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Thesis

Investigating the cause of limb amputation in physical rehabilitation reference center

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Abstract

South Sudan, the newest African nation where firearms are owned almost by all men has always been experiencing waves of conflict since independence. Egypt which tried to colonize the country in the 1870s divided it into regions with Equatoria where the country's capital city is located has always been a combat zone. Since then several firearms have continued to be used by both soldiers and the civil populace. Anti-personnel landmines and items of explosive ordnance that were either planted/left before or during these conflicts have caused many injuries to the country's population. Many of these affected individuals have potentially lost their limbs. Nonetheless, an estimated 30% of amputees to whom the International Committee of the Red Cross has been delivering prosthetic limbs since 2008 were said to be landmine patients. Cattle raids alongside inter-communal fighting are quite common in South Sudan's States and Central Equatoria State where Juba belongs. Road traffic accidents, particularly in the streets of Juba City where speeding is not well controlled by the concerned authority, are equally common. These and many others have led to limb amputations. Marriages and relationships are perhaps terminated the affected families experience hunger since a man is considered to be the main breadwinner. The World Health Organization has estimated the number of people living with limb loss in South Sudan to be 0.714% of the country's 12 million population as per the 2012 report. Though traumatic injuries are thought to be topping the table, non-traumatic injuries are also on the rise. The United Nations Mine Action Service (UNMAS) has removed and destroyed nearly 40 thousand anti-personnel landmines and more than 1 million items of explosive ordinance in the Country, according to their report. What is the leading cause of amputation? Which sex or age group is the most affected by limb loss in South Sudan? What effects does limb loss inflict upon the life of an individual and the family? These were the steering wheels of this research.

Abbreviations and acronyms

ADLs: Activities of Daily Living; BCE: Before Christian Era; CNS: Central Nervous System; EMS: Emergency Medical Services; Et al: Et alia (and others); Etc: Excetra; Fig: Figure; ICRC: International Committee of the Red Cross; MESI: Mangled Extremity Syndrome Index; MESS: Mangled Extremity Severity Score; NHS: National Health Service; PAD: Peripheral Arterial Disease; P&O: Prosthortists and Orthortists; PRRC: Physical Rehabilitation Reference Centre; RTAs: Road Traffic Accidents; SSMAA: South Sudan Mine Action Authority; SSMJ: South Sudan Medical Journal; UN: United Nations; WHO: World Health Organization

CHAPTER ONE

Introduction

This chapter gives a brief overview of some causes of limb loss to clients visiting the Physical Rehabilitation Reference Center (PRRC). Human extremity amputation has been viewed as a global burden [1]. When an individual undergoes this condition, there would be no proper locomotion such as walking, running, swimming, or climbing [2]. In 2017, the number of people living with limb amputation due to traumatic causes was exactly 57.7 million worldwide [3]. South Sudan, the world's newest nation has just increased its population by 1.68% out of this number, 1.2 million are amputees, many of whom were gunshot and land-mine victims, according to a report [4]. Road Traffic Accidents (RTAs) mostly caused by private cars and motorcycles are among the leading causes of limb loss in Juba besides other injuries [5]. In the Physical Rehabilitation Reference Center, people pay special attention to the causes of limb loss among the service objects visiting the rehabilitation center. This research aims to improve this voice. It focuses on amputation caused by causal factors (Figure 1).

Background

Limb amputation is one of the oldest treatment options available in today's medical Discipline. In a book entitled, "On

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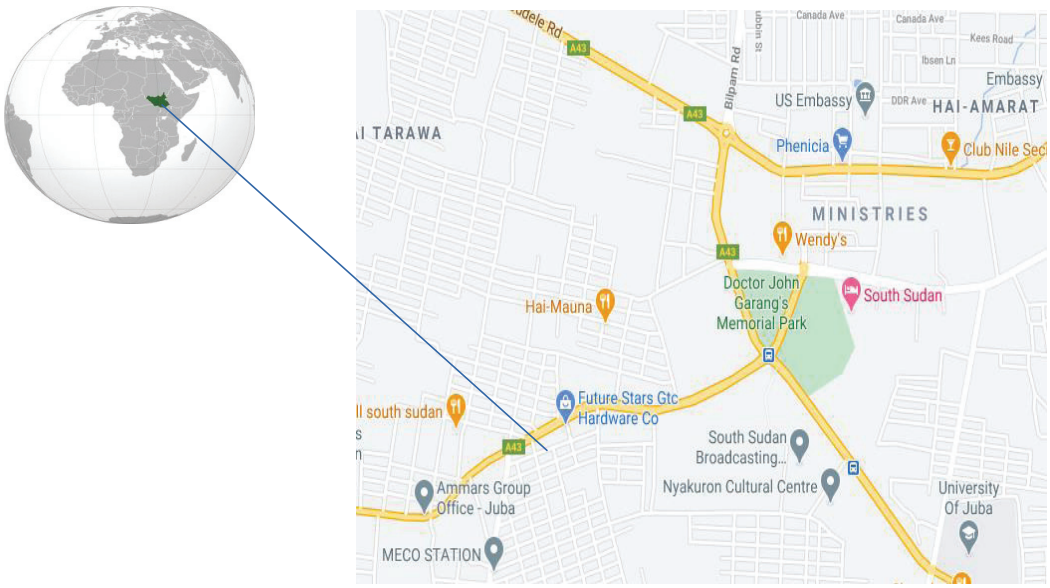

Figure 1: A map of PRRC.
Source: Secondary.

Joints," Hippocrates was the first to describe and perform a surgical amputation but was later criticized as being, "the last resort. During that time, (about 460 BCE), knowledge of how to perform an amputation on living flesh was limited until the 17th Century (1674), when Etienne Morel, a French Army Surgeon introduced the tourniquet [6]. His discovery gave a medical drive to amputation surgery. In 1536, Ambroise Pare carried out the first elbow disarticulation procedure. His amputation procedure at the ankle joint was later reported by Sir James Syme, in what is now known as Syme amputation [7].

Recent worldwide literature, says: "The common cause of limb amputation varies from 2.8 to 43.9 per 100,000 people in a population [8]". In the developed world, most people lose their limbs due to diabetes mellitus, especially type 2, commonly diagnosed in older people. In contrast, trauma-related amputations are the most common cause of limb loss in developing countries like South Sudan [9]. The World Health Organization (2016) highlighted the increasingly serious epidemic of 1 in 11, adults whom it said, were living with diabetes, the great majority being type 2 [10]. And in another report, there has been a four-fold increase in diabetics over the past 35 years [11]. The increase is most rapid in low- and middle-income countries with limited access to treatment and awareness of its complications [12].

In Juba, the Capital City of South Sudan, years of civil war, tribal conflict, and political unrest have provided the population with ready access to weapons and the knowledge to use them [13]. Gunfire, especially at night, is not uncommon [14]. A media report pinpoints road traffic accidents as the major cause of disability in between 50 and 60 thousand of the affected individuals estimated in the country [15]. Most previous studies showed male drivers aged between 20 years - 30 years, who were allegedly driving private cars to be involved in most accidents occurring on the city's streets mostly during rush hour. Though this has been observed, up to 99.5% of those who were trapped in these waves of incidence were not in any way intoxicated [16]. Road Traffic Accidents (RTAs), especially those caused by rickshaws, motorbikes, and motorcars are among the leading sources of problems among amputees visiting the Physical Rehabilitation Reference Centre (PRRC), others being falls, snake bites, etc. PRRC is the only Institution rendering physical therapy services in the country. The center is equipped with a prosthetic limb factory where amputees from all parts of the country get their new limbs with the support of ICRC in partnership with the Government's lined Ministry [17].

Statement of the problem

The cause of limb amputation in developing countries depends upon their stage of development [18]. South Sudan once at war, is now at peace, yet the Mine Action Authority (2016) had said, 3,217 people were injured in land mine explosions. According to the United Nations (2017), an estimated 50 to 60 thousand people were living with disabilities in the country. In Juba, traffic accidents alongside other forms of trauma, are common causes of limb amputation among the populace. The World Health Organization report (2017) puts South Sudan number 18 in the world where road traffic accident was listed as the underlying cause. Though traumatic accidents are considered fatal, not all cases are serious; some simple injuries or fractures that could easily be managed in other parts of the world often end in infections and amputation in South Sudan. As such, it is not unusual to see an individual reporting or moving with three or more limbs on the premises of PRRC.

Objectives (Purpose) of the study

Broad objective: The main goal of this study is to uncover

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the leading cause of amputations at the Physical Rehabilitation Reference Centre (PRRC).

Specific objectives:

1. To examine the common cause of amputation at the Physical Rehabilitation Reference Centre.
2. To find out the most affected age and gender.
3. To explore its effects on individual and family levels.

Research questions

1. What is the main cause of limb loss at the Physical Rehabilitation Reference Centre?
2. Which age group/gender is the most involved?
3. What effect does limb loss inflict upon the life of an individual or family?

Significance of study

This study is projected to be "a ladder" for understanding the causes of limb amputation at the Physical Rehabilitation and Reference Centre (PRRC). The study may consequently reward bookmen in accessing an extensive set of evidence to wise up to their inquiry. It could yet serve as an outlet for further research in areas of lineal to limb amputation not detailed in this specific study. From the research findings, the study may enable the lined Ministries or Organizations to formulate relevant policies, strategies, design programs and projects, and assessment tools for curving the menace of people living with limb loss. The study would provide feedback to the government and other agencies that provide funds to support limb-loss clients.

Justification

This study aims to provide fundamental data to stakeholders and program managers, necessary for intervention to ultimately, reduce the causal agents of limb amputation.

It is necessary because the data expected to be generated from the study is sufficient to expand further knowledge of this topic from many other dimensions.

The study also presents sufficient challenges for academicians to increase their research interests in the field of knowledge.

It will help other organizations to appreciate the benefits of having researchers in the field of Physiotherapy.

Scope and delimitation of the study

This study will be carried out in the Physica Rehabilitation Reference Center (PRRC), Juba, South Sudan. The center is chosen because of its range of coverage pertinent to amputees' rehabilitation program. Since the study deals with limb amputation, other forms that will be culled are considered a delimitation.

Conceptual framework (Figure 2)

CHAPTER TWO (Literature review)

Definition

Limb Amputation has been defined by several scholars, researchers, and authors, as the removal of all or part of a limb or extremity such as an arm, leg, foot, hand, toe, or finger, usually by surgical, constrictive bands and or traumatic means.

Classification

Limb amputation is broadly categorized into Minor and major. A minor amputation is defined as occurring distal or through the tarsometatarsal joint (Forefoot, Tarsometatarsal, and Lisfranc) whereas, major amputations, are those that occur proximal to the tarsometatarsal joint (Chopart, Boyd, Syme, Below-Knee, and Above Knee). Charcot foot (arthropathy) as seen in Figure 3.

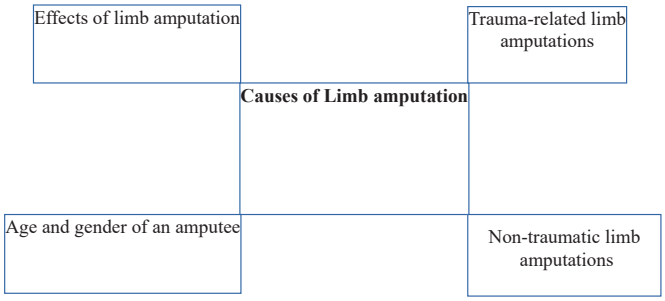

Figure 2: Conceptual framework.

Anatomy (Figure 3)

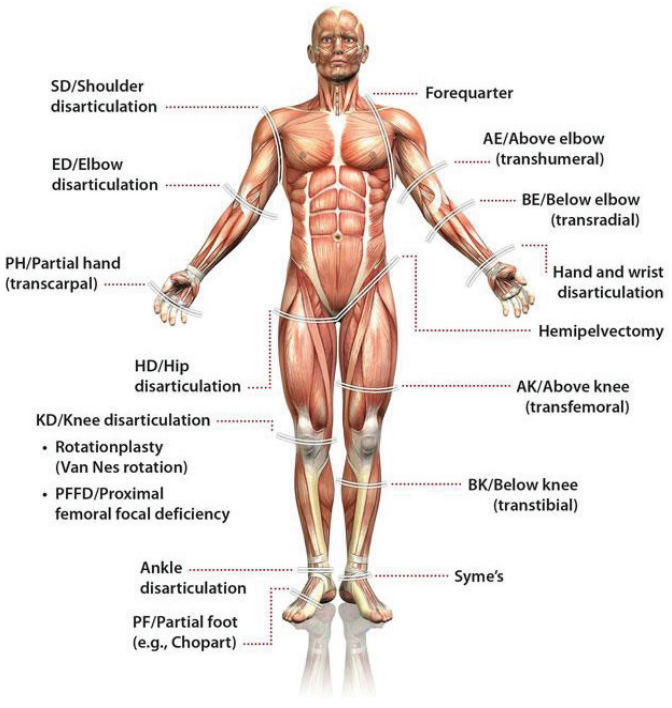

Figure 3: Human Anatomy showing levels of amputation.
Source: Secondary data.

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Epidemiology

The loss of a leg or arm (limb amputation) can impact a person's ability to walk or balance correctly. Daily life will tend to be changed forever. The victim may also experience what is referred to as phantom pain.

Non-traumatic amputations: As a matter of fact, people requiring amputation due to poor circulation from conditions like Peripheral Artery Disease (PAD) or diabetes account for most non-traumatic amputations. Those with diabetes have a 10 times higher risk of amputation compared to those without diabetes. About 22 percent of people with foot ulcers experience an amputation within 19 years of being diagnosed with type 2 diabetes. The risk of readmission to the hospital after a minor amputation increases if you have chronic diseases such as PAD, hypertension, kidney failure, or previous leg bypass surgery. The risk of undergoing an amputation increases eight times once a person develops a non-healing foot ulcer. It is estimated that 14 to 25 percent of people with a non-healing foot ulcer will need an amputation. Approximately 20 percent of people with the most severe form of PAD will undergo an amputation due to PAD within a year of diagnosis.

Traumatic amputations: The traumatic loss of a limb, defined as an injury to an extremity that results in immediate or non-immediate separation of the limb due to accident or injury is said to be the second most common cause of amputation in the world (Sarvestani, et al. 2013). It occurs most frequently due to motor vehicle accidents, farming accidents, the use of power tools or firearms, or severe burns and electrocution (William Shiel 2013). Intercontinental prevalence of traumatic amputations is higher in East and South Asia, followed by Western Europe and North Africa (Pomeres, et al. 2018). In Ethiopia, trauma is by far, the cause of limb loss accounting for 37.7%, and the male gender is more involved than the female (Gebreslassie, et al.2018). This study is supported by similar results released by South Sudan Medical Journal in 2017 in which traumatic amputation due to road traffic accidents especially those caused by cars other than other means of transport, trauma was at the top of the table (Chama, et al. 2017). Though trauma-related amputation is seen in these studies to be occurring most commonly among young adult men, it is worth saying, "this incidence" can happen at any age to individuals of either sex depending upon three interacting factors: movement of the object that caused the injury; the direction, magnitude, and speed of the energy vector; and the particular body tissue involved (Kirk, et al. 2008)

Aetiology

Even though limb amputation is based on its factors, it is mostly considered "treatment of the last resort." It is worth saying, that for a person to depart with a limb, there must be certain factors that coke the gun and the others that pull the trigger. Once trapped in this life-changing condition, an individual or their family may experience dramatic events in the environment. However, two theories/models have been put in place to help explain how these occur and their managerial attempts:

Kübler-ross theory: This theory states that "after the loss of a loved one, and a limb in this case, an individual will go through five different stages of grief, pain, and a drastic change in how he/she perceives his/herself." Limb amputation is like divorce, absence of the whole or part of your extremity is a painful departure in life. This Theory/Model describes the internal emotional journey that individuals in this case, (with limb loss) typically experience when dealing with change and transition.

The gate control theory of pain: The second Theory of pain perception is known as the "Gate control theory." It asserts that the spinal cord contains a neurological "gate" that either blocks pain signals or allows them to continue to the Central Nervous System (CNS). There has been an idea that thoughts, emotions, and expectations are influential factors in an individual's pain perceptions. For instance, if you are upset or frightened, pain may seem more intense than it would if you were calm. For an amputee to psychologically manage this pain, he/she should cease other activities that will provoke the pain in the residual limb. Pieces of information are carried to two areas of this region; the small nerve fibers carry pain, and the large nerve fibers transmit normal fibers for touch, pressure, and other skin senses.

Pendulating theory: Pendulating or Looping Theory explains the behavior and underlying concerns of a patient shortly after a leg amputation is linked to the process of realizing that they are experiencing a life-changing event that has potential life- and identity-threatening consequences. It is basically talking of switching between resourcing and titration, to allow a person to move between a state of arousal triggered by a traumatic event and a calm state. After a limb loss, a patient undergoes three phases in realizing a life-changing event. But swallowing the life-changing decision, detecting the amputated body, and struggling with dualism help the patient regain it (Madsen, et al. 2016). Ideally, concepts from this Theory could be used by those who support patients coping with the condition by offering terms to express and recognize patients' reactions.

Mangled Extremity Severity Score (MESS)

It is important to have a scoring scale for assessing the severity of limb injury. Though there has not been any generally agreed grading system for limb amputation, Mangled Extremity Syndrome Index (MESI) and Mangled Extremity Severity Score (MESS) grading systems are used for upper and lower limbs [19]. Unlike the former, MESS is widely used due to its wider inclusivity compared to MESI (Demir, et al. 2018). Johansen, et al. 1990 developed this assessment system following a retrospective evaluation of patients with lower mangled extremities. The criteria for MESS include age, the presence of shock, warm ischemic time, and skeletal and soft tissue injury. In case the warm ischemia time is longer than 6 hours, the score is doubled. A MESS value equal to or greater than 7 is suggested as highly predictive for amputation. In contrast, MESI may be used because its rule says, any limb injury having a cut-off of 20 is considered for amputation.

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CHAPTER THREE (Methodology)

Introduction

This chapter addresses research methodology in terms of research design, study area, study population, sample size, sampling techniques, study variables, Data collection tools/ instruments, data collection techniques, quality control, data analysis, and presentation. However, it also highlights ethical considerations and study limitations.

Research design/criteria

A rehabilitation-based research design was used to assess the magnitude of limb loss among amputees who had either visited or were visiting the Physical Rehabilitation Reference Centre of Juba. The sample size was determined by a single population proportion technique that led to the obtention of the desired sample size.

Inclusivity: This study included all ages, all individuals with limb amputations, all inpatients with limb amputees,

Exclusivity: Though this study included all ages, those who were outpatients, non-amputees, amputated in other parts of the body other than the limbs, not staying in the study area, or coming to the center after the study time frame were excluded.

Study area

The study was conducted in the Physical Rehabilitation Reference Center.

Study population

The study targeted all ages of the population which enabled the researcher to investigate the commonest cause of amputations at the Physical Rehabilitation Reference Center.

Sample size

A sample of 15 correspondents was selected using random and convenience sampling methods in which the respondents from the Physical Rehabilitation Reference Center were approached (Table 1).

Sampling techniques

Both random and Convenience sampling techniques were used because the selection especially for children was based on the availability and willingness of the respondents' parents/ guidance to take part.

Study variables

The study variables were divided into independent and dependent; in which causes, and effects affected age and gender fell under independent and so on (Table 2).

Sample size estimation

The sample size of 15 respondents was determined using single population proportion techniques. This method involves calculating the required sample size based on a known or estimated proportion of the population exhibiting a certain characteristic or outcome. In this case, it allowed for a representative assessment of limb loss among amputees visiting the Physical Rehabilitation Reference Centre.

Table 1: A sample size of a population study.

Age groups	Target Population	Sample size	Sampling Technique
31 - 58	30	7	Random
18 - 30	25	6	Random
0 - 17	5	2	convenience
Total	60	15	

Table 2: Dependent and independent variables.

Dependent variable	Independent variables
Investigating the common cause of amputation	Causes Effects Affected age and gender

Conclusion for an observational or correlational study

The small sample size of 15 respondents was deemed appropriate for an observational or correlational study. This size was selected to ensure a manageable and focused investigation, particularly given the specific nature of the study objectives. The limited sample size allows for in-depth examination and correlation analysis without overwhelming logistical challenges.

Data collection tools/instruments and techniques

Questionnaires, checklist guide and observation were data collection tools for this research. Each questionnaire comprised open and close-ended questions which were divided into three sections. The first section requires demographic information of a respondent, the second part required the causes of limb amputation and the last section required the effects of amputation.

Data collection procedure

Primary data main source was used in this study. Data were collected through a questionnaire, interview and observation methods whereby the researcher approached commonly fitted amputees at Physical Rehabilitation Reference Center after other considerations.

Quality control

A draft of the proposal alongside a questionnaire were submitted to the academic supervisor for feedback whether the questions were to be considered for the validity and reliability of the intended study.

Data analysis and presentation

The Data for this research was presented in tables, figures, percentages, graphs, and pie charts.

Ethical consideration

To conduct the study, St. Mary's College issued me with

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an introductory letter requesting the Physical Rehabilitation Reference Center's maladministration desk to give me a green light, and I obtained informed consent forms from the respondents after providing them with all the necessary details about this study. The data was upheld with confidentiality throughout the study.

Study limitations

The following limitations were faced:

- Shortage of well-equipped libraries to get different kinds of information on the same topic.
- Lack of data on the number of amputees in South Sudan and Juba in particular.
- Lack of electric power, especially at home contributed to the procrastination of this book.
- Too many appointments with the Supervisor were aborted.
- Financial constraints delayed the printing, binding as well and submission of this book.

CHAPTER FOUR
(Data entry and presentation)

Introduction

This chapter presents the findings of the study Investigating the causes of limb amputation at the Physical Rehabilitation Reference Centre. Quantitative data was summarized in the form of tables, percentages, frequencies, pie charts, and bar graphs whereas qualitative data was presented in the form of statements using the words of the respondents.

Socio-demographic characteristic (Table 3)

The number of respondents who were interviewed was 15. But out of the total number, the majority were lying between the age of 18 - 30 with the number of 7 (46.7%), followed by 31 - 60, 5(33.3%), 61 - 100, 2(13.3%) and lastly 0 - 17, 1(6.7%) (Table 4).

From the respondents interviewed masculine gender emerged as the majority with a total of 13(86.7%) and a few were feminine gender with only 2(13.3%) (Table 5).

Out of the 15 respondents many of them attended Primary school 5 (33.3%) followed by secondary school leavers with the number of 4(26.7%) and the other respondents were unlearned, 3(20%), Tertiary 5 (33.3%), and only one respondent attended Nursery school (6.7%) (Table 6).

Many of the respondents who participated in the study were military personnel 6(40%), followed by other respondents who were either serving or had lost their jobs due to amputation or any other reason 5(33.3%), while students were 3(20%) in number and lastly 1 (6.7%) was a trader (Figure 4).

Table 3: Age of the respondents.

Age groups	Number of respondents	Percentage (%)
0 - 17	1	6.7%
18 - 30	7	46.7%
31 - 60	5	33.3%
61 - 100	2	13.3
Total	15	100

Source: Field data 2021.

Table 4: Gender of the respondents.

Gender	No of respondents	Percentage (%)
Male	13	86.7
Female	2	13.3
Total	15	100

Source: Field data 2021.

Table 5: Levels of education of the respondents. **Percentage (%)**

Tertiary	2	13.3
Secondary	4	26.7
Primary	5	33.3
Nursery	1	6.7
Unlearned	3	20
Total	15	100

Source: Field data 2021.

Table 6: Occupation of the participants.

Occupation	Number of respondents	Percentage (%)
Soldier	6	40
Trader	1	6.7
Student	3	20
Other	5	33.3
Total	15	100

Source: Field data 2021.

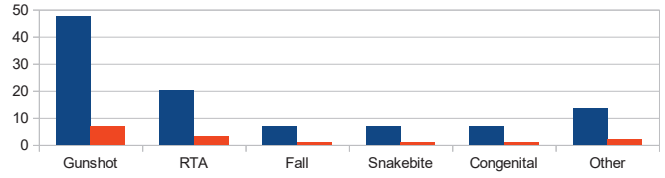

Figure 4: The chart represents the causal agents of amputation.
Source: Primary field data 2021.

Causes of amputation

The commonest cause of limb amputation, according to the graph was an infection resulting from gunshot wound 7(46.7%) which was preceded by RTA 3(20%). Meanwhile, limb amputation due to Falls, Snakebite, and Congenital (present at birth) stood at the same level as 1(6.7%) Other causes of limb loss aside from the aforementioned was 2(13.3%) in number, higher than the latter (Figure 5).

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Lower limbs showed a greater percentage of 9 (73.3%) than upper limbs 1(6.7%) with below-knee being the commonest level of amputation 9(60%) compared to below-knee 4(13.3%) in the portion. In the upper limb, only six point seven percent of above-elbow joints underwent amputation, according to the graph data. Of the 15 respondents, there was no one who underwent the level of Below-elbow amputation (Figure 6).

As per the data collected from the respondents, the majority were lower-limb amputees (93.3%) most of whom had their right lower limb 8(53.3%) and left lower limb 6 (40%) amputated compared to upper limbs (6.7%) only the right side represented 1(6.7) (Figure 7).

Of a total of 15 respondents in the participation, 14(93%) of them said they were able to take care of themselves independently. This includes bathing, grooming, oral care, nail and hair care. Only one respondent said he was unable to carry out all Activities of Daily Living without help.

According to the findings, 8(53.3%) of the participants said they were using assistive devices to access the toilets, but 3(20%) of them said they were using the toilets properly and independently, meanwhile, others 4(26.7%) said that they were using other ways to get to the toilets and all of them denied assistance by someone else (Figure 8).

The majority, if not, all participants 15(100%) said they were able to change positions while in bed, make safe transfers from the bed to the wheelchair, and walk independently.

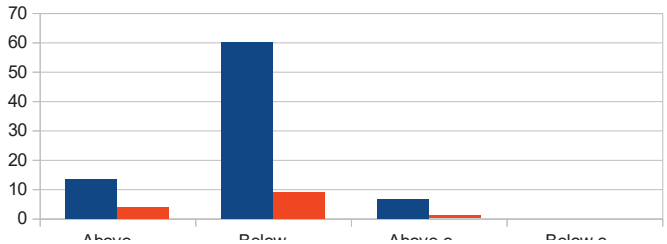

Figure 5: Graph chart showing the levels of limb amputation.
Source: Primary data 2021.

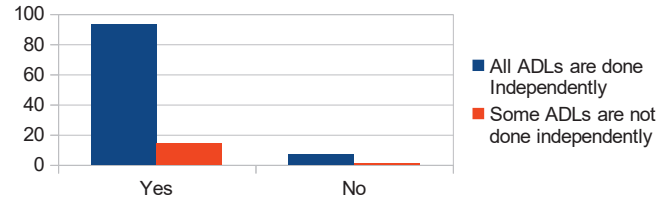

Figure 6: A line graph representing the side of amputation.

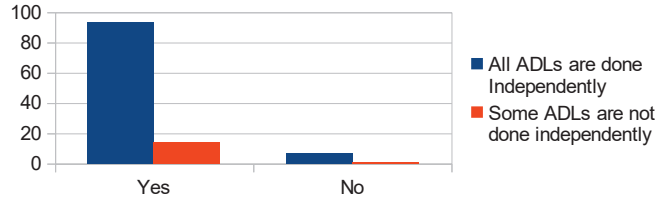

Figure 7: Showing independence in self-care the respondents.

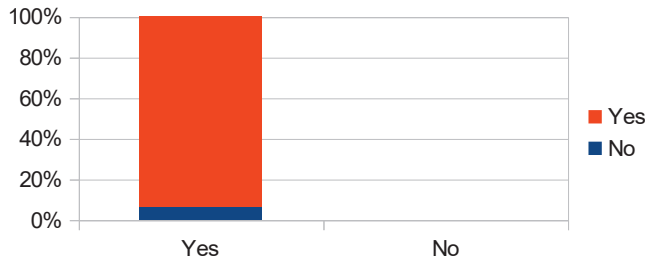

Figure 8: Shows changing of position, transfers, and walking independently.
Source: field data 2021.

CHAPTER FIVE

(Data analysis, discussion, and recommendation)

Introduction

This chapter entails findings in comparison to the literature reviewed in chapter two linking it with specific objectives of the study.

Demographic information

Age: Age, especially in the advanced group, is seen in recent literature as an influential factor in limb amputation. The results of this study showed the age of 18 - 30 7(46.7%) to be the most involved in limb amputation (LA) followed by 31 - 60, 5 (33.3%), and 61 - 100 2 (13.3%). The least affected age was 0 - 17 1(6.7%). This could be because the age was not favorable for employment or recruitment compared to adults.

Gender: Of the affected age, the masculine gender constituted the majority of 13 (86.7%) compared to feminine 2(13.3%). Nevertheless, many of them had a low level of education. That is, 1(6.7%) attended or was still in nursery school, 5(33.3%) ended in primary education, 4(26.7%) attended secondary school and at least 2(13.3%) reached tertiary level. Out of this number, 3(26.7%) had never attended any schools; they were unlearned. A great many of them were soldiers 6(40%) who were either active or already assigned a different duty or pensioned. Of those who were still students or waiting for employment 3(20%) and only a trader 1(6.7%) were found among them. The rest 5(33.3%) were housewives, cattle herders, and or peasant farmers.

Causes of amputation

In the study, I found gunshot to be the commonest cause 7(46.7%) of limb amputation preceded by Road Traffic Accidents 3 (20%). Falls, snakebites, and congenital 1(6.7) were seen at the same level. Other causes were 2(13.3%), excluding the aforementioned. However, these results were not in harmony with those in the South Sudan Medical Journal (5) and (16.)

Effects of amputations

Limb amputation does not only affect an individual's image, it can also cost an individual his or her job. Usually, after limb rehabilitation, individuals will get employed or be reinstated in the position if they were caught in the incident at that moment. In this particular study, some of the respondents lost their jobs

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after the incident. One of the males at the age of 40 did say that he was divorced by his wife after he sustained a gunshot injury that resulted in limb loss. The majority who served in the military said they were inactivated due to physical fitness. A few of them said they were reinstated into their positions after rehabilitation. In Juba, when this happens the affected individuals, families, and communities will be affected in one way or the other. For an individual, the quality of life will tend to reduce.

Discussion

In examining the findings of this study, it is essential to contextualize them within the broader body of existing literature. A comparative analysis with relevant studies, such as those referenced in the South Sudan Medical Journal, reveals both congruencies and disparities. The observed variations could be attributed to contextual differences, methodological approaches, or unique characteristics of the study population. Addressing these divergences enhances the depth of understanding and provides a nuanced interpretation of the current study's significance in the broader scientific discourse on limb amputation.

Conclusion

The results of the study indicated that the majority of amputees were younger people aged 18 and 30. In reference to various reliable literature, younger and older people, especially drivers are more involved in road traffic accidents which later leads to limb loss than the middle-aged [20]. This study is comparable to this assertion. Lower limb and below-knee amputations are shown to be more common. These were mostly primary and secondary school leavers, partially educated, and a few professionals. It is also seen that most of the patients were males. This shows that males were mostly affected by the incidence as compared to females.

Recommendations

To St. Mary's College-Juba:

1. The library should be well-equipped and have a greater capacity.
2. A panel for research guidance be formed in the College

To the Ministry of Roads and Transport:

1. More Street signs should be introduced in all parts of Juba City to limit speeding.
2. The speed limit should be availed and anyone who goes beyond it must be taken to book.
3. An Automated Road Traffic Monitoring System should be used for tracking stubborn road users instead of a manual.

To the Ministry of Health: For early and better control of Diabetes, older people should be screened against it, especially type 2.

Physiotherapy should be introduced in all high-learning institutions to curb the risk of limb amputation.

To clients: Seek health services before it is too late for your limb salvage.

Dedication

I am dedicating this research project to all amputees wherever they may be while giving me sighing thanks to God for the wonders He has done for me from the genesis to the extremity of this project. Without Him, I wouldn't have been who I am today. I would like to stretch my words of mouth to my humble spouses, Fadia Alma alongside Aber Julise and our beloved children; Lomogo Joseph Lofere, Emanuel Bidal Lofere, William Tanza Lofere, Obedmot Noel Lofere while not forgetting my lost young angel, Naboi Shakira Lofere. You have been unifying blood in my family. May the Holy water of our Lord Jesus Christ be sprinkled upon you all. My sincere gratitude is yet extended to my dear parents, Eneriko Kürüle Lotïtï and Kharleta Idongï Lopoi. You have made this world a better place for me to live in. Bringing me upright and exposing me to the world of academia is the greatest thing in my life. May your ideal motive dwell forever. To my blood male siblings; Lochoroi Adamo H. Lotiti, Lominga Denis H. Lotiti, Loyok Karlo H. Lotiti, and Lolam Kiyango. H. Lotiti not excluding my female sibling; Teresa Nakang H. Lotiti, Rebecca Issoba H. Lotiti, Helena Nakai H. Lotiti, Susan Inyirim H. Lotiti, Joyce Madi H. Lotiti and Almerina Ijïok H. Lotiti. Missing you in the 4 or more years of this project was a significant detachment.

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Operational definition of terms

Activities of daily living: The fundamental skills typically needed to manage basic physical needs, comprised the following areas: grooming/personal hygiene, dressing, toileting/continence, transferring/ambulating, and eating.

Amputation: This is surgical removal of all or part of a limb.

Congenital: Present at birth but not necessarily hereditary.

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Major limb: The lower extremity of a human body.

Quality of life: This is a personal satisfaction (or dissatisfaction) with a cultural or intellectual condition under which you live (as distinct from material comfort).

Barriers: Anything serving to maintain separation by obstructing vision or access.

Limitations/Restriction: This is an act of restricting the extent of something.

Participation: This is an act of sharing in the activity of a group.

Explosive ordnances: Any military armament that can detonate upon triggering.

Land mine: An anti-personnel explosive device concealed on or underground to destroy or disable an enemy above 5 kilograms.

Rehabilitation: Is the restoration of someone to a useful place in society through the treatment of physical disabilities by massage electrotherapy and exercises.

Impairment/Disability: This is the condition of being unable to perform as a consequence of physical or mental unfitness.

Client: A person who requires medical care.

Amputee: A person who has had a limb removed by surgery, disease, and or congenital.

Declaration

This research dissertation is solely my original work and it has not passed through any brain for any award of either degree or its equivalent in any other College or university.

Project approval

I, the undersigned, certify that this dissertation is the work of the candidate carried out during his/her studies under my direct supervision. I hereby certify that I have read and recommended for the research examination entitled: "Investigating the cause of Limb amputation in Physical Rehabilitation Reference Center."

This research project entitled: "Investigating the Cause of Limb amputation in Physical Rehabilitation Reference Center has been submitted with my approval.

(Appendix)

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