بسم الله الرحمن الرحيم

Napata collage

Faculty of Medicine

Risck factor for lower limb amputataion in diabetic patient in (Turkish , bashair , umbada) hospitals at Khartoum state (2022)

A this is submitted in partial fulfillment of the requirement for the degree of MBBS in faculty of medicine

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الأيـة

قال تعالى:

چ قَالُوا سُبْحَانَكَ لا عِلْمَ لَنَا إلاَّ مَا عَلَّمْتَنَا إنَّكَ أَنتَ العَلِيمُ الحَكِيمُ چ

الـبقـرة : ٣٢

Dedication:

To the fountain of patience and optimism and hope

To everyone in existence after Allah and His Messenger

To our mothers...

To the big hearts, our dear fathers...

To whose love flows in our veins, and our hearts always remember them,

to our brothers and sisters...

To the people who paved our way of science and knowledge

All our teachers Distinguished

A Acknowledgement

We are very grateful to our supervisor for his generous help and advices

Our thanks go to all participants from all hospitals in Sudan

And our thanks to those we did not mention

Abstract

Introduction :

Diabetes mellitus is a group of metabolic disorders sharing the common underlying feature of hyperglycemia **.**

Diabetes has many complications: diabetic macrovascular diseases, microvascular and Foot infections are the most common problem in diabetic patients, that is due to vascular compromising (macrovasculardisease), lack of sensation (neuropathy) in addition to microvascular disease that lead to various foot infections from superficial cellulites to chronic osteomylitis. these infections are very difficult to treat and lead to lower limb amputation (3).

Objective of research:

Study the risk factor for lower limb amputation in diabetic patient at Sudan hospitals in 2022

Method of research:

Analytic cross sectional study the risk factor for lower limb amputation in diabetic pt at **(**Turkish , bashair , umbada **)** hospitals and to list the post amputated complication including morbidity and mortality, also to determine the way of management and prevention provided to diabetic patients were enrolled 60 cases and orally approved to participate in the study after the approval from Ministry of Health and management of Sudan hospital.

The data had been collected by questionnaire which consists of 20 questions.

The population size was 60 person.

Results:

During our study most of cases studied were result the risk factor for lower limb amputation due to poor controlled diabetes percentage 66.7% compare with regular follow up are represents percentage 33.3%, The study also showed that cases due to low socio economic state represented percentage 61.7%,also the

Study Trauma and infection represented percentage of 55%%

مستخلص البحث

مقدمة :

داء السكري هو مجموعة من الاضطرابات الأيضية التي تشترك في السمة الأساسية المشتركة لارتفاع السكر في الدم.

مرض السكري له العديد من المضاعفات: أمراض الأوعية الدموية الكبيرة السكرية والتهابات الأوعية الدموية الدقيقة والتهابات القدم هي المشكلة الأكثر شيوعًا لدى مرضى السكري ، وذلك بسبب تضرر الأوعية الدموية (أمراض الأوعية الدموية الكبيرة) ، ونقص الإحساس (الاعتلال العصبي) بالإضافة إلى أمراض الأوعية الدموية الدقيقة التي تؤدي إلى عدوى القدم المختلفة من السيلوليت السطحي لالتهاب العظم المزمن. يصعب علاج هذه الالتهابات وتؤدي إلى بتر الأطراف السفلية (3).

هدف البحث:

دراسة عامل الخطر لبتر الأطراف السفلية لدى مرضى السكري في مستشفيات السودان عام 2022

طريقة البحث:

دراسة مقطعية تحليلية لعامل الخطر لبتر الأطراف السفلية في مرضى السكري في المستشفيات (التركية ، بشائر ، أمبادا) ولإدراج المضاعفات التي تم بترها بما في ذلك المراضة والوفيات ، وكذلك لتحديد طريقة الإدارة والوقاية المقدمة لمرضى السكري. 60 حالة وتمت الموافقة شفهيا على المشاركة في الدراسة بعد موافقة وزارة الصحة وإدارة مستشفى السودان.

تم جمع البيانات عن طريق استبيان يتكون من 20 سؤالا.

كان عدد السكان 60 شخصًا.

نتائج:

خلال دراستنا معظم الحالات التي تمت دراستها كانت نتيجة عامل الخطر لبتر الأطراف السفلية بسبب ضعف نسبة السكر الخاضع للرقابة 66.7٪ مقارنة بالمتابعة المنتظمة تمثل النسبة المئوية 33.3٪ ، كما أظهرت الدراسة أن الحالات بسبب الحالة الاجتماعية الاقتصادية المنخفضة تمثل نسبة 61.7 ٪ ، وكذلك

بلغت نسبة الرضوض والعدوى في الدراسة 55٪٪

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Chapter One

Introduction

Background:

Diabetes mellitus is a group of metabolic disorders sharing the common underlying feature of hyperglycemia, caused by defect in insulin secretion, insulin action or both. It is classified to type 1 diabetes mellitus or insulin dependent and type 2 diabetes or non insulin dependent"(1).

Type 1 diabetes mellitus is an autoimmune disease which lead to defect in insulin secretion, it is very common in children, that there 90% of B cells destroyed. they treated by exogenous insulin.

But in Type 2 diabetes mellitus, there are strong family history with normal pancreas, very common in elderly and associated with obesity, that lead to insulin resistance, patients treated by oral hypoglycemic drugs.

Diabetes has many complications: diabetic macrovascular diseases: atherosclerosis that lead to myocardial infarction and diabetic microvascular, diabetic diabetic septic foot nephropathy diabetic retinopathy, diabetic neuropathy and diabetic septic foot (2).

Foot infections are the most common problem in diabetic patients, that is due to vascular compromising (macrovasculardisease), lack of sensation (neuropathy) in addition to microvascular disease that lead to various foot infections from superficial cellulites to chronic osteomylitis. these infections are very difficult to treat and lead to lower limb amputation (3).

Problem statements:

Lower limb amputation is a common deplitating and costly complication of diabetes mellitus. about 1.2% of general population of patient in sudan. It is very common in developing countries (Africa countries e.g. Sudan). In Sudan caused high morbidity and mortality rates .

A considerable number of diabetic foot ulcer (DFU) Patient require amputation every year , which worsens their quality of life , aggravates the social burden , and shortens their life expectancy .

Considering these negative effects , it is important to explore the relative risk factors affecting amputation in DFU patients . (4)

Justification:

In this research, we will discuss the risks of lower limb amputation in diabetic patients and way of prevention and management. Choose this topic, because it is very common problem in sudan that cause high degree of handicap that effects the psychological and economic state.

Objectives :

General objectives:

To study Risck factor for lower limb amputataion in diabetic patient in (Turkish , bashair , umbada) hospitals at Khartoum state (2022)

Specific objectives :

To identify high risks of amputations.

To list post-amputations complications including morbidity and mortality.

To determine the way of management and prevention provided to diabetic patients.

Chapter two

Literature review

Type 1 diabetes develops if the body cannot produce any insulin. Insulin is a hormone which helps the glucose to enter the cells where it is used as fuel by the body. Type 1 diabetes usually appears before the age of 40. It is the least common of the two main types and accounts for around 10 per cent of all people with diabetes.

Diabetes mellitus is a condition in which the amount of glucose (sugar) in the blood is too high because the body cannot use it properly. There are two main types of diabetes.

Type diabetes develops when the body can still make some insulin, but not enough, or when the insulin that is produced does not work properly (known as insulin resistance). In most cases this is linked with being overweight. This type of diabetes usually appears in people over the age of 40, though in South Asian and African-Caribbean people, it often appears after the age of 25. However, recently, more children are being diagnosed with the condition, some as young as seven. Type 2 diabetes is the more common of the two main types and accounts for around 90per cent of people with diabetes (5).

Most health experts agree that the UK is facing a huge increase in the number of people with diabetes. Since 1996 the number of people diagnosed with diabetes has increased from 1.4 million to 2.6 million By 2025 it is estimated that over four million people will have diabetes(6).

Most of these cases will be Type 2 diabetes, because of our ageing population and rapidly rising numbers of overweight and obese people.

Globally:

- The estimated diabetes prevalence for 2010 is 285 million and is expected to affect 438 million people by 2030.
- The International Diabetes Federation (IDF) estimates that in 2010 the five countries with the largest numbers of people with diabetes are India, China, the United States, Russia and Brazil.
- The IDF also reported that in 2010 the five countries with the highest diabetes prevalence in the adult population are Nauru, the United Arab Emirates, Saudi Arabia, Mauritius and Bahrain.
- Low and middle income countries face the greatest burden of diabetes (7)

UK

Diagnosed:

- There are 2.6 million people who have been diagnosed with diabetes in the UK (2010) (8).
- By 2025 there will be more than four million people with diabetes in the UK.(9).
- In 140.000 people were diagnosed with diabetes in the UK. To put this into context this is more than the population of Middlesbrough.
- It is equivalent to:

-around 400 people every day.

-almost 17people every hour.

-three people every ten minutes(10).

Undiagnosed.

It is estimated that there are up to half a million more people inthe UK who have diabetes but have not been diagnosed (11)It is estimated that up to one in 20 people in England has diabetes diagnosed and undiagnosed). UK-wide, it is not quite one in(12).

Who is at risk factor of diabetes?

The risk factors are different for Type 1 and Type 2 diabetes. Type 1 diabetes develops when the insulin-producing cells in the pancreas have been destroyed. No one knows for certain why these cells have been damaged, but the most likely cause is the body having an abnormal reaction to the cells. This may be triggered by a viral or other infection(13)

Type 2 diabetes usually appears in middle-aged or older people, although more frequently it is being diagnosed in younger overweight people, and it is known to affect Black and South.

Asian people at a younger age. Type 2 diabetes occurs when the body is not making enough insulin, or the insulin it is making is not being used properly. The risk of developing Type 2diabetes can be reduced by changes in lifestyle (14) Some of the risk factors are provided in more detail below:

Genes:

Type 1 diabetes

On average:

- if a mother has the condition, the risk of developing it is about 2 per cent
- . If a father has the condition, the risk of developing it is about 8 per cent
- If both parents have the condition, the risk of developing it is up to 30 per cent
- if a brother or sister develops the condition, the risk of developing it is 10 per cent

(Rising to 15 per cent for a non-identical twin and 40 per cent for an identical twin).

Type 2 diabetes

Ethnicity:

• Type 2 diabetes is up to six times more common in people of South Asian descent and up

to three times more common among people of African and African-Caribbean origin (15)

according to the Health Survey for England 2004, doctor- diagnosed diabetes is almost four times as prevalent inbangladeshi men, and almost three times as prevalent in Pakistani and Indian men compared with men in the general population(16) . Among women, diabetes is more than five times as likely among Pakistani women, at least three times as likely in Bangladeshi and Black Caribbean women, and two-and-a-half times as likely in Indian women, compared with women in the general population.

Obesity:

Of all serious diseases, Type 2 diabetes has the strongest association with obesity (17)

- Almost two in every three people in the UK are overweight or obese (61.9 per cent of women and 65.7 per cent of men).

In 2006, almost one in four children in England measured in reception year were overweight or obese. in England, the rate was nearly one in three(18) .

- The Department of Health recommends that everyone has at least 30 minutes moderate intensity physical activity a day on five or more days a week.

Deprivation:

Deprivation is strongly associated with higher levels of obesity, physical inactivity, unhealthy diet, smoking and poor blood pressure control. All these factors are inextricably linked to the risk of diabetes or the risk of developing serious complications for those already diagnosed(19) .

Statistics for Wales are broken down into eight socio-economic groups so it is not always possible to make direct comparisons. Minority ethnic group Men Women Bangladeshi 8.2% 5.2% Black African 5% 2.1% Black Caribbean 10% 8.4% Chinese 3.8% 3.3% Indian 10.1% 5.9% Irish 3.6% 2.3% Pakistani 7.3% 8.6% General population 4.3% 3.4%

Diabetes in Wales is almost twice as high in the most deprived areas compared to the least deprived.

In Scotland, the odds of developing Type 2 diabetes are 77 per cent higher for people from the most deprived areas compared to those in the in the most affluent area(20).

Complications may begin five to six years before diagnosis and the actual onset of diabetes may be ten years or more beforeclinical diagnosis(21)

Cardiovascular disease:

The term cardiovascular disease (CVD) includes heart disease, stroke and all other diseases of the heart and circulation, such as hardening and narrowing of the arteries supplying blood to the legs, which is known as peripheral vascular disease (PVD). People with diabetes have an increased risk of CVD compared with those without diabetes. The reason is prolonged, poorly controlled blood glucose levels, which increases the likelihood of furring up of the vessels leading to CVD. Research shows that you can reduce the overall chance of developing CVD by improving dietary habits, managing weight and keeping active. Using medication where required will also help to control risk factors such as diabetes, high cholesterol, triglyceride levels and high blood pressure(22)

Kidney disease:

Kidney disease can happen to anyone but it is much more common in people with diabetes and people with high blood pressure. The kidneys are the organs that filter and clean the blood and get rid of any waste products by making urine. They regulate the amount of fluid and various salts in the body, helping to control blood pressure. They also release several hormones.

Kidney disease (or nephropathy) is caused by damage to small blood vessels making the kidneys work less efficiently and this can cause the kidneys to start to fail. Keeping blood glucose levels as near normal as possible and blood pressure well controlled can greatly reduce the risk of kidney disease developing as well as other diabetes complications. Almost onein three people with Type 2 diabetes develops overt kidney disease.

- Diabetes is the single most common cause of end stage renal disease.
- Kidney disease accounts for 21 per cent of deaths in Type 1 diabetes and 11 per cent of deaths in Type 2.

Eye disease:

People with diabetes are at risk of developing a complication called retinopathy. Retinopathy affects the blood vessels supplying the retina - the seeing part of the eye. Blood vessels in the retina of the eye can become blocked, leaky or grow haphazardly. This damage gets in the way of the light passing through to the retina and if left

untreated can damage vision. Keeping blood glucose, blood pressure and blood fat levels under control will help to reduce the risk of developing retinopathy. For protection against retinopathy, it is best to have eyes screened with a digital camera when first diagnosed and then every year, to identify and then treat eye problems early(23) .

Amputation:

Foot problems can affect anyone who has diabetes. Diabetes, particularly if it is poorly controlled, can damage your nerves, muscles, sweat glands and circulation in the feet and legs leading to amputations. Reviewing the feet of people with diabetes regularly and keeping blood glucose levels, blood fats and blood pressure under control can prevent some of the complications associated with the feet.

- Diabetes is the most common cause of lower limb amputations.

100 people a week lose a toe, foot or lower limb due to diabetes.

- Around one in twenty people with diabetes will develop a foot ulcer in one year.

More than one in ten foot ulcers result in the amputation of a foot or a leg.

- The rate of leg amputations in people with diabetes is over 15 times higher than in people without.
- Up to 70 per cent of people die within five years of having an amputation as a result of diabetes. (24)

Depression:

The emotional well being of people with diabetes is important and is integral to the overall health of an individual, particularly for people with long-term conditions such as diabetes.

People with diabetes may have emotional or psychological support needs resulting from living with diabetes or due to causes external to the condition. Coming to terms with diagnosis, the development of a complication, the side effects of medication, or dealing with the daily responsibility of self managing diabetes can take their toll on

emotional well being. In some cases this can lead to depression, anxiety, eating disorders, or phobias.

- The prevalence of depression is approximately twice as high in people with diabetes as it is in the general population. (25)

Neuropathy:

Neuropathy causes damage to the nerves that transmit impulses to and from the brain and spinal cord, to the muscles, skin, blood vessels and other organs. This can cause erectile dysfunction. The best way to reduce the risk of developing neuropathy, or prevent it from becoming worse, is to control blood glucose levels. Following a healthy, balanced diet, making sure that prescribed medication is taken properly, and having some form of regular exercise are all important factors that help maintain good control of blood glucose levels.

Sexual dysfunction:

Erectile dysfunction (ED) or impotence (the inability to achieve or maintain an erection for sexual intercourse) is one of the most. common sexual problems experienced by men.

- There are no studies giving the prevalence of erectile dysfunction in men in the UK. A study in men over 40 in Kuwait found that about a third of men newly diagnosed with diabetes have erectile dysfunction.
- One study found that 27 per cent of women with Type 1 diabetes reported sexual dysfunction. However, this is an under-researched area.

Amputation of the lower limb is one of the most feared adverse health outcomes among people with diabetes. The result is frequently devastating in terms of social functioning and mood Amputation also poses a considerable cost to providers of healthcare, while the financial burden on the patient and their family can be enormous in countries(26).

Moves to reduce the incidence are likely to be most effective in those communities in which the baseline incidence is particularly high, and will be achieved mainly by improving access to effective primary care, with improved control of blood sugar and

interventions to minimise the onset of complicationssuch asperipheral arterial disease and neuropathy. Those withnew diabetes-related ulceration of the foot should be referred promptly for expert assessment as an association has been demonstrated between time to expert referral and clinicaloutcome.

Study:

In the Sudan the prevalence of diabetes has been estimated to between 3.4% and 10.4% the latter Agure in certain com - munities in the Northern State. Due to limited resources, most patients do not receive a satisfactory diabetes care and education, do not a satisfactory diabetes care education resulting in a low rate of clinic attendance and dietary non-lence of lence of acute and chronic complications and a low quality of life.

For both type I and type 2 diabetes, the clinical course and prognosis for the development and progression of both macro - and micro vascular complication are linked to the glycaemic control and duration of diabetes. Infecation and foot ulcers are common complication of diabetes second ary to peripheral vascular disease and diabetic patients devolp foot ulcerations, which may lead to lower limb amputations including a signi A cant increase in postoperative mortality.

As there are no available data on African populations, the aim of this study was to explore the effect of lower limb amputation on health related quality of life in Sudanese diabetic subjects(27)

Study:

Diabetes mellitus (DM) is a chronic, potentially life-threatening disorder that may be accompanied by decreased quality of life. Described as a 'silent killer by Todkar,2 DM is a growing threat to public health worldwide. In 2015, 415 million people worldwide had DM and this number is expected to increase to 642 million by the year 2040.4 In Africa 14.2 million people were diagnosed with DM in the year 2015 and by the year 2040, 34.2 million people are projected to be having DM. South Africa has an estimated population of 52.98 million people and the exact prevalence of diabetes is not known. It is estimated to be between 5% and 7% of the general population with the Indian population comprising 11-13%, Coloured 8-10%, Black 5-8% and the White population consisting of 4%.5 In Sri Lanka the prevalence of DM is 16.4% in the urban population and 8.7% among rural populations(28)

Chapter Three

Methodology

Study design:

Analytic Cross - Sectional facility based study

Study setting:

Bashaier teaching hospital (mayo – Khartoum state)

Turkish hospital (kalakla – Khartoum state)

Umbda hospital (Umbda – Khartoum state)

Study population:

- **Inclusion criteria:**

  Diabetic patients with lower limb amputation

- **Exclusion criteria:**

- Patients with amputation not caused by diabetic.

Sample size :60

Sampling type:

Convenience sample.

Data collection:

Questionnaire consist of 20 question (as paper)

Variables:

Dependent variable:

Risk factor for lower limb amputations in diabetic patients.

Independent variables:

Age, sex,race, type of diabetes, degree of education Confounding variables:

Socio-economic status, psychological problems

Ethical consederation:

The ethical clearance from the institutional review board hospitals of Sudan. Permission from faculty authorities Verbal consent from patients..

Data Analysis:

The data had been collected by the questionnaire, which consist of 20 Question. The population size was 60 person, to find out the risk factor for lower limb amputation in diabetic pt.

The data had analysis using the SPSS (Statistical Package for Social Science). The measure sued to assesses the statements answer were frequency and percent.

Methods:

- Alpha Cronbach's has been used to verify the stability of the questionnaire.
- Frequencies and percentages has been used to know the statistics.

Table (1) Reliability statistics for questionnaire

Reliability statistics

Cronbach's Alpha	No. of items
.960	60

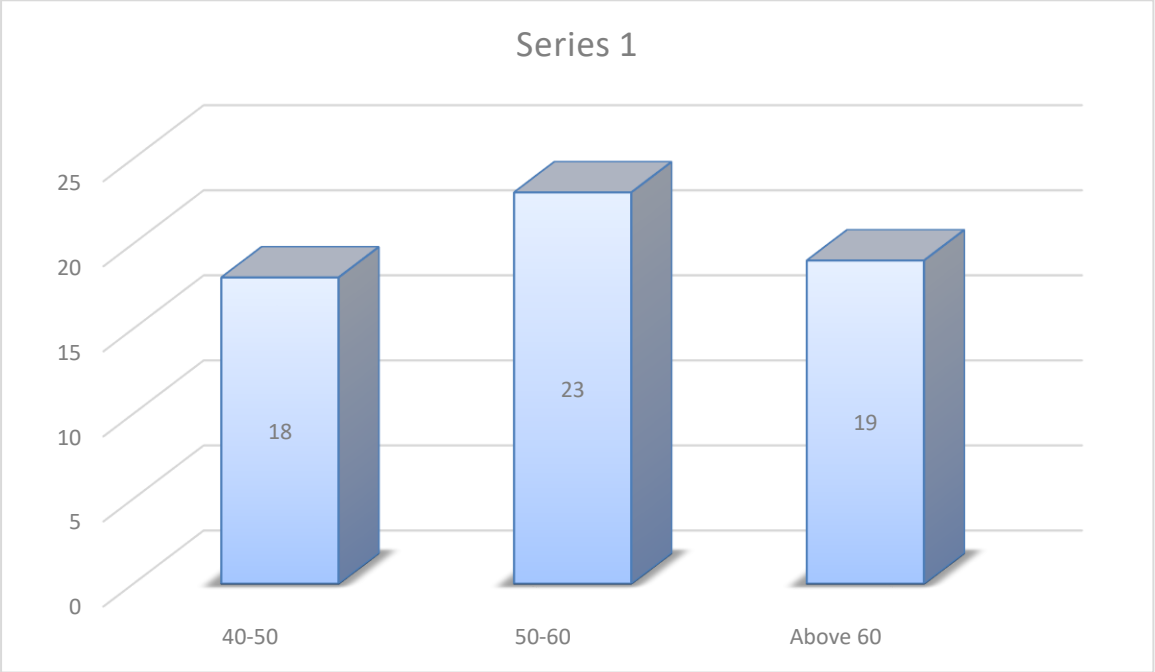
The reliability statistic depend on the p-value (sig) which is (0.5) whenever th sig is more than (0.5) that mean high is reliability statistic. and if it is less than (0.5) which is mean low reliability statistic, and here we have (0.960) it indicate for good reliability.

Chapter four

Result

Question one: Age?

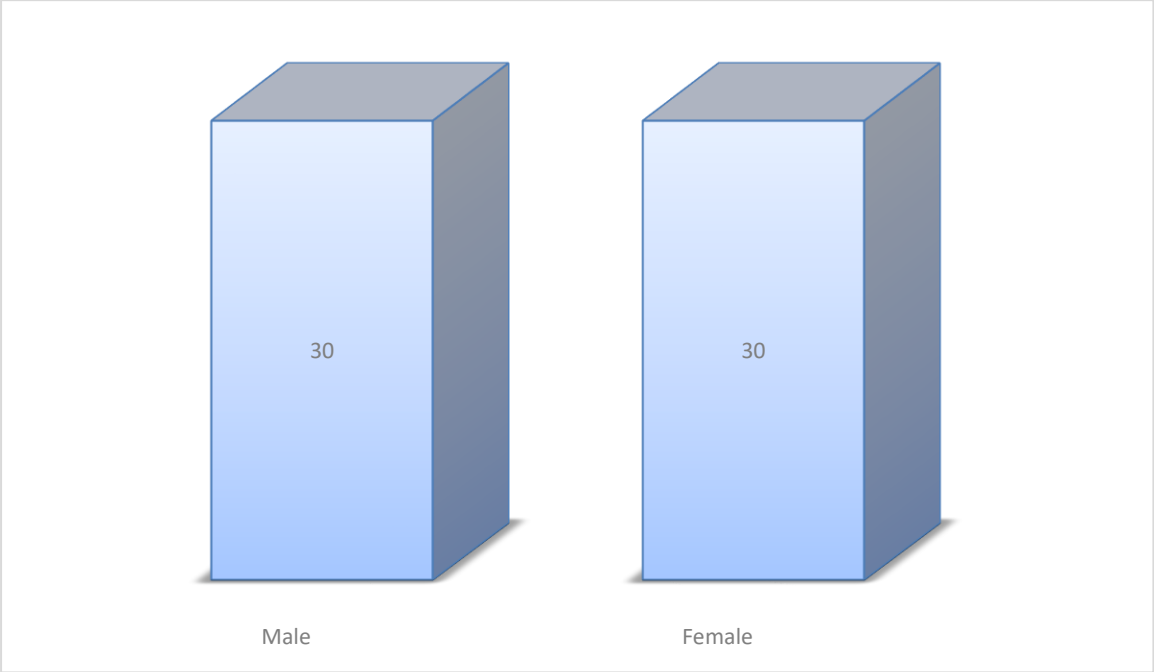
Figure No (1) the population's Answer of the question one:



From Table and figure above we notice that the population were (40-50) with percent (30%) , (38.3%) answered (50-60), While (31.7%) of them were above 60.

Question Two: sex?

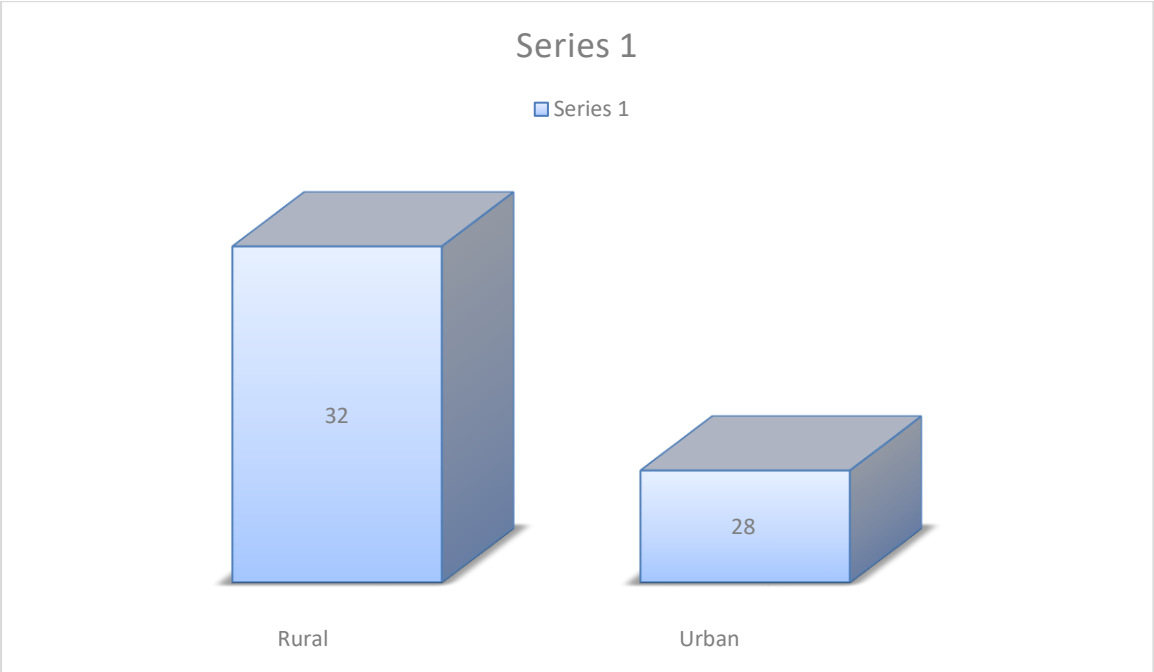
Figure No (2) the population's Answer of the question Two:



From Table and figure above we notice that the populations were Male. With percent (50%) , (50%) female.

Question Three: Residence?

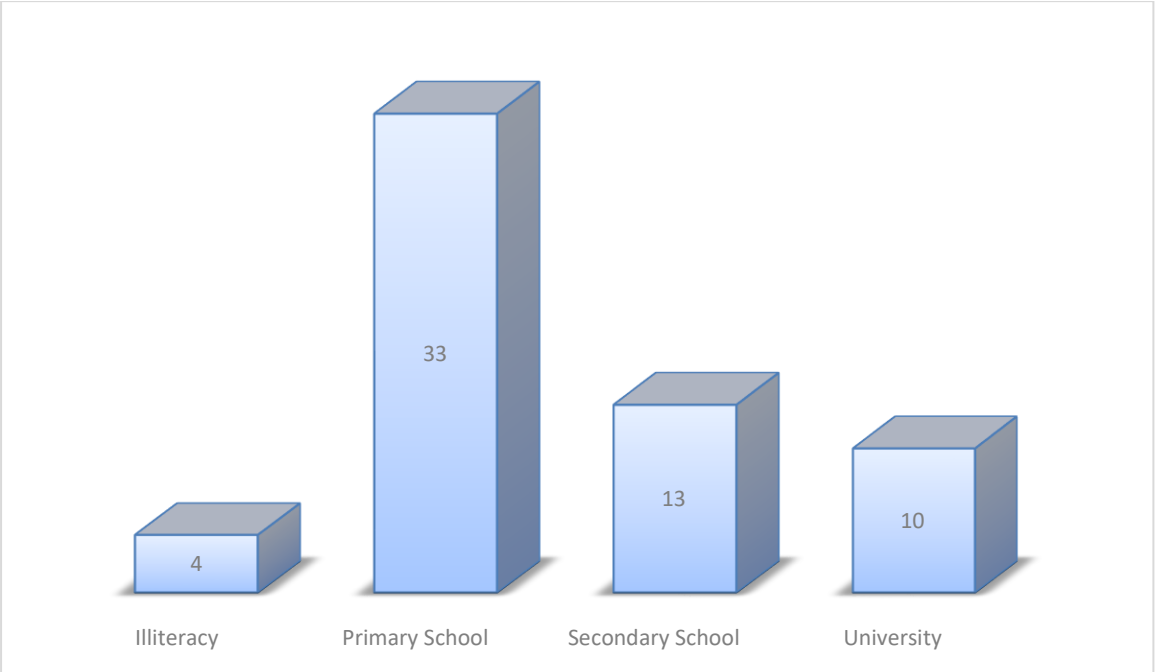
Figure No (3) the population's Answer of the question Three:



From Table and figure above we notice that the populations were answered rural (53.3%) , (46.7%) answered urban.

Question Four: Level of Education?

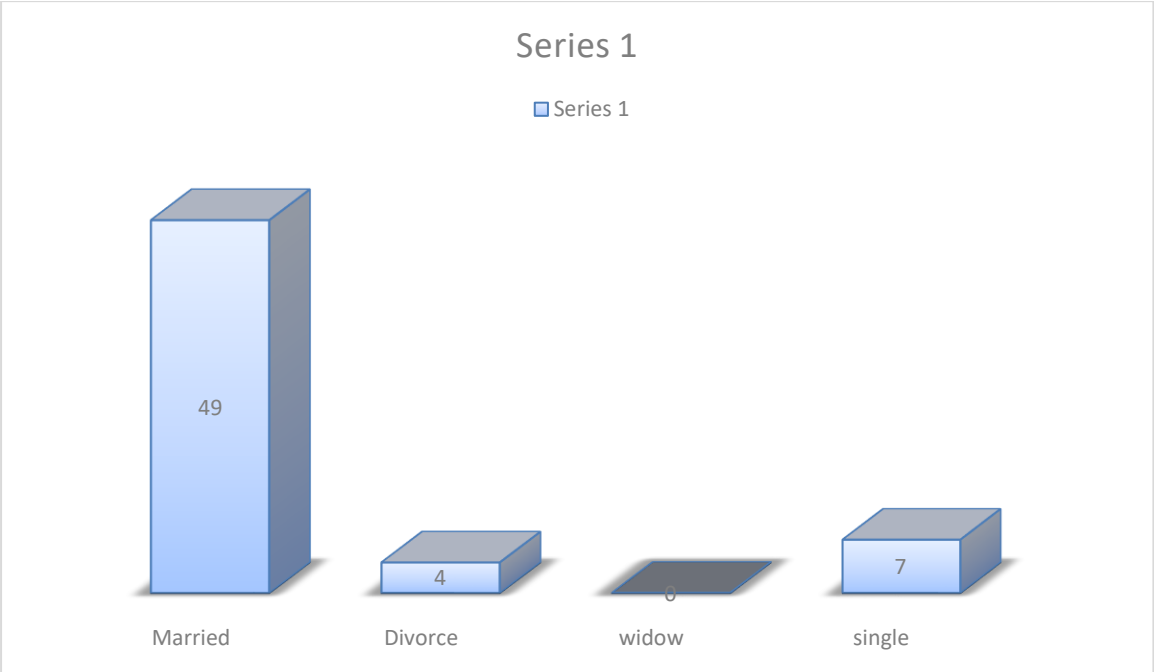
Figure No (4) the population's Answer of the question Four:



From Table and figure above we notice that the populations were answered illiteracy with percent (6.7%) , (55%) answered primary School, while (21.7%) of them were answered secondary school and (16.7%) were answered university.

Question five: Marital status

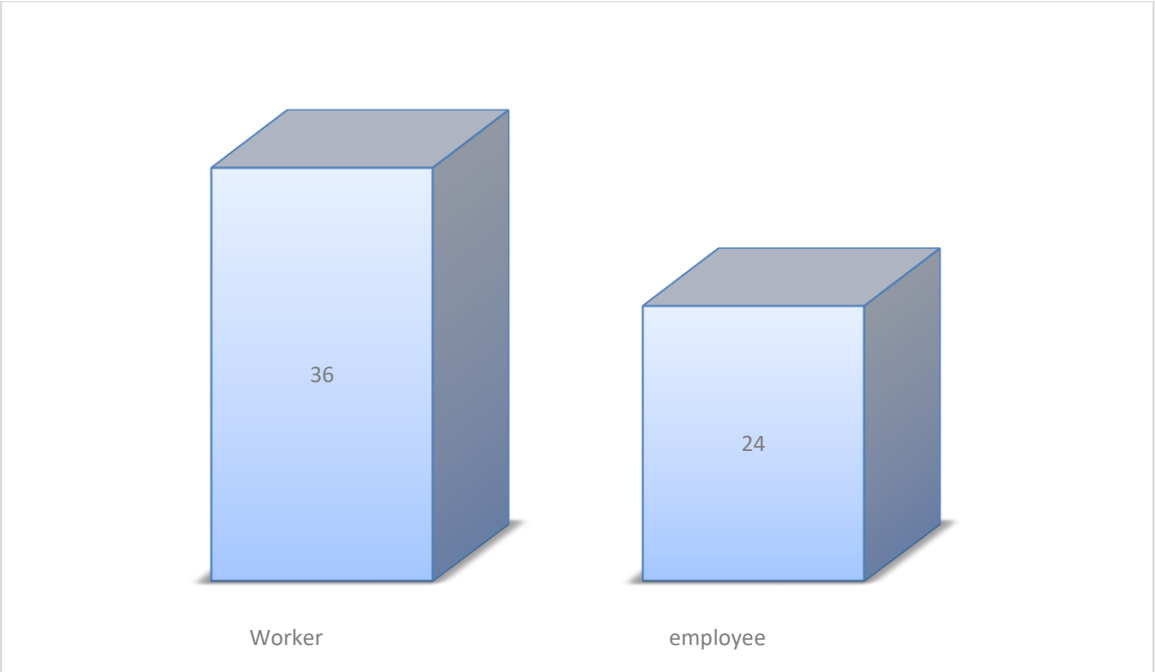
Figure No (5) the population's Answer of the question five:



From Table and figure above we notice that the populations were Answered married with percent (82.7%), (6.7%) answered divorce, while (11.7%) of them were single.

Question six: Occupation?

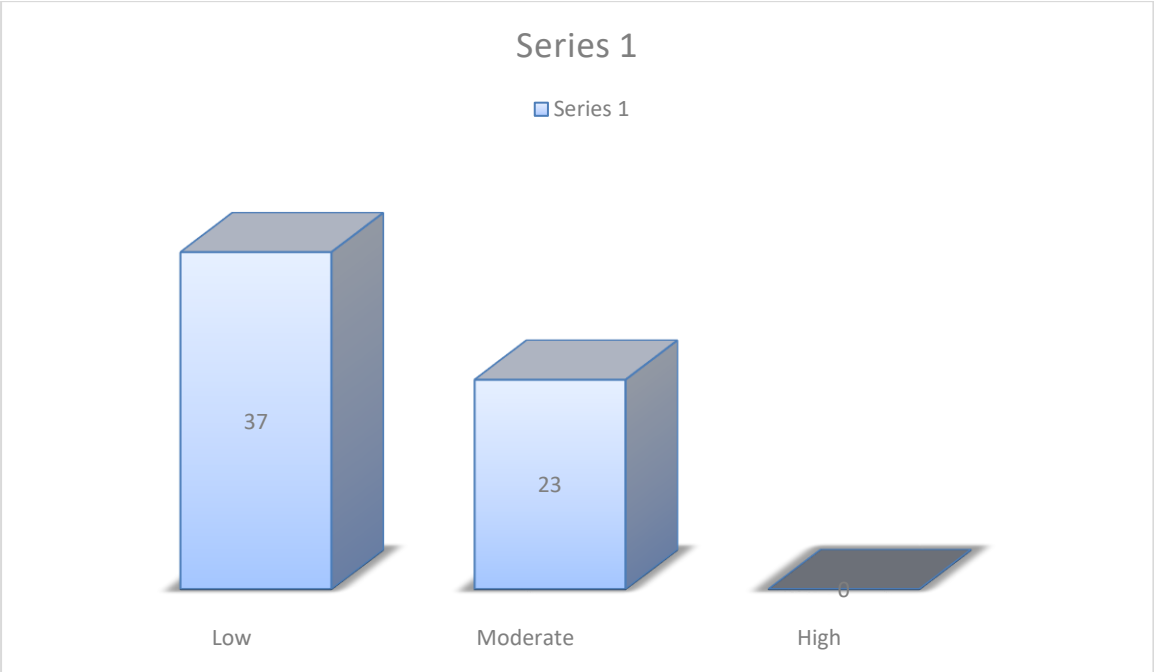
Figure No (6) the population's Answer of the question six:



From Table and figure above we notice that the populations were answered worker with percent (60%), (40%) answered employee.

Question seven: Socio economic?

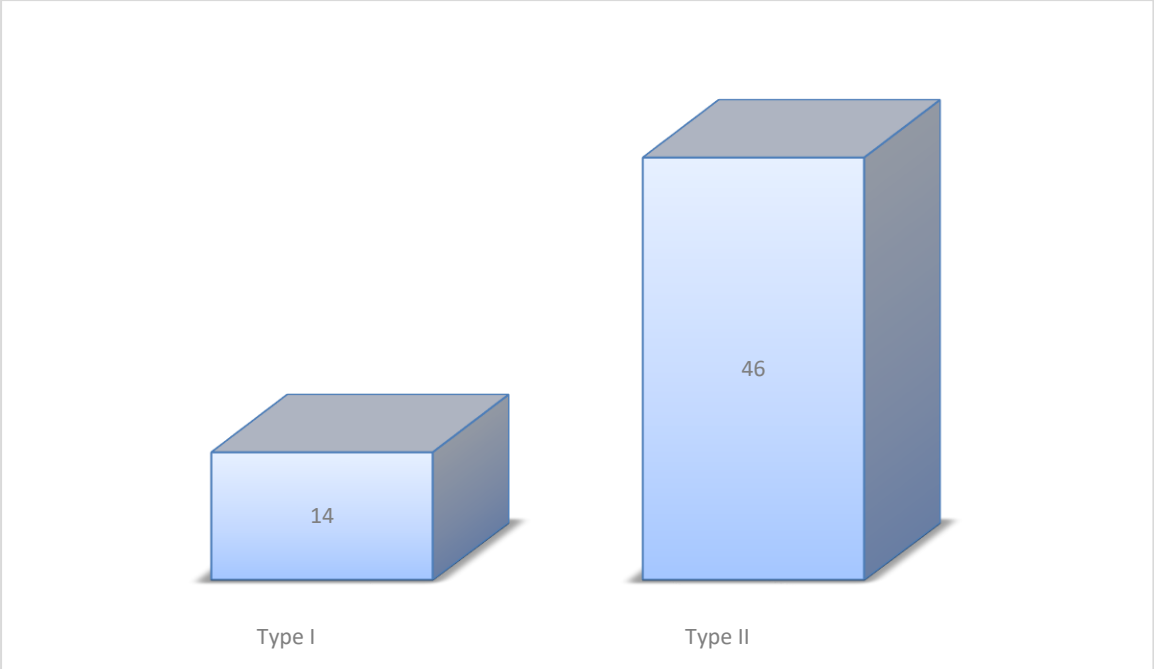
Figure No (7) the population's Answer of the question seven:



From Table and figure above we notice that the populations were answer low with percent (61.7%) , (38.3%) answer moderate.

Question eight: Type of DM?

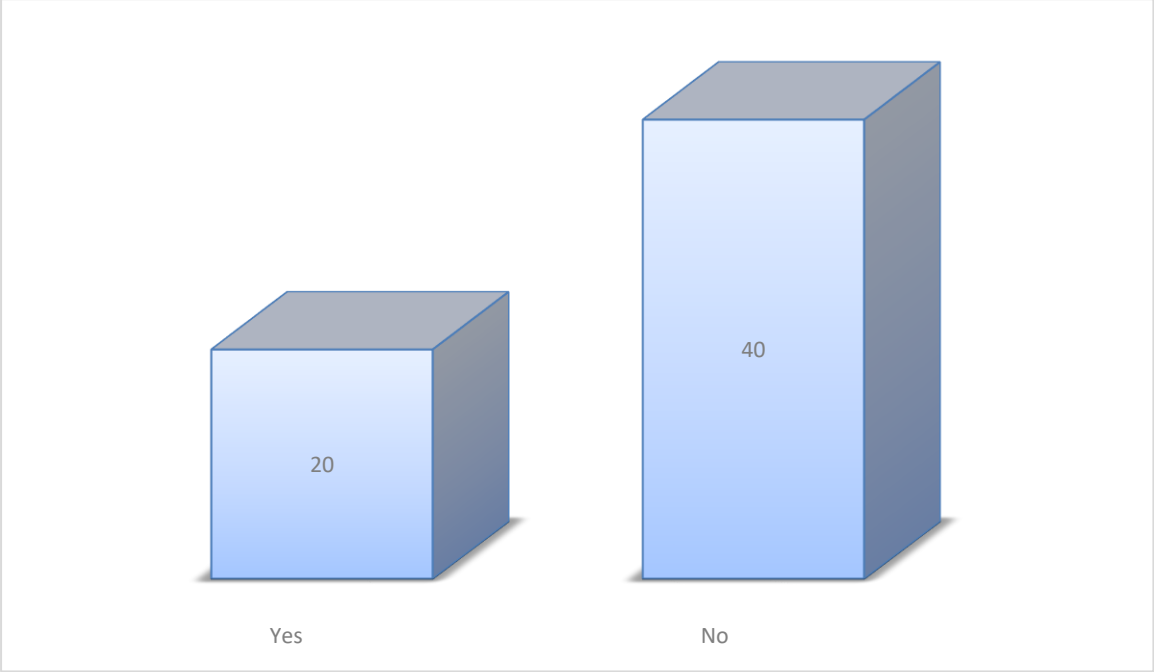
Figure No (8) the population's Answer of the question eight:



From Table and figure above we notice that the populations were Answer type I with percent (23.3%), (76.7%) answer type II.

Question nine: P.t with regular follow up?

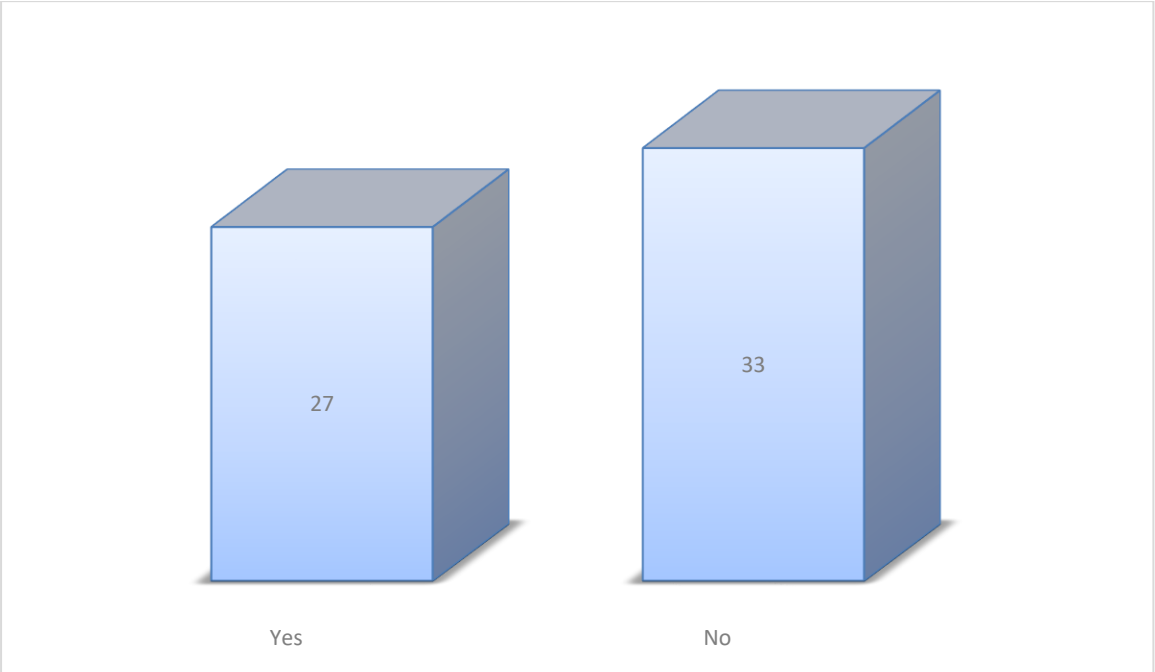
Figure No (9) the population's Answer of the question nine:



From Table and figure above we notice that the populations were answer yes with percent (33.3%),(66.7%) answered No.

Question ten: history of trauma?

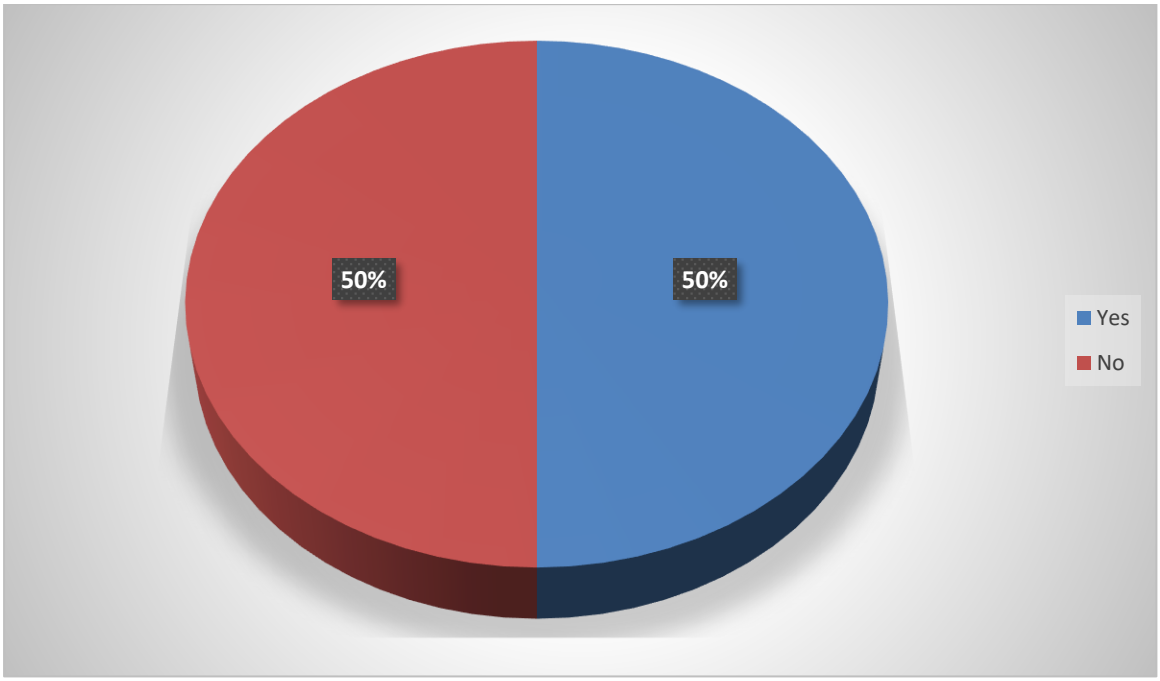
Figure No (10) the population's Answer of the question ten:



From Table and figure above we notice that the populations were yes with percent (45%) , (55%) answered No.

Question eleven: History of any operation?

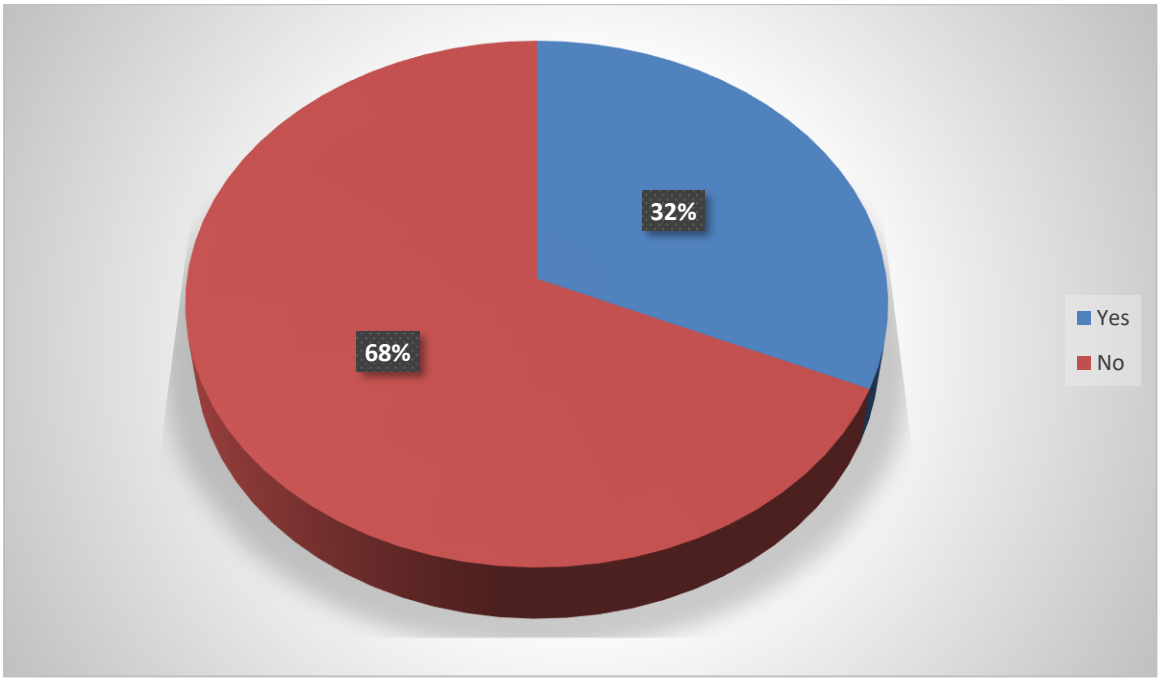
Figure No (11) the population's Answer of the question eleven:



From Table and figure above we notice that the populations were answer yes with percent (50%) , (50%) answered No.

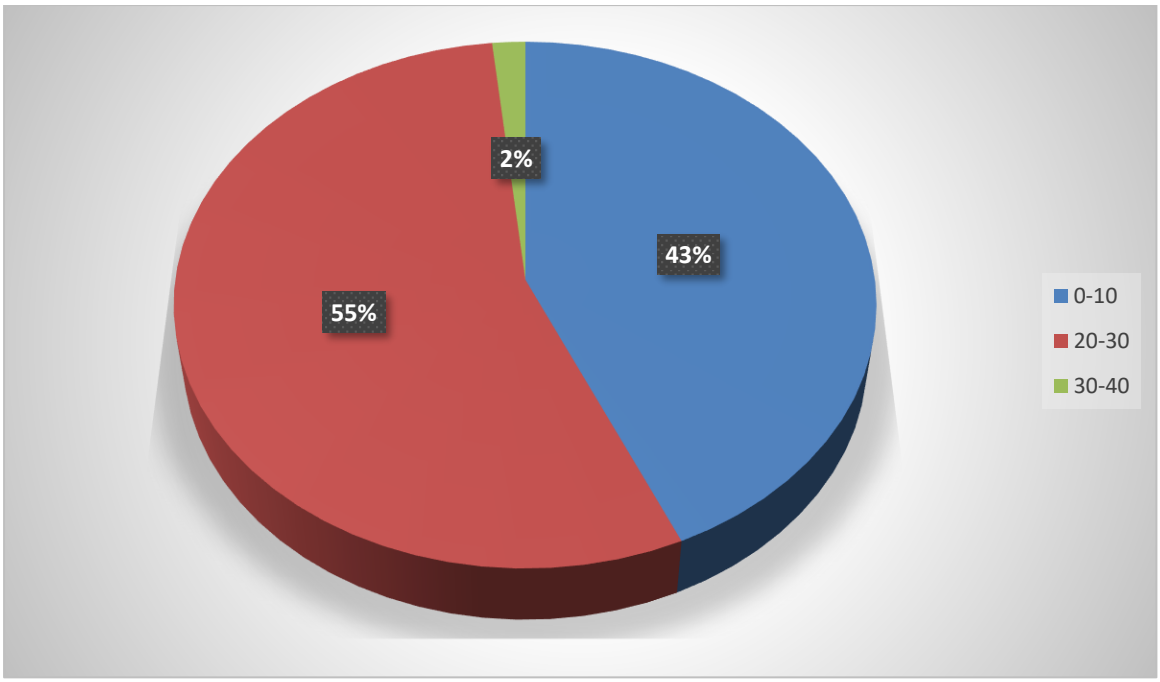
Question twelve: family history of amputation?

Figure No (12) the population's Answer of the question twelve:



From Table and figure above we notice that the populations were yes with percent (31.7%) , (68.3%) answered No.

Figure No (13) the population's Answer of the question thirteen:

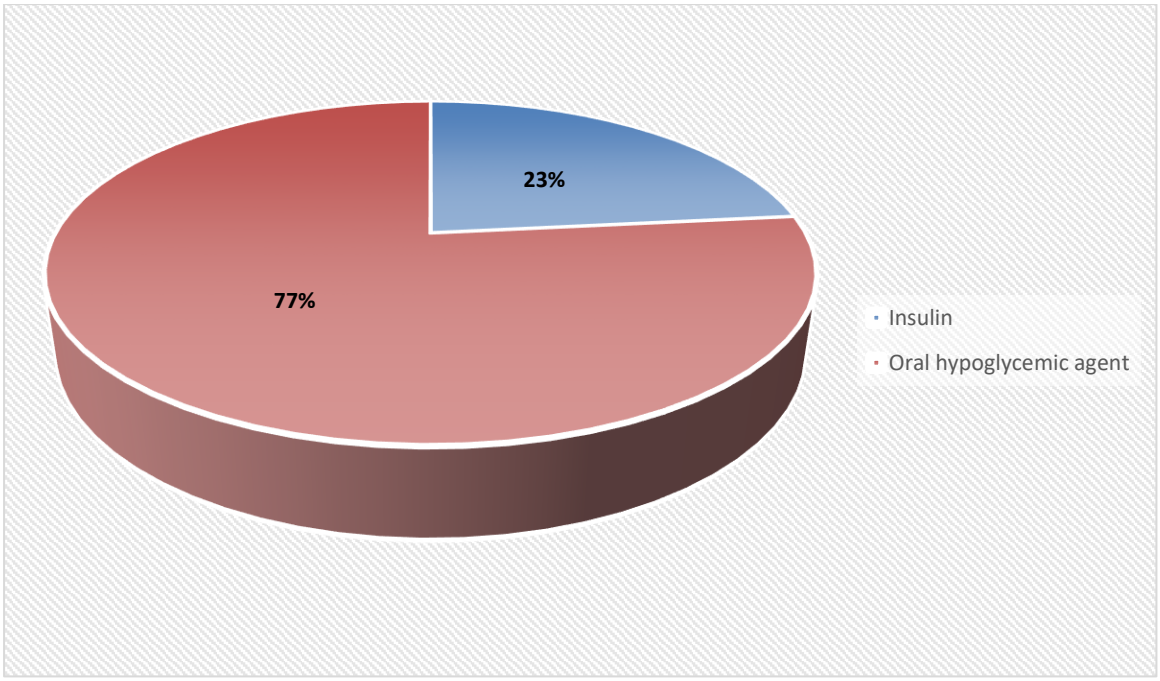


From Table and figure above we notice that the populations were

From Table and figure above we notice that the populations were answer (0-10) and moderate with percent (43.3%) , while (55%) answered (20-30) and (1.7) were answer (30-40).

Question fourteen: Type of medication?

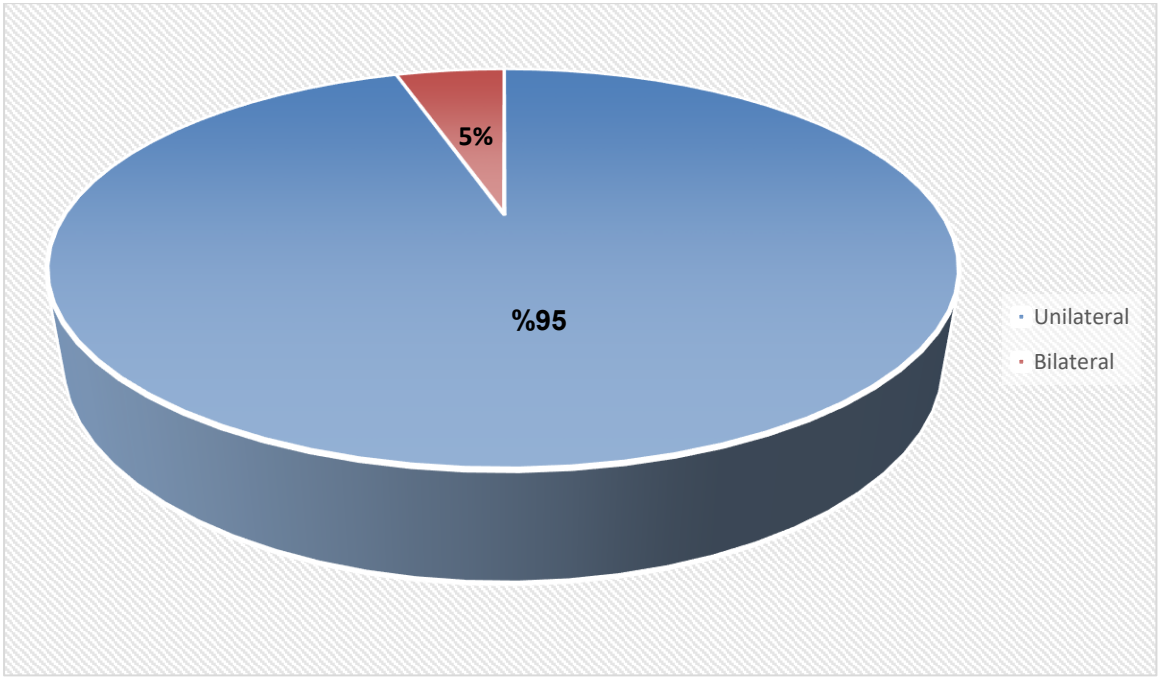
Figure No (14) the population's Answer of the question fourteen:



From Table and figure above we notice that the populations were Answered insulin with percent. (23.3%), (76.7%) Answered oral hypoglycemic agent.

Question fifteen: Amputated lower limb?

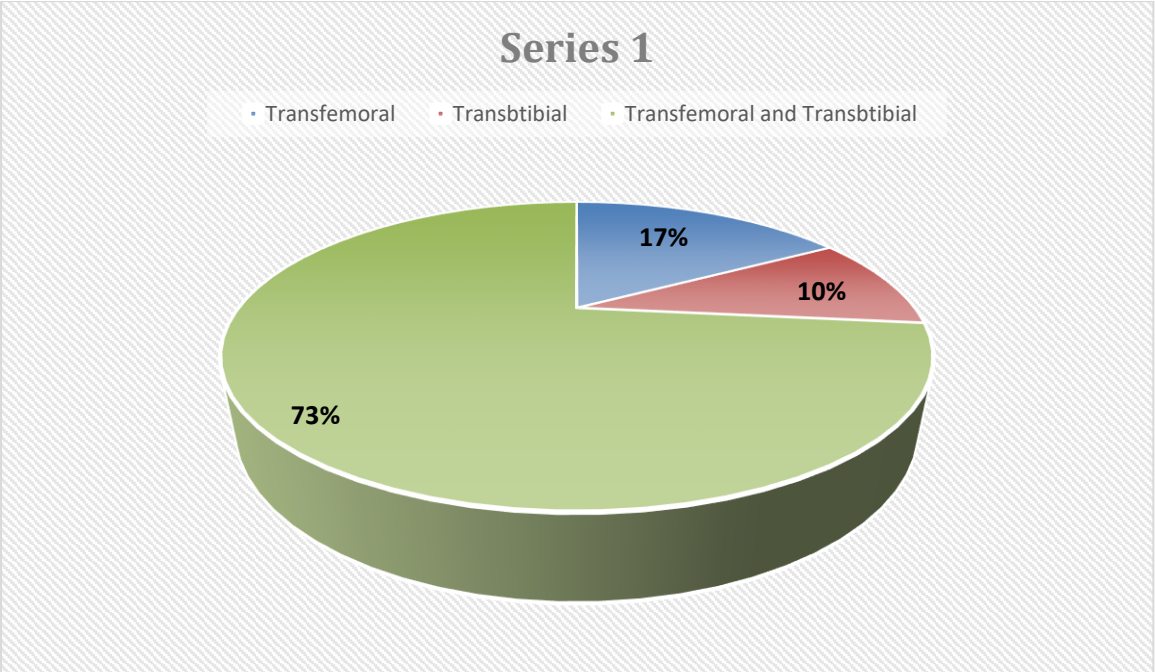
Figure No (15) the population's Answer of the question fifteen:



From Table and figure above we notice that the populations were unilateral with percent (95%) , (5%) answered bilateral .

Question sixteen: Amputation site?

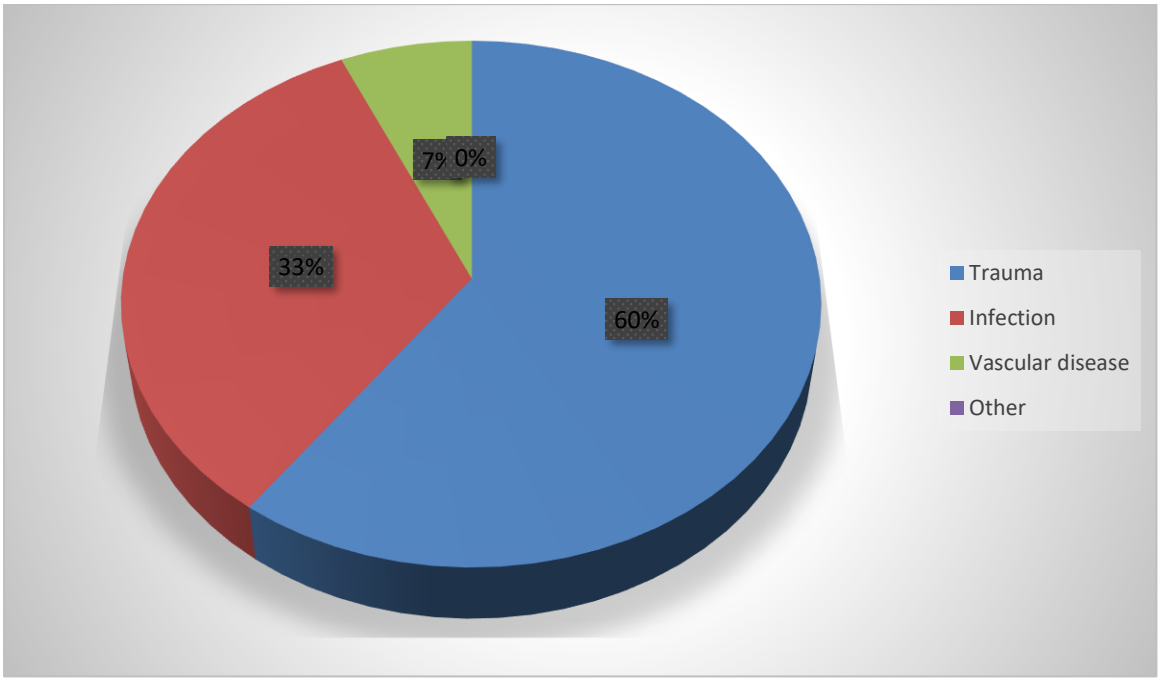
Figure No (16) the population's Answer of the question sixteen:



From Table and figure above we notice that the populations were Transfemoral with percent (16.7%), (10%) answered Transbtibial (73.3%) answered Transfemoral and Transbtibial.

Question seventeen: Reasons of amputation?

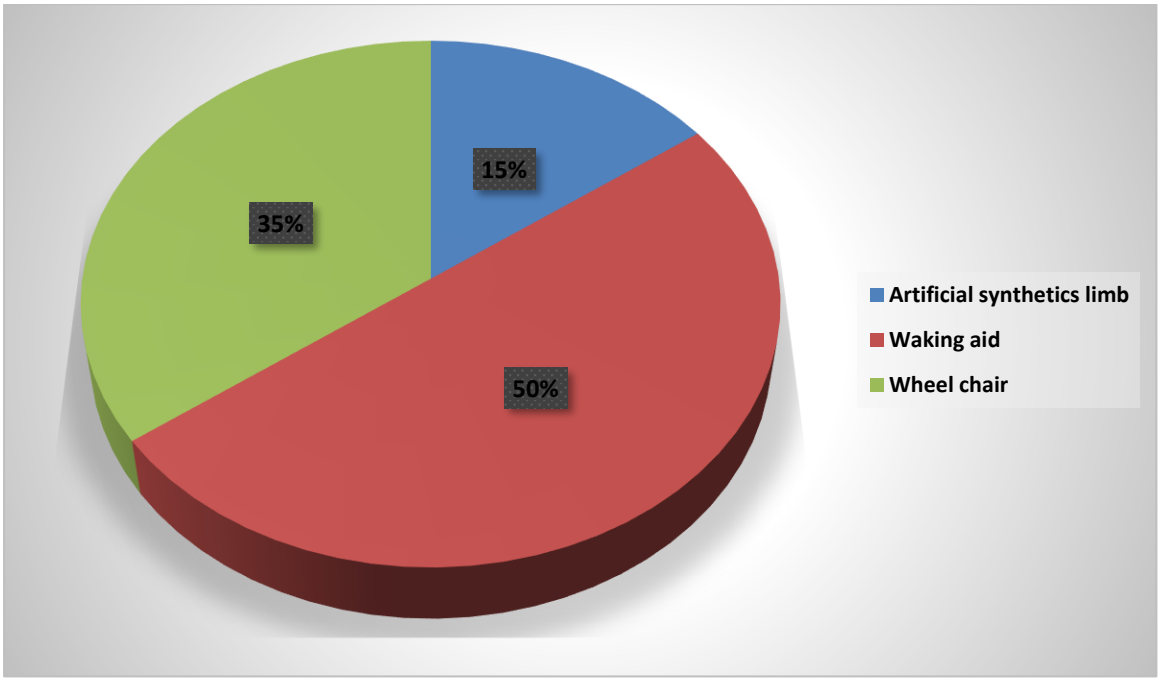
Figure No (17) the population's Answer of the question seventeen:



From Table and figure above we notice that the populations were trauma with percent (60%), (33.3) answered infection , while (6.7%) answered vascular disease.

Question eighteen: Post amputation patients uses?

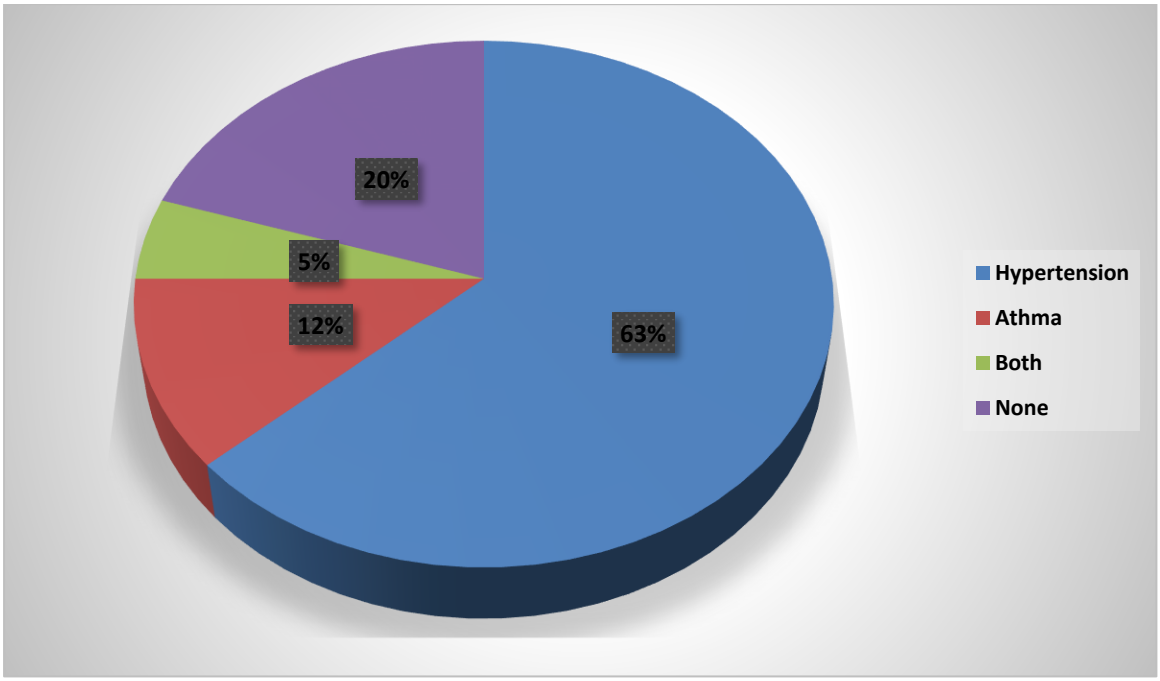
Figure No (18) the population's Answer of the question eighteen:



From Table and figure above we notice that the populations were Artificial synthetics limb with percent (15.1%), (50%) used waking aid, while (35%) used wheel chair.

Question nineteen: Other history of chronic disease?

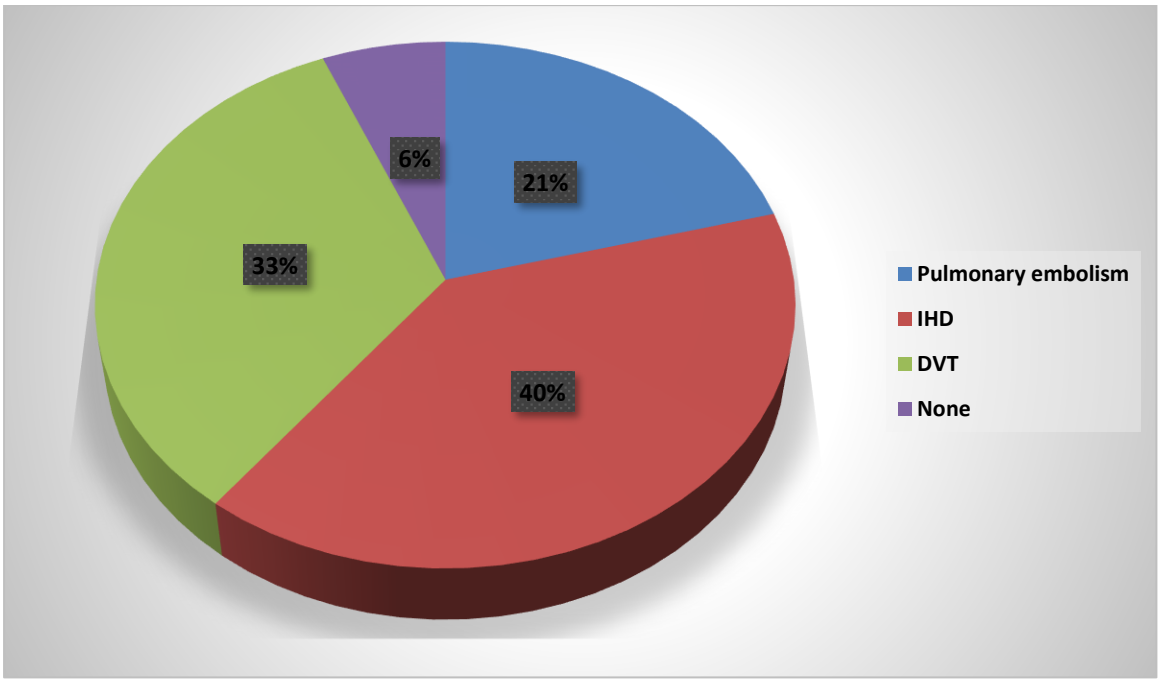
Figure No (19) the population's Answer of the question nineteen:



From Table and figure above we notice that the populations were Hypertension with percent (63.3%), (11.7%) answered athma., while (5%) answered both and (20%) answered none.

Question twenty: Post amputation complication?

Figure No (20) the population's Answer of the question nineteen:



From Table and figure above we notice that the populations were Answered pulmonary embolism with percent (16.7%), (26.7%) answered IHD while (5%) answered DVT and (51.7%) were answered none.

Chapter five

Discussion

In our study the study design (descriptive cross-sectional) and the objective (risk factor for lower limb amputation in diabetic in Sudan has been estimated to between3.4% and 10.4%,the latter a gure in certain communities in the northern state in the Indian 5.9%.,black Africa 5%., also the prevalence UK 1.7% and Pakistan 8.9%
In the our study we notice that population were (40-50) age with
percent 38.3% compare to age above 60,also notie equal sex
affected. the rural residence more risk factor than urban
53.3%, we notice that the level of education in illiteracy and primary school with presented 61.7%. the study showed that married 81.7%, worker 60.0%, low socio economic state 61.7%, type II 76.7%, pt was no follow up 66.7%, history of trauma 27%, pt long standing DM more than 20-30 yrs 55.0%, pt on oral hypoglycemic agent 76.7%, amputated lower limb unilateral 95.0%, amputation site transfemoral and transtibial 73.3%, post amputation pt uses' waking aid 50.0% other history of chronic disease hypertension 63.3%,post amputation complication depression 51.7%.

DFU is the most frequent cause of hospitalization among diabetic patients and LEA is the most feared consequence of foot ulceration. The present study examined whether or not certain baseline characteristics and laboratory measures can predict the risk of LEA. In Indonesia, studies of the incidence or determination of particular risk factors of LEA in the diabetic population are few. This study reports the results of an extensive subset analysis of the data collected during a period of hospitalization in the treatment of DFU. Our references at most will examine age, sex, and/or BMI as predictors of interest, however we considered such variables to be included in study matching criteria thus providing a difference from the previous research. The samples were limited to 94 patients treated by a diabetic foot team in a tertiary hospital in Semarang, Indonesia and the studied populations represented a diabetic population .that constituted the highest risk of poor outcome .

The most important finding in our study was that poor glycemic control had a major role in the development of LEA. In the results of our study, baseline glycemic control median plasma glucose 325.5 mg/dL mean FPG 220.6±73.5 mg/dL, and mean) HbA1c 11.3±2.8%, see Table 2) show that the diabetics in our studied population was poorly controlled. HbA1c above 8% was a significant risk factor for LEA (OR 20.47, CI 3.44–134.31; p=0.002) whereas admission blood glucose was not included in %95 the final model, and FPG did not meet statistical significance in the final multivariate analysis. The role of chronic hyperglycemia as indicated by high HbA1c level as a marker of LEA incident is similar to several other studies, notably those reported by Moss et al. Miyajima et al. from Japan (29), and Imran et al.. In contrast to admission plasma glucose, FPG, or post-prandial blood glucose; the level of HbA1c is directly related to the average glucose concentration over the life span of the hemoglobin. The strong association of HbA1c with LEA could reflect a greater pathogenic role of chronic hyperglycemia probably via neuropathy, autonomic dysfunction, PAD, and susceptibility to infection. The United Kingdom Prospective Diabetes Study (30) reported that the hazard ratio of death from amputation declines 43% when HbA1c

declines by 1%. The Steno- study has shown that an intensified multifactorial intervention including tight glucose control reduces the risk of vascular complication by half, and significantly lowers the amputation rate compared to standard treatment for patients with type 2 diabetes. The meta-analysis adds to the accumulating data on .hyperglycemia as an independent risk factor for LEAs.

diabetes stage of, DFU and amputation could be considered as the marker of advanced Overal . Some authors hypothesized that DFU could be per se an independent predictive variable of LEA as well as mortality Many factors influence the decision of whether or not an LEA should be performed on a patient with DFU, besides the ulcer severity as determined by high Wagner grade. The predictive estimate of our model was 0.89 (95% CI 0.83–0.95; p<0.001); it was similar to that of a model suggested by Martins-Mendes et al., 0.81 (95% CI 0.74–0.87; p=0.001) from Portugal and a study by Lipsky et al., 0.72 (95% CI 0.67–0.77; p<0.001) in diabetic foot infection (31). Martins-Mendes et al. suggested the following risk factors for LEA: previous DFU, PAD complication history, neuropathy, and nephropathy. Lipsky et al. reported that LEAs were higher for patients with surgical site infection, vasculopathy, amputation We added a few more variables to this (32).history, and high leukocyte count suggested model and identified a typology of risk for LEA in DFU patients with an average HbA1c ≤8%, along with the presence of PAD, hypertriglyceridemia, and hypertension. Accordingly, diabetic patients with foot ulcers with the above-mentioned profile should be considered to be at high risk of LEA and signal the need for close monitoring by health care professions. The variations in the extent and ranking of risk factors for the development of diabetic foot LEA between the present results and other research are probably due to differences in study settings and .population selection (33)

Chapter six

Chapter six

Conclusion:

In Sudan caused high morbidity and mortality rates. we must increase the awareness for the screening and follow up of DM and reduce the risk factor and early management and rehabilitation.

Recommendations:

1- lower limb amputation in diabetic pt one of health problems in Sudan, a strategy must be performed for prevention comprising educational programs in Radio, TV and Newspaper , to increase awareness of DM.

2-continuous assessment and screening of DM. Also need to be aware about the importance of the risk factor for lower limb amputation.

3- Management and rehabilitation of lower limb amputation to prevent the complication.

4-post amputated pt should be offered peer visit as a post operative compound of the rehabilitation process to prevent any complication.

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Appendix

Napata collage

Risk factor for lower limb amputation in diabetic patient at Sudan hospitals (2022)

Faculty of medicine

" Questioner "

1) Age :

   (40-50) ( ) , (50-60) ( ) , above 6 ( )

2) Sex :

   Male ( ) , female ( )

3) Residence :

   Rural ( ) , urban ( )

4) Level of education

   Illiteracy ( ) , primary school ( )

   Secondary school ( ) , University ( )

5) Marital Status :

   Married ( ) , Divorce ( ) , widow ( )

   Single ( )

6) Occupation :

   Worker ( ) , Employee ( )

7) socio economic State :

   Low ( ) , moderate ( ) , high ( )

8) TYPE of DM :

   TYPE I ( ) , TYPE II ( )

9) PT .with regular follow up :

   Yes ( ), NO ( )

10) History of trauma :

    Yes ( ), NO ( )

11) History of any operation

    Yes ( ), NO ( )

12) Family history of amputation :

    Yes ( ), NO ( )

13) For how long patient diagnosis with DM :

    (0-10) ( ) , (10-20) ( ) , (20-30) ( )

    (30-40) ( )

14) Types of medication :

    Insulin ( ) , oral hypoglycemic agent ( )

15) Amputated lower limb :

Unilateral ( ) , bilateral ( )

16) Amputation site :

Transfemoral ( ) , transtibial ( )

Transfemoral and transtibial ( )

17) Reasons of amputation :

Trauma ( ) , infection ( ) ,

vascular disease ( ) Other ( )

18) Post amputation patients uses :

Artificial synthetics limb ( ) , waking aid ( )

Wheel chair ( )

19) Other history of chronic disease :

Hypertension ( ) , asthma ( )

20) Post amputation complication :

Pulmonary embolism ( ) , IHD ( ) ,DVT ( )

Depression ( )