Facebook: https://www.facebook.com/uonknh.erc
Twitter: @UONKNH_ERC http://twitter.com/UONKNH_ERC

KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/156

9th May, 2016

Ogendi Joshua Nyamweya
TM306-2882/2014
JKUAT

Dear Joshua

REVISED RESEARCH PROPOSAL – ASSESSMENT OF LEVELS OF PAIN AND DISABILITY IN PATIENTS WITH SOMATIC AND NEUROGENIC LOW BACK PAIN AT MBAGATHI DISTRICT HOSPITAL IN NAIROBI COUNTY (P243/03/2016)

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH-UoN ERC) has reviewed and approved your above proposal. The approval period is from 9th May 2016 – 8th May 2017.

This approval is subject to compliance with the following requirements:

a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH-UoN ERC before implementation.
c) Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
e) 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*).
f) Clearance for export of biological specimens must be obtained from KNH- UoN ERC for each batch of shipment.
g) Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

For more details consult the KNH- UoN ERC website **http://www.erc.uonbi.ac.ke**

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Appendix VI: Clearance Letter from Mbagathi Hospital

Appendix 6: Clearance letter from Mbagathi District Hospital

NAIROBI CITY COUNTY

Tel: 2724712, 2725705, 0721 311 808
Email: mdhnairobi@yahoo.co.uk

Mbagathi Hospital
P.O. Box 20725 - 00202
Nairobi

COUNTY HEALTH SERVICES

18th May 2016

Ogendi Joshua Nyamweya
ITROMID JKUAT

Dear Sir,

RE: RESEARCH AUTHORIZATION

This is in reference to your application for authority to carry out a research on *"Assessment of levels of pain and disability in patients with somatic and neuropathic low back pain at Mbagathi Hospital"*

I am pleased to inform you that your request to undertake the research in the hospital has been granted.

On completion of the research you are expected to submit one hard copy and one soft copy of the research report / thesis to this office.

MBAGATHI HOSPITAL P.O. Box 20725 - 00202 NAIROBI 18 MAY 2016

Dr. A. J. Sulek
Medical Superintendent
Mbagathi Hospital

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Appendix VII: Publication

East African Medical Journal Vol. 95 No. 1 January 2018
ASSOCIATION BETWEEN LEVELS OF PAIN AND DISABILITY IN PATIENTS WITH SOMATIC AND NEUROGENIC LOW BACK PAIN AT MBAGATHI DISTRICT HOSPITAL IN NAIROBI COUNTY, KENYA
J.O Nyamweya, P.K. Mwaniki, D.N. Sawe, College of Health Sciences, Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya, P. Wanzala, Centre for Public Health Research, Kenya Medical Research Institute, Nairobi, Kenya

Corresponding Author: J.O. Nyamweya. Email: jp.nyamweya@gmail.com

ASSOCIATION BETWEEN LEVELS OF PAIN AND DISABILITY IN PATIENTS WITH SOMATIC AND NEUROGENIC LOW BACK PAIN AT MBAGATHI DISTRICT HOSPITAL IN NAIROBI COUNTY, KENYA

J.O. Nyamweya, P.K. Mwaniki, D.N. Sawe and P.Wanzala

ABSTRACT

Background: Low Back Pain is a problem of public health importance in developed countries as well as developing ones including Kenya. Low Back Pain, sub-categorized into somatic and neurogenic pain manifests in different unknown levels which have enormous health and socio economic impact. In Kenya, information on levels of pain and disability and how the two affect each other remain scanty.

Objective: To determine the relationship between levels of pain and disability among patients with somatic and neurogenic Low Back Pain at Mbagathi District Hospital in Nairobi County, Kenya.

Design: A cross-sectional study.

Setting: Mbagathi District Hospital from May 2016 to August 2016.

Subjects: All consenting Low Back Pain patients referred for out-patient physiotherapy clinic at Mbagathi District Hospital

Results: Out of 176 participants enrolled in the study, majority, (63.1%) were females compared to 36.9% who were males. The proportion of patients with somatic Low Back Pain was 72.7 %(n=128) compared to 27.3 % (n=48) that had neurogenic Low Back Pain. More than half, 55.7 % (n=98) of the participants had pain intensity of moderate level while the remainder, 44.3 %(n=78) presented with severe pain level. Most respondents, 60.8 %(n=107) had minimal disability level compared to 33.5 %(n=59), and 5.7 %(n=10) whose levels were moderate and severe disability respectively. Results showed significant association between severe pain and moderate and severe disability (P<0.001). Neurogenic pain was also significantly associated with severe and moderate disability (P=0.006).

Conclusion: A great majority of patients attending out-patient physiotherapy clinic presented with somatic Low Back Pain whose disability level was Minimal. A smaller proportion of patients with neurogenic Low Back Pain had moderate and severe disability. Neurogenic pain posed the highest risk of moderate and severe disability.

INTRODUCTION

Low back pain is pain, muscle tension, or stiffness localized below the costal margin and above the inferior gluteal folds, with or without sciatica, and is defined as chronic when it persists for 12 weeks or more (1). It is categorized into two types, namely somatic and neurogenic pain. Low Back Pain is one of the most common health problems affecting people (2).It has been found to be a global health dilemma affecting the global economic, social and public health sectors thus increasing and incurring billions of dollars in medical expenditure each year (3).

It is one of the leading causes of physical limitation in the USA and a chief source of incapacitation, suffering and expenses, the medical costs exceeding $24 billion in 1990 (4). It is the main source of temporary disability affecting population aged below 45 years (5). In the United States of America (USA) and Australia, Low Back Pain is one of the most common problems treated in the Health care System affecting 2-5% of the population at any one time, 26-27% over any 3 month period and 70-80% over the course of their life time (6, 7, 8, 9). In South Africa 80% of the workforce suffers from severe discomfort and disability due to Low Back Pain at some point in their working life (10).

Studies show unexplained and large variations in diagnostic tests and evaluation (1, 11). The 2010 Global Burden of Disease Study ranked low back pain as the condition with the highest number of years lived with disability (YLDs) and sixth in terms of disability-adjusted life years (DALYs) (12,13). Factors found to be associated with neuropathic pain which comprises of 20-35% include older age, female sex, manual occupation, being unable to work, living in a rural area or council-rented accommodation, and lower educational attainment (14).

A study on self-reported pain and disability outcomes showed a significant association between pain and disability and that disability was predicted by sex, pain intensity and leg pain (15). Patients with pain referral to the legs were more severely affected than those whose pain was localized and patients with signs of nerve involvement were the ones most severely affected (16). In Kenya, literature on similar study is scanty.

MATERIALS AND METHODS

This was a cross sectional study design of 176 patients with Low Back Pain with or without leg pain attending physiotherapy clinic at Mbagathi District Hospital in Nairobi County. Patients who were below 18 years and those that did not give consent to participate in the study were excluded. Recruitment into the study was done on a daily basis between 8 am and 2pm for three (3) months until the targeted sample size was attained.

Data Collection Procedure: Data was collected by two research assistants who were always present at the physiotherapy clinic each day during the study period. Those patients who met the inclusion criteria, aged 18 years and above and had given consent to participate, were recruited into the study. A record of all patients with Low Back Pain attending the clinic was kept by principal investigator or the research assistants. Each study participant was identified by a subject identifier number corresponding to the questionnaire. A researcher-administered questionnaire was used to capture information on selected socio-demographic factors while the Self-complete Leeds Assessment of Neuropathic symptoms and Signs(S-LANSS) and Oswestry Disability Index(ODI) were used to capture data on levels of pain and disability respectively. All the study participants were interviewed until the sample size was attained in readiness for analysis.

Data management and analysis: All filled questionnaires were counterchecked to

ensure that all were completed well and to check if there were any missing information. The completed questionnaires were then kept and locked in a secured place to ensure privacy and confidentiality of the participants. Data was entered into Microsoft excel and double data entry was carried out so as to validate the study variables. Once the validation was completed, the data was exported into a Statistical Package for Social Sciences (SPSS-version 19.0) for statistical analysis. The results were presented in proportions and tables. Associations between pain and disability was done using odds ratios (OR) and P-values. P-values ≤0.05 were considered significant.

Ethical consideration: Approval to carry out the study was sought from the University of Nairobi-Kenyatta National Hospital ethics review committee and Mbagathi District Hospital. A written informed consent was obtained from all participants. The study participants were interviewed in the private treatment rooms for privacy and confidentiality.

RESULTS

A total of 176 participants with Low Back Pain were recruited into the study. Out of 176 patients, majority, 63.1 %(n= 111) were females while the males comprised of 36.9 %(n=65). The median age was 40 years, (IQR) 32-48 years. Less than half, 34.1 %(n=60) of the participants were aged between 30-39 years. The most majority of the participants, 95.5 %(n=168) were Christians. Out of the 176 participants, majority, 75.6 %(n=133) were married and the remainder comprised of those that were never married, 22.7 %(n=40), divorced, 1.1 %(n=2) and widowed, 0.6 %(n=1). (Table 1)

Table 1: Socio-demographic characteristics of the respondents

Variable	Frequency (%)
Gender	
Male	65 (36.9)
Female	111 (63.1)
Age group	40(32-48)Median age in years(IQR)
18-29	26 (14.8)
30-39	60 (34.1)
40-49	47 (26.7)
50-59	25 (14.2)
≥60	18 (10.2)
Religion	
Christian	168 (95.5)
Muslim	8 (4.5)
Marital status	
Never married	40 (22.7)
Divorced	2(1.1)
widowed	1(0.6)
Married	133 (75.6)

Employment status	
Not working	16 (9.1)
Informal employment	97 (55.1)
Formal employment	63 (35.8)
Income	
<10,000	31 (17.6)
10,000-19,999	52 (29.5)
20,000-29,999	50 (28.4)
30,000-39,999	25 (14.2)
40,000-49,999	15(8.5)
≥50,000	3(1.7)
Education status	
Primary education	22 (12.5)
Post-secondary education	154 (87.5)

Pain type, Pain Intensity and disability levels in patients with Low Back Pain: The proportion of patients with somatic Low Back Pain was 72.7 %(n=128) compared to 27.3 % (n=48) that had neurogenic Low Back Pain. More than half, 55.7 %(n=98) of the participants had pain intensity of moderate level while the remainder, 44.3 %(n=78) presented with severe pain level. Most respondents, 60.8 %(n=107) had minimal Low Back Pain disability compared to 33.5 %(n=59), and 5.7 %(n=10) whose levels were moderate and severe disability respectively (Table 2).

Table 2: Pain type, pain intensity and the levels of disability in patients with Low Back Pain

Variable	Frequency (%)
Pain type	
Somatic	128 (72.7)
Neurogenic	48 (27.3)
Pain intensity	
Moderate	98 (55.7)
Severe	78 (44.3)
Disability level	
Minimal	107 (60.8)
Moderate	59 (33.5)
Severe	10(5.7)

Association between pain intensity and levels of disability: Majority of participants with severe pain, 70.5 %(n=55) had severe and moderate disability compared to 29.5% who had minimal disability. Out of ninety-eight respondents with moderate pain, 85.7 %(n=84) had minimal disability compared to 14.3% that had severe and moderate disability. This test revealed that severe pain (OR=14.3; 95%CI: 6.8-30.2; p<0.001) was significantly associated with severe and moderate disability (Table 3).

Table 3: Relationship between pain intensity and the level of disability

Variable	Level of disability		OR (95% CI)	P value
	Severe and moderate	Minimal		
Pain intensity				
Moderate	14 (14.3)	84 (85.7)	1.0	
Severe	55 (70.5)	23 (29.5)	14.3 (6.8-30.2)	<0.001*

*significant p≤0.05

Pain type and level of disability: Neurogenic pain was significantly (p<0.001, OR=20.9) associated with moderate and severe disability as shown in Table 4.

Table 4: Association between pain type and levels of disability

	Disability level		OR (95% CI)	P value
	Severe and moderate	Minimal		
Pain type				
Somatic	28 (21.9)	100 (78.1)	1.0	
Neurogenic	41 (85.4)	7 (14.6)	20.9 (8.5-51.7)	<0.001*

*Significant p≤0.05

Association between pain type and disability level stratified by socio-demographic characteristics: This analysis was carried out to control for confounding and this was done for the selected socio-demographic characteristics. In gender, neurogenic pain in both male and female had a significant association with severe and moderate disability (p<0.001) but the 95%CI were overlapping.

In age groups apart from ≥60 years being marginally significant (p>0.058), the rest were statistically significant (p<0.05) in neurogenic pain with severe and moderate disability level though the strata were also overlapping. Being 30-39 years old revealed a higher risk (OR=33) of severe and moderate disability in patients with neurogenic pain compared to somatic pain. Other strata that were significant are religion (Christians), Marital status (married and unmarried), employment status (informal and formal), all income categories, and post- secondary education were statistically significant (P<0.05) and therefore associated with severe and moderate level of disability. In this analysis neurogenic pain was consistently significant (Table 5).

Table 5: Association between pain type and disability level stratified by socio-demographic characteristics

Variable		Pain type	Disability level		OR (95% CI)	Fishers Exact test P value	Mantel-Haenszel test	
			Severe and moderate	Minimal			OR (95% CI)	P value
Gender	Male	Somatic Neurogenic	9 (18.4) 13 (81.3)	40 (81.6) 3 (18.8)	1.0 19.3 (4.5-82.0)	<0.001*	21.0 (8.5-52.3)	<0.001*
	Female	Somatic Neurogenic	19 (24.1) 28 (87.5)	60 (75.9) 4 (12.5)	1.0 22.1 (6.9-71.1)	<0.001*		
Age group	18-39	Somatic Neurogenic	12 (19.0) 20 (87.0)	51 (81.0) 3 (13.0)	1.0 28.3 (7.2-111.1)	<0.001*	20.6 (8.2-51.8)	0.001*
	40-59	Somatic Neurogenic	13 (23.6) 15 (88.2)	42 (76.4) 2 (11.8)	1.0 24.2 (4.9-120.2)	<0.001*		
	≥60	Somatic Neurogenic	3 (30.0) 6 (75.0)	7 (70.0) 2 (25.0)	1.0 7.0 (0.9-56.9)	0.069		
Religion	Christian	Somatic Neurogenic	25 (20.7) 40 (85.1)	96 (79.3) 7 (14.9)	1.0 21.9 (8.8-54.8)	<0.001*	22.4 (8.6-56.2)	<0.001*
	Muslim	Somatic Neurogenic	3 (42.9) 1 (100.0)	4 (57.1) 0	- -	0.285		
Marital status	Not married	Somatic Neurogenic	8 (25.8) 11 (91.7)	23 (74.2) 1 (8.3)	1.0 31.6 (3.5-288.3)	<0.001*	21.4 (8.6-53.2)	<0.001*
	Married	Somatic Neurogenic	20 (20.6) 30 (83.3)	77 (79.4) 6 (16.7)	1.0 19.3 (7.0-52.6)	<0.001*		
Employment status	Not working	Somatic Neurogenic	5 (35.7) 2 (100.0)	9 (64.3) 0	- -	0.086	23.5 (9.2-59.7)	<0.001*
	Informal employment	Somatic Neurogenic	16 (22.5) 22 (84.6)	55 (77.5) 4 (15.4)	1.0 18.9 (5.7-62.9)	<0.001*		
	Formal employment	Somatic Neurogenic	7 (16.3) 17 (85.0)	36 (83.7) 3 (15.0)	1.0 29.1 (6.7-126.8)	<0.001*		
Income	>10,000	Somatic Neurogenic	5 (20.0) 5 (83.3)	20 (80.0) 1 (16.7)	1.0 20.0 (1.9-211.9)	0.003*	21.1 (8.5-52.6)	<0.001*
	10,000-19,999	Somatic Neurogenic	9 (23.1) 11 (84.6)	30 (76.9) 2 (15.4)	1.0 18.3 (3.4-98.4)	<0.001*		
	20,000-29,999	Somatic Neurogenic	7 (20.0) 12 (80.0)	28 (80.0) 3 (20.0)	1.0 16.0 (3.5-72.6)	<0.001*		
	30,000-50,000	Somatic Neurogenic	7 (24.1) 13 (92.9)	22 (75.9) 1 (7.1)	1.0 40.9 (4.5-370.5)	<0.001*		
Education status	Primary	Somatic Neurogenic	5 (27.8) 4 (100.0)	13 (72.2) 0	- -	0.008*	22.3 (8.8-56.1)	<0.001*
	Post-	Somatic	23 (20.9)	87 (79.1)	1.0			

	secondary	Neurogenic	37 (84.1)	7 (15.9)	19.1 (7.5-48.4)	<0.001*		

*significant, p≤0.05

DISCUSSION

This study sought to determine the levels of pain and disability in patients with somatic and neurogenic low back pain at Mbagathi District Hospital in Nairobi County. Findings from this study indicated majority (72.7%) of the study participants had somatic Low Back Pain compared to 27.3% that had neurogenic Low Back Pain. More than a half (55.7%) reported moderate pain on Visual Analogue Scale (VAS), while less than a half (44.3%) reported severe pain. These findings were similar to studies done on the burden of neuropathic pain which showed that patients with high Neuropathic Pain Scale or Visual Analogue Scale (≥6) reported severe or moderate pain or greater pain intensity (15,16,17,18).

A higher proportion of patients reported minimal disability (60.8%) followed by a small proportion that reported moderate disability (33.5%). The least reported severe disability (5.7 %). These findings were similar to studies that were done in developed countries (19, 20). The differences in proportions could be attributed to pain intensity whereby those that had moderate pain had moderate to minimal disability compared to those that had severe pain. Other factors could be due to differences in races and/tribes, pain thresholds and pain levels may have been controlled.

Results from this study indicated that there exists an association exists between pain intensity (severe pain) and levels of disability (moderate and severe). These findings agreed with a study of Korean adults with a mean age of 40 years (21) which found that the degree of disability from Low Back Pain was influenced by pain intensity. The same study revealed that the degree of disability was reported to be influenced by pain type. This was demonstrated in the risk whereby those patients with severe pain were 14.1 times at risk of suffering severe and moderate disability compared to those that had moderate pain.

In establishing association between pain type and disability level, stratified by socio-demographic factors, neurogenic pain consistently remained the variable with the highest risk of suffering moderate and severe disability in every stratum. The explanation for all participants whose total score was 12 or more, and reported as positive for neurogenic pain was perhaps attributed to presence of peripheral nerve sensitization and central sensitization, high pain intensity and presence of leg pain (15, 16, 22, 23).

Another study on sub-classification of low back-related leg pain showed that those patients who had peripheral nerve sensitization had severe disability compared to those that had central sensitization and denervation (24). Therefore severe and moderate disability group in this study may have been as a result of peripheral nerve sensitization.

In conclusion the study found out that majority of patients attending Mbagathi physiotherapy clinic in Nairobi County were suffering from somatic Low Back Pain whose disability level was minimal. However, the smaller proportion that had neurogenic pain, suffered severe and moderate disability representing greater disability. Consequently, participants with neurogenic LBP pain were at a higher risk of suffering moderate and severe disability compared to those with somatic LBP.

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