# CORRELATES OF DEPRESSION AMONG SPINAL CORD INJURY PATIENTS ATTENDING NATIONAL SPINAL INJURY HOSPITAL, NAIROBI.

**Dissertation Submitted in Partial Fulfilment of the Requirement for the Award of the Degree of Master of Science in Clinical Psychology at the University of Nairobi.**

**BY**

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**AUGUST 2016**

## DECLARATION

I Mary Njeri Mbuthia do hereby declare that this dissertation is my original work and that it has not been presented in the University of Nairobi or any other institution for the purpose of obtaining a degree.

Signature_____

Date_____

**CERTIFICATE OF APPROVAL**

This is to certify that this dissertation work has been carried out independently by Mary Njeri Mbuthia, student of Master of Science Clinical Psychology and has been submitted and approved by the Kenyatta National Hospital Ethics and Research Committee for review and evaluation with our approval as University supervisors.

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I thank Francis, the statistician who helped in data analysis making my final report successful.

I give all glory to God.

**DEDICATION**

I dedicate this study to my family, friends and colleagues for their continuous support and encouragement throughout the study.

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## ABSTRACT

**Introduction**: Spinal cord injury remains a major public health issue in developing countries as well as worldwide. It is a devastating condition causing profound life changes for millions of people around the world. Road traffic accidents have been reported to be a major cause of spinal cord injury and is expected to take third position in the disease and injury burden.Patients with spinal injury are faced by a myriad of challenges; physical, psychological, financial as well as social challenges.Existing literature documents high rates of depression and psychological morbidity following spinal cord injury.jykk

Thus there is need for regular screening of these patients for depression as well as identifying the risk factors associated with depression. This will help mitigate the risk factors and ensure timely treatment for depression for better treatment outcomes.

**Setting:** The study was conducted at the National spinal injury hospital, Nairobi among spinal cord injury patients attending the out-patient clinic.

**Study design**: This was a descriptive cross sectional study with a sample size of (n=139) persons who had sustained spinal cord injury with over one year duration of injury and over 18 years of age completing a single interview for socio- demographic, pain intensity and patient health questionnaire (PHQ-9) scales.

**The objectives**: To determine the factors that may be a risk to development of depression among persons with spinal cord injury.

**Data collection instruments**: Socio-demographic questionnaire was used to collect demographic data of the patients; Patient Health Questionnaire-9(PHQ-9 scale) to determine the

depression levels and Numerical Pain intensity scale used to measure the pain intensity among the participants.

**Data analysis**: After data collection, the information was coded and data entered into Statistical Package for Social Sciences version 20 (SPSS 20). Data was summarized using descriptive statistics and presented in frequency tables and charts. Categorical data was analyzed using Chi-square statistic with the Significance level set at <0.05. Further multivariate analysis was done using logistic regression to investigate the independent predictive value for the identified risk factors for depression (being quadriplegic, inadequate social support, lack of self-efficacy and increased pain intensity), with the significance set at < 0.05.

**Results:**

The overall prevalence of depression according to PHQ-9 scores was 25.8%. Quadriplegic patients were found to have 4 times risk of developing depression as compared with paraplegic patients (OR 4.044 [95% C.I of OR 1.357- 12.051], P= 0.012);patients with severe pain intensity were reported to have 3 fold risk of developing depression (OR 3.104 [95% C.I of OR 1.765-5.46], P< 0.05) as compared with those who experienced mild pain or no pain at all .Other factors that were significantly related to depression were decreased support systems (P=0.010) and lack of self –efficacy (P=0.016). Demographic factors were found not to have a significant relationship to depression.

## Conclusions

Depressive symptoms are common among patients with spinal cord injury and more so among those who are quadriplegic. The decreased support system, lack of self- efficacy and increased pain intensity.The study shows that there is need for regular screening and treatment for depression among patients with spinal cord injury.

The results of the study forms a baseline for future studies on the mental health status of patients with spinal cord injury and further studies with larger samples are recommended especially in Kenya.

## OPERATIONAL DEFINITIONS

**Spinal cord injury:** It is trauma to the spinal cord either through a blow, fall, assault or malignant tumors resulting to cord compression or complete severance, thereby interfering with the motor and sensory functioning of the area below the injury site.

**Paraplegia:** This term refers to impairment or loss of motor and/or sensory function in the thoracic, lumbar or sacral (but not cervical) segments of the spinal cord, secondary to damage of neural elements within the spinal canal. With paraplegia, arm functioning is spared, but, depending on the level of injury, the trunk, legs and pelvic organs may be paralyzed.

**Quadriplegia:** Refers to a condition where the spinal cord is injured at a cervical level, resulting in partial or complete loss of function to the upper and lower limbs.

**Incomplete injury**

The presence of some sensory or motor function below the primary level of the injury

**Complete injury**

There is no function or sensation below the level of the injury

**Rehabilitation:** It is a process of helping a person who has suffered injury to restore adaptation skills and regain self- sufficiency.

**Depression**

This is a psychological state characterized by low moods, sadness, fatigue, motor retardation or agitation, loss of weight and lack of pleasure in previously pleasurable activities.

**ACRONYMS**

**SCI**- spinal cord injury

**PHQ-9**- Patient health questionnaire-9

**DSM-IV -**Diagnostic and statistical manual for mental disorders edition 4.

**WHO**- World Health Organization

**NSCISC**- National spinal cord injury statistical centre

**DASS-21**-Depression, anxiety and stress scale with 21 subscales

**POMS-** Profile of mood states

**PTSD-**Posttraumatic stress disorder

**BDI**- Beck Depression Inventory

**HADS-**Hospital anxiety and anxiety scale

# CHAPTER 1

## INTRODUCTION:

### Background of the Study

Spinal cord injury (SCI) is a major public health issue in developed countries as well as worldwide (Jia, 2011). A significant increase of the SCI incidence has been experiencedas a result of increased road traffic accidents, civil wars and terrorist attacks experienced globally.

Road traffic accident is the major cause of spinal cord injuries in the developed and developing countries followed by fall from heights. Motor traffic injuries are recognized as a major public health problem in developing countries and they continue to cause morbidity, mortality and disability in Sub Saharan Africa (Tarimo, 2012). According to the researcher, majority of the patientstreated at spinal injury hospital have been reported to have sustained the spinal cord injury through road traffic accidents.

Patients with spinal injury are faced by a myriad of challenges; physical, psychological, financial as well as social challenges. Existing literature documents high rates of depression and psychological morbidity following spinal cord injury, with the probable rate for major depression 3 times higher in people with spinal cord injury than in general population(Fann, 2011).

Majority of studies have been done on the prevalence of psychiatric morbidity among spinal cord injury patients mainly in the developed countries with scanty literature in the developing countries; Kenya included (Craig et al, 2008; Hoffman, 2011; Kaguchia, 2005). This study however aimed at determining the correlates of depression in spinal cord injury patients at the National Spinal injury hospital, Nairobi.

## STATEMENT OF THE PROBLEM

There has been increased number of road traffic accidents and terrorist attacks in Kenya resulting in loss of lives while those who survive are maimed, many of them sustaining spinal cord injuries. Spinal cord injury is generally a traumatic and life threatening event with a high risk of negative psychological states, which are associated with factors such as pain, poor sleep and feelings of helplessness. A previous study in Kenya (Kaguchia,2005) on psychiatry morbidity in persons with spinal cord injury found the prevalence of depression to be 17.2%. The present study aimed at determining the correlates of depression among spinal cord injury patients at the National spinal cord injury hospital.

The success of the biopsychosocial model of treatment of patients with spinal cord injury will heavily depend on assessment of the various risk factors that are associated with poor health and thus the purpose of this study was to determine the correlates of depression among patients with spinal cord injury.

## OBJECTIVES OF THE STUDY

### General Objective

The main objective of this study was to determine the correlates of depression among persons with spinal injuries in National Spinal Injury Hospital, Nairobi.

### Specific Objectives:

1. Assess the prevalence of depression among the participants.
2. To determine the risk factors for depression in persons with spinal cord injury.

## Research Questions

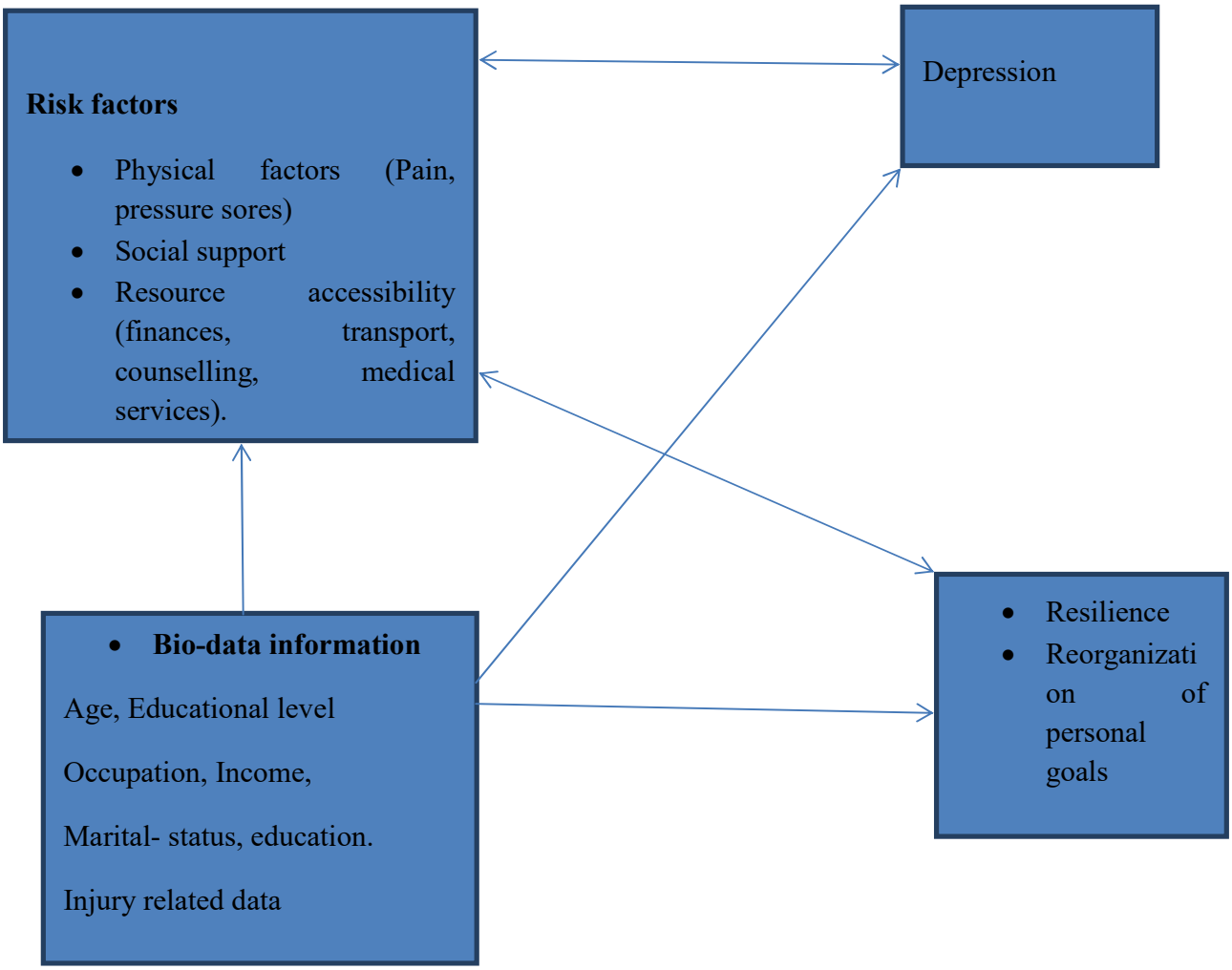
1. What is the prevalence of depression among the participants?
2. What are the risk factors for depression in persons with spinal cord injury?

## Significance/ Rationale

- Traditionally, the treatment plan for persons with SCI has focused more on physical and medical treatments. The findings of this study will further support the biopsychosocial model of intervention in the management of persons with spinal cord injury for better treatment outcomes.
- Early identification of the depression and comorbid psychological illnesses will improve the treatment outcomes and reduce hospital visits for persons with spinal injury.

- The findings of this study will provide baseline scientific evidence that will enhance the existing strategies to support people with SCI participate actively in the community.

**CONCEPTUAL MODEL**



## CHAPTER 2

## LITERATURE REVIEW:

### Concept of spinal cord injury

Spinal cord injury (SCI) is a chronic neurological disorder that involves the cord being severely bruised, lacerated, or severed during a traumatic injury or damaged as a result of disease. Most injuries to the spinal cord in adults involve damage to the surrounding protective vertebral column, consisting of the cervical, thoracic, lumbar, sacral, and the coccygeal vertebrae

Extreme damage to the spinal cord leads to loss of sensation and paralysis of voluntary muscles, resulting in reduced mobility and independence in activities of daily living and impairment of social and vocational skills. Potential negative influences on respiratory, cardiovascular, urinary, gastrointestinal, and reproductive systems may also occur.

### Incidence

It is estimated that the annual incidence of spinal cord injury, not including those who die at the scene of the accident is approximately 40 cases per million population in the U.S or approximately 12,000 new cases each year (NSCISC, 2012).

A study on the global incidence rate (Lee, 2013), reported 29 cases per million people in Sub Saharan Central Africa and 21 per million in Sub-Saharan East Africa.

According to the unpublished data from the ministry of health, it is estimated that there are between 50,000 and 75,000 persons living with SCI with over 1,500 new cases recorded annually.

## Etiology

Spinal cord injuries can etiologically be divided into traumatic and non- traumatic. Traumatic SCI results from road traffic accidents, falls, assaults and sports. Non-traumatic SCI may result from infections like tuberculosis, tumors or inflammation.

Road traffic accidents account for the majority of persons sustaining traumatic SCI, which is evident both in developed and developing countries. Batsou (2008) &Koutsodontis (2011) in their studies reported Greece to have the highest car accident in Europe, with 32000 injured of whom 3200-3500 resulted in permanent disability.

Motor vehicle accidents have been reported as the most frequent cause for traumatic SCI followed by fall from a height and violence while non-traumatic SCI was perceived to be commonly caused by tuberculosis followed by malignant illnesses (Draulans, 2011).

According to the World Health Organization report "The Global Burden of Disease" 2008 update, road traffic accidents are projected to take third place in the rank order of disease and injury burden by the year 2030 among men aged 15- 44 years. There has also been an increase in TB spine (non-traumatic SCI) especially in developing countries, Kenya included.

## Demographic data

Demographically, men are more at risk of sustaining SCI as research indicates. A study by Siddall (2003) concluded that young adult males are at a higher risk of sustaining spinal cord injury. Another study conducted at Lagos, Nigeria (Obalum, 2009) also got similar findings. This

is also evident at National spinal injury hospital, Nairobi according to the researcher's observation.

**Consequences of spinal cord injury**

Patients with SCI usually have permanent neurological deficits and disabilities including, chronic pain (neuropathic), motor and sensory disorders, muscle flaccidity or spasticity, urinary and gastrointestinal complications, sexual disorders, pulmonary and urinary complications and pressure sores. Chronic pain has been reported to be one of the major symptoms associated with trauma including spinal cord injury. Studies by Pender (2006) indicate that people living with constant pain are four times more likely to suffer from depression or anxiety, and more than twice to report difficulty in dealing the working and social environment, compared to those without pain.

**Depression**

According to Diagnostic and Statistical Manual of Mental Disorders edition four (APA, 2000), a diagnosis of a depressive disorder requires a minimum number of symptoms presenting for at least 2 weeks. Major depressive diagnosis is diagnosed based on the presence of a depressed mood and or loss of interest, significant weight loss, insomnia or hypersomnia, psychomotor agitation or retardation, fatigue, feelings of worthlessness, indecisiveness or inability to concentrate, and recurrent thoughts of death or suicide.

According to studies, nearly half of the population with SCI suffers mental health problems of depression, anxiety, clinical stress or posttraumatic stress disorder (Migliorini, 2008).

**Loss of employment**

Loss of employment or ability to work is a particularly significant problem for trauma patients as it affects financial status, life roles and social interactions. Although physical disabilities affect an individual's ability to return to work after the injury, several studies have found that mental and emotional problems after injury are significant determinants in return to work and may have more influence than the physical factors (McCrimmon, 2006)

**Review of Previous Studies**

Included in this section are the previous studies on depression and anxiety among persons with spinal cord injury by different researchers; globally, regional and locally.

Depression and anxiety disorders and/or symptoms are commonly reported after SCI. Despite a conceptual distinction between depression and anxiety, clinically differentiating the two constructs has proven difficult, as people who experience anxiety are often depressed as well. (Mergl, 2007) found that depression without comorbidity occurred significantly less than expected by chance. Further, a high comorbidity odds ratio (6.25) between depressive and anxiety disorders was found, leading to the conclusion that depression and anxiety comorbidity occurs more often than expected.

According (Craig, 2008) study on the relationship between SCI and negative psychological states, the profile of mood states (POMS) showed that the SCI participants had raised levels of psychopathology; with 20% having elevated negative psychological states typical of people with a psychiatry disorder.

(Migliorini , 2009) used DASS-21 to examine the likelihood of depression, anxiety and stress in adults with non-traumatic SCI and comparing them with those with those with traumatic SCI. The overall prevalence of adverse mental health problems defined by scoring above DASS- 21 cutoffs, were depression 37%, anxiety 30% and clinically significant stress 25%. Further to that, general demographic and injury related characteristics did not show any significant association with the mental health of adults with SCI.

A study conducted in Kenya (Kaguchia, 2005) equally found significant levels of psychiatric disorders among patients with SCI though at lower levels compared with other studies done elsewhere. Kaguchia used the DSM-IV (APA, 2000) to make the diagnosis. PTSD was diagnosed in 23.4% of the subjects, depression 17.2% and generalized anxiety at 5% of the patients. He also noted that despite the psychiatry comorbidities among patients with SCI this was not featured in the management plan of the patients.

Various studies have shown that certain characteristics of SCI for example pain, are associated with negative mood states among the SCI patients. A studyassessing mood states in relation to pain intensity (Rodrigues, 2013) found that high pain intensity subgroup had significantly elevated anxiety, depression, anger, fatigue, confusion and significantly reduced vigor. The results provided further evidence that patients with SCI experience clinically elevated negative mood states if they have intense levels of pain over extended periods of time.

A study by (Rafta, 2012) investigated the relation between gender, socio-demographic factors, pain and the level of anxiety and depression and the HADS scores showed high levels of anxiety and depression among patients with pain than those who had no pain. Women were shown to be at significantly high risk of having anxiety and depressive symptoms and those with high levels of education had high levels of anxiety and depression than those with low levels of education.

(Zang ,2012) study concurred with findings of a study by Rafta, the same year (2012), which found women to be at a higher risk of suffering probable anxiety as compared to men.

(Kemp, 2004) noted that depression is not simply a necessary consequence of sustaining a SCI and that not all who sustain a SCI become depressed. (Tirch, 1999) studied depressive symptoms in 11 pairs of monozygotic twins where one of the pair had sustained a SCI and concluded that SCI does not inevitably lead to increased depression.

(Kemp, 2004) study reported little relationship between depression and the level of SCI or the completeness of the lesion. On the same note, (Hall et al. 1999) study similarly found individuals with quadriplegia reporting high self- esteem and quality of life; with 95% feeling they were "glad to be alive".

Bombardier et al (2012) study findings associated severe depression with age, level of education, unemployment and the number of years post spinal cord injury. This study had some simmilarity with the findings of Krause et al (2000) which reported some relationship between levels of ducation, years since injury and depression.

Studies have suggested that social support serve as a protective factor against depression andhaving sufficient social support reported lower levels of depression(Ibrahimi, 2012). Social support is an integral element for social integration and the latter is compromised by negative outcomes associated with depression among patients with spinal cord injuries(Burns, 2011).

Self efficacy has been defined as a person's belief or a sense of confidence in his or her ability to perform a particular task or behavior successfully in the future(Bandura, 1977). People with spianl cord injury have been found to have significantly elevated levels of depressive mood and poor self- efficacy. Low self efficacy was further shown to have significantly elevated levels of

depression among spianl cord injury participants in comparison to those with high levels of efficacy(Craig, 2013).

**Summary of Literature Review**

Road traffic accident is the leading cause of spinal cord injury followed by falls and violence. Young males of between 15 and 44 years are more prone to sustaining spinal cord injury. Spinal cord injury is associated with elevated levels of negative psychological states, depression having been reported to range between 15 and 30%.Spinal cord injury per se does not cause depression but the consequences of spinal cord injury like pain, loss of employment and the related issues are the real cause of depression. Women have been reported to have a higher prevalence for depression as well as people with increased pain intensity scales. Social support and self-efficacy have been reported to be significantly related to depression. Majority of studies have been done in the developed countries with very few studies in the developing countries. This study will determine the correlates of depression which has been reported to be most prevalent among spinal cord injury patients. The study will also add to the existing research information.

# CHAPTER 3:

# 3.0: STUDY DESIGN AND METHODOLOGY

## 3.1 Study Design

This was a descriptive cross-sectional study on the correlates of depression among spinal cord injury patients in the National Spinal Injury Hospital, Nairobi.

### 3.2 Study Area Description

Spinal injury hospital is a national referral hospital which specializes in rehabilitation of patients with spinal cord injuries. It is the only unit in Eastern and Central Africa. It was established in 1944 for the rehabilitation of World War 2 victims and later taken over by the Government of Kenya in 1964.

It is located on Lenana Road, Kilimani, Nairobi county in Kenya. It has a bed capacity of 30 patients and receives referrals from various hospitals in the country as well as from neighbouring countries.

Spinal injury hospital also offers other services like orthopaedic, dental, nutrition, counselling, social work, occupation therapy, physiotherapy, nursing, theatre etc. all forming a multidisciplinary team in the rehabilitation process. It has a work force of 175 workers

### 3.3 Study Population

The study population included all patients attending Spinal Injury hospital outpatient department having sustained spinal injuries with one year and above post injury. The study participants included patientscoming for rehabilitation, doctor's review, disability assessment and those seeking treatment or admission.

The total population of patients with spinal cord injury in the hospital is about 300, inpatient and outpatient included. The patients seen at the outpatient physiotherapy department ranges between 10 and 15 per day, a week. There are also a number of other patients referred from other health facilities whose number is not constant.

**Inclusion Criteria**

1) All patients with spinal cord injury with over one year post injury.

2) Able to communicate in English and Kiswahili languages.

3) Those willing to participate in the study by signing the consent.

**Exclusion Criteria**

1) Patients with moderate to profound mental retardation

2) Patients with active psychopathology.

3) Patients under the age of 18 years.

**Sample Size Determination**

The sample size was determined using Cochrane's formula:

$$n=\underline{Z^2(p)(q)}/d^2$$

N = the desired sample size

**Z** =refers to the confidence limits of the survey results or the standard normal deviation on a normal curve at the required confidence level of 95%, which corresponds to Z scores of 1.96.

**P=** refers to the proportion of the target population estimated to have characteristics being measured. The researcher will use a prevalence of 17% as found by (Kaguchia, 2005), a study done in Kenya.

**D=** refers to the desired precision of the estimate, the level of statistical significance. This means that your results are accurate within a range of plus or minus 5%).

So, using these figures in the equation above, we get:

$$N=\frac{(1.96^{2})(0.17)(0.83)}{.05^{2}} = 216.81 = 217$$

Given this calculation, the researcher needed a sample size of 217 to be 95 percent confident of our overall results, within a range of plus or minus 5 percent. That is to say, n = 217 is the sample size to be used for the observed percentages to be within plus or minus 5 percent of the unknown population parameter.

In this study, the target population of persons with spinal cord injury at Spinal injury hospital was less than 10,000. Hence the final sample estimate (nf) was calculated using the following formula (Mugenda, 2003):

nf=n/1+n/N

Nf= 217/1+217/300

nf= 125.94

=126

**Sampling Method**

Convenience sampling technique was used to recruit the study participants. The researcher purposively targeted the participants on the basis of having spinal cord injury. This means that all those patients with spinal injuries either visiting the hospital for rehabilitation, assessment or doctor review were approached for recruitment. The researcher identified the diagnosis of the participants and other clinical data using the patient's file.

The criteria for exclusion was explained to the participants to prevent the willing participants from feeling discriminated against. A consent formwas made available by the researcher and a clear explanation made on the nature of the study, theobjectives, time the study was to be carried outand the benefits to be accrued from the study. Those that met the criteria of inclusion and were willing to sign the consent were included in the study.

### 3.4 Data Collection

#### Instruments

Data was collected using structured questionnaires purposely prepared for this particular study. A questionnaire for socio-demographic profile of the participants included age, gender, marital status, employment status, education levels and current monthly income. This was purposely prepared by the researcher for this study.

The second part included a researcher designed questionnaire with questions related to the injury; services accessed; coping strategy; support systems and the impact of the injury. The participants were required to tick the choices that applied to them in the specific questions.

Pain intensity was measured using a Numerical Rating Scale (NRS) developed by McCaffey (1993). Pain intensity is assessed on a scale of 11 points; **no pain** at "0";**Mild pain** at "1-3";

**moderate pain** at “4-8” and **worstpossible pain** at “9 -10”. This is a self- reporting scale and has been used in clinical and research populations successfully especially post-operative, oncology, back pain and pain on lower limbs. NRS have been shown to have good test retest reliability and adequate validity in terms of associations with other pain measures and treatments (Jensen, 1999).

A score of 0 indicated “no pain”; 1- 3 indicated “mild pain”; 4 -8 indicated “moderate pain while a score of 9- 10 indicated “severe pain”. NRS has a record of strong psychometric performance among persons with spinal cord injury according to (Hanley, 2006).

Depression level was screened using the Patient Health Questionnaire (PHQ-9) by Spitzer, (1993). He adapted the PHQ-9 from Primary care evaluation of mental disorders (Prime-Med). It can be used to make a diagnosis, based on DSM-IV criteria for depression and also measures the severity of depression. This is a self- report measure on 4 scales; Not at all=0,Several days=1, More than half the days=2 and Nearly every day=3. The report is given to cover the last two weeks.

The sum total of the reported scales gives the total depression score for the individual participant.

Scores of 1-4=minimal depression; Scores of 5-9= Mild; Scores of 10-14= moderate; Scores of 15- 19= moderately severe; Scores of 20- 27= Severe depression.

Omoro et al, 2006, translated the English language PHQ depression scale into Swahili and then validated this scale in Kenyan among the head and neck cancer patients, adhering to established International quality of Life Association (IQOLA) guidelines. The Swahili PHQ-9 had a good test retest reliability with a correlation coefficient of 0.71 and an internal consistency of 0.80 (cronbanch’s alpha). It is a reliable scale in Kenyan head and cancer patients and a valuable tool

in screening for and monitoring depression as a function of quality of life in these patients. Thus the tool can equally be used among spinal cord injury patients.

**Data Collection Procedure:**

Letters of clearance were obtained from the KNH/UON Ethics and Research committee and the relevant authorities in the ministry of health and National Spinal Injury Hospital after which apretesting (piloting) was done by the researcher two weeks prior to the actual study to assess the feasibility of the study.

In preparation for the actual data collection, the researcher requested for a memo from the hospital administrator informing the staff of the intended study and dates so as to be ready for the participants as they come for services. The researcher's desk was positioned strategically at a central area between the doctor's clinics, outpatient department and the gymnasium. The researcher had put posters directing the patients from these areas to the desk. The researcher did self- introduction and explained the study objectives, procedure and benefits of the study. The inclusion criteria and exclusion criteria for participation was then explained. Those who met the criteria were recruited upon signing an Informed consent. The participants who signed the consent filled were engaged in the interview by the researcher starting with the socio demographic data and the clinical data, pain intensity instrument and finally the screening tool for depression. Theinstruments were researcher administered to reduce the time spent in filling in the questionnaires. Other participants signed the consent for participation and promised to fill in the questionnaire on another appointment due to the nature of their injury. The researcher thanked the participants upon completion of filling in the questionnaire and those who required interventions were referred to the appropriate hospital personnel for assistance. Data collection

took the researcher two (2) months in accordance with the permission letter granted by the institution. The information was kept safely ready for analysis and the researcher thanked the management and staff for their support during the whole exercise.

The participants who were found to be clinically depressed were referred for treatment and follow-up by the clinicians within the hospital and those with mild levels of depression were referred for psychotherapy by the counsellors working in the hospital.

**Ethical consideration**

Prior to the commencement of the proposed study, the research protocol was approved by KNH/UON Ethics and research committee. The aims and objectives of the study along with its procedure, risks and benefits of this study and the expected time of the study was explained to the participants in easily understandable language and then informed consent was taken from each participant.

The participants were assured that all information and records was to be kept confidential and the procedure was to be used only for research purposes. The participants were assured that the findings would be helpful for developing policy to increase the spinal injury related knowledge among the service providers as well as improving service provision.

The researcher clearly explained to the study participants that there would be no monetary compensation for participation and that they will only benefit from psychotherapy intervention where need be and possible referrals for appropriate clinical interventions.

Any other concerns or questions regarding the proposed study would be answered and the researcher also gave the contacts in case of future correspondences.

### 3.5: Data Management and Statistical Analysis

In preparation for data analysis, the researcher prepared dummy tables in advance to help bridge research questions with data analysis.

The collected data was coded using the Statistical Package for Social Sciences version 20 (SPSS 20).Descriptive statistics were used to summarize data using frequency tables and graphs.

Categorical data was analyzed by Chi- Square (x2) statistic. The statistical significance was set at $<0.05$.

Further, multivariate analysis was done to show the level of significance between the predictor variables (quadriplegic type of injury, social support systems, self- efficacy and pain intensity) and depression, using logistic regression analysis. The significance level was set at 5%.

## 4.0: RESULTS

## 4.1: DESCRIPTION OF THE STUDY PARTICIPANTS

### TABLE 4.1.1:SOCIODEMOGRAPHIC CHARACTERISTICS

| Variable | Category | N | % |
|---|---|---|---|
| **Age in years** | 18-28 | 35 | 25.2% |
| | 29-39 | 55 | 39.6% |
| | 40-50 | 34 | 24.5% |
| | over 50 | 15 | 10.8% |
| **Marital status** | Single | 49 | 35.3% |
| | Married | 71 | 51.1% |
| | Separated | 16 | 11.5% |
| | Widowed | 3 | 2.2% |
| **Gender** | Male | 103 | 74.1% |
| | Female | 36 | 25.9% |
| **Level of education** | No education | 3 | 2.2% |
| | Primary | 36 | 25.9% |
| | Secondary | 46 | 33.1% |
| | College | 54 | 38.8% |
| **Occupation status** | Formally employed | 36 | 25.9% |
| | Unemployed | 25 | 18.0% |
| | Self employed | 78 | 56.1% |
| **Income per month** | None | 0 | 0.0% |
| | Below 10000 | 24 | 17.3% |
| | 11000- 30000 | 38 | 27.3% |
| | 31000- 50000 | 57 | 41.0% |
| | 0ver 50000 | 20 | 14.4% |

Majority of the participants were males 103 (74.1%), with the highest proportion 59 (39.6%) aged between 29- 39 years of age. A large proportion 71 (51.1%) reported to be married and 54 (38.8%) educated to college level. Over half of the participants 78(56.1%) were self- employed; and the highest proportion 57 (41%) reported to be earning between 31000 and 50000 Kenya Shillings.

**TABLE 4.1.2: INJURY RELATED INFORMATION**

| Variable | Category | N | % |
|---|---|---|---|
| **Years of injury** | 1-2 | 50 | 36.0% |
| | 3-4 | 57 | 41.0% |
| | 5-6 | 19 | 13.7% |
| | 7 and above | 13 | 9.4% |
| **Cause of injury** | Road traffic accident | 96 | 69.1% |
| | Fall | 22 | 15.8% |
| | Assault | 2 | 1.4% |
| | Disease | 19 | 13.7% |
| **Injury type** | Paraplegia | 104 | 74.8% |
| | Quadriplegia | 35 | 25.2% |

**TABLE 4.1.3: INJURY RELATED COMPLICATIONS**

| | | n | % |
|---|---|---|---|
| Number of complications | 0 | 33 | 23.7% |
| | 1 | 75 | 54.0% |
| | 2 | 17 | 12.2% |
| | 3 | 14 | 10.1% |
| Urinary complication | | 68 | 48.9% |
| Constipation | | 45 | 32.4% |
| Pressure sores | | 38 | 27.3% |

Table 4.1.2 illustrates the injury related factors whereas Table 4.1.3 shows complications resulting from these injuries.Most of the participants 57 (41%) were 3-4 years post injury; majority 96 (69.1%) sustained the injury through road traffic accidents and the paraplegic patients were 104 (74.8%), almost 3 times the number of quadriplegic patients 35(25.2%). The highest majority of the participants 68 (48.9%) reported to have suffered urinary complications; constipation 45 (32.4%) and pressure sores 38 (27.3%).

**TABLE 4.1.4: RESOURCES**

| Social support system | n | % |
|---|---|---|
| Spouse | 61 | 43.9% |
| Family | 114 | 82.0% |
| Colleagues | 24 | 17.3% |
| Friends | 63 | 45.3% |
| **Services available** | **n** | **%** |
| Counselling | 64 | 46.0% |
| Medical | 137 | 98.6% |
| Transport | 45 | 32.4% |
| Legal | 10 | 7.2% |
| **Coping Mechanisms** | **N** | **%** |
| Support groups | 34 | 24.5% |
| Self-efficacy | 77 | 55.4% |
| Spiritual intervention | 101 | 72.7% |
| other ways of coping | 23 | 16.5% |

Table 4.1.4 illustrates the resources that were reported to be available to the study participants during recovery. Family support system was available to majority of the participants 114 (82%), with less than half of them receiving support from spouses 61 (43.9%) and friends 63 (45.3%); almost all the participants 137 (98.6%) reported to have accessed medical services, 64 (46%) received counseling services with only 10 (7.2%) accessing legal services. Spiritual intervention was the most employed coping mechanism among the participants with 101 (72.7%) reporting to have sought spiritual intervention. Over half of the respondents indicated that they employed self-efficacy as a coping mechanism 77 (55.4%).

**TABLE 4.1.5: EFFECT OF INJURY**

| Impact of injury | N | % |
|---|---|---|
| **Became stronger** | 39 | 28.1% |
| **Set new goals** | 75 | 54.0% |
| **Multiple losses** | 37 | 26.6% |
| **Immobilized** | 27 | 19.4% |

**FIGURE 4.1.6:PAIN INTENSITY**

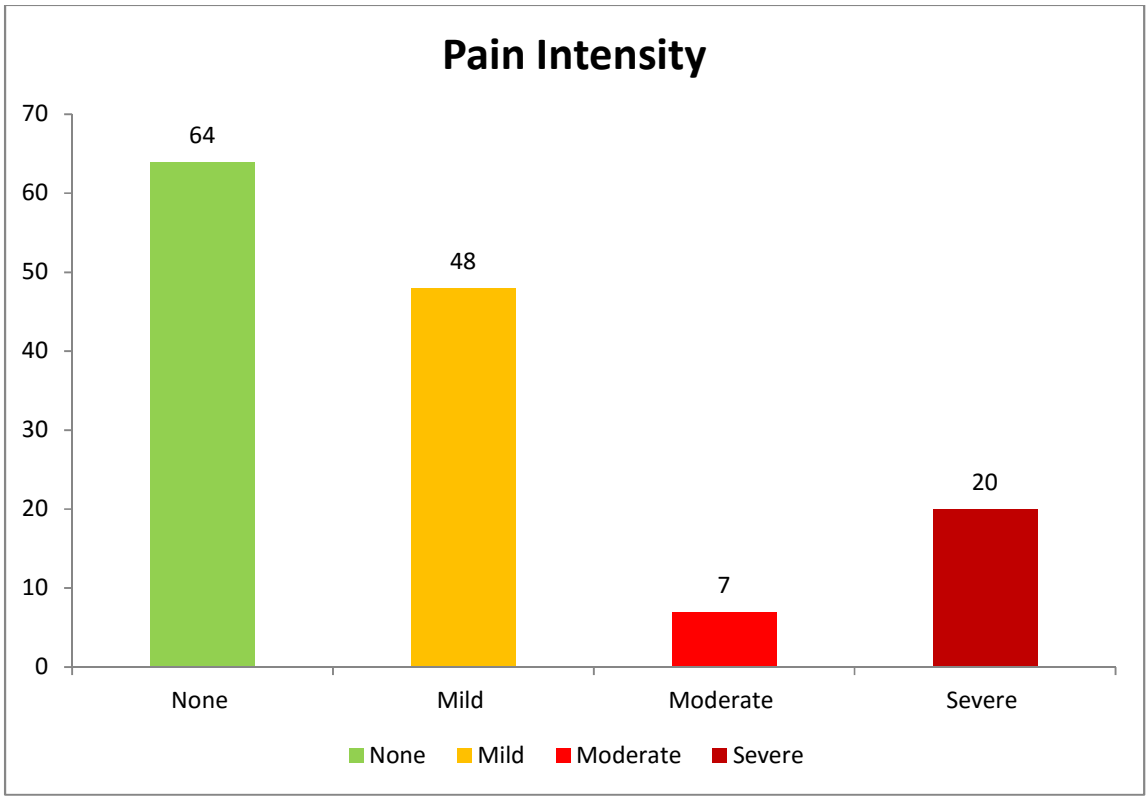



Table 4.1.5 shows the impact of the injury; with 75 (54%) reporting to have set new life goals after the injury and 27 (19.4%) reporting to have been immobilized by the injury. 48 (34.5%) of the participants reported to have mild pain; 7 (5%) moderate pain and 20(14.4%) severe pain as shown in Figure 4.1.6.

**TABLE 4.1.7: PREVALENCE OF DEPRESSION**

| | | n | % |
|---|---|---|---|
| **PHQ Category** | Score 0-4 "Minimal depression" | 103 | 74.1% |
| | Score 5-9 "Mild depression" | 33 | 23.7% |
| | Score 10-14 "Moderate depression" | 2 | 1.4% |
| | Score 15-19 "Moderately severe depression" | 1 | 0.7% |
| | Score 20-27 "Severe depression" | 0 | 0.0% |
| **Depression** | Not depressed | 103 | 74.1% |
| | Depressed | 36 | 25.8% |

Over half of the participants 103 (74.1%) reported to have minimum depression with scores of 0-4 on the PHQ scale; 33 (23.7%) had mild depression; 2 (1.4%) moderate depression and 1 (0.7%) reported moderately severe depression. Participants with a score of > 5PHQ scores were considered to have depression and thus the prevalence of depression among the study participants was 25.8%.

## 4.2.0 CORRELATES OF DEPRESSION (BIVARIATE ANALYSIS)

**TABLE 4.2.1:CORRELATION BETWEEN DEMOGRAPHIC FACTORS AND DEPRESSION.**

| Socio-demographic characteristics | | Depression | | | | | |
|---|---|---|---|---|---|---|---|
| | | Not depressed | | Depressed | | | |
| | | n | % | n | % | Chi square | P value |
| Age in years | 18-28 | 27 | 77.1% | 8 | 22.9% | 6.698 | 0.082 |
| | 29-39 | 42 | 76.4% | 13 | 23.6% | | |
| | 40-50 | 27 | 79.4% | 7 | 20.6% | | |
| | over 50 | 7 | 46.7% | 8 | 53.3% | | |
| Marital status | Single | 35 | 71.4% | 14 | 28.6% | 4.950 | 0.175 |
| | Married | 50 | 70.4% | 21 | 29.6% | | |
| | Separated | 15 | 93.8% | 1 | 6.2% | | |
| | Widowed | 3 | 100.0 % | 0 | 0.0% | | |
| Gender | Male | 79 | 76.7% | 24 | 23.3% | 1.399 | 0.272 |
| | Female | 24 | 66.7% | 12 | 33.3% | | |
| Level of education | No education | 0 | 0.0% | 3 | 100.0 % | 10.190 | **0.017** |
| | Primary | 28 | 77.8% | 8 | 22.2% | | |
| | Secondary | 32 | 69.6% | 14 | 30.4% | | |
| | College | 43 | 79.6% | 11 | 20.4% | | |
| Occupation status | Formally employed | 28 | 77.8% | 8 | 22.2% | 1.679 | 0.432 |
| | Unemployed | 16 | 64.0% | 9 | 36.0% | | |
| | Self employed | 59 | 75.6% | 19 | 24.4% | | |
| Income per month | None | 0 | 0.0% | 0 | 0.0% | 2.516 | 0.472 |
| | below 10000 | 15 | 62.5% | 9 | 37.5% | | |
| | 11000- 30000 | 30 | 78.9% | 8 | 21.1% | | |
| | 31000- 50000 | 42 | 73.7% | 15 | 26.3% | | |
| | 0ver 50000 | 16 | 80.0% | 4 | 20.0% | | |

Although people who were above 50 years old, female gender, being married, having lower level of education, unemployment and lower levels of income showed a higher prevalence for depression, only lower level of education had a statistically significant association with depression (p=0.017)as shown in Table 4.2.1

### 4.2.2: CORRELATION BETWEEN INJURY RELATED FACTORS AND DEPRESSION

| Injury related characteristics | | Depression | | | | | |
|---|---|---|---|---|---|---|---|
| | | Not depressed | | Depressed | | | |
| | | n | % | n | % | Chi square | P value |
| Years of injury | 1-2 | 34 | 68.0% | 16 | 32.0% | 19.429 | **<0.0001** |
| | 3-4 | 50 | 87.7% | 7 | 12.3% | | |
| | 5-6 | 15 | 78.9% | 4 | 21.1% | | |
| | 7 and above | 4 | 30.8% | 9 | 69.2% | | |
| Cause of injury | RTA | 68 | 70.8% | 28 | 29.2% | 2.148 | 0.542 |
| | Fall | 18 | 81.8% | 4 | 18.2% | | |
| | Assault | 2 | 100.0% | 0 | 0.0% | | |
| | Disease | 15 | 78.9% | 4 | 21.1% | | |
| Injury type | Paraplegia | 83 | 79.8% | 21 | 20.2% | 7.009 | **0.008** |
| | Quadriplegia | 20 | 57.1% | 15 | 42.9% | | |

Increased years posts injury (P<0.0001) and being quadriplegic (P= 0.008) were significantly related to depression; with those over 7 years of injury and quadriplegic patients having higher prevalence of depression (69.2% and 42.9%) respectively.

**TABLE 4.2.3: CORRELATION BETWEEN INJURY RELATED COMPLICATIONS AND DEPRESSION.**

| Complications | | Depression | | | | | |
|---|---|---|---|---|---|---|---|
| | | Not depressed | | Depressed | | | |
| | | n | % | n | % | Chi square | P value |
| Urinary complication | No | 50 | 70.4% | 21 | 29.6% | 1.023 | 0.312 |
| | Yes | 53 | 77.9% | 15 | 22.1% | | |
| Constipation | No | 67 | 71.3% | 27 | 28.7% | 1.207 | 0.272 |
| | Yes | 36 | 80.0% | 9 | 20.0% | | |
| Pressure sores | No | 80 | 79.2% | 21 | 20.8% | 5.021 | **0.025** |
| | Yes | 23 | 60.5% | 15 | 39.5% | | |
| Number of complications | 0 | 21 | 63.6% | 12 | 36.4% | 6.870 | 0.076 |
| | 1 | 62 | 82.7% | 13 | 17.3% | | |
| | 2 | 10 | 58.8% | 7 | 41.2% | | |
| | 3 | 10 | 71.4% | 4 | 28.6% | | |

| Pain intensity | Depression | | | | | |
|---|---|---|---|---|---|---|
| | Not depressed | | Depressed | | | |
| | n | % | n | % | Chi square | P value |
| None | 52 | 81.2% | 12 | 18.8% | 9.029 | **0.029** |
| Mild | 37 | 77.1% | 11 | 22.9% | | |
| Moderate | 4 | 57.1% | 3 | 42.9% | | |
| Severe | 10 | 50.0% | 10 | 50.0% | | |

Among the injury related factors, having pressure sores as a complication was significantly related to depression prevalence (P=0.025) with a significant difference between those with pressure sores and those who did not (39.5%; 20.8%).

Pain intensity was significantly related to depression (P=0.029). Those who reported to have severe pain intensity hadhigher depression prevalence (50%) than those without pain (18.8%).

### 4.2.4: CORRELATION BETWEEN ACCESIBILITY OF SERVICES AND DEPRESSIONTABLE

| Services | | Depression | | | | | |
|---|---|---|---|---|---|---|---|
| | | Not depressed | | Depressed | | | |
| | | n | % | n | % | Chi square | P value |
| Counselling services | No | 56 | 74.7% | 19 | 25.3% | 0.027 | 0.869 |
| | Yes | 47 | 73.4% | 17 | 26.6% | | |
| Medical services | No | 0 | 0.0% | 2 | 100.0% | 5.806 | 0.016 |
| | Yes | 103 | 75.2% | 34 | 24.8% | | |
| Transport services | No | 69 | 73.4% | 25 | 26.6% | 0.073 | 0.786 |
| | Yes | 34 | 75.6% | 11 | 24.4% | | |
| Legal services | No | 99 | 76.7% | 30 | 23.3% | 6.529 | 0.011 |
| | Yes | 4 | 40.0% | 6 | 60.0% | | |

There was a significant difference in depression prevalence between those who accessed medical services and those who did not (P= 0.016). Over half of the participants who got medical services, only a small proportion (24.8%) had depression; while a large proportion (100%) of those who did not get medical services got depressed. On the contrary, there was a significant negative correlation between those who received legal services and those who did not (P=0.011); a large proportion (60%) of those who received legal services had depression as compared to 23.3% of those who did not get the services.

**TABLE 4.2.5: CORRELATION BETWEEN SOCIAL SUPPORT SYSTEMS AND DEPRESSION**

| Support system | | Depression | | | | | |
|---|---|---|---|---|---|---|---|
| | | Not depressed | | Depressed | | | |
| | | n | % | n | % | Chi square | P value |
| Spouse support | No | 54 | 69.2% | 24 | 30.8% | 2.196 | 0.138 |
| | Yes | 49 | 80.3% | 12 | 19.7% | | |
| Family support | No | 20 | 80.0% | 5 | 20.0% | 0.553 | 0.457 |
| | Yes | 83 | 72.8% | 31 | 27.2% | | |
| Colleagues support | No | 83 | 72.2% | 32 | 27.8% | 1.288 | 0.256 |
| | Yes | 20 | 83.3% | 4 | 16.7% | | |
| Friends support | No | 54 | 71.1% | 22 | 28.9% | 0.812 | 0.368 |
| | Yes | 49 | 77.8% | 14 | 22.2% | | |
| Number of support systems | 1 | 39 | 66.1% | 20 | 33.9% | 9.837 | **0.007** |
| | 2 | 33 | 75.0% | 11 | 25.0% | | |
| | 3 | 28 | 96.6% | 1 | 3.4% | | |

There is a negative correlation between social support and depression prevalence (P= 0.007) and the more social support systems one has the lesser the prevalence for depression. Those who had the most support systems reported to have the least prevalence of depression (3.4%) than those who had only one support system (33.9%).

**TABLE 4.2.6: CORRELATION BETWEEN COPING MECHANISMS AND DEPRESSION**

| Coping mechanisms | | Depression | | | | | |
|---|---|---|---|---|---|---|---|
| | | Not depressed | | Depressed | | | |
| | | n | % | n | % | Chi square | P value |
| Support groups | No | 82 | 78.1% | 23 | 21.9% | 3.569 | 0.059 |
| | Yes | 21 | 61.8% | 13 | 38.2% | | |
| Self-efficacy | No | 40 | 64.5% | 22 | 35.5% | 5.357 | 0.021 |
| | Yes | 63 | 81.8% | 14 | 18.2% | | |
| Divine intervention | No | 28 | 73.7% | 10 | 26.3% | 0.005 | 0.945 |
| | Yes | 75 | 74.3% | 26 | 25.7% | | |
| Other ways of coping | No | 88 | 75.9% | 28 | 24.1% | 1.133 | 0.287 |
| | Yes | 15 | 65.2% | 8 | 34.8% | | |

There was a significant difference in depression between those who developed self -efficacy and those who did not (P=0.021). 35.5% proportion of those who did not develop self- efficacy had depression against 18.2% proportion of those who developed self- efficacy. There was no significance between depression and other mechanisms of coping.

**TABLE 4.2.7: MULTIVARIATE ANALYSIS**

| | Coefficient | S.E. of coefficient | P value | OR | 95% C.I.for OR [Lower - Upper] |
|---|---|---|---|---|---|
| **Quadriplegiainjury** | 1.397 | .557 | .012 | 4.044 | [1.357 - 12.051] |
| **Decreased support systems** | -1.139 | .444 | .010 | .320 | [0.134 - 0.764] |
| **Lack of self-efficacy** | -1.486 | .616 | .016 | .226 | [0.068 - 0.757] |
| **Increased pain intensity** | 1.133 | .288 | .000 | 3.104 | [1.765 - 5.46] |

On multivariate analysis, the following factors were independently associated with depression; being quadriplegic, having decreased support systems, lack of self- efficacy and increased pain intensity.

Quadriplegic patients were 4 times more likely to develop depression(OR 4.044 [95% C.I of OR 1.357- 12.051], P= 0.012). For each increase in pain intensity category, risk for depression increased 3-fold, (OR 3.104 [95% C.I of OR 1.765- 5.46], P< 0.05).

There was a negative association between depression and decreased support systems (OR .320 [95% C.I of OR 0.134- 0.764], P=0.010) as well as between depression and lack of self- efficacy; (OR0.226 [95% C.I of OR 0.068- 0.757], P=0.016).

## CHAPTER 5.0: DISCUSSION, CONCLUSION AND LIMITATIONS

### 5.1: DISCUSSION

The findings of this study indicate that depressive symptoms are common among spinal cord injury patients with a prevalence of 25.8%. This rate is slightly higher than that of a previous study in Kenya (Kaguchia, 2005) which reported a rate of 17.2% using Diagnostic and Statistical Manual 4$^{th}$ Edition (DSM-IV). The study findings concur with Kemp (2004) whose study findings indicated that depression is not necessarily a consequence of spinal cord injury, meaning that not all patients with spinal cord injury develop depressive symptoms. This means that there are other risk factors that may predispose a person to developing depression like being quadriplegic, lack of adequate social support and increased pain intensity.

The study findings show that majority of spinal cord patients were aged between 29and 39 years (39.6%) and males formed the highest proportion (74.1%) as compared to females (25.9%). This compares with Siddal (2003) whose study reported more young adult males to be more at risk of sustaining spinal cord injuries. Similar findings were reported in Nigeria (Obalum, 2009). The higher prevalence for spinal cord injuries among young males may be attributed to the fact that males are generally known to engage in risky behaviors for example on construction sites, mines and long distance drivers.

Spinal cord injury in the study was reported to be caused mainly by road traffic accidents (69.1%), followed by fall from a height (15.8%). similar to findings of other studies in Sub Saharan Africa (Draulans, 2011; Tarimo, 2012) as well as earlier studies conducted in Greece (Batsou, 2008;Koutsodontis, 2012).

Although the report findings indicated a probable risk for depression for those advanced in age, female gender and those with no education, there was no significant relationship between these factors and depression. This contrasts earlier studies (Krause, 2000, Rafat, 2012) who reported age, gender and socioeconomic factors as related to depression.

The nature of injury (quadriplegic), lack of adequate social support, low self-efficacy and increased pain intensity were reported to be significantly related to depression. Similarly, Pender (2009), reported people with constant pain to be 4 times more likely to suffer depression than those without pain. Rodrigues(2013) equally reported significantly elevated depression levels among those with high pain intensity.

The finding ofthe present study shows a significant relationship between depression and social support (P= 0.010). The participants who received less social supportwere reported to have a high risk for depression than those who had adequate support. Ibrahimi (2012) study findings equally reported lower levels of depression among study participants who received sufficient social support.

Lack of self- efficacy was reported to be significantly associated with depression in the present study (P= 0.016). The study findings show that the participants who had lacked self- efficacy were more at risk of developing depression than those who developed self- efficacy. This concurs with earlier study findings by Craig (2013) which reported low efficacy to be significantly associated with elevated levels of depression as compared to the participants who elicited high levels of self- efficacy.

## 5.2: CONCLUSION

The study shows that depression is a common comorbidity among spinal cord injury patients and identified risk factors as being quadriplegic, poor social support, lack of self- efficacy and severe pain intensity.

## 5.3: IMPLICATIONS

The study findings indicate there is need for enhanced support for spinal cord patients within the family and the community settings to ensure smooth adaptation and reduce chances of developing mental health disorders especially depression.

Pain management among spinal cord patients through biological and psychotherapeutic interventions will serve as a buffer against depression.

Health care workers, families and the community at large should be educated on measures that will boost the esteem to enhance self- efficacy among spinal cord injury patients as a measure to improve their mental status.

The study findings show that there is need for regular screening for mental health disorders among patients with spinal cord injury and integration of psychotherapeutic interventions within the primary health care settings.

## 5.4: RECOMMENDATIONS

There is need for furtherstudies with larger samples on the mental health status of patients with spinal cord injuryand interventions especially in the African context.

The researcher recommends capacity training for health professionals on the physical, psychological and social needs of patients with spinal cord injury in order to ensure a holistic approach in their care.

The ministry of health, both at the national and county levels should establish counselling centersran by qualified professionals to provide psychosocial support to spinal cord injury patients and families to promote smooth recovery and integration to the community.

Stringent measures should be put in place to curb road traffic accidents which is the major cause of spinal injury in Kenya.

## 5.5: LIMITATIONS

The choice of a cross sectional study design was a limitation since the participants completed just a single interview and changes over time were not measured.

The choice of the convenience method of sampling may have resulted to biased result findings which may not be generalized to the general population of patients with spinal cord injury.

The Patient Health Questionnaire (PHQ-9) Scale used to assess depressive symptoms consists of somatic symptoms (items) which are also common among spinal cord patients. This may give biased results or tend to raise the depressive symptom levels.

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**APPENDIX 1**

**Consent by the Medical Superintendent of Spinal Injury Hospital**

I…….being the Medical Superintendent of National spinal injury hospital, P.O Box…… have been explained the nature of the study by Mary Njeri Mbuthia of P.O Box 44090-00100 Nairobi; Tel 0721496874 as explained in the detailed consent. I do hereby give consent for persons with spinal cord injury treated at spinal injury hospital to participate in the study. I have also been made to understand that I can withdraw this consent any time before data collection should I find the exercise inconsistent with the agreed terms as explained to me before the study.

Name……

Signature…….

Date……..

Witnessed by

Name……

Signature……

**APPENDIX 2**

**Consent Explanation**

**Introduction**

My name is Mary Njeri Mbuthia. I am Master of Science in Clinical Psychology student at the University of Nairobi.

Permission is requested from you for enrollment in a clinical research study. You should understand the general principles, which apply to all in medical research, whether normal or patient volunteers:

1. Your agreement to participate is voluntary.
2. You may withdraw from the study at any time.
3. Refusal to participate will not involve any penalty or loss of benefits to which you are otherwise entitled.
4. After you read the explanation, please feel free to ask any questions that will allow you to understand clearly the nature of the study.

**Title:**"The correlates of depression among persons with spinal cord injury"

**Institution:** Department of Psychiatry, Faculty of Medicine, College of Health Sciences at the University of Nairobi.

**Investigator**: Mary Njeri Mbuthia

**Supervisors:** 1. Dr. Pius Kigamwa 2. Professor Caleb Othieno

**Objective of the study**: To assess the correlates of depression among persons with spinal injury.

**Procedure**: The study will not involve any physical invasion and thus no specimen will be taken from you. All that is required of you is to complete a questionnaire incorporating your socio- demographic data such as marital status, age, gender, occupation, educational status etc.; a self- rating questionnaire indicating the way you have been feeling in the past 2 weeks and a self- reported numerical pain intensity rating scale. The entire exercise will take less than one hour.

**Benefits:**

It is hoped that the results of this study will help in the following ways:

1. Those found with depressive symptoms will be referred for further treatment.
2. The findings will help in policy making geared towards improving the lives of persons with spinal cord injury through mobilization of resources and networking.

**Risks:** There is the possibility that you may become uncomfortable answering the questions. However, except for your time and inconvenience that may have been caused by your participation, there are no foreseeable risks to you participating in this study.

**Compensation**: Participation in this study is entirely voluntary and you will not receive any monetary payment for participating.

**Voluntariness**: You are welcome to participate in the study out of your own free will without any form of coercion. You are also free to withdraw from the study at whatever point during the exercise without penalty or loss of benefits that may have been awarded.

**Confidentiality**: All information collected will be kept confidential and no names will be used during the study or in any resulting publication. However a bleach of confidentiality may occur if your life or the lives of other people are in danger.

**Ethical considerations**: The protocol will be designed with the client's confidentiality in mind. Participants found to be in need of treatment or other interventions will be referred to the appropriate places.

**Contacts**: If you have any questions regarding the study or participation in this study, you can call any of the supervisors given below.

DR. Pius Kigamwa on telephone no- 0722521261

Professor Othieno. Telephone no- 0733255111

Principal investigator- Telephone- 0721496874

If you have any questions about your rights as a study participant, you can contact the chairman Kenyatta National Hospital ethics committee, on this telephone number 020-2726300-9.

**Appendix 3**

**Consent Form for Participants**

I, the undersigned do hereby volunteer to participate in this study, whose nature and purpose has been fully explained to me by Mary Njeri Mbuthia. I understand that all the information gathered will be used for the purposes of the study only. I understand that I can freely withdraw from the study and will not lose any benefits or rights that I may have.

Participant

Sign……

Date……..

Researcher

Sign……

Date…….

**APPENDIX 4**

**Socio-demographic Data**

Dear sir/ madam

I am a Master in clinical psychologystudent at UON intending to carry out a study on **"The correlates of depression among persons with spinal cord injury".** I kindly request your assistance by completing this questionnaire.

The questionnaire is for research purposes only.

Do not write your name.

Confidentiality will be highly maintained.

Your participation will be highly appreciated.

Thank you for your assistance.

Tick the preferred choice for the following questions

1: **What is your age bracket in years?**

18- 28

29-39

40- 50

Over 50

**2:Marital status**

Single

Married

Separated

Widowed

**3: Gender**

Male

Female

**4:Education level**

No education

Primary education

Secondary education

College education

**5: What is your occupational status?**

Unemployed

Self- employed

Formally employed

**6: What is your current income?**

Below 10,000

11,000- 30,000

31,000-50,000

51,000 and above

**7: How long has it been since the time of injury?**

1-2 years

3-4 years

5-6 years

7 years and above

**8: What was the cause of the injury?**

Road traffic accident

Fall from height

Assault

Disease

**9: What kind of injury did you sustain?**

Paraplegia

Quadriplegia

**10: What complications have you suffered as a result of the injury? Tick "Yes" or "No" as it applies to you.**

| **Complication** | **Yes** | **No** |
|---|---|---|
| Pain | | |
| Urinary complications | | |
| Constipation | | |
| Pressure sores | | |

Others

**11: What would you say are your social support systems? Tick "Yes" or "No" as it applies to you.**

| **Support** | **Yes** | **No** |
|---|---|---|
| Spouse | | |
| Family | | |
| Colleagues | | |
| Friends | | |
| Others | | |

**12: What resources have you been able to access during your recovery? Tick "Yes" for the services you have accessed and "No" for those you have not been able to access.**

| **Services** | **Yes** | **No** |
|---|---|---|
| **Counselling services** | | |
| **Medical services** | | |
| **Transport services** | | |
| **Legal services** | | |

**Others**

**13: What are your coping strategies since the time of injury? Tick "Yes" for what applies to you and "No" for what does not apply to you.**

| Coping strategy | Yes | No |
|---|---|---|
| Joining support groups | | |
| Self- efficacy | | |
| Divine intervention | | |
| Others | | |

**14: What has been the impact of the injury on your life? Tick "Yes" for what applies to you and "No" for what does not apply.**

| Impact of injury | Yes | No |
|---|---|---|
| Have become stronger | | |
| Have set new life goals | | |
| Experienced of multiple losses. | | |
| Have been | | |

**immobilized.**

**Others**

**APPENDIX 5**

**Pain Intensity Rating Scale**

**Instructions for the patient:**

1: **0** means “no pain” and **10** means “the worst pain that you can imagine. On this scale from 0-10, tick the number that indicates the level of pain you are experiencing currently.

Ikiwa**0**inamaanisha “hakunauchunguunaohisi” na**10**inamaanisha “uchunguzaidiyaunayowezakufikiria”,

tiaalamakwenyenambariinayoonyeshakiwangoyauchunguunaohisikwasasa.

**Pain rating scale**

0 1 2 3 4 5 6 7 8 9 10

**Source:** Huang et al. BMC Care 2012, 11: 5

**APPENDIX 6**

**Patient Health Questionnaire-9 (PHQ-9)-English version**

**NAME_____ DATE_____**

Over the last two weeks, how often have you been bothered by any of the following problems? (Use a tick to indicate your answer.)

| | | **Not at all** | **Several days** | **More than half the days** | **Nearly every day** |
|---|---|---|---|---|---|
| 1 | Little interest or pleasure in doing things | 0 | 1 | 2 | 3 |
| 2 | Feeling down, depressed, or hopeless | 0 | 1 | 2 | 3 |
| 3 | Trouble falling or staying asleep, or sleeping too much | 0 | 1 | 2 | 3 |
| 4 | Feeling tired or having little energy | 0 | 1 | 2 | 3 |
| 5 | Poor appetite or overeating | 0 | 1 | 2 | 3 |
| 6 | Feeling bad about yourself- or that you are a failure or | 0 | 1 | 2 | 3 |

| | | | | | |
|---|---|---|---|---|---|
| | have let yourself or your family down | | | | |
| | | Not at all | Several days | More than half the days | Nearly every day |
| 7 | Trouble concentrating on things such as reading a newspaper or watching television. | 0 | 1 | 2 | 3 |
| 8 | Moving or speaking so slowly that other people could have noticed or being so fidgety or restless that you have been moving around alot more than usual. | 0 | 1 | 2 | 3 |
| 9 | Thoughts that you would be better off dead, or of hurting yourself. | 0 | 1 | 2 | 3 |
| Add columns to get the total | | | | + | + |

**TOTAL**

10: If you checked off any problems, how Not difficult at all_____

| | |
|---|---|
| difficult has these problems made it for you to do your work, take care of things at home, or get along with other people? | Somewhat difficult_____<br>Very difficult_____<br>Extremely difficult_____ |

**APPENDIX 7**

**Kidodosijuuyaafyaya mgonjwa-9 (phq-9)**

**Katikakipindi cha wiki mbilizilizopita, nimarangapiumesumbuliwanamatatizohayayafuatayo? –Kwa lughaya Kiswahili.**

(Tia alamakwenyejibulako).

| | | Haijatokezea kabisa | Sikukat haa | Zaidi yanusuyasik uhizo | Takribaniki lasiku |
|---|---|---|---|---|---|
| 1 | Kutokuwanahamu au rahayakufanyakitu | 0 | 1 | 2 | 3 |
| 2 | Kujisikiataabusana au kukatatamaa | 0 | 1 | 2 | 3 |
| 3 | Matatizoyakupatausingizi au kuwezakulala au kulalasana | 0 | 1 | 2 | 3 |
| 4 | Kujisikiakuchoka au kutokuananguvu | 0 | 1 | 2 | 3 |
| 5 | Kutokuwanahamuyakula au kulasana | 0 | 1 | 2 | 3 |
| 6 | Kujisikiavibaya-au kujionakuwaumeshindwakabisa au umejiangusha au kuikatisha tama familiayako | 0 | 1 | 2 | 3 |

| | | | | | |
|---|---|---|---|---|---|
| 7 | Matatizoyakuwamakinikwamfanounaposomagazeti au kuangaliateleviseni. | 0 | 1 | 2 | 3 |
| 8 | Kutembea au kuongeataratibusanampakawatuwakawawameonatofauti? Au kutotulianakuhangaikasanakulikoilivyo kawaida. | 0 | 1 | 2 | 3 |
| 9 | Mawazokuwaniafadhaliufe au ijidhurukwanamna Fulani. | 0 | 1 | 2 | 3 |

Ongezaalamazakutelemkaupatejumlayamajibu.

**10: Kama ulitiaalamamatatizoyoyote, matatizohayoyamefanyaiwevigumukwakokufanyakaziyako, kushugulikiavitunyumbani, au kutangamananawatuwengine?**

Siongumuhatakindogo

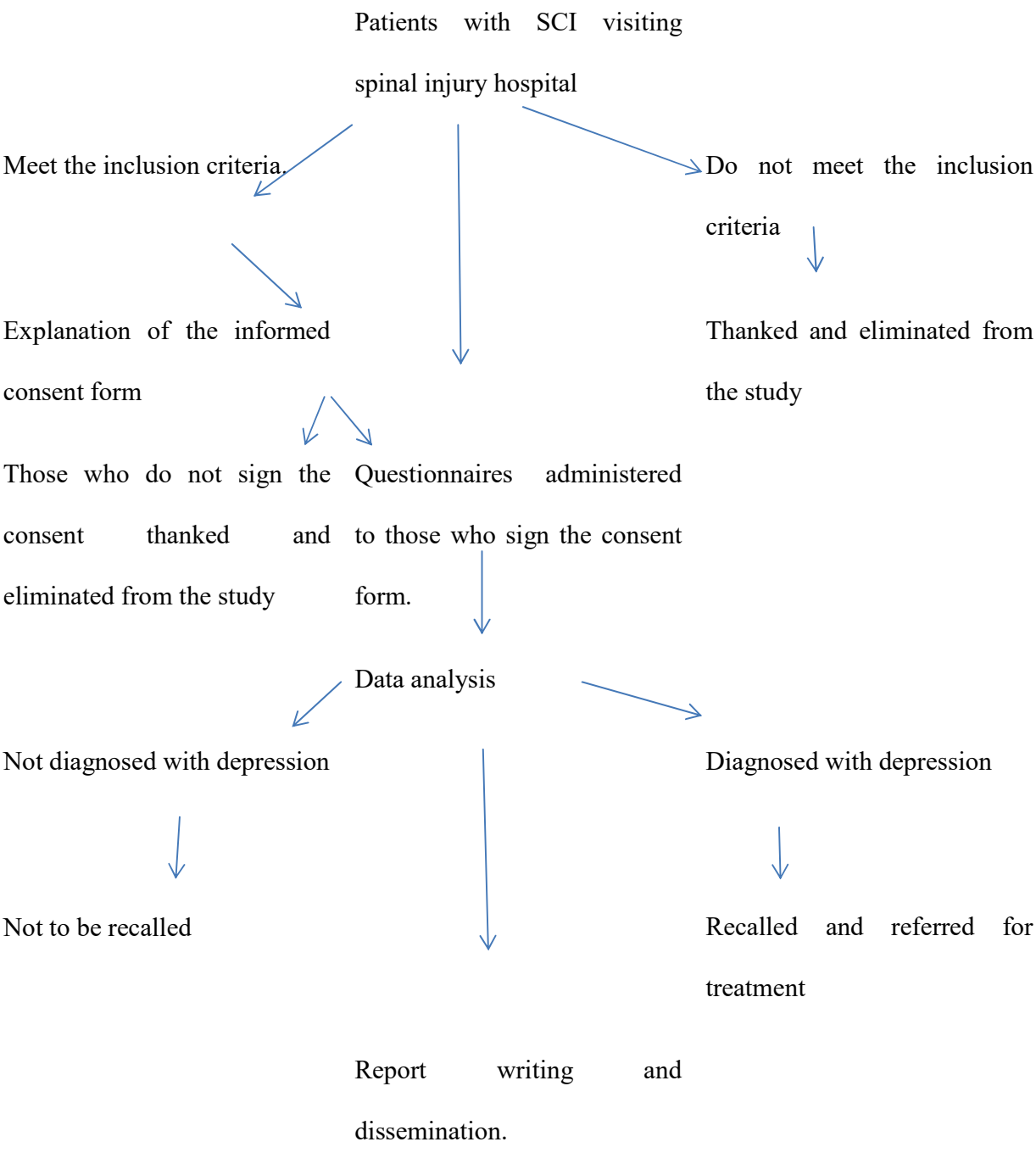
Ngumukiasi

Ngumusana

Ngumu Zaidi

Imetengenezwana Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kronkenawenzake, naruzukuyakielimukutokakwa Pfizer Inc. Hakunakibalikinachihitajikaupya, kutafsiri au kuonyesha au kusambaza.

**APPENDIX 8:Flow Chart for Data Collection Procedure**




**Source: The researcher,2014**

**APPENDIX 9**

**TIME TABLE**

| **Task** | **Month** | **Dates** |
|---|---|---|
| Proposal development | March 2014 | 1st – 31st |
| Approval by the Department | April | 1st-10th April |
| Ethics Committee | April /May | 11th April- May 31st |
| Clearance from the Ministry of Health | June | 1st -30th |
| Data collection | July | 1st July -30th August |
| Data analysis and presentation | September-April 2015 | 1st September -17 April |

**APPENDIX 10**

**Budget Allocation**

| **ITEM** | **AMOUNT** |
|---|---|
| Proposal preparation, internet searching and referencing | 5000 |
| Proposal typing, printing and photocopying | 5000 |
| KNH Ethics Committee | 2000 |
| Statistician | 20000 |
| Transport and communication | 10000 |
| Researcher's personal costs | 10000 |
| Data processing and binding | 15000 |
| Overheads | 5000 |
| Subtotal | 58000 |
| Contingencies 20%of subtotal | 14400 |
| **Total** | **86400** |

## APPENDIX 11

23 UMHS Depression Guideline, August 2011

## PHQ-9* Questionnaire for Depression Scoring and Interpretation Guide

## For physician use only

**Scoring:**
Count the number (#) of boxes checked in a column. Multiply that number by the value indicated below, then add the subtotal
to produce a total score. The possible range is 0-27. Use the table below to interpret the PHQ-9 score.
Not at all (#) _____ x 0 = _____
Several days (#) _____ x 1 = _____
More than half the days (#) _____ x 2 = _____
Nearly every day (#) _____ x 3 = _____
**Total score: _____**

### Interpreting PHQ-9 Scores

| Diagnosis | Total Score | For Score Action |
|---|---|---|
| Minimal depression | 0-4 | The score suggests the patient may not need depression treatment |
| Mild depression | 5-9 | Physician uses clinical judgment about treatment, based on patient's duration of symptoms and functional impairment |
| Moderate depression | 10-14 | Warrants treatment for depression, using antidepressant, psychotherapy and/or a combination of treatment. |
| Moderately severe depression | 15-19 | |
| Severe depression | 20-27 | |

≤ 4
5 - 14
> 14

* The PHQ-9 is described in more detail at the Pfizer website: http://www.phqscreeners.com/