

Depressive symptoms and quality of life among lower limb amputees

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**DEPRESSIVE SYMPTOMS AND QUALITY OF LIFE AMONG LOWER
LIMB AMPUTEES**

By

Aaron Ndipo Aaron

**A Dissertation Submitted in (Partial) Fulfillment of the Requirements for the Degree
of Master of Medicine (Orthopedics and Traumatology) of**

**Muhimbili University of Health and Allied Sciences
October, 2019**

CERTIFICATION

The undersigned certifies that, he has read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled: **“Depressive symptoms and quality of life among lower limb amputees”**, in (partial) fulfillment of requirement for degree of Master of Medicine (Orthopaedics and Traumatology) of Muhimbili University of Health and Allied Sciences.

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DECLARATION AND COPYRIGHT

I, **Dr. Aaron Ndipo Aaron**, declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature: **Date:**.....

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DEDICATIONS

This dissertation is dedicated to my beloved late mother Bupe Mwaikambo and my beautiful daughter Aarona Bupe Aaron.

ABSTRACT

Background: Lower limb amputation is a common and oldest surgical procedure used for treatment of traumatic and non-traumatic conditions. Complications faced by patients following unilateral lower limb amputation include depressive symptoms and physical impairment that affect their quality of life.

Objective: This study described the prevalence of depressive symptoms and quality of life status of unilateral lower limb amputees at MOI and MNH in Dar es Salaam, Tanzania.

Material and methods: This is a cross-sectional descriptive study of 50 patients who underwent unilateral lower limb amputation at MOI or MNH between November 2017 and March 2018. Base demographics were recorded and patients were assessed for depressive symptoms and quality of life, using the Patient Health Questionnaire (PHQ-9) and EQ-5D research tools respectively at the two weeks post operation visit. Data were analyzed using Statistical Package for Social Scientists (SPSS) from IBM using student t-test and chi-square test.

Results: 50 patients who underwent unilateral lower limb amputation at MOI or MNH between November 2017 and March 2018 and were enrolled in the study; males were 30(60%) and females were 20(40%).

The prevalence of patients who developed depression that needed medical intervention (PHQ9 score of ≥ 10) was 22%, (12.4-36%). More males (53.85%) developed depression than females (46.15%) approached significance ($p=0.090$). Participants who had amputations as a result of trauma were more likely to be depressed (54.55%) than those who had an amputation due to non-traumatic causes (45.45%)($p=0.5$). younger patients with median age of 35 years (IQR 24-45 years) were more likely to be depressed than older median age of 52years(IQR 32-60 years) ($p=0.04$).

Quality of life was lower in lower limb amputees compared to general population median EQ VAS score ~ 100. Furthermore participants who were not depressed had better quality of life (median EQ VAS score = 78, IQR 73-80) than those who were depressed (median EQ VAS score =62, IQR 58-700) statistically significant ($p=0.01$).

Conclusion: Depression is common after lower extremity amputation. Depression was associated with young age. There was a trend to association with male gender. There was no association with the cause of amputation, relative support or level of amputation. Quality of life is lower among amputees compared to general population and even lower in depressed patients.

Recommendations: Individuals' especially young adults and possibly men, who suffer unilateral lower limb amputation, may need special attention with proper counseling to prevent depression.

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LIST OF ABBREVIATIONS

Acronym	Definition of Abbreviations
AIDS	Acquired Immunodeficiency Syndrome
AKA	Above Knee Amputation (Transfemoral amputation)
BKA	Below Knee Amputation (Transtibial amputation)
CDC	By Centers for disease control and prevention
DSM-5	Diagnostic and statistical Manual of Mental disorders fifth edition
EQ – 5D	Emotional quotient health questionnaire
HIV	Human Immunodeficiency Virus
IQR	Interquartile range
LMICs	Low and Moderate Income Countries
LSS	Limb Salvage Surgery
MMed	Masters in Medicine
MOI	Muhimbili Orthopaedic Institute
MNH	Muhimbili National Hospital
MTC	Motor Traffic Crash
MUHAS	Muhimbili University of Health and Allied Sciences
OTA	Orthopedic Trauma Association
PVD	Peripheral Vascular Disease
PHQ – 9	Patient health questionnaire
VAS	Visual analog score

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

The American Psychiatric Association's (Diagnostic Statistical Manual of Mental Disorders, Fifth Edition (DSM -5)(1) defines the depressive disorders as disruptive mood deregulation disorder. The common features of depressive disorders are the presence of sadness, emptiness, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individual's capacity to function (1).

Amputation is a surgical procedure by which a part or the whole extremity is being removed. A structural loss is also accompanied by the consequential loss of function, like a change of the distribution of body mass, coordination disorder, and psychosocial disorders. The most common causes of surgical amputations are the complications caused by diabetes (diabetic foot) including a number of vascular complications in the form of ischemia and peripheral artery disease (2)(3)(4)

Lower limb amputation is one of the oldest known surgical procedures, dating back to prehistoric times (5)(6). The earliest literature discussing amputation is the Babylonian code of Hammurabi, inscribed on black stone, from 1700BCE. In 385BCE, Plato's symposium mentions therapeutic amputation of the hand and the foot. Hippocrates provided the earliest description of a therapeutic amputation in *De Articularis* for vascular gangrene as well as amputation at the edge of the ischemic tissue, with the wound left open to heal by secondary intention(7)

Lower extremity amputations may be performed for many reasons among them being; peripheral vascular disease (PVD), traumatic amputation, malignancy, and infection. PVD is the leading indicator of the lower limb amputation in United States, it is commonly indicated in the elderly with Diabetes Mellitus (DM) who often experience peripheral neuropathy which progress to trophic ulcers and subsequent gangrene and osteomyelitis. Patients with DM

accounts for 50% of the population with PVD. An estimated 65,000 lower limb amputations are performed for this group each year in the United States of America (8)(9)(10)(11).

Traumatic amputation continues to happen because of industrial and motor traffic accidents which are associated with high-grade fractures associated with neurovascular injury and soft tissue loss. These injuries require multiple surgeries however patient end up with a painful, nonfunctional stump, and less efficient than a prosthesis (12).

In U.S.A 30,000 – 40,000 amputations are performed annually. In 2005 there were an estimated 1.6million individuals living with a loss of limb, by 2050, this figure is expected to be 3.6 million. Amputation is usually perceived as a failure of treatment while in actual fact is one of the treatment options in severe trauma of lower limb, Peripheral vascular disease, and tumors (13).

Traumatic or Surgical limb amputation leads to depression in the individual (14)(15). To recover from depression one has to go through acceptance of physical changes such as impairments in physical functioning, prosthesis use, phantom pain, changes in employment status or occupation and alterations in body image(16)(17). The impact of depression and poor quality of life on the life of the patient are important for treatment, rehabilitation and social care services (18).

The higher the level of amputation, the higher the energy expenditure which is required for walking. The more the energy used more stress to the patient, finding it difficult to cope with the new life predisposing him/her to depression. As the level of amputation moves proximally, the walking speed of the individual decreases while the energy expenditure and oxygen consumption increases (19).

The success of amputation surgery is multifactorial in terms of functional and emotional satisfaction. The goal is to achieve a functional residual limb in an individual who is active with a positive attitude, who accepts amputation and continues to be a productive member of the society (20).

However, most of these patients encounter a series of complex psychological responses (21). Many people successfully use these responses to adjust to amputation but others develop depressive symptoms (21). Shula and colleagues (1982) reported that depression is the most common psychological reaction among amputees (21) (22).

Traumatic amputations remain one of the most emotionally disturbing wounds of conflict, as demonstrated by their frequent use in films to illustrate the horrors of war (23). Trauma-related amputations are usually performed on young and previously healthy patient and his disparity highlight the most important difference between trauma-related amputations and those performed on more elderly or infirm individuals for other indications (24).

The traditional beliefs of reincarnation with a missing part or living after death with a deformity make it increasingly difficult for some patients to accept amputation. The person who has lost a limb must confront not only the physical reality of mutilation but also, the body image changes associated with it and the personal meanings they carry (25).

1.1 Literature Review

Socio-demographic factors among unilateral lower limb amputees

Trauma is the leading cause of leg amputation in developing countries and is second only to peripheral arterial disease in developed countries. Amongst civilians in the UK, trauma accounts for 7–9 percent of the 5000 amputations performed annually (26). It is estimated that 25-27 in 100,000 of the German population have undergone amputation (26). Data from Nigeria is sparse, but Onuba reported that 0.38% of all orthopedics operations were amputations (27).

A Ten-Year Survey, in Iran, showed the average number of amputations was 21.6 per year and the average age was 39.26 ± 12.6 years; males were more affected than female and the average age of men at amputation was less than that of women; 38.15 ± 12.2 years in comparison to 43.4 ± 14.4 (28). In Nigeria 86.4% of amputees were males with mean age 30.43 ± 16.28 years (29).

A study was done by Ziad M. H *et al* in Jordan among unilateral lower limb amputees in Jordan revealed that among 56 patients who had unilateral lower limb amputation, 47(83.9%) were males while 9(16.1%) were females. The mean age among the 56 participants was 45 ± 18 ³⁴. He also revealed that among the 56 amputees, 11(19.6%) were employed while 45 (80.4%) had no employment (21)(28).

Cause and level of amputation among unilateral lower limb amputees

Of the 56 amputee in Jordan, there were 21(37%) who had an amputation due to traumatic causes while those who had an amputation due to non-traumatic causes were 35 (62.5%) (21). While in Iran the most common indication of amputation was trauma 54.16%, non-trauma causes were diabetes (26.38%), severe obstruction of blood vessels (10.46%), infections (4.1%), malignancy were (4.14%) and congenital anomalies were (0.46%) (28). In Nigeria causes of amputation were trauma (42.4%), gangrene (31.8%) and tumors (12.9%)

With regards to the level of amputation, there were 22 (39.3%) and 56(25.92%) cases of above knee amputation in Jordan and Iran respectively 41(31.1%) of patients were amputated above knee and 48(36.4%) below knee (21).

Prevalence of depression among traumatic and non-traumatic unilateral lower limb amputees

Trauma-related amputations of any nature are associated with significant morbidity and disability. It is generally asserted that the prospect or actual loss of limb leads to severe emotional and physical problems (30). Trauma-related amputation is a significant cause of long-term ill-health and disability primarily in young and previously active individuals(31).

In a study done by Ziad M. H *et al* among unilateral lower limb amputees in Jordan revealed that 11(20%) patients had depression; 9(19.1%) were male and the mean age was 45 ± 18 . With regard to causes of amputation traumatic amputees 10(47.6%) developed depression more than non-traumatic amputees 1(2.9%). Among those who were depressed 2 (9.1%) and 9 (26.5%) individuals underwent above knee amputation and below knee amputation respectively (21).

One of the potential criteria in adaptation with the amputation is the age. Various studies show that the rate of depression adaptation with amputation among young people is not desirable compared with adults, but the other studies have shown that there is no statistically significant relationship between depression and age (32)(33).

Social support is one of the factors affecting the adaptation with the lower- limb amputation in traumatic and non – traumatic amputees. *Khademi* showed that people with high social support had lower levels of depression (33)

Marital status is one of the important criteria in adaptation with amputation. Various studies show that the level of depression differs significantly in married and unmarried groups married people are less depressed than single ones(33) .

Quality of life among unilateral lower limb amputees

People with a lower limb amputation show significantly worse scores of quality of Life compared with population norms. People with lower limb amputation are mostly unsatisfied with their physical functioning and they tend to expect improvement before discharge and the months to come (21).

Quality of life has also been linked to the development of health service designs and allocation of adequate funds and resources, however each person has his own method of dealing with this loss and it has been shown that hoping for a better outcome and social support play an important role in positive adjustment (30).

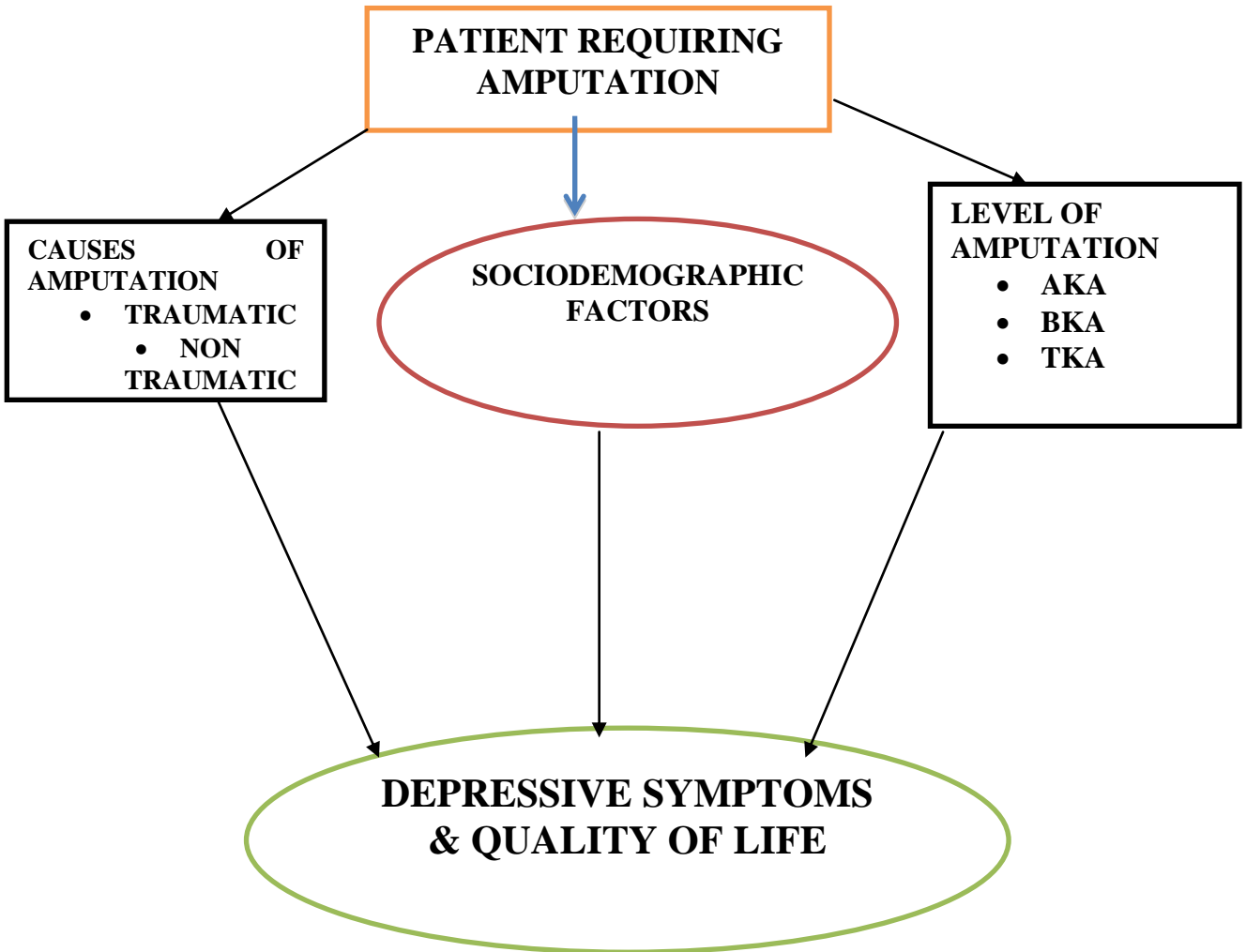
In a study done in South Africa in 2007 by *Godlwana* it was found that Participants who had an extreme problem with mobility preoperatively had a median VAS of 30 less than those who had no problem with mobility in the EQ-5D item 72 postoperatively and this was statistically significant ($p < 0.001$) (34).

When the mobility in the EQ-5D was adjusted for gender in the multivariate analysis, female Participants had a median VAS of 15 greater than their male counterparts postoperatively ($p = 0.05$) at 95% CI. However, females who have some problem or extreme problem with mobility as measured by the EQ-5D preoperatively had a median VAS of 23 less than those that have no problem with mobility ($p = 0.04$) at 95% CI and ($p < 0.001$) at 95% CI (34).

Participants who were independent in mobility in the BI mobility preoperatively had a postoperative median VAS of 20 greater and those who were dependent and this was statistically significant ($p = 0.004$). When the mobility on the BI was adjusted for gender in the multivariate analysis, female participants had a median VAS of 16 greater than their male counterparts postoperatively ($p = 0.03$) at 95% CI (34).

One study done in India by *Sinha et al* found that People with lower limb amputation had worse QoL as compared to the general population. Two-thirds of the study population comprised male amputees. Presence of phantom-limb pain affected the physical health component more negatively than the mental health component of QoL. However, this factor was still found to significantly affect both physical and mental health components of QoL in this study (39).

1.2 Conceptual Framework



All patients who underwent traumatic and non-traumatic amputations during the study period were screened for inclusion criteria and exclusion criteria to get a study population. The information on socio-demographic factors, level of amputations was documented.

From the study population, the presence of depressive symptoms and quality of life was analyzed among unilateral lower limb amputees.

1.3 Problem Statement

Major lower limb amputation is a preventable public health problem that is associated with profound economic, social and psychological effects on the patient and family.

By the year 2050 it's expected to have 3.6 million people living with a loss a limb in U.S.A caused by severe trauma of lower limb, Peripheral vascular disease, and tumors (13).

Trauma alone is a major cause of leg amputation in developing countries like Tanzania and is second only to peripheral arterial disease in developed countries. Amongst civilians in the UK, trauma accounts for 7–9 percent of the 5000 amputations performed annually (26). In Africa(Nigeria) reported that 0.38% of all orthopedics operations were amputations (27)

Lower limb amputation leads to depression and poor quality of life (21,22). Adaptation to depressive symptoms encounter challenges of physical changes such as impairments in physical functioning, prosthesis use, pain, changes in employment status or occupation and alterations in body image.

Currently, in our region there is no research done on how amputation affects the psychological aspect of an individual. Although there is a study done in Mwanza, Tanzania showing that trauma is the leading cause of lower limb amputees affecting young adults in their productive age and another study in Dar es salaam, Tanzania showing poor quality of life in lower limb amputees(35)(36)

This study will benefit us to know the extent of depression among unilateral lower limb amputees, helping in building a comprehensive framework of care giving which will involve mental and physical health.

1.4 Rationale

The findings of this study are expected to enlighten us on the burden of depressive symptoms among traumatic and non-traumatic amputees. It will create awareness to surgeons hence the patients with depressive symptoms will be channeled to psychologists and psychiatrists.

1.5 Research Questions

1. What is the prevalence of depressive symptoms and quality of life status of lower limb amputees?

1.6 Objectives

1.6.1 Broad Objective

- To determine depressive symptoms, quality of life and associated factors among unilateral lower limb amputees operated at MOI and MNH from November, 2017 to June, 2018.

1.6.2 Specific objectives

1. To determine socio-demographic profile of patients who undergo unilateral lower limb amputation at MOI and MNH from November 2017 to June 2018.
2. To determine causes and level of amputation among patients who undergo unilateral lower limb amputation at MOI and MNH from November 2017 to June 2018
3. To determine the prevalence of depressive symptoms among traumatic and non-traumatic lower limb amputees attended at MOI and MNH from November 2017 to June 2018.
4. To determine quality of life among traumatic and non-traumatic amputees attended at MOI and MNH from November 2017 to June 2018.

CHAPTER TWO

2.0 METHODOLOGY

2.1 Study design

Hospital-based Descriptive Cross-sectional Study

2.2 Study population

All patients who underwent unilateral lower limb amputation at MOI or MNH who consented to be involved in the study.

2.3 Study Area

This study was conducted at Muhimbili Orthopedic Institute (MOI) and Muhimbili National Hospital (MNH) in Dar es Salaam, Tanzania from November to June 2018 here patients will be enrolled in the study.

Muhimbili Orthopedic Institute (MOI) is the largest orthopedic referral center in Tanzania, which offers both Orthopedic and Neurosurgery services, with a capacity of 150 beds (30 private and 120 general). With the completion of new MOI building (MOI phase III), the institute will have the capacity of more than 380 beds. In 2014 the hospital had 11245 inpatients and 38984 outpatients' visits. There are thirty-five orthopedic surgeons, five anesthesiologists, two radiologists, forty-eight medical residents, 115 operating room nurses, and ward nurses, 3 radiologists technician. These personnel are directly involved in delivering care to patients with musculoskeletal and neurosurgical conditions at MOI.

Muhimbili National Hospital is one of the four main tertiary hospitals in Tanzania. Others are Bugando Medical Centre, Kilimanjaro Christian Medical Centre, and Mbeya Referral Hospital.

MNH is a national referral hospital, Research Center, and university teaching hospital. It is located in Ilala district of Dar es Salaam city. Of the three municipalities of Dar es Salaam, Kinondoni is the largest, covering an area of 531km², with a population of 2,497,940. The district has a total of 185 health facilities. Temeke is the second largest district, while Ilala is the smallest, covering an area of 210km², with a population of 637,572 and has 145 health facilities (URT, 2004, Yengo 2009)

MNH is a 1,500-bed facility, attending 1,000 to 1,200 outpatients per day and admitting 1,000 to 1,200 patients per week. It has 3000 employees of which 300 are doctors and specialists, 900 registered and enrolled nurses and the rest are support services employees.

2.4 Sample size

The pilot study was done at MNH and MOI from June to December 2016, the number of unilateral lower limb amputees due to various medical reasons was 87 out of 2806 cases of all total surgical procedures done at MNH and MOI making the prevalence of unilateral lower limb amputation to be 3.1%.

The sample size of this study was calculated from the formula;

$$N = Z^2 P (1 - P) / E^2$$

N = Sample size

P = Prevalence 3.1%.

E = Marginal error. (0.05 For 95% CI)

Z = Confidence interval. (1.96 For 95% CI)

$$N = 1.96^2 \times 0.031 \times (1 - 0.031) / 0.05^2$$

$$N = 46.$$

This sample size was adjusted for 10% non-response rate: = 46×10/100= 4.6

Therefore minimum sample size was 50.

2.5 Sampling technique

All patients who had unilateral lower limb amputation were enrolled after they consented. The patient was assessed 2 weeks post-surgery or during the first clinic visit if he/she has depressive symptoms by responding to self-administered questionnaire using PHQ-9 Depression Test Questionnaire, quality of life was measured using EQ5D tool.

2.6 Inclusion criteria

All patients with unilateral lower limb amputation who were above eighteen years of age regardless of the cause of amputation.

2.7 Exclusion criteria

1. Patients with amputations distal to a Transmetatarsal level.
2. Patients known to have a congenital amputation.
3. Previous history of psychiatric disorder before amputation or those known to use drugs which may cause depression.

2.8 Data collection and Enrollment

Technique: The self-administered structured questionnaire was administered to obtain socio-demographic information of the participant after an informed verbal and written consent was obtained. A structured questionnaire was used. Patient Health Questionnaire-9(PHQ-9) was used to assess depressive symptoms and EQ-5D Health Questionnaire was used to assess quality of life.

Tools: Structured questionnaire, PHQ-9 Depression Test Questionnaire and EQ-5D Health Questionnaire.

Validity and reliability; PHQ-9 Depression Test Questionnaire (88% specificity and 88% sensitivity) and EQ-5D Health Questionnaire are both valid, reliable and recognized by the World Health Organization (WHO).

Translation into Swahili; the Swahili version of the (PHQ-9) into Swahili, was translated adhering to established International Quality of Life Association (IQOLA) guidelines. And was psychometrically validated, the newly translated scale using was used in a prospective study of 48 patients and was found to be reliable scale in Kenyan Head & Neck cancer patients at Kenyatta National Hospital ENT clinic in Nairobi, Kenya in 2006. It is a valuable tool in screening for and monitoring of depression as a function of QOL in this population.

The EQ-5D-3L has now been translated into more than 170 languages (Swahili is one of them) and is used worldwide.

2.9 Ethical consideration and Consent

Ethical clearance to conduct this study was obtained from MUHAS IRB. Permission to conduct the study was obtained from directors of MNH and MOI.

All patients were informed about the study and consented to be enrolled. The procedures followed observed the principles of good clinical practice.

These included telling the patients the right and freedom to participate or not and, the protection of the patient's data and privacy. They were allowed to have a confidant help in case they needed assistance.

2.10 Data Analysis

Data were entered into a computer and analyzed using Statistical Package for Social Scientists (SPSS) from IBM SPSS statistics version 21 computer program. Then from this data, incidence and the proportion of depressed patients among unilateral lower limb amputees was calculated using student t-test and chi-square in relation with the level of amputation, sex, causes, and age.

The dependent variable was Depressive symptoms in amputees while independent variables were sex, age, level of amputation, traumatic and non-traumatic amputees.

CHAPTER THREE

3.0 RESULTS

Table 1: Socio-demographics characteristics of all study participants with unilateral lower limb amputation

Characteristic	Total, 50 (100)	Females, 20 (40)	Males, 30 (60)
Median age, (IQR), years	46.5 (30-60)	46.5 (35-58.5)	47.5 (30-60)
Occupation, n (%)			
House wife	2 (4.0)	2 (10.0)	-
Manual worker (unskilled)	1 (2.0)	1 (5.0)	-
Manual worker (semi-skilled)	11 (22.0)	2 (10.0)	9 (30.0)
Non-manual worker (semi-skilled)	17 (34.0)	9 (45.0)	8 (26.67)
Retired personnel	11 (22.0)	4 (20.0)	7 (23.33)
Student	1 (2.0)	-	1 (3.33)
Unemployed	7 (14.0)	2 (10.0)	5 (16.67)
Relative support, n (%)			
No relative support	2 (4.0)	-	2 (6.67)
Support from 1 to 3 relatives	34 (68.0)	14 (70.0)	20 (66.67)
Support from >3 relatives	14 (28.0)	6 (30.0)	8 (26.67)
Dominant right leg, n (%)	49 (98.0)	19 (95.0)	30 (100.0)
Indication for amputation, n (%)			
Non traumatic	25 (50.0)	9 (45.0)	16 (53.33)
Traumatic	25 (50.0)	11 (55.0)	14 (46.67)
Complicated recovery, n (%)	1 (2.0)	-	1 (3.33)
Type of amputation, n (%)			
AKA	30 (60.0)	10 (50.0)	20 (66.67)
BKA	19 (38.0)	10 (50.0)	9 (30.0)
TKA	1 (2.0)	-	1 (3.33)
Ability to work, n (%)			
Easy to work	31 (62.0)	14 (70.0)	17 (56.67)
Moderately difficult	18 (36.0)	6 (30.0)	12 (40.0)
Extremely difficult	1 (2.0)	-	1 (3.33)

KEY:

Non-manual worker (semi-skilled) such as bartender, clerks, salespersons

Manual worker (semi-skilled) such as mechanic, driver, carpenter.

Manual worker (unskilled) such as local security guards, cleaner

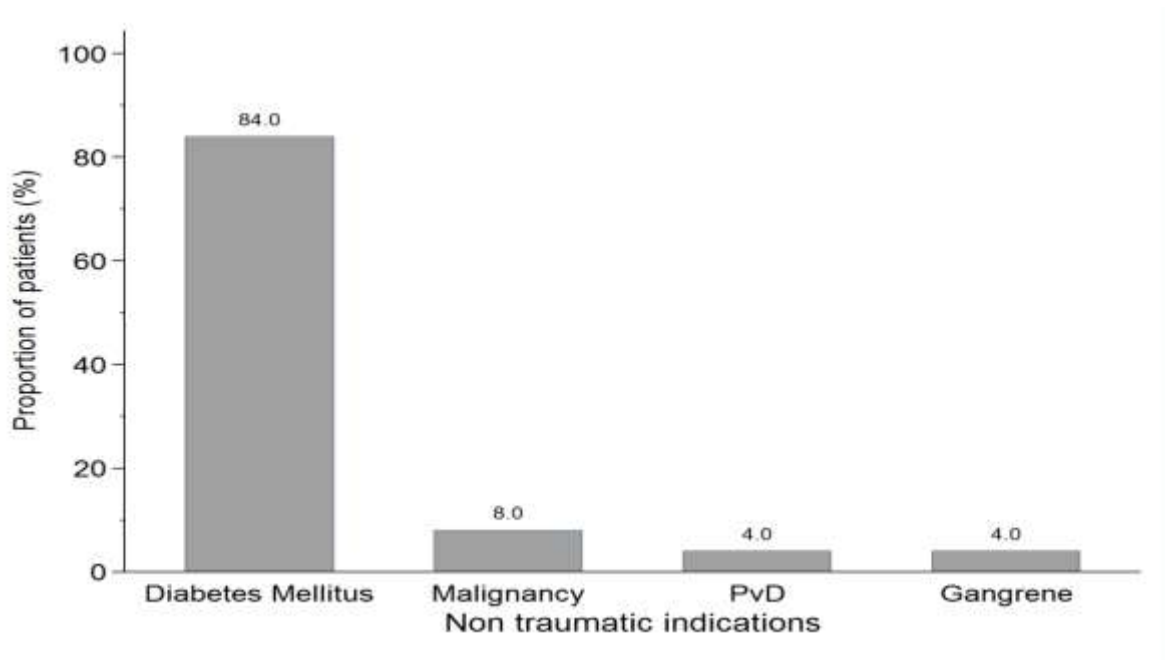


Figure 1: Plot showing proportions of patients who had amputations due to non-trauma causes

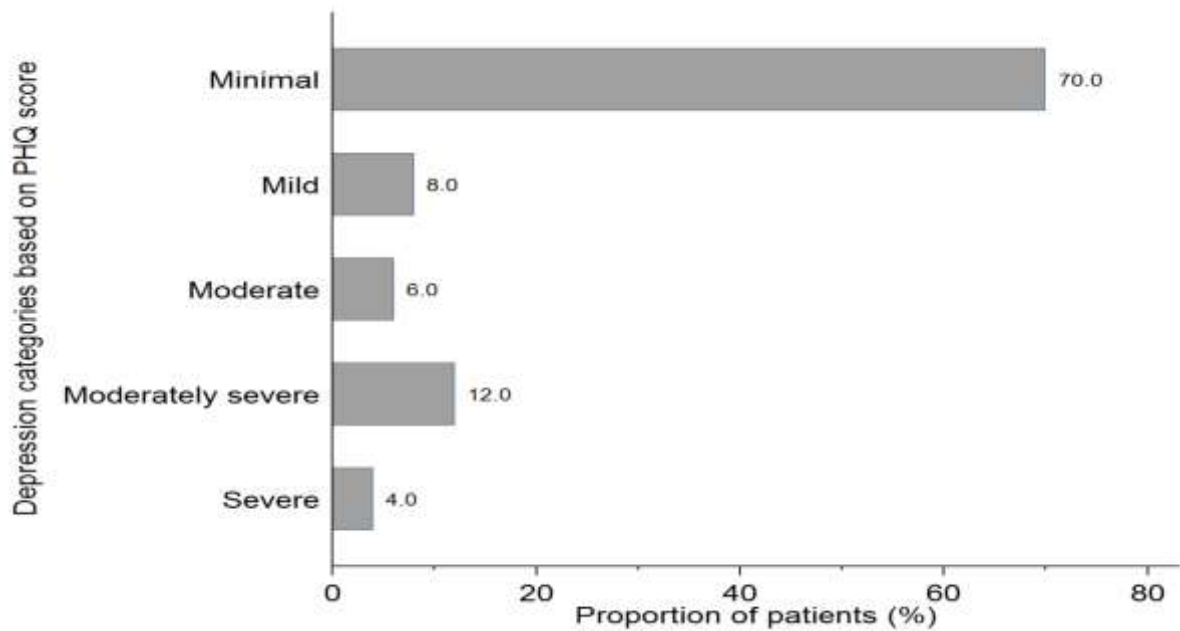


Figure 2: Proportions of different categories of depression based on PHQ scores among all study participants.

Table 2: Depression and quality of life

Characteristics, n (%)	No depression, 39 (78%)	Depression, 11 (22%)	P value
Median age (IQR)	52 (32-60)	35 (24-45)	0.041
Sex, n (%)			0.094
Females	18 (46.15)	2 (18.18)	
Males	21 (53.85)	9 (81.82)	
Relative support, n (%)			0.445
No relative support	1 (2.56)	1 (9.09)	
One to three relatives	26 (66.67)	8 (72.73)	
More than three relatives	12 (30.77)	2 (18.18)	
Indication for amputation, n (%)			0.50
Non traumatic amputees	20 (51.28)	5 (45.45)	
Traumatic amputees	19 (48.72)	6 (54.55)	
Type of amputation, n (%)			0.604
AKA	22 (56.41)	8 (72.73)	
BKA	16 (41.03)	3 (27.27)	
TKA	1 (2.56)	-	
Median EQ VAS score, (IQR)	78 (73-80)	62 (58-70)	0.01
Depressive symptoms, n (%)			
Difficulties in ambulation	23 (58.97)	9 (81.82)	0.287
Difficulties on self-care	3 (7.69)	2 (18.18)	0.463
Difficulties on daily activities	12 (30.77)	7 (63.64)	0.001
Experiences some pain	1 (2.56)	2 (18.18)	0.118
Not worried at all	36 (92.31)	6 (54.55)	0.002

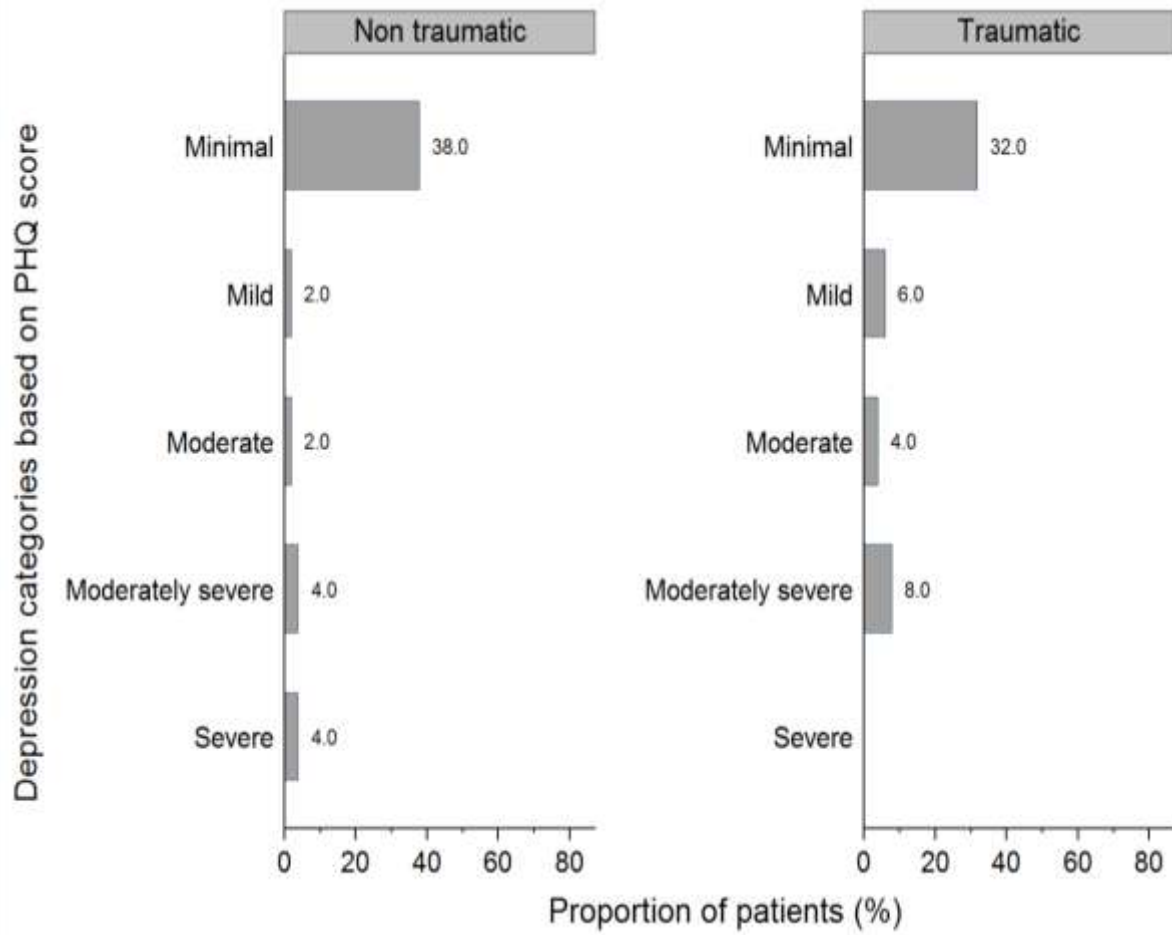


Figure 3: Proportions of different categories of depression based on PHQ scores among all study participants categorized by the indication for amputation

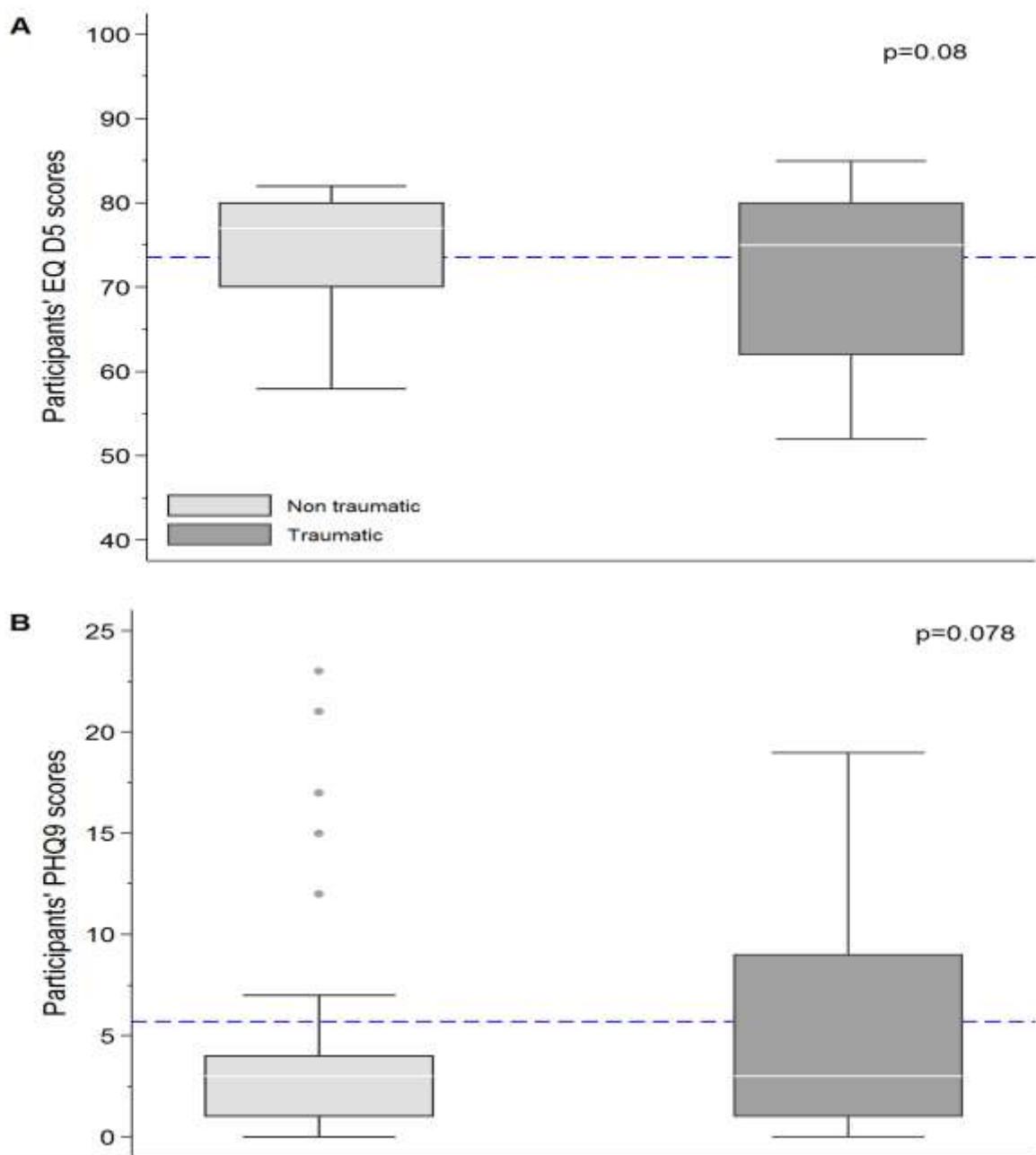


Figure 4: Box plots showing distributions of participants EQ D5 scores stratified by indication for amputation (Panel A) and distribution of participants PHQ9 scores stratified by indication for amputation (Panel B). Dashed lines indicate the overall mean score for EQD5 and PHQ9 which were 73.6 and 5.7 respectively

The median EQ visual analog score (EQ-VAS) was 76, IQR 70-80, with the median EQ VAS being slightly larger among participants who had a non-traumatic indication for amputation; however, the difference was not statistically significant with $p=0.08$. Although the mean PHQ score was higher for participants with a traumatic indication for amputation i.e., 5.92, 95% CI 3.34-8.49 vs., 5.48, 95% CI 2.74-8.22, the scores were not normally distributed and lacked statistical difference. This was also reflected by overlapping median PHQ scores across these two groups (see Figure 4B).

CHAPTER FOUR

4.0 DISCUSSION

In this study, a total of 50 patients were recruited. There were more males 30(60%) compared to females 20(40%). Most patients - 30 (60%) had above knee amputation as compared to BKA and through knee amputations representing 19 patients (38%) and 1 patient (2%) respectively (TABLE 1). Similar findings were found in the study done by Ajibade et al (29) in which the majority of amputees were males 84% with a mean age of 30 ± 16 years and levels of amputation found to be 38.4% BKA and 31.1% Above knee amputation. Trauma-related amputations were done on relatively young adults with previous health status. Non-trauma trauma-related amputations were done on relatively old patients, and a majority of them 84% had diabetes mellitus. Other indications for amputation in this group were 8% malignancy, 4% PVD and 4% gangrene (FIGURE1). Similar results were found in other studies (23,26,30).

The prevalence of patients who developed depression that needed a medical intervention (PHQ9 score of ≥ 10) after amputation was 22%, (95% confidence interval: 12.4-36%). Patients who had amputations as a result of trauma were not more likely to be depressed than those who had an amputation due to non-traumatic causes (FIGURE 3). This is inconsistent with the study done by Ziad M (21) in which 20% of the patients had depressive symptoms and there was a significant reduction in presence of depressive symptoms among patients whose indication for amputation was not trauma.

This study showed that there was no association of depressive symptoms with the number of relative/social support ($p=0.445$) inconsistent other studies where there were significant reduction in depressive symptoms among patients with social support compared to those who had no social support(16,17, 21)

There was a significant difference in age of patients who showed depression ($p=0.04$) with mean age of 35 years and those with mean age of 52. This could be because they are the most active and responsible for taking care of their families. This is replicated in other studies(31,32,33).

This study showed that male patients were tended to be depressed post amputation as compared to females; However this difference was not statistically significant ($p= 0.09$). However in the same study females developed depressive symptoms more than males. The differences could be attributed to the fact that these two studies were conducted in two different countries with different social economic status and again the findings in Ziad M study were concluded to be statistically not significant with $p\text{-value} < 0.002$. Relatively similar results were found in other studies (28,37,38).

It was found that there is no difference in development of depression with the level of amputation ($p =0.604$). Findings in this study were different from a study done by Ziad M (21) in which BKA amputees were more likely to develop depression compared to AKA.

Quality of life was low in amputees whether depressed (median EQ VAS score = 62) or not depressed (median EQ VAS score = 78) compared to the general population (median EQ VAS score ~ 100). This was replicated in the studies done in india by sinha et al (39). Additionally we find that patients with depression have low QoL (median EQ VAS score = 62) compared with patients without depression (median EQ VAS score = 78) ($p=0.001$). patients with difficulty of daily activity are twice as likely to be depressed 63% compared to those who were not depressed 31% with significance of ($p=0.001$); conversely patients who were not worried at all about lower limb amputation were significantly less to have depression($p=0.002$). Similar findings were found in South Africa in 2007 by Goldwana LL (34).

4.1 Study Limitation

The limitations of this study included small sample size, cross sectional design which can introduce bias; may miss patients who develop depression,

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Young patients were more likely to develop depression after lower limb amputation. Men trended towards depression after lower limb amputation. Patients who were facing difficulty in daily activity were more likely to be depressed than those who were not worried at all about their loss of a limb. Quality was affected in amputees with regard to the general population and even more affected in depressed patients.

5.2 Recommendation

1. Individuals' especially young adults and possibly men, who suffer unilateral lower limb amputation, may need special attention with proper counseling to prevent depression.

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APPENDICES

Appendix I: Consent Form (English Version)

Study Title: Depression among unilateral lower limb amputees at MOI and MNH

Part A:

Introduction

My name is Dr. Aaron Ndipo Aaron, MMed. Student at MUHAS, Department of Orthopaedic and Traumatology I am conducting a study on depression among unilateral lower limb amputees. I would like to conduct the study above as a necessary requirement for fulfillment of my postgraduate studies.

Purpose of the study

The purpose of this study is to assess the prevalence of depression among unilateral lower limb amputees at MOI and MNH. This information will help in changing the management policy of patients after undergoing unilateral lower limb amputation due to various causes in this hospital and the country at large.

Study procedures

The main information required from you is your particulars as in the data collection sheet and filling of the questionnaire provided for the assessment of your condition. Follow up will be done for up to 3 months. Thereafter further management and rehabilitation will continue as usual.

Risks and benefits to the participant

No risks are directly related to the study because management is as per established hospital protocol. The benefits will be participating in a study that will result in better management in patients who undergo unilateral lower limb amputation at our health facility and the country at large.

Confidentiality

The data collection sheet is strictly confidential. Your name will not appear in it and your telephone number is strictly for follow up purposes.

Participant information

Your participation in this study is voluntary and failure to participate or withdrawal from the study will not affect your management in any way at any stage.

Contacts and Questions

The researcher conducting this study is Dr. Aaron Ndipo Aaron

Can be reached by email: aaronndipo@gmail.com, Mobile numbers: 0715-221-333, 0624054895

If you have any questions or concerns regarding the study and would like to talk to someone other than the researcher, you are encouraged to contact Dr. Kitugi S. Nungu and Dr. Joyce Masalu who is Director of MUHAS Research and Publications Committee, MUHAS P.O.BOX 645001, Dar es Salaam. Telephone (+255) 222-152-489 Dar es Salaam.

Part B

Participant consent form

I have understood the above information which has been fully explained to me by the investigator and I voluntarily consent to participate.

Signature.....

Or participants thumbprint.

Date.....

Witness signature.....

Appendix II: Consent Form (Swahili Version)

Idhini ya Kushiriki:

Sehemu A:

Utambulisho

Mimi ni Dr. Aaron Ndipo Aaron, Mwanafunzi wa Chuo kikuu cha Afya cha Muhimbili (MUHAS) Idara ya Mifupa na Ajali, Nachukua shahada ya uzamili ya Tiba (MMED) ninafanya utafiti juu ya msongo wa mawazo kwa wagonjwa ambao wanatibiwa kwa kukatwa mguu mmoja kutokana na sababu mbalimbali za kiafya ambao zinahitaji matibabu ya kukatwa mguu.

Hivyo unakaribishwa ushiriki kwenye utafiti huu ambao unaangazia uwepo wa msongo wa mawazo kwa wagonjwa waliotibiwa kwa kukatwa mguu mmoja. Tafadhali soma maswali vizuri uyaelewe kabla hujaya jibu.

Dhumuni la Utafiti

Dhumuni la utafiti huu ni kutathimini uwepo wa taarifa muhimu ili kutafuta njia bora za kutibu wagonjwa waliotibiwa kwa kukatwa mguu hospitalini kutokana na sababu mbalimbali za kiafya, vile vile kusaidia mabadiliko ya sera kwa hospitali na nchi nzima. Aidha taarifa hizi zitamsadia mtafiti kuhitimu shahada yake ya uzamivu ya tiba katika upasuaji wa mifupa.

Taratibu za Utafiti

Taarifa muhimu zinazohitajika kutoka kwako zitaingizwa kwenye fomu maalum ya kukusanyia taarifa. Taarifa hizo zinahusu dalili mbalimbali ambazo zinaashiria mgonjwa kuwa na msongo wa mawazo baada ya kutibiwa kwa kukatwa mguu mmoja kutokana na sababu mbalimbali za kiafya. Ufuatiliaji wa taarifa hizi utakuwa wa muda wa miezi 3.

Athari na Faida za Kushiriki kwenye Utafiti

Hakuna athari zozote zinazoweza kujitokeza. Vile vile kwa kushiriki kwenye utafiti huu utafaidisha taifa na hospitali kwa ujumla kuandaa sera sahihi ya kuwahudumia wagonjwa ambao wametibiwa kwakukatwa mguu mmoja.

Siri

Taarifa zote zitakazo kusanywa zinatajazwa kwenye fomu maalum na zitakua siri, Jina lako au namba yako ya simu zitatumika kwa madhumuni ya matibabu na kufuatilia maendeleo yako.

Taarifa za Mshiriki

Ushiriki wako kwenye utafiti huu ni wa hiari, unaweza kushiriki au kutoshiriki , Aidha unaweza kujiondoa kushiriki na hautaathiri matibabu yako

Endapo unahitaji kupata maelezo kuhusu haki zako au taarifa ,wasiliana na Dr Aaron Ndipo, 0715221333 au Dr Kitugi S. Nungu wa chuo kikuu cha Afya na tiba Muhimbili na taasisi ya mifupa muhimbili. Kama unaswli lolote kuhusu haki yako kama mshiriki wasiliana na Dr. Joyce Masalu ambaye ni mkurugenzi wa bodi ya utafiti chuo kikuu cha Afya na Tiba Muhimbili, kwa S.L.P 65001 numba ya simu +255222152489 Dar es Salaam.

Sehemu B

Kiapo cha ridhaa ya Kusiriki

Nimesoma na kuelewa taarifa zilizotolewa hapo juu kama zilivyo fafanuliwa na mtafiti na kwa ridhaa yangu mwenyewe nimeamua kushiriki.

Sahihi.....

Au alama ya dole gumba

Tarehe.....

Sahihi ya Shahidi.....

Appendix III: Checklist

Study title: Depression among unilateral lower limb amputees at MOI and MNH

CHECKLIST FOR PATIENT’S CLINICAL PROFILE

(A) Demographics

1. Patient’s code number
2. Date of birth:
3. Gender: Male Female
4. Occupation:
5. Address:
6. Phone number
7. Relative phone no:.....
8. The number of relatives who will support the patient at home and during the course of treatment.....
9. Date and time of admission:
10. Dominant leg R....L.....

(B) Details of Surgery (Lower limb amputation):

1. Indication for Surgery
 Traumatic
 Non-traumatic.....
2. Level of Amputation
3. Complications during surgery
 YES () NO ()

*If YES, please mention below according to the post-operation notes

.....
.....
.....

Appendix VI: Dodoso

KIDODOSI JUU YA AFYA YA MGONJWA -9 (PHQ-9)				
Katika kipindi cha <u>wiki mbili zilizopita</u> ni mara ngapi umesumbuliwa na matatizo haya yafuatayo? (Tumia <input checked="" type="checkbox"/> ili kuashiria jibu lako)	Haljatoke zea kabisa	Siku kadhaa	Zaidi ya nusu ya siku hizo	Takriban kila siku
1. Kutokuwa na hamu au raha ya kufanya kitu	0	1	2	3
2. Kujisikia tabu sana au kukata tamaa	0	1	2	3
3. Matatizo ya kupata usingizi au kuweza kulala au kulala sana	0	1	2	3
4. Kujisikia kuchoka au kutokuwa na nguvu	0	1	2	3
5. Kutokuwa na hamu ya kula au kula sana	0	1	2	3
6. Kujisikia vibaya-au kujiona kuwa umeshindwa kabisa au umejiangusha au kuikatisha tama familia yako	0	1	2	3
7. Matatizo ya kuwa makini kwa mfano unaposoma gazeti au kuangalia TV	0	1	2	3
8. Kutembea au kuongea taratibu sana mpaka watu wakawa wameona tofauti? Au kinyume chake kwamba hutulizani na unahangaika sana kuliko ilivyo kawaida	0	1	2	3
9. Mawazo kuwa ni afadhali zaidi ufe au ujidhuru kwa namna fulani	0	1	2	3

FOR OFFICE CODING 0 + _____ + _____ + _____
=Total Score: _____

Kama ulitia alama matatizo yoyote, matatizo hayo yamefanye iwe vigumu kivipi kwako kufanya kazi yako, kushughulikia vitu nyumbani, au kutangamana na watu wengine?

Sio ngumu hata kidogo <input type="checkbox"/>	Ngumu kiasi <input type="checkbox"/>	Ngumu sana <input type="checkbox"/>	Ngumu zaidi <input type="checkbox"/>
---	---	--	---

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

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



Name: _____

Hospital Registration Number: _____

Kwa kuweka alama ya vema kwenye kisanduku kimoja katika kila fungu hapo chini, tafadhali onyesha maelezo yapi yanaelezea vizuri zaidi hali ya afya yako kwa leo.

Uwezo wa kutembea

Sina tatizo katika kutembea

Nina matatizo kiasi katika kutembea

Siwezi kutembea kabisa

Uwezo wa kujihudumia

Sina tatizo kujihudumia mwenyewe

Nina matatizo kiasi katika kujisafisha au kuvaa mwenyewe

Siwezi kujisafisha wala kuvaa mwenyewe

Shughuli za kila siku (*mfano: kazi, kusoma shuleni/chuoni, kazi za nyumbani, shughuli za kifamilia au starehe*)

Sina tatizo katika kufanya shughuli zangu za kila siku

Nina matatizo kiasi katika kufanya shughuli zangu za kila siku

Siwezi kabisa kufanya shughuli zangu za kila siku

Maumivu/Kutojisikia vizuri

Sina maumivu au sina kutojisikia vizuri

Nina maumivu kiasi au najisikia vibaya kiasi

Nina maumivu makali au najisikia vibaya sana

Wasiwasi/mnyong'onyeo

Sina wasiwasi au mnyong'onyeo

Nina wasiwasi kiasi au mnyong'onyeo kiasi

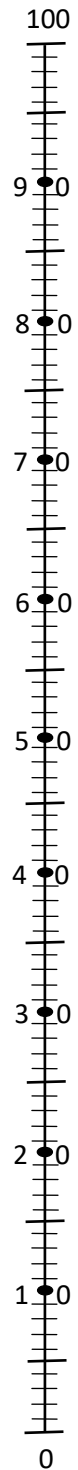
Nina wasiwasi sana au nina mnyong'onyeo sana

Ili kuweza kukusaidia wewe kusema kama hali yako ya kiafya ni nzuri au mbaya, tumechora **kipimo** kinachofanana na kipima joto. Hali nzuri kabisa unayoweza kufikiria imewekewa alama ya 100 (mia moja) na hali mbaya kabisa unayoweza kufikiria imewekewa alama ya 0 (sifuri).

Sasa tungependa utuambie sehemu katika kipimo hiki ambapo ungeiweka hali yako ya afya leo. Tafadhali fanya hivi kwa kuchora mstari kutoka kwenye kisanduku hapo chini hadi kwenye sehemu yoyote katika kipimo ukionyesha jinsi hali ya afya yako ilivyo nzuri au mbaya kwa leo.

**Hali ya afya yako
kwa leo**

Hali ya afya nzuri
kabisa inayoweza
kufikirika



Hali ya afya mbaya
kabisa inayoweza
kufikirika