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SCHOOL OF MEDICINE
DEPARTMENT OF PHYSIOTHERAPY**

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RESEARCH REPORT (PTY 5524)

**“THE PREVALENCE AND COMMON INDICATIONS OF
DIABETIC RELATED AMPUTATIONS AT UNIVERSITY
TEACHING HOSPITAL”**

BY

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**SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR THE AWARD OF THE BACHELOR OF PHYSIOTHERAPY AT
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ABSTRACT

Introduction: Amputation of a limb is always distressing and the consequence of the loss can be devastating. While it is true that people with diabetes have a higher statistical risk of amputation, it is largely a preventable fate. Almost 75% of diabetic-foot related amputations are preventable. Unlike developed countries where data on the incidence of amputations can be obtained relatively easily, these rates are unknown in most of developing countries, which record high prevalence of diabetes.

The main objective of this study was to determine the rate and common indications of diabetic related amputations at University Teaching Hospital (UTH) from January 2013 to December 2014.

Methodology: This study was a retrospective, descriptive study and quantitative in nature. It was conducted at the University Teaching Hospital (UTH), General surgical wards G-block. A convenient sampling method was used and the sample size comprised 53 records of patients who underwent diabetic related amputations in the years 2013 and 2014. Data was collected using a checklist.

Results: Out of 53 medical records that were reviewed, the commonest indication for diabetic related amputations was gangrene with the proportion of 49.1% (n=26). The prevalent age group 28.3% (n=15) was that belonging to the category 61-70 years of age, followed by 26.4% (n=14) was of the range 71-80 years. Data showed that most patients 56.6% (n=30) were males. Most of the patients were from medium density residential locations 35.8% (n=19), followed by high density locations (32.1%). Below knee amputations were more common with 47% of the patients (n=25) and the least was above knee amputations 15% (n=8).


Conclusion: The prevalence of diabetic related amputation was 12% with gangrene being the most common cause. In this study it was noted that 1 in every 8 amputations at UTH is diabetic related. If this information is confirmed in other parts of Zambia, it will offer health care workers and other stake holders the chance to come up with interventions that will help reduce the rate of diabetic foot complications and minimize chances of lower limb amputations.

Key terms: Prevalence, Indications, Level, Diabetes, Amputation

DECLARATION

I hereby declare that the work presented in this study in the partial fulfillment for the attainment of the Bachelor of Physiotherapy is purely as a result of my individual effort and hard work and that it has not been presented anywhere else for any other degree.

Simona Nkabhise

Signed.....

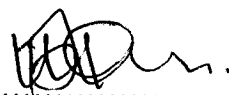
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This dissertation is presented to the University of Zambia, School of Medicine in partial fulfillment of the requirement of Bachelor of Physiotherapy.

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Signature.....Date.....

DEDICATION

I dedicate this work to my lovely mother Mrs. Grace Chituta Simona who has been a pillar of my strength. Mum, you have always been there for me. I am looking forward to the next challenge with you by my side. I love you.

ACKNOWLEDGEMENTS

Firstly, I thank God Almighty for giving me strength and being with me throughout this school period. I wish to acknowledge the invaluable help of my supervisor Dr. Martha Banda for her advice, instructions, and simply bearing with me during this arduous task. Thank you for the time you sacrificed just so that I could do this work perfectly, even the times you had to go home late.

Secondly, I would also like to thank Mr. Shula and Ms. Nkhata the research coordinators and all the lecturers, supervisors in the physiotherapy department for their advice. Particular thanks go to my colleagues from Ridgeway Campus who have enhanced the text by reading various chapters and providing helpful critiques and served as editors for this work. Their thoughtful comments, suggestions, and encouragement have been of immense help to me in compiling an excellent report. This project would not have been a success without the unfailing support.

Special thanks go to my mother Mrs. Simona for her support, financially, spiritually and emotionally. Thanks also go to my siblings (Taonga and Alinani) and Mr and Mrs Chituta.

Without these people, I would not have come this far.

May God bless you all.

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LIST OF ACRONYMS

DM -	Diabetes Mellitus
LLA -	Lower Limb Amputation
LEA -	Lower Extremity Amputation
TCC -	Total Contact Casting
UTH -	University Teaching Hospital
PVD -	Peripheral Vascular Disease
PAD -	Peripheral Arterial Disease
SPSS -	Statistical Package for Social Sciences
AGE -	Advanced Glycation End-products
ADA -	American Diabetes Association
AKA -	Above Knee Amputation
BKA -	Below Knee Amputation

LIST OF KEY WORDS

Prevalence

Indications

Level

Diabetes

Amputation

DEFINITION OF TERMS

Diabetes: A metabolic disease in which the body does not produce insulin or the insulin being produced is not enough for body use.

Amputation: removal of all or part of a limb, appendage or any outgrowth of the body.

Lower Limb Amputation: removal of part or the entire lower limb.

Peripheral Arterial Disease: a circulatory disease in which narrowed arteries reduce blood flow to the limbs.

Polyneuropathy: damage or disease affecting peripheral nerves.

Gangrene: This is the death or decay of a body tissue or part due to reduced or no blood supply to that area.

Infection: Invasion and multiplication of microorganisms such as bacteria, viruses and parasites that are normally not present in the body.

Low density residential locations: These are areas that if dominant in an area result in low average housing density.

Medium density residential locations: These refer to areas with the average type of homes.

High density residential locations: These refer to areas with development outcomes that result in more homes than usual on a property meant for one home.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Limb loss is one of the most physical and psychologically devastating events that can happen to a person (Gitter & Bosker, 2005). According to Chalya (2012), limb amputation is one of the most ancient of all surgical procedures with a history of more than 2500 years. Amputation is defined by Dorland and Anderson (2003) as the removal of all or part of a limb, other appendage or body outgrowth. According to Federicks (2012), amputations are inevitable as a result of vascular disease, diabetes mellitus (DM), trauma, tumors, infection and congenital deformities. For many years loss of a limb has been considered a tragic frequent consequence of diabetes mellitus (Federicks, 2012).

Diabetes, often referred to as diabetes mellitus (DM), describes a group of metabolic diseases in which the person has high blood glucose (blood sugar), either because insulin production is inadequate, or because the body's cells do not respond properly to insulin, or both (American Diabetes Association, 2011). According to (ADA, 2011), there are three types of diabetes:

1. **Type 1 Diabetes** – The body does not produce insulin. Some people may refer to this type as insulin-dependent diabetes, juvenile diabetes, or early-onset diabetes. People usually develop Type 1 diabetes before their 40th year, often in early adulthood or teenage years (ADA, 2011).
2. **Type 2 Diabetes** – The body does not produce enough insulin for proper function, or the cells in the body do not react to insulin (insulin resistance) (ADA, 2011).
3. **Gestational Diabetes** This type affects females during pregnancy. Some women have very high levels of glucose in their blood, and their bodies are unable to produce enough insulin to transport all of the glucose into their cells, resulting in progressively rising levels of glucose (ADA, 2011).

Diabetes is a carbohydrate metabolism disorder usually characterized by inadequate levels of blood insulin, and excessive blood and urine sugar levels (Abdul-Ghani, 2006). About 86, 000 of all amputations per year are due to diabetes and diabetes-related

complications (Vinik, 2013). Among people with DM, lower extremity disease is the most common source of complications and hospitalization (Boyko *et al.*, 1999).

The number of people with DM has been conservatively estimated to approximately double by 2030 to a worldwide prevalence of 4.4% at which time 366 million people will have diabetes (Wild *et al.*, 2004). As the number of people with DM raises, so will the burden of diabetic foot disease, particularly since the factors contributing to ulcer formation such as peripheral neuropathy and vascular disease are already present in 10% of people at the time of diagnosis (Boulton *et al.*, 2005). The risk of an individual with DM developing a foot ulcer some time in his or her lifetime could be as high as 15% and foot ulcers are found in 12% to 25% of diabetics (Singh *et al.*, 2005).

Diabetes-related lower-extremity amputations rates are important indicators for the effectiveness of health care provided to diabetic patients including prevention and management of foot ulcers and to forecast the magnitude of the problem (Schofield *et al.*, 2006).

While it is true that people with diabetes have a higher statistical risk of amputation, it is largely a preventable fate (Larsson *et al.*, 2007). Almost 75% of diabetic-foot related amputations are preventable (Zoungas *et al.*, 2008). Unlike developed countries where data on the incidence of amputations can be obtained relatively easily, these rates are unknown in most of developing countries, which record high prevalence of diabetes (Schofield *et al.*, 2006).

The National Commission on Diabetes in United Kingdom reports that an estimated 5 to 15% of all diabetic individuals require a lower extremity amputation at some time in their lives. If this trend continues, more than one million diabetic persons alive today will eventually require an amputation (Brem *et al.*, 2006). In a study carried out by Obimbo *et al.* in 2010, diabetic vasculopathy complicated by infection is a leading cause of diabetic related amputations in elderly males in Kenya

Amongst people who have diabetes, amputations are reported to be 15 times more common than amongst other people (O'Loughlin *et al.*, 2010). According to (Zoungas *et al.*, 2008), 50% of all amputations occur in people who have diabetes. This is worrying

for the future of Zambia especially with the increase in the prevalence rate for diabetes which was at 3.4% in 2010 (International Diabetes Federation, 2010).

Diabetes is the leading cause of amputation in developed countries while trauma causes most of the amputations in developing countries (Esquenazi, 2004). This is in line with literature by Tembo (2000) and Mulla (1997); trauma is the leading cause of amputation in Zambia. In a study by Tembo (2000), the common level of amputation was above knee amputation followed by below knee amputations. In Nigeria, diabetes and its complications caused most of the amputations (Kaka, 2012). This seems to be the same in Zambia where Lungu (2006) reported that trauma and diabetes are the leading cause of amputations in Zambia.

Treatment of diabetes is not just limited to glycemic control. Physiotherapy through exercises helps treat secondary complications of diabetes and help prevent peripheral arterial disease and peripheral neuropathy. These can lead to amputation if not prevented.

1.2 STATEMENT OF THE PROBLEM

People with diabetes are likely to be earning members of their family, thus the impact of diabetic foot (and related complications such as amputation) is more severe on entire family. Amputation of a limb is always distressing and the consequence of the loss can be devastating (Lungu, 2012). Not only do lower limb amputations cause major disfigurement, it renders people less mobile and at risk of lack of independence (Lungu, 2012).

Lungu (2006) and Tembo (2000) reported on the common indications and complications of amputations at University Teaching hospital (UTH) but unfortunately no current prevalence of diabetic related amputations in Zambia has been reported. The current prevalence of diabetes in Zambia, Lusaka has risen from 3.79% in 2012 to 5.1% in 2014 (Diabetes Association of Zambia, 2014). There might be a chance that this increase could lead to an increase in the number of diabetic related amputation cases as it is a complication of diabetes. No study on the prevalence of diabetic related amputation has been reported at UTH. This does not mean such amputations are not taking place at UTH or in our country. This study will help find out the prevalence of diabetic related

amputations at the UTH and hence know the burden of the disease. This will help clinicians come up with the best management approaches for diabetic patients to prevent amputation as the complication of diabetes.

1.3 JUSTIFICATION OF THE STUDY

A clearer understanding of the nature of the complications of diabetes and the threats they pose will enable healthcare providers to make informed decisions and implement best practices of care for management and prevention. Determining the prevalence and common indicators of diabetic related amputations in the General Surgical wards (G-block) at the University Teaching Hospital (UTH) will help know what needs to be done to reduce the complications of diabetes hence reduce the number of amputations.

Physiotherapists can help reduce the chances of amputations due to diabetes by treating the secondary complications that lead to amputations. Hence this study will highlight whether physiotherapists are participating in the prevention of diabetic related amputations. Since the patients that undergo amputations come back to physiotherapists for balance training, stump shaping and muscle strengthening, this study will help the Physiotherapy department put measures that will prevent complications such as stump deformity or infection that may arise during rehabilitation. Knowing the common levels of amputation is important because the rehabilitation process depends on the level of the amputation and so does the functional activity outcome. Level of amputation affects the kind of prosthesis an individual will need.

1.1 RESEARCH QUESTIONS

1. What is the prevalence and the common indications of diabetic related amputations at UTH?

1.2 OBJECTIVES

1.2.1 GENERAL OBJECTIVE

To determine the prevalence and common indications of diabetic related amputations in the General Surgical wards (G-block) at the University Teaching Hospital (UTH) from 1st January, 2013 to 31st December, 2014.

1.2.2 SPECIFIC OBJECTIVES

1. To establish the prevalence of diabetic related amputations in the General Surgical wards (G- block) at UTH from 1st January, 2013 to 31st December, 2014.
2. To identify the common indications diabetic related amputations in the General Surgical wards (G- block) at UTH from 1st January, 2013 to 31st December, 2014.
3. To identify the levels of diabetic related lower limb amputations at UTH.
4. To determine the demographic characteristics of people who underwent amputations due to diabetes in the General Surgical wards (G- block) at UTH from 1st January, 2013 to 31st December, 2014.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Diabetes is the global epidemic of the 21st century. At present, 366 million people are affected by diabetes worldwide and 80% of them live in low and middle-income countries (Al Tawfiq & Johndrow, 2009). According to (Vinik, 2013), by 2030 the global burden of diabetes is projected to increase to 552 million people. People with diabetes are known to be predisposed to complications involving the lower extremities such as neuropathy, peripheral vascular disease (PVD), and infection and have been estimated to account for 45-70% of all lower extremity amputations (LEA) performed (Amputation Coalition of America, 2010).

More than a million lower limb amputations (LLA) take place every year due to diabetic foot, one lower limb amputation every 30 seconds (Chao & Cheing, 2009). The Diabetic Leadership Forum Africa (2010) further states that diabetes is the leading cause of non-traumatic lower limb amputations in Africa and that about twelve percent of all diabetic patients have foot ulcers and amputations occur in seven percent of all hospitalized diabetic patients. A study done by Tembo (2000) revealed that the commonest cause of amputations at UTH was trauma (31.5%) followed by dry gangrene (22%). Diabetes (9%) was third common cause of amputations at UTH.

2.2 INDICATIONS FOR DIABETES-RELATED AMPUTATION

Generally speaking, the same factors involved in ulceration of the diabetic foot can have at least contributory roles in LEAs (Moulik et al., 2003). Persons with diabetes are known to be predisposed to complications involving the lower extremities such as neuropathy, peripheral vascular disease (PVD), and infection and have been estimated to account for 45-70% of all lower extremity amputations (LEA) performed (Amputation Coalition of America, 2010).

According to the American Podiatric Association, (2013) neuropathy, vascular changes, infection, nail disorders and foot deformities are significant indicators for amputation in diabetic patients.

2.2.1 Neuropathy

Diabetic neuropathy is the medical term used to describe the nerve change that occurs in the network of nerves. The nerve damage that occurs with diabetes decreases the ability to feel pain or discomfort in the feet. This leads to further complications. The risk of neuropathy increases with age and poor glycemic control.

According to Awori and Atinga (2007) Diabetic neuropathy may present with no symptoms or pain, sensory loss, weakness, or autonomic dysfunction. The condition may result in significant morbidity and may contribute to other major complications, such as lower extremity amputation, which is the major debilitating complication (Mwendwa *et al*, 2005).

The most common causal pathway to diabetic foot ulceration involves the confluence of loss of sensation resulting in failure to detect repetitive pressure or trauma and abnormal foot structure or deformity producing sites of abnormally high pressure, usually over areas of bony prominence (O'Loughlin *et al.*, 2010).

2.2.2 Vascular changes

Peripheral Vascular Disease (PVD) is a common condition in which blood vessels narrow which causes reduced blood flow to the feet and legs. The combination of reduced blood flow, reduced oxygen supply and reduced pain sensation can increase the probability of infection, tissue damage and amputation. Ischemia is a contributory if not the major factor determining the need for a LHA (Schofield *et al.*, 2006). Adequate blood supply is necessary for healing and resolution of infection as impaired blood interferes with tissue oxygenation and antibiotic delivery to affected regions (Moulik *et al.*, 2003).

Adequate vascular supply is essential for healing and ischemia often plays a role in ulceration of the diabetic foot. Wound healing requires an adequate supply of oxygen and nutrients be provided to cells involved in the repair process. Peripheral Vascular disease (PVD) is estimated to occur twice as frequently among persons with DM as those without (Dinh *et al.*, 2009). Probability of healing in diabetic foot ulcers has been shown to be strongly related to severity of peripheral vascular disease (Apelqvist *et al.*, 2011).

2.2.3 Infection

Cuts, blisters and ulcers that develop in diabetic patients can lead to infection. The combination of poor circulation, decreased oxygen and nutrient supply and neuropathy can lead to cuts and blisters that will go all the way to the bone. These ulcers destroy the body's first line of defense, the skin. Open areas give bacteria and fungus an opportunity to multiply within the body tissues. This complication can lead to amputation.

2.2.4 Nail disorders and foot deformities

Problems with toenails such as ingrown nails and fungal infections can go unnoticed and if not treated properly they can lead to ulcerations and infections. Foot deformities such as hammertoes and bunions can have the same effect. All these lead to amputation.

2.3 RISK FACTORS FOR DIABETIC RELATED AMPUTATIONS

According to Tentolouris et al (2009), if a person has diabetes, the risk for amputation is higher if they:

- Are 65 years or older.
- Are African American
- Have a previous amputation.
- Have a loss of feeling in your feet or legs (This is called neuropathy.)
- Have poor circulation in your feet and legs.

2.4 LEVELS OF LOWER LIMB AMPUTATIONS

Level of amputation is the description of the location of where a patient has had a body part removed. Amputations can be performed at a variety of different sites, depending on the location of the damaged tissues. There are five levels of lower limb amputation as described by Einsten Healthcare Network (2005);

- Foot, this category includes any part of the foot. The types that fall in to this category are toe amputations, mid tarsal, linsfranc, boyds and symes amputations.
- At the ankle (ankle disarticulation), this amputation occurs at the level of the ankle joint.
- Below knee Amputation (transtibial), these include all the levels from the knee to the ankle.

- At the knee (knee disarticulation), this amputation occurs at the level of the knee joint.
- Above knee Amputation (transfemoral), this amputation includes all levels of thigh amputations from the hip to the knee joint.
- At the hip (hip disarticulation), this level of amputation is at the hip joint with entire thigh portion being removed.

2.5 EPIDEMIOLOGY OF DIABETIC RELETED LOWER EXTREMITY AMPUTATION

Incidence rates of all Lower Extremity Amputations (LEA) are 4-7 times higher in men and women with DM than in people without DM (Frykberg et al., 2009). A Dutch study found the incidence rate of initial unilateral LEA was 8 times higher in persons with DM than in persons without DM (Johannesson et al., 2009). Lavery et al (1999) found men with DM were 2.35 times more likely to have an LEA than women with DM.

2.6 MANAGEMENT OF DIABETIC RELATED AMPUTATIONS

The over-arching goal of healthcare professionals engaged in the management of persons with DM is to successfully intervene in the causal pathway leading to diabetic foot ulcers and ultimately amputation (Cavanagh and Bus, 2011). Management of the diabetic foot can be viewed in 4 phases: prevention, accommodation or adaptation, healing and rehabilitation which unfortunately often circles around to become prevention again in an effort to prevent re-ulceration (Faglia et al., 2010).

Early recognition and management of risk factors for foot complications may prevent amputations, especially of the major type and prevent other adverse outcomes (Larsson *et al.*, 2007).

2.6.1 PREVENTION OF DIABETIC RELATED AMPUTATIONS

According to McCulloch (2011) Preventing or onset of peripheral neuropathy and its attendant sensory, motor, and autonomic sequelae is paramount to prevention of diabetic related amputations.

Many diabetes-linked hospitalizations and amputations could be prevented by better management of diabetes via increased insulin sensitivity and the reversal of the imbalance of blood glucose and insulin called Insulin Resistance (Chao and Cheing, 2009).

According to Maji (2004), prevention begins with:

- Daily foot inspections (Look for redness, cracks in skin, or sores.)
- Daily foot care (Dry completely between toes and use lotion to keep skin moist.)
- Regular visits to the physician and podiatrist
- Foot-care education
- Wearing proper shoes at all times
- Early treatment of any trouble areas.

2.6.2 POST OPERATIVE MANAGEMENT

A multidisciplinary approach should be taken in managing patients after a major limb amputation (Matsen, 2000). Patients after undergoing amputation should be evaluated for cognitive and physical abilities. Consultation with a physical therapist, social worker, and possibly a psychiatrist should be obtained to determine the patient's ambulatory potential.

2.6.2.1 Physiotherapy and rehabilitation

After surgery, the patient will be helped by an amputation rehabilitation team to learn to deal with the physical and emotional challenges (McCulloch, 2011). Physical therapy, beginning with gentle, stretching exercises, often begins soon after surgery. A prosthesis may be needed and the team will help the patient adjust. The team will also be able to help with assistive devices, home adaptations, and learning to accomplish normal daily activities. Practice with the artificial limb may begin as soon as 10 to 14 days after surgery (McCulloch, 2011).

Physiotherapy aims to prevent contractures, limit oedema and to aid general mobility in bed and on transfer. Active strategies to prevent contractures are well documented for the transtibial or transfemoral amputee and include bed positioning, prone activities, various stretching techniques and knee and hip joint mobilization by a physical therapist (Bates, 2007)

Bed mobility, transfers in and out of bed and on and off the toilet, and other activities of daily living are taught early in the post-amputation period to promote and encourage independence, increase strength, and reduce the fear of falling (Houghton, 2002).

Matsen, (2000) stipulated that soft compressive dressings are used in many centres as a primary means of treatment therefor proper wrapping techniques *are* taught to the patient and caregivers to reduce complications. Once the wound has healed, an elasticated stump-shrinker sock is applied to provide stump moulding.

Ideally, the wound should fully heal in about four to eight weeks. But the physical and emotional adjustment to losing a limb can be a long process. Some amputees experience pain or discomfort in the missing limb. This is called phantom pain. The team can help them learn how to deal with this problem. Hogan and MacLachlan (2004) further stated that long-term recovery and rehabilitation includes:

- Exercises to improve muscle strength and control
- Activities to help restore the ability to carry out daily activities and promote independence
- Use of artificial limbs and assistive devices
- Emotional support, including counseling, to help with grief over the loss of the limb and adjustment to the new body image.

2.7 PROGNOSIS

Mortality risk following LEA is higher for individuals with DM than those without DM (Tentolouris *et al.*, 2004). People with DM had a 55% increased risk of death after amputation compared to those without DM (Schofield *et al.*, 2006). Almost 10 years later, researchers were still reporting people with DM who underwent LEA had a 55% greater risk of dying than those without DM (Schofield *et al.*, 2006). Risk of re-amputation is highest within the first 6 months of initial amputation (Skoutas *et al.*, 2009). Forty percent of subjects with DM in a study by Tentolouris *et al* (2004) had an ipsilateral or contralateral amputation within an average of about 16 months of the first DM-related LEA. 41% - 70% of diabetic persons who experience a leg amputation do not survive more than 5 years after the surgery; 30% require an

amputation of the remaining limb within 3 years (Amputation Society for Vascular Surgery, 2010).

2.8 COMPLICATIONS

The causal factors leading to the initial amputation remain in place following LEA and continue to place these individuals at elevated risk for re-ulceration (Schofield *et al.*, 2006). Re-ulceration risk is higher in those with a previous amputation due to increased pressure on a smaller residual weight bearing area, abnormal pressure distribution on the remaining plantar surface and alterations in bony architecture (Apelqvist *et al.*, 2011).

Re-amputation at a higher level on the residual limb is a function of disease progression, failure to heal, and risk factors that develop as a result of the initial amputation such as alteration in the pressure distribution on the residual weight bearing surface (Schofield *et al.*, 2006).

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

In this chapter, the methodology is presented under the following: study design, research setting, study population, data collection tools, it also includes data presentation (analysis of data), ethical consideration, work plan and research budget.

3.2 STUDY DESIGN

This was a non-interventional cross sectional study using quantitative research methods. A quantitative research involves the collection of numerical data. It is used to summarize numbers into a format which is easy to assimilate (Hunter *et al.*, 2008).

3.3 STUDY SETTING

This study was conducted at the University Teaching Hospital (UTH) in the general surgical wards (G-block). UTH is the nation's tertiary referral hospital. It was officially opened in 1979 by the first Republican President, Dr. Kenneth Kaunda. It is located in the capital city of Zambia. There are four main departments which include: internal medicine, surgery, pediatrics and child health, obstetrics and gynecology and three core departments (physiotherapy, pathology, pharmacy). According to the UTH statistics (2011), UTH has a bed capacity of 2000.

There are six General surgical wards (G-wards) and these are G01, G02, G11, G12, G21 and G22. G01, G21 and G22 are male wards; G02 and G12 are female wards while G11 is a high cost ward. The high cost ward (G11) has a bed capacity of 26 and the rest of the wards have a bed capacity of 36.

3.4 STUDY POPULATION

Varkervisser (1990) stipulated that a population is the group from which a sample is drawn. The study population in this case was all patients who underwent amputations at

the University Teaching Hospital within the period 1st January, 2013 and 31st December, 2014 in the general surgical wards. The population consisted of 400 medical records.

3.5 SAMPLING METHOD

A convenient sampling method was used. This means all medical records that were found at the main records department in the general surgical wards during data collection were used in this study. These were 400 patients' medical records found during data collection.

3.6 SAMPLE SIZE

The sample size included all medical records of patients who underwent diabetic related amputations in the general surgical wards from 1st January, 2013 to 31st December, 2014. The sample size comprised of 53 medical records which met the inclusion criteria of the study.

3.7 INCLUSION AND EXCLUSION CRITERIA

3.7.1 Inclusion criteria

1. For prevalence, the study included records of all patients who underwent diabetic related amputations and were admitted and treated at UTH within the period from 1st January, 2013 to 1st January, 2014.
2. For common indications and levels of amputation, the study included records of patients who underwent diabetic related amputations from 1st January, 2013 to 1st January, 2014.
3. The patients' records were to be complete with confirmed diagnosis.

3.7.2 Exclusion criteria

1. Records of all patients who underwent amputations due to reasons which are not diabetic related at UTH in the period 1st January, 2013 to 1st January, 2014 at.
2. Records of patients who were admitted in G-block due to other medical conditions
3. Records which were incomplete with unconfirmed diagnosis.

3.8 PILOT STUDY

A Pilot study was conducted by reviewing 5 records of patients who underwent amputations due to diabetes in the orthopedic wards (C-wards) at University Teaching Hospital. The test was done in order to test the data collection tool (check list) and this in turn help to expose the weakness or strength of the research tools and give room for further revision of data collection process. From the pilot study, it was determined that the data collection tool could be used for the main study without any revisions.

3.9 DATA COLLECTION

Data was collected retrospectively using patients' medical records. Available information which is in the patient's medical records was collected using a record review checklist also known as a data capture sheet. The checklist comprised of the indication of amputation, level of amputation, patient's age, sex, residential address and the total number of patients.

3.10 VARIABLES

In this study the dependent variables (presumed outcome) included; level of amputation and the number of diabetic related amputations treated at UTH. Then, independent variables (presumed cause) included demographic characteristics of the patients (age, sex and residential location) and indications for amputation (neuropathy, infection, foot deformities, peripheral arterial disease).

3.11 DATA ANALYSIS

The data was analyzed using software called Statistical Package for Social Sciences (SPSS) version 20. Raw data was sorted out and analyzed and interpreted using descriptive statistics. However, the variables analyzed were indications of diabetic related amputations and the demographic characteristics of the patients who underwent amputation due to diabetes. This information was displayed using tables (histograms), bar charts and pie charts.

3.12 ETHICAL CONSIDERATIONS

Approval and permission was sought from University of Zambia School of Medicine Undergraduate Research Ethics Committee (UNZASOMUREC). Permission was also sought from UTH to carry the study and access their patient's records. The information that was to be obtained was kept secure to ensure confidentiality and was purely for academic purposes. Security was achieved by ensuring that the obtained information was stored on a laptop which had a password known by the researcher alone.

CHAPTER FOUR:

RESULTS

4.1 INTRODUCTION

This chapter describes the results of the study whose aim was to determine the prevalence, common indications and levels of diabetic related amputations in the General Surgical wards (G- block) at the University Teaching Hospital (UTH) from 1st January, 2013 to 31st December, 2014.

4.2 PREVALENCE

The prevalence of diabetic related amputations in this study was 12% and 1 in approximately every 8 amputations at UTH is diabetic related as shown in the calculations below.

Prevalence = number of people with condition * 100

Total population (number of total amputations)

$$= 53/441 * 100$$

$$= 1/8.3 * 100$$

$$= \mathbf{12\%}$$

4.3 DEMOGRAPHIC CHARACTERISTICS

4.3.1 Age distribution

The majority 28.3% (n=15) were aged between 61-70 years.

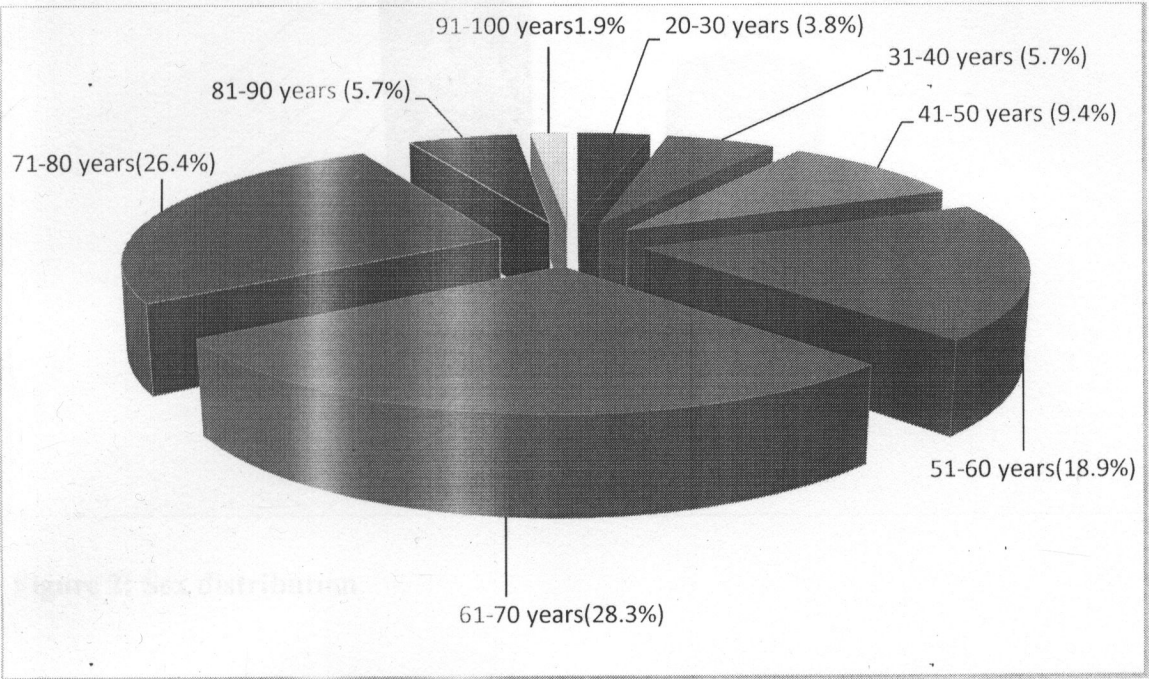


Figure 1: Age distribution

4.3.2 Sex distribution

The majority of the patients with diabetic related amputations were male 56.6%.

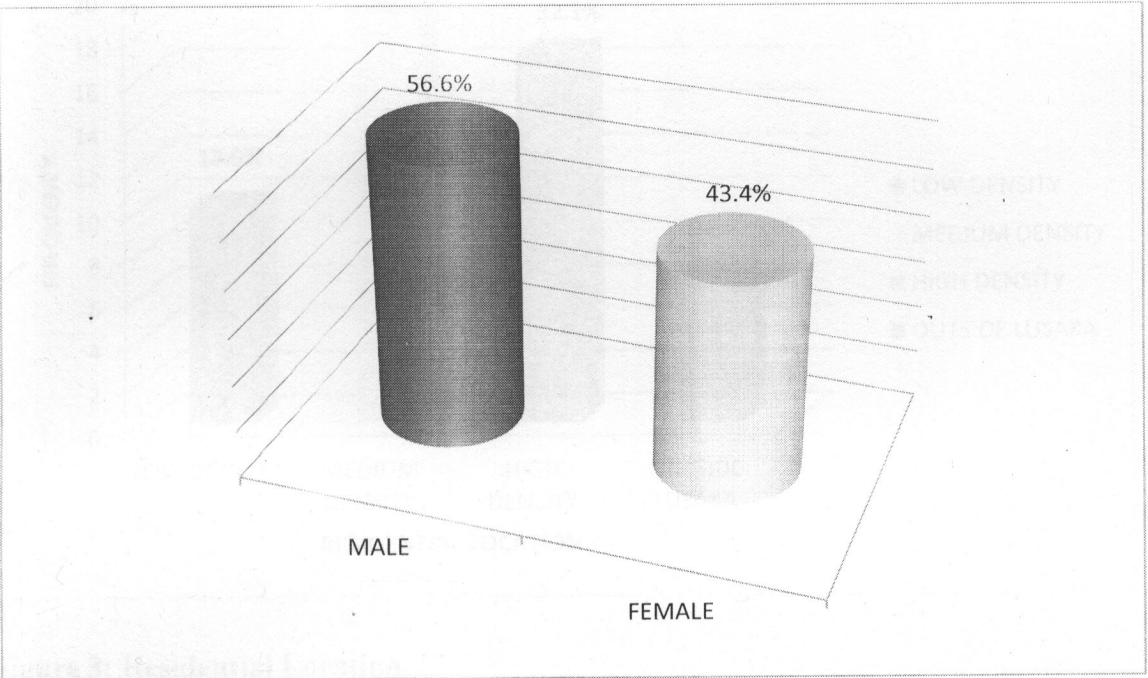


Figure 2: Sex distribution.

4.3.3 Residential location distribution

Most of the patients were from medium density residential areas (35.8%)

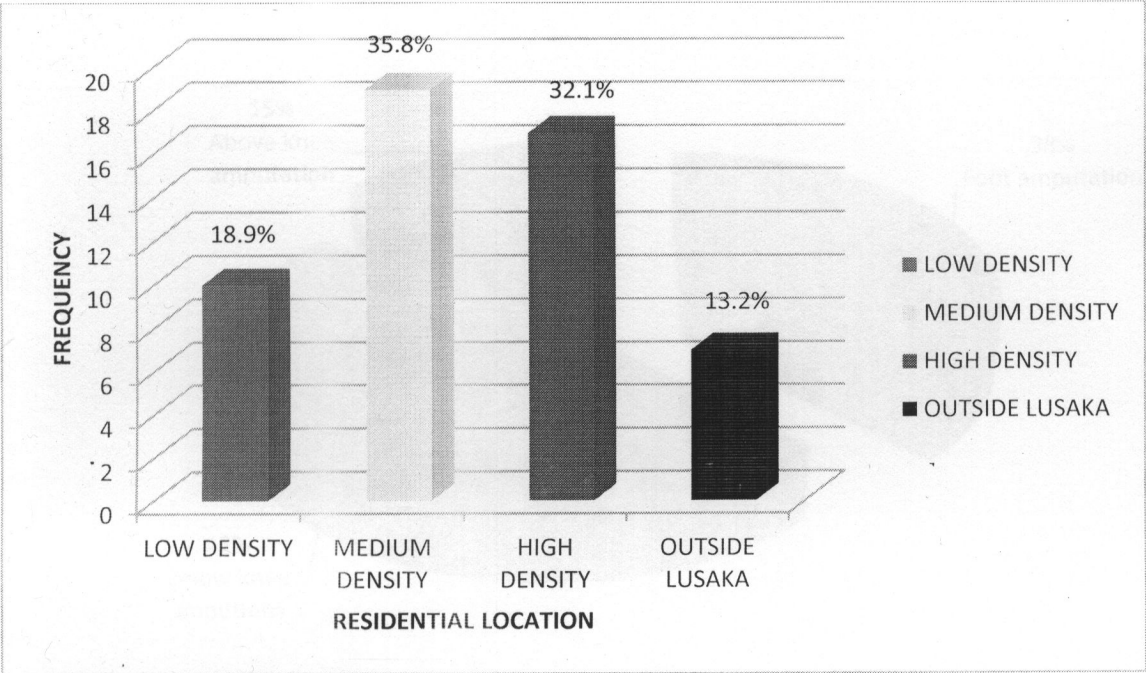


Figure 3: Residential Location.

4.4 LEVEL OF AMPUTATION

The patients who had below knee amputations accounted for 47% (n=25).

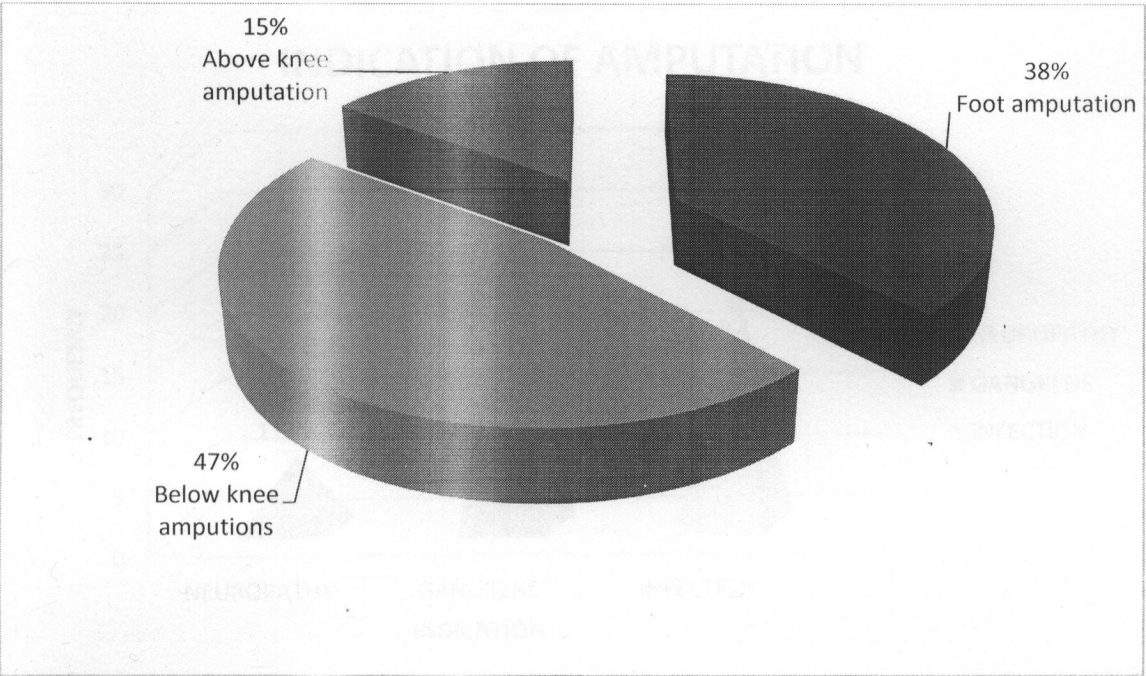


Figure 4: Level of Amputation

4.5 INDICATION OF AMPUTATION

The commonest indication of diabetic related amputation was gangrene 49.1% (n=26).

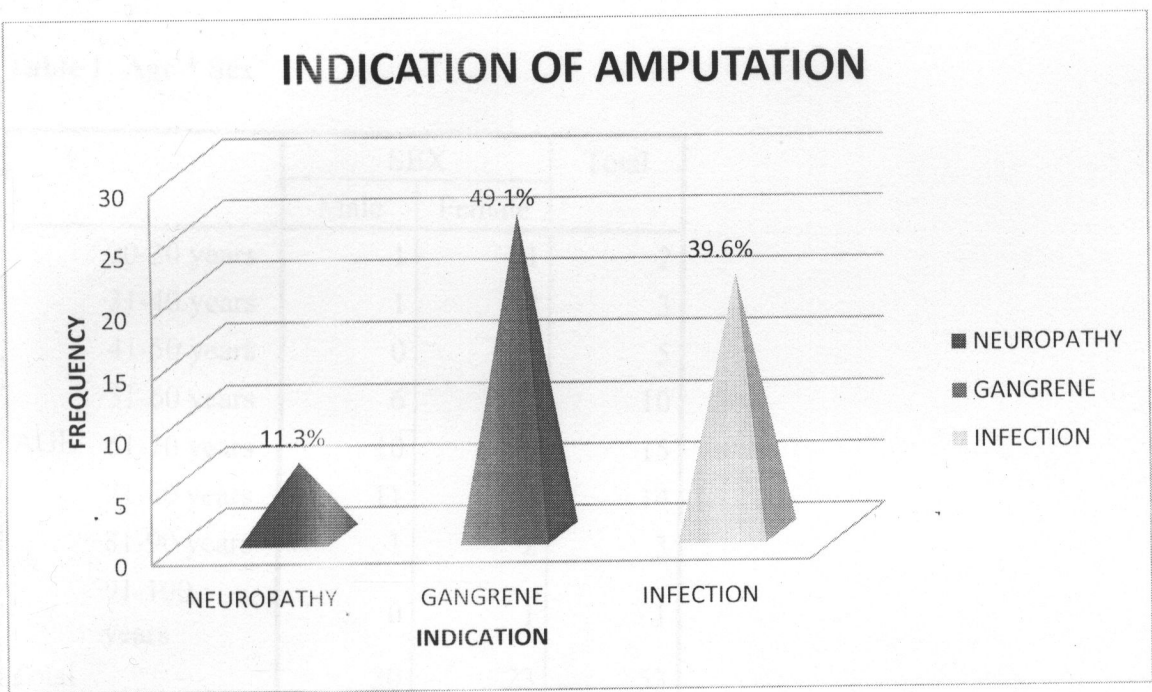


Figure 5: Indication distribution.

4.6 CROSS TABULATIONS

4.6.1 Age * Sex cross-tabulation

Males in the age ranges of 51-60 years, 61-70 years and 71-80 years were affected more than females.

Table 1: Age * Sex

		SEX		Total
		Male	Female	
AGE	20-30 years	1	1	2
	31-40 years	1	2	3
	41-50 years	0	5	5
	51-60 years	6	4	10
	61-70 years	10	5	15
	71-80 years	11	3	14
	81-90 years	1	2	3
	91-100 years	0	1	1
	Total	30	23	53

4.6.2 Age * Indication cross-tabulation

Gangrene caused most amputations in the age range 51-60 years (n=7) and 61-70 years (n=10). Infection caused most the amputations in the age range 71-80 years while neuropathy caused all the amputations in age range 91-100 years (n=1).

Table 2: Age * Indication

		INDICATION			Total
		Neuropath y	Gangrene	Infection	
AGE	20-30 years	0	1	1	2
	31-40 years	0	1	2	3
	41-50 years	0	2	3	5
	51-60 years	0	7	3	10
	61-70 years	1	10	4	15
	71-80 years	1	5	8	14
	81-90 years	3	0	0	3
	91-100 years	1	0	0	1
Total		6	26	21	53

4.6.3 Level * Indication cross-tabulation

Below knee know amputations were mostly caused by gangrene (n=16) while foot amputations were mostly caused by infection (n=11). Above knee amputations were caused by gangrene (n=3) and neuropathy (n=3).

Table 3: Level * Indication

		INDICATION			Total
		Neuropath y	Gangrene	Infection	
LEVE L	Foot	1	8	11	20
	Below knee Amputation	2	16	7	25
	Above Knee Amputation	3	2	3	8
Total		6	26	21	53

CHAPTER FIVE:

DISCUSSION

5.1 INTRODUCTION

The aim of the study was to determine the prevalence, common indications and level of diabetic related amputations at University Teaching Hospital (UTH) between 2013 and 2014. This chapter therefore, brings out relevant explanations to the findings of the study. This discussion is based on the findings made by the researcher through the reviewing of the patients' medical records.

5.2 PREVALENCE

The study sample consisted of 53 records of patients, who underwent amputations due to diabetes in the general surgical wards between January, 2013 and December, 2014. Out of the 441 records of patients who underwent amputations in the general surgical wards, 53 diabetic related amputation cases were found. These are the records that met the inclusion criteria. Period prevalence, an epidemiological mathematical determinant for disease surveillance, was used to determine the prevalence of diabetic related amputations in the study. This method involves finding the total number of cases, divided by the total population and multiplying by 100%. Hence, from this calculation of prevalence, it was found that diabetic related amputations accounted for 12% ($n=53$) of all the total amputations at UTH in the year 2013 and 2014. The prevalence found in this study is lower than that which was found in a study by Obimbo (2010) who stated that in Kenya, the prevalence of diabetic related amputations was 32%.

The prevalence rate found in the current study is lower than what was found in other countries over the years. Such findings include: Turkish 36.7%, Norwegian 53%, Malaysia 78.1%, Scottish 27%, Trinidad 81.8%, Coted'Ivoire 31.4%, Kenyan 17.5 % and Nigerian 26.4% (Obimbo, 2010). These countries could have recorded such higher prevalence because maybe the studies were over a longer period of time. The current study was however only for a period of two years.

However, other studies in Taiwan and England found much lower prevalence rates of 1.6 % and 9.1 % respectively (Tseng, 2006; Vamos *et al*, 2010). In Zimbabwe, Sibanda *et al*, (2009) reported 9% diabetes related lower limb amputation contrary to the current study even though Zimbabwe and Zambia are neighbor countries.

The prevalence of 12% in the current study is within the reported range of 0.3 – 45% among African states (Abbas & Archibald, 2007). This suggests that in Lusaka, diabetes is already an established problem. The current study reveals that 1 in 8 amputations carried out at UTH is diabetic related.

The rate of diabetic amputation in this study may be related to late presentation, poor foot care education, risky foot wear or walking barefoot (Obimbo *et al*, 2008). These findings and are consistent with literature reports, and imply that stringent control of blood sugar and foot care education constitute important control measures for diabetic amputations (Obimbo, 2010).

5.3 DEMOGRAPHIC CHARACTERISTICS

5.3.1 Age distribution

The mean age was 58 years (range 26 – 92) and the peak age groups were at 61-70 years followed by 71 – 80 years. The results of this study are in line with the findings in a study carried out in Kenya by Obimbo (2010) who reported that the peak age groups were at 51-60 and 71 – 80 years. He further stated that in individuals aged over 50 years, vascular amputations comprise 54% of the cases. In this study, gangrene caused most amputations in the age range 51-60 years (n=7) and 61-70 years (n=10). Infection caused most the amputations in the age range 71-80 years while neuropathy caused all the amputations in age range 91-100 years (n=1). There were no amputations below the age of 26 and above 92 in the current study.

Vascular amputations in developed countries occur mostly in individuals older than 65 years (Feinglass *et al*. 2000) Observations of the current study reveal, in agreement with another Kenyan study (Obimbo, 2010), that more than 55% of the patients are over 60 years under go amputations due to diabetes. This may imply that as the aging population in Africa increases, vascular amputation will increase especially considering that

universal access to health care facilities remains a challenge (Obimbo, 2010). Levin and O'neal (2007) reported that the risk of amputation increases with age; it is 1.4 and 2.4 times higher in individuals age 65 -74 years and those ages greater than 75. The current study also reveals that more amputation occurred in people above the age of 61 years. In the present study, 17.9% of the patients were aged 50 years and below.

5.3.2 Sex distribution

In this study, 56.6% represented males who were the majority and 43.4% were females. These findings are in line with Feinglass *et al* (2000), who reported that males are affected more than females by vascular amputations. In a Kenyan study, vascular amputations were more common in males than in females below 60 years but the ratio approached 1:1 in those above 60 years (Awori and Atinga, 2007). Observations of the current study reveal that in the age groups 51-60, 61-70 and 71-80 years, males predominate. This could suggest that age related factors such as circulating hormones in females do not play a major role in these cases, and that other factors such as constraints regarding access to health care may be important (Obimbo, 2010). Levin and O'neal (2007) also reported that male had a higher risk (1.4-2.7) of diabetic related amputations as compared to women.

In a study in Southern Nigeria, more males presented with diabetic foot lesions, which is consistent with findings of other studies (Ngim *et al*, 2012). This may be due to engagement of more males in manual labor often without wearing protective shoes. This could be the case in the current study.

A study by Levin and O'neal (2007) revealed that the overall male to female ratio was 1.8:1, displaying subtle variations with age. Over the age of 50 years, the male: female ratio is 2.3:1. In the current study the overall male to female ratio was 1.3:1 and over the age of 50 years the male to female ratio was 1.9:1.

5.3.3 Residential location

Most of the patients who underwent diabetic related amputations were from medium density residential locations 35.8% (n=19) followed by high density residential locations 32.1% (n=17). Few patients 18.9% (n=10) were from the low density locations and 13.2%

(n=7) were from outside Lusaka. According to a research in America, people living in the poorest areas of California were on average about twice as likely to have diabetes related amputations of their lower extremities compared to those living in the wealthiest regions (Seaman, 2014). Looking at the situation in Lusaka, there are more poor people in the high and medium density areas.

It could be assumed that there is less education on management of diabetes and avoidance of its complications in the high and medium density areas. Another explanation could be that there are high levels of illiteracy and ignorance in the high and medium density areas and so this affects their health seeking behaviors. A study by Ngim et al (2012) revealed that the high incidence of patients without any formal education is a reflection of the general level of literacy in the country and has a direct bearing on the ability of the patient to understand and practice diabetic foot care education programmes.

5.4 INDICATIONS

In this study the commonest indication for amputation was gangrene 49.1% (n =). The observations in the current study are in line with reports elsewhere in Africa. Observations of a studies by Ogeng'o *et al* (2009), reports that in Kenya diabetic gangrene is a major cause of amputation. The commonest reason why a diabetic patient requires an amputation is a foot lesion, deteriorating to deep infection and/or gangrene (50-70 percent; Larsson *et al* 1994a). In retrospective studies, the proportion of diabetic patients who had gangrene at the time of amputation was estimated to be 50 percent (Sage 1987, Akanji *et al.* 1988). In a corresponding prospective study (Larsson et al. 1994b), 70 percent had gangrene at the time of amputation.

However, findings by another researcher do not agree with the findings of the current study. According to Feleke *et al.*, (2007), infection is the most serious complication of diabetes and recognized as leading cause of morbidity while cardiovascular diseases were the leading cause of mortality. In the current study however, infection 39.6% (n=21) was the second common indication of diabetic related amputations. This however, still confirms that infection is implicated in diabetic related amputation.

Notable among the reported complications is 22.8% peripheral neuropathy reported in this study. This is lower than: 68% in old Nigerian report by Akanji and Adetuyidi

(1990) and 27.3% reported by Ndip *et al.*, (2006) in Cameroon. The finding in the current study is however higher by a small margin (0.1%) than the 22.7% reported by Ahmed *et al.*, (2009) in Khartoum, Sudan. Neuropathy was an independent predictor of amputation risk in a study in the Caribbean, with each unit of volt increase being associated with a 5% increased amputation risk. Poor long-term glycemic control underpins vascular and neuropathic complications (Hennis *et al.*, 2004).

The reported complications in this study were similar to reported diabetic foot complications elsewhere in Africa. The predominant risk factors for foot complications are underlying peripheral neuropathy, peripheral vascular disease (Abbas and Archibald, 2007) and infection. This report is in line with the findings of the current study.

5.5 LEVEL OF AMPUTATION

In this study, 47% of the patients had below knee amputations (n=25), followed by foot amputations 38% (n=20). The least was above knee amputations 15% (n=8). This is supported by reports in a study by Ngim *et al.* (2012); the most common lower limb amputation carried out was below knee amputation (53%). The reason of this finding could probably be due to late presentation of the patients.

Other research findings are not in line with current study's findings, in other studies in developed countries, most of the amputations were minor amputations around the foot (Resnick *et al.*, 2004; Aksoy *et al.*, 2004). In a research by Hennis *et al.* (2004) 60% of amputations were minor and 40% were major (22.9% below-knee and 17.1% above-knee amputations). The findings in these other studies could attribute to the fact that in these countries majority of the patients sought medical attention earlier before the problems advanced. The percentage of AKAs in the study by Hennis *et al.* (2009) (17.1%) and the current study (15%) were, however, both the least amongst the amputations in the respective studies.

Though the current study identifies below knee amputations as most common, another study in California reported that overall, toe amputations were the most common level of amputation and had the highest level-specific incidence of amputation in all three groups. The proportion of toe amputations decreased and thigh amputations increased as age increased (Lavery *et al.*, 1996).

The high rate of major amputations in this study places even greater burden, economic and social, on the affected patients as many of them are unable to acquire limb prosthesis to ensure full rehabilitation.

The current study reveals that gangrene was implicated as the common cause of BKAs while infection caused most of the foot amputations. Neuropathy and infection were responsible for most of the AKAs.

This chapter finalizes the research that was undertaken to determine the prevalence, common indications and level of diabetic related amputations at University Teaching Hospital (UTH) general surgical ward from January, 2013 to December, 2014. The chapter will discuss the conclusions, limitations to the study that were encountered during the study and will also present recommendations based on the results presented.

4.2 CONCLUSION

The prevalence of diabetic related amputations at UTH in 2013 and 2014 was 1.2% with the most prevalent age group being between 40-70 years. These amputations occurred more in medium and high density areas and more among males. If this information is confirmed in other parts of Zambia it will offer health care workers the starting or design an intervention that will help reduce the incidence of diabetic foot ulcers, ulcers and chances of lower limb amputations to barest minimum.

In order to reduce the incidence of Diabetes related amputation, medical supervision and patient education is important in diabetic foot care. It was recommended. The contributing factors to the occurrence of foot amputations in our country may include lack of awareness of foot care issues among patients and health care providers alike, very few health care workers are trained in the diabetic foot or trained to provide specialist services, poor quality primary services, long distances for patients to travel to the clinic, delay among patients in seeking timely medical care, lack of the concept of a team approach and absence of refresher training programs for health care professionals.

4.3 PHYSIOTHERAPY IMPLICATIONS

Treatment of diabetes is not just limited to glycaemic control. Physiotherapy through exercise helps treat secondary complications of diabetes and help prevent peripheral vascular disease and peripheral neuropathy. These can lead to amputation if not prevented.

CHAPTER SIX

CONCLUSION, LIMITATIONS AND RECOMMENDATIONS.

6.1 INTRODUCTION

This chapter finalizes the research that was undertaken to determine the prevalence, common indications and level of diabetic related amputations at University Teaching Hospital (UTH) general surgical ward from January, 2013 to December, 2014. The chapter will discuss the conclusion, limitations to the study that were encountered during the study period and recommendations based on the results presented.

6.2 CONCLUSION

The prevalence of diabetic related amputations in Zambia in 2013 and 2014 was 12% with the most prevalent age group being between 61-70 years. These amputations occurred more in medium and high density areas and more among males. If this information is confirmed in other parts of Zambia, it will offer health care workers the scenario to design an intervention that will help reduce the incidences of diabetic foot complications and chances of lower limb amputations to barest minimum.

To reduce the incidence of Diabetes related amputation, medical supervision and patient education on prevention of diabetic foot complication are recommended. The contributing factors to poor outcomes of foot complications in our country may include: lack of awareness of foot care issues among patients and health care providers alike; very few professionals with an interest in the diabetic foot or trained to provide specialist treatment; non-existent podiatry services; long distances for patients to travel to the clinic; delay among patients in seeking timely medical care; lack of the concept of a team approach and absence of refresher training programs for health care professionals.

6.3 PHYSIOTHERAPY IMPLICATIONS

Treatment of diabetes is not just limited to glycemic control. Physiotherapy through exercises helps treat secondary complications of diabetes and help prevent peripheral arterial disease and peripheral neuropathy. These can lead to amputation if not prevented.

Since the patients that undergo amputations come back to physiotherapists for balance training, stump shaping and muscle strengthening, this study will help the Physiotherapy department put measures that will prevent complications such as stump deformity or infection that may arise during rehabilitation. Knowing the common levels of amputation is important because the rehabilitation process depends on the level of the amputation and so does the functional activity outcome. Level of amputation affects the kind of prosthesis an individual will need.

6.4 LIMITATIONS

The following are some of the limitations to the study that the researcher acknowledges:

6.4.1 The time allocated for the study was not enough.

6.4.2 Being the first research project for the researcher, the study was more of a learning process due to lack of experience.

6.4.3 It being a retrospective study, only available medical records were reviewed thus, retrieving of information needed for the study from medical records and files was challenging as some information was missing or not indicated. Therefore, this could have contributed to the results of the study not being of expected quality.

6.4.4 Finding the records at the main records department was a challenge as the filing system currently being used is not of standard.

6.4.5 Although the sample size comprised of 53 records which were reviewed, the results cannot be conclusive and generalised as it represented only a small fraction of patients who underwent diabetic related amputations in two years.

6.5 RECOMMENDATIONS

Since the rate of diabetic amputations still remains a challenge, the researcher recommends the following;

6.5.1 Further research should be done at a larger scale so that a country wide rate would be determined. There is need for the study to be done even in other hospitals and Zambia at large.

6.5.2 The management at UTH should ensure that documentation in patients' medical records is improved as almost every part of the information was missing. They should also introduce new methods of record keeping for the hospital as the current one is not reliable in tracing patient's records over the years.

6.5.3 There is need for more patient education on diabetes and its complications especially in the medium and high density areas which recorded a high number of amputations due to diabetes.

6.5.4 Government should embark on training of more specialists so that diabetic patients may receive specialist care. They should also introduce more awareness campaigns or workshops for the patients and the care givers.

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APPENDICES

APPENDIX I

WORK PLAN

The researcher aims to do the project within 5 months after approval from the ethics committee. Below is the time plan for the project.

Work plan Year 2014/2015

MONTH	NOV	DEC	JAN	FEB	MAR	APRIL	MAY
TASK							
Proposal writing							
Ethics Submission							
Data collection							
Data analysis							
Report writing							
Submission of report							

APPENDIX II

BUDGET

The total budget of the project is presented below. The researcher will spend approximately K 1540.55 on the project activities.

		Quantity	Unit cost (K)	Total cost (K)
1	Stationary A4 photocopying Papers	5 reams	30.00	150.00
2	Pens	10	1.00	10.00
3	Pencils	5	0.50	2.50
4	Folders	1	8.00	8.00
5	Rubbers	1	1.00	1.00
6	Ti-pex	1	6.00	6.00
7	Stapler	1	27.00	27.00
8	Stapples	1 box	5.00	5.00
9	Perforator	1	26.00	26.00
11	Photocopying Checklist		0.50	15.00
12	Logistics during data Collection			250.00
13	Data entry			350.00
14	Data analysis			250.00
15	Binding	5	20.00	100.00
16	Report writing		200.00	200.00
17	Contingency 10%			140.05
	TOTAL			1540.55

APPENDIX III

CHECKLIST

[illegible]

APPENDIX IV

INTRODUCTORY LETTER



**THE UNIVERSITY OF ZAMBIA
SCHOOL OF MEDICINE
DEPARTMENT OF PHYSIOTHERAPY**

Telephone: 260-211-252111
Telegrams: UNZA, LUSAKA
Telex: UNZALU ZA 44111

Dean's Office
P.O. Box 59110
Lusaka, Zambia

9th March 2015

TO WHOM IT MAY CONCERN

RE: INTRODUCTORY LETTER: SIMONA NKABIHISE - COMPUTER NUMBER 29000084

The above named is a 5th year student at the University of Zambia, School of Medicine in the Department of Physiotherapy. She is pursuing a Bachelor's Degree in Physiotherapy (BScPT).

She is required to carry out a research project as a partial fulfilment for the award of Bachelor of Science in Physiotherapy Degree.

I therefore write to request that you assist the student in any way possible to help her carry out the research at your institution.

Yours faithfully

Dr. Martha Banda Chhalwe (PhD)
**ACTING HEAD
DEPARTMENT OF PHYSIOTHERAPY
SCHOOL OF MEDICINE**

PERMISSION LETTER FROM UTH

The University of Zambia,
Department of Physiotherapy
School of Medicine,
P.O. Box 5011,
Lusaka.
16th March, 2014.

The Medical Superintendent,
University Teaching Hospital,
P.O. Box 500,
Lusaka.
Dear sir/madam

Agreed
[Signature]

22/03/2015
Mr. Banda
kindly assist
her with the
relevant dates
Faith C. Phiri

REF: PERMISSION TO CONDUCT A STUDY AT UNIVERSITY TEACHING HOSPITAL

I am a fifth year student at the University of Zambia, School of Medicine, Department of Physiotherapy. As partial fulfillment of the programme, I am required to do a research study. My research topic is: **The prevalence, common indications and levels of diabetic related amputations at the University Teaching Hospital from 1st January, 2013 to 31st December, 2014.** I therefore request your permission to conduct a pilot study in orthopedic wards (C-block) and the actual study in the General surgical wards (G-block).

Your favorable response will be greatly appreciated.

Yours faithfully,

[Signature]

Nkabhise Simona (Ms).

Phone number: 096 4 064708

Email address: nksimona@gmail.com

APPROVAL LETTER FROM RESEARCH ETHICS



THE UNIVERSITY OF ZAMBIA BIO-MEDICAL RESEARCH ETHICS COMMITTEE

Telephone: 2590
Telegrams: UNZAM LUSAKA
Telex: UNZAT 211370
Fax: 260-1-250
E-mail: unz@unz.zm

Ridgeway Campus
P.O. Box 80110
Lusaka, Zambia

Assurance No. 1 WA00000318
IRB0000113-01 FOR G0000774

11th March, 2015

Simona Nkabhise
School of Medicine
Department of Physiotherapy
University of Zambia
LUSAKA

Dear Simona Nkabhise,

SUBJECT: PROPOSAL ENTITLED "THE PREVALENCE, COMMON INDICATION AND LEVEL OF DIABETIC RELATED AMPUTATIONS AT UTHI"

The above proposal was presented to the University of Zambia Undergraduate Research and Ethics Committee on 10th March 2015 and the following observations were noted:

This proposal is approved

The approval is only for this proposal and if you need to change methodology or study you will need to get approval of UNZASOMUREC

Yours faithfully,

A handwritten signature in dark ink, appearing to read 'Dr. Bellington Zwalika'.

Dr Bellington Zwalika
CHAIRPERSON- UNZASOMUREC

APPENDIX V

INFORMATION SHEET (FOR THE MANAGER RECORDS KEEPPING, UTH.)

I am Nkabhise Simona, a fifth year physiotherapy student in the school of medicine at the University of Zambia. As partial fulfillment of the program, I am required to undertake research in any area of benefit to the provision of quality health care and to contribute to the body of knowledge.

This study is aimed at determining the prevalence, common indicators and levels of diabetic related amputations at UTH. It is hoped that the results of this study will help in administrative planning and implementation of measures that can be put in place so as to help reduce the rising diabetic related amputations. I therefore, seek your permission to review the records of all patients who underwent amputations from 2013 to 2014.

Participation and confidentiality

No names or initials of patients will not be written down and all collected information will be kept in the researcher's confidentiality.

Risks of participation

There are no risks involved as the study does not involve any intervention and purely involves reviewing records.

Benefits

There are no direct benefits to you as this is purely an academic study.

If you have any questions and clarifications, please notify the researcher on cell 096-4-064705 or using the address below or the secretary research ethics committee, UNZA.

Your support will be highly appreciated, thank you.

Persons to contact

Simona Nkabhise.

University of Zambia,

School of medicine,

Department of physiotherapy,

P.O Box 50110,

Lusaka.

Phone number: 096 4 064705

Email address: nksimona@gmail.com

Or

Research Ethics Committee,

University of Zambia,

P.O Box 50110,

Lusaka.

Tel: 0211-256067

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