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Original article

A STUDY ON PREVALENCE OF DIABETES MELLITUS TYPE2 AMONG PATIENTS AGED 30-60 YEARS ATTENDING HEALTH SERVICE AT BUKEDEA HEALTH CENTER IV IN BUKEDEA DISTRICT. A CROSS-SECTIONAL STUDY.

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Abstract

Background:

Type 2 diabetes mellitus is very prevalent in Uganda and affects a wide percentage of the adult population. Much as there have been successive Interventions in the prevention and control of this non-communicable disease, it's still increasing annually. The objective of this study is to determine the prevalence of diabetes mellitus type 2 among clients of age between 30-60 years attending Health service at Bukedea Health center IV in Bukedea district.

Study objectives:

The study objectives were; Prevalence, individual factors and knowledge of patients on diabetes mellitus type 2 among adult clients between age 30-60 years.

Methodology:

A cross-sectional study of 80 respondents was used for the study. A simple random sampling technique was used and data collected using survey and interviewing method was presented and analyzed using descriptive frequencies and percentages using Microsoft Excel and Microsoft word.

Results:

There is slightly high prevalence of diabetes mellitus type 2 with 38 (47%) having been diagnosed with the condition, 28 (38%) having a family member diagnosed with the condition and 9 (11%) having their sugar levels above 10mm/l, the majority of respondents 68 (85%) were ignorant about the condition, 12 (15%) were weighing above 60kgs ,majority 50 (62%) had gained weight and of which the majority 57 (71%) do not do body exercise,

Conclusions :

Of the 80 respondents, still many had ever been diagnosed with diabetes mellitus. and had a family member diagnosed with diabetes mellitus 2,slightly a moderate number of patients had no knowledge about diabetes mellitus, while still a slight majority were weighing above 60 kgs, However a majority of the respondents had gained weight, majority of respondents still don't do body exercise.

Recommandations :

Improvement of knowledge about DM2 through creating awareness, screening services and continuous re-stocking of DM drugs by the government.

Keywords: Prevalence, knowledge, Diabetes mellitus, Body Sugars, non-communicable diseases,
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1. Background:

Diabetes mellitus (DM) is a metabolic disorder where a human body does not produce or properly uses insulin, a hormone that is required to convert sugar, starches and other food into energy. Absence or reduced insulin in turn leads to persistent abnormally high blood sugar and glucose in tolerance. It is probably an oldest disease known to man. It is also referred as black-death from the 14th century. (Nitin et al., 2018).

Diabetes mellitus (DM) is abroad term used to describe chronic metabolic disorders leading to prolonged hyperglycemia, it is generally classified into 2 main types (type 1 and type 2), Type 1 DM is generally due to environmental and genetic factors triggering an autoimmune destruction of B-cells that lead to absolute insulin deficiency while type 2 DM is characterized by insufficient insulin production as well as insulin resistance in the body unable to effectively use the insulin it produces (Getenetet al.,2020).

The high prevalence of type 2 diabetes worldwide continues to rise, and there are no signs of it stabilizing. A concerning finding is the rapidly rising burden in lower-income countries. Type 2 diabetes continues to increase in prevalence, incidence, and as a leading cause of human suffering and deaths. Certain regions of the world, such as Western Europe and island states in the Pacific, are experiencing a disproportionately high burden(Khan et al., 2019). A study done in America on global prevalence of type 2 DM showed that there were 437.9 million prevalent cases of type 2 diabetes in 2019, with an age-standardized point prevalence of 5282.9 per 100,000 populations, which represents a 49% increase since 1990. Type 2 diabetes accounted for 1472.9 thousand deaths in 2019,.(Safiriet al., 2022), In Comparison to the study conducted in China which revealed that the number of people living with diabetes mellitus quadrupled between 1980 and 2014. Between 2010 and 2030, Asia has emerged as the major area with a rapidly developing T2DM epidemic. China and India are the top two epicenters of the global epidemic of T2DM1. In these countries, the T2DM epidemic is characterized by onset at a lower BMI and younger age than in Western populations(Zheng et al., 2018)

A study done in sub Saharan Africa revealed that the number of adults living with DM2 in 2017 was 9.8 to 27.8 million with a regional prevalence of 6%. The prevalence of DM2 in sub-Saharan Africa could outweigh other regions. (Zimmermannetal, 2018, A study conducted in Nigeria showed that the age-adjusted prevalence rates of T2DM in Nigeria among persons aged 20–79 years increased from 2.0% in 1990 to 5.7% in 2015, accounting for over 874 000 and 4.7million cases, respectively. Our findings suggest an increasing burden of T2DM in Nigeria with many persons currently undiagnosed, and few known cases on treatment(Adeloyeet al., 2017)

In East Africa, there is a high rate ofT2DM though this is not fully statistically assessed. This is mainly because most of the diabetes cases in East Africa are undiagnosed with pooled prevalence of 4.43.Afew of these who are aware of their glycemic condition have received treatment and not all have their blood glucose under control (Dessie et al.,2020)

A study done in kanungu district (Uganda) showed that the overall prevalence of type 2 diabetes was 18.7% among the tested patients. 22.8% of diabetic patients were females as 7.8% were males. The age group most affected by diabetes was 61-65 years.. There was a high prevalence of type 2 diabetes observed in this study compared to studies done in previous years which raise a public health concern. This study also found that females and patients aged 61-65 years were most affected by diabetes. (Asiimwe et al., 2020)

In Bukedea district there is little information about the burden of diabetes mellitus type 2. Hence the purpose of this research will be to determine the prevalence of diabetes type 2, factors associated, alongside the knowledge of patients on the prevalence of type 2 diabetes among adults aged 30-60 years in Bukedea district at Bukedea

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Health Center IV.

The study focuses on the Prevalence, individual factors and knowledge of patients on diabetes mellitus type 2 among adult clients between age30-60 years attending health service at Bukedea health centre iv in Bukedea district.

2. Methodology:

2.1. Study design:

The study design used was across sectional research study .Across sectional research design is a type of observational study that analyzes data from a population or are representative subset at specific point in time, I choose cross sectional study because it allows me to collect data within a short period of time and it's cheap, The study was conducted between January 2023 and March 2023.

2.2. Study area:

This study was conducted at Bukedea health center IV in Bukedea district, located 1km off Soroti-Mbale high way. The health center is in Lubega cell, Kakere, 1km from Bukedea town, and serves different tribes like Iteso, bagwere and karamajongs.

2.3. Study population:

Adults between 30-60 years attending the Health service at outpatient department (OPD) in Bukedea health center IV.

2.4. Sample size determination:

A sample is a small part or quantity intended to show what the whole is like. Sample size determination is the act of choosing the number of observations or replicates to include in a statistical sample. The sample size was calculated using the formula below

$n = N/1+N (e)^2$

Where n = sample size

e = the proportion of sampling error (0.05)

N = Population (slovin, 2012)

Calculations

$n = 100/1+ (0.05)^2$

$n = 100/1+0.25$

$n = 100/1.25$

$n = 80$

As per the above formula and calculation, the sample size for this study was 80 respondents.

2.5. Sampling technique:

The selection of respondents to be interviewed was done by simple random probability sampling.

2.6. Sampling procedure:

The population targeted was identified, the sample size used was decided, the sample was randomly selected, and the data was then collected from the sample.

2.7. Data collecting Method:

Data was collected by means of questionnaires.

2.8. Data collection tools:

The researcher used interview administered semi structured, questionnaire, pens, notebook, and ruler for data collection compiling.

2.9. Data collection procedure:

The researcher used an interview scheduled designed in English, a pen and a note book in data collection. Each respondent was told the purpose of interview, questions were explained for easy understanding and interview was carried-out on every respondent

2.10. Study variables

2.11. Dependent variable:

The dependent variable was the prevalence of diabetes mellitus type 2 among adults aged 30-60 years at Bukedea Health Center IV, in Bukedea district. It was obtained by testing respondents.

2.12. Independent variable:

The individual factors associated with diabetes mellitus type 2 among adults aged 30-60 years at Bukedea Health Center IV in Bukedea district.

The knowledge of the patients on diabetes mellitus type 2 among adults aged 30-60 years at Bukedea Health Center IV in Bukedea district.

2.13. Quality control:

2.13.1. Validity of the study:

Validity refers to how well a test or research instrument measures what it is supposed to measure. The researcher pre-tested the instruments to determine the content validity of items. To establish the validity, the questionnaires were subjected to the scrutiny by the supervisor who was to evaluate the relevance of the items in the instruments to the objectives. The supervisor will rate each item on a scale and recommendations will be used to finally modify questions and the format of the tools that will have the ability to solicit the expected data.

2.13.2. Reliability of the Study:

The questions in the questionnaire were designed taking in to consideration the issues related to the problem and goals of the study. Reliability determines whether the research instrument is reliable and therefore be adopted for collecting data. The reliability of the questionnaire was ensured through pilot study instrument. Data collected from sample of respondents was analyzed and computed.

2.14. Inclusive criteria:

The study considered patients attending the Diabetic clinic at Bukedea Health Center IV who were able to give informed consent to participate in the study.

2.15. Exclusive criteria:

The study was to exclude all patients outside the age group of 30-60 years during the research.

2.16. Data analysis and presentation:

Data collected was analyzed using Microsoft Excel ,Data presentation was in form of pie chart, distribution table and column charts.

2.17. Ethical considerations:

An introductory letter was obtained from the school authority and introduces the researcher to the medical director/ superintendent Bukedea Health Center IV. The permission to carry out the study was obtained from the health center in charge and other concerned committees of the hospital. An informed consent was sought and respondents were assured the confidentiality of the information.

3. RESULTS:

3.1. Demographic characteristics of respondents.

In table 1 above, majority of the respondents 38(47.5%) were aged above 41 years, and 9(11.25) were less than 18 years, most of these respondents wereIteso63(78.75%), Karimojong being only 2(2.5%), For the education level, the majority of patients 36 (45%) had reached secondary level of education, 5 (6.25%) had reached university, Most of the respondents were married 54 (67.5%), 6 (7.5%) were single.

4. PREVALENCE OF DIABETES MELLITUS TYPE 2:

Figure 1 above shows majority of the respondents had not checked for their sugar levels 64 (80%) and the rest had checked for their sugar levels. 16 (20%).

Figure 2 above shows that majority of respondents 35 (44%) had their sugar levels between 7 – 10 mm/l, 8 (10%) had their sugar levels between 1 – 3 mm/l, 28 (35%) had their sugar levels between 4 – 6mm/l, and 9 (11%) had their sugar levels above 10 mm/l hence had diabetes mellitus.

The majority of the respondents 52 (65%), had no family member being diagnosed with Diabetes mellitus, while the rest 28 (35%) had at least a family member diagnosed with diabetes mellitus, also A slight majority 42 (53%) had never been diagnosed with diabetes mellitus while 38 (47%) had ever been diagnosed with diabetes mellitus.

5. INDIVIDUAL FACTORS ASSOCIATED DIABETES MELLITUS TYPE 2.

Most of the respondents 36 (45%) were weighing between 41 – 60 kgs, 5 (6%) said they are

Table 1: Shows demographic characteristics of respondents (n=80)

Variables	Category	Number.	Percentage.
Age	< 18	9	11.25%
	19 – 30	11	13.75%
	31 – 40	22	27.5%
	41 Above.	38	47.5%
Total		**80**	**100%**
Tribe	Itesot	63	78.75%
	Karimojong	2	2.5%
	Mugwere	10	12.5%
	Mugisu	5	6.25%
	Others	None	0%
Total		**80**	**100%**
Education level	Not Educated	12	15%
	Primary level	27	33.75%
	Secondary level	36	45%
	University	5	6.25%
Total		**80**	**100%**
Marital status	Single	6	7.5%
	Married	54	67.5%
	Widowed	9	11.5%
	Divorced	11	13.7%
Total		**80**	**100%**

Source: Primary Data (2023)

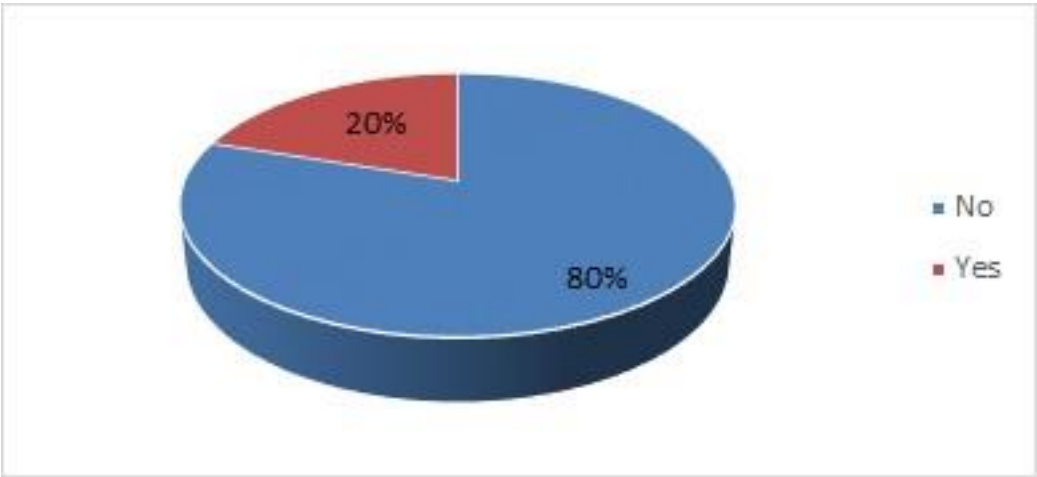

Figure 1: Shows distribution of patients according to whether they have checked for their blood sugars.(n=80)

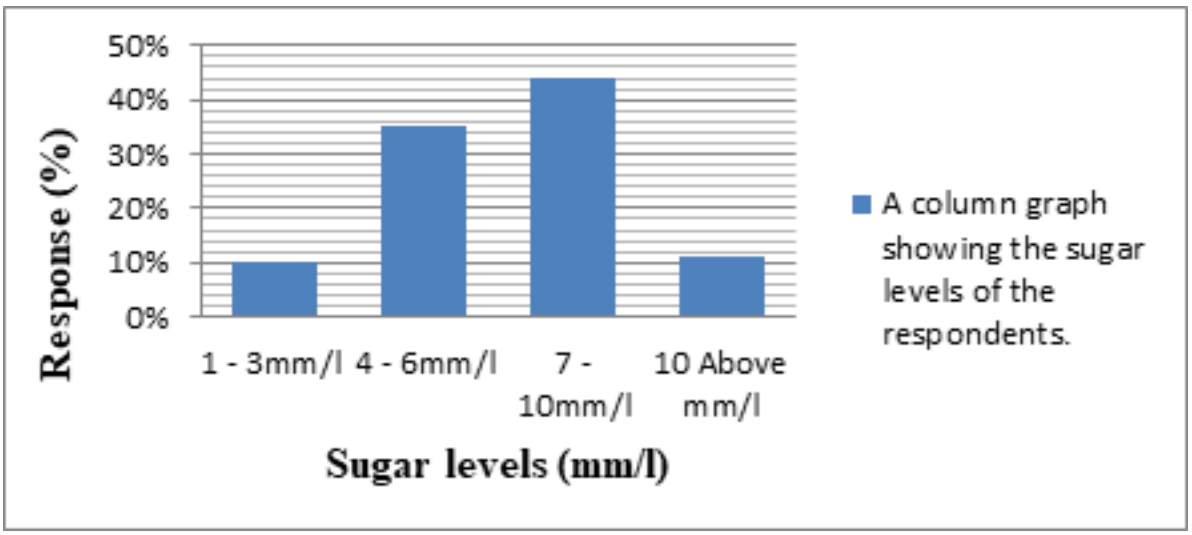

Figure 2: Shows distribution of the respondents according to their levels of sugar levels. (n=80)

Table 2: Shows patients response on whether any family member has ever been diagnosed with diabetes mellitus type 2 and patients response on whether they have ever been diagnosed with diabetes mellitus type 2.(n=80)

Response on whether any family member has ever been diagnosed with diabetes mellitus type 2 (n=80)		
Response	**Number**	**Percentage**
Yes	28	35%
No	52	65%
	80	**100%**
Response on whether they have ever been diagnosed with diabetes mellitus type 2 (n=80)		
Response	**Number**	**Percentage**
Yes	38	47%
No	42	53%
	80	**100%**

Source: Primary Data (2023)

weighing between 1 – 20 kg, 27 (34%) said they are weighing between 21 – 40 kg and 12(15%) said they are weighing above 60 kgs above.

In table 3 above, Most of the respondents 50 (62%) had gained weight, 30 (38%) said they had lost weight also the majority of respondents 57 (71%) said they don't do body exercise, 23 (29%) of the respondents said they do body exercise.

6. KNOWLEDGE OF PATIENTS ON THE PREVALENCE OF DIABETES MELLITUS TYPE 2.

In figure 4 above, the majority 68 (85%) had knowledge about diabetes mellitus and the rest 12 (15%) had no knowledge about diabetes mellitus.

In figure 5 above, majority of respondents 42 (52%) said that diabetes mellitus kills, 21 (26%) said that diabetes mellitus spreads, 11 (14%) said that diabetes mellitus is not a common condition, while 6 (8%) say it's a rare condition.

In figure 6, the big majority of the respondents 50 (62%) said that diabetes mellitus is caused by

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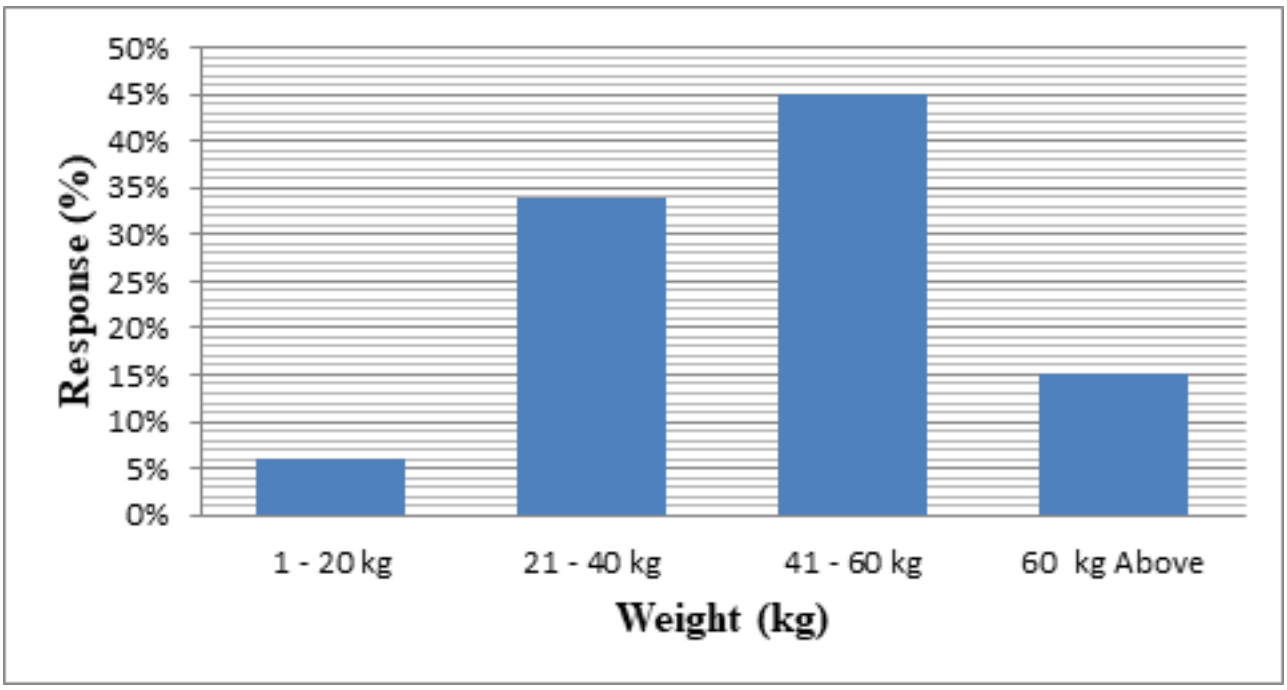

Figure 3: Shows distribution of patients according to their weight. (n=80)

Table 3: Shows distribution of patients according to whether they have gained or lost weight and distribution of patients according to whether they do body exercise or not. (n=80).

Response of patients on whether they have gained or lost weight (n=80)		
Response	**Number**	**Percentage**
Gained weight	50	62%
Lost weight	30	38%
	80	**100%**
Response of patients on whether they do body exercise or not. (n=80)		
Response	**Number**	**Percentage**
Yes	23	29%
No	57	71%
	80	**100%**

Source: Primary Data (2023)

eating sweet food, 20 (25%) said that it's caused by being very fat, 16 (8%) say that its caused by poverty, while 4 (5%) were not sure about the cause of diabetes mellitus.

In the figure 7 above, the majority of the respondents 46 (58%) said that elderly people is commonly affected by diabetes mellitus, 18 (22%) of the respondents said the youth and 16 (20%) said children.

6. Discussion:

6.1. The prevalence of diabetes mellitus type 2 among patients aged 30-60 years.

38 (47%) of the respondents had ever been diagnosed with type 2 diabetes mellitus, 42 (53%) had never been diagnosed with diabetes type 2this shows that there is a larger number of individuals with diabetes mellitus type 2, in the community who don't know their diabetic status probably because of less sensitization of community

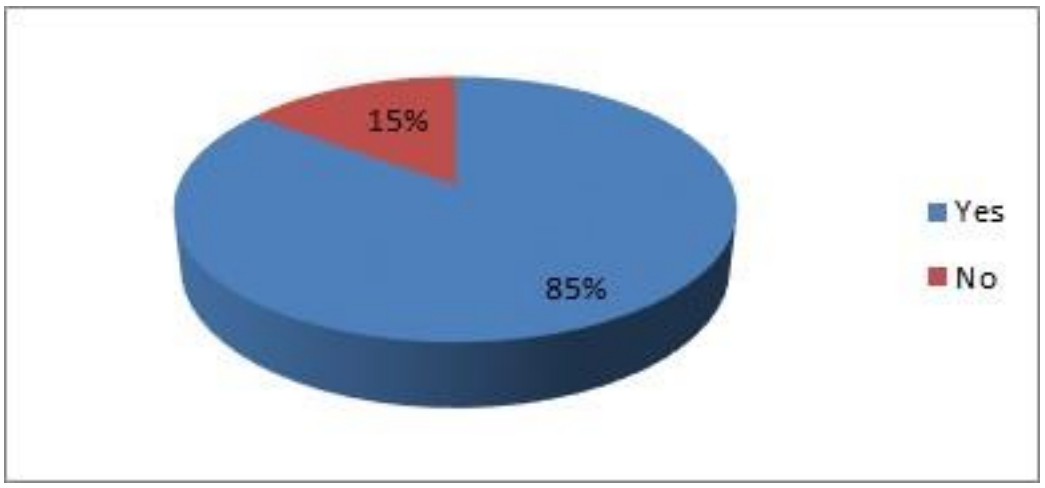

Figure 4: Shows distribution of patients according to their knowledge about diabetes mellitus. (n=80).

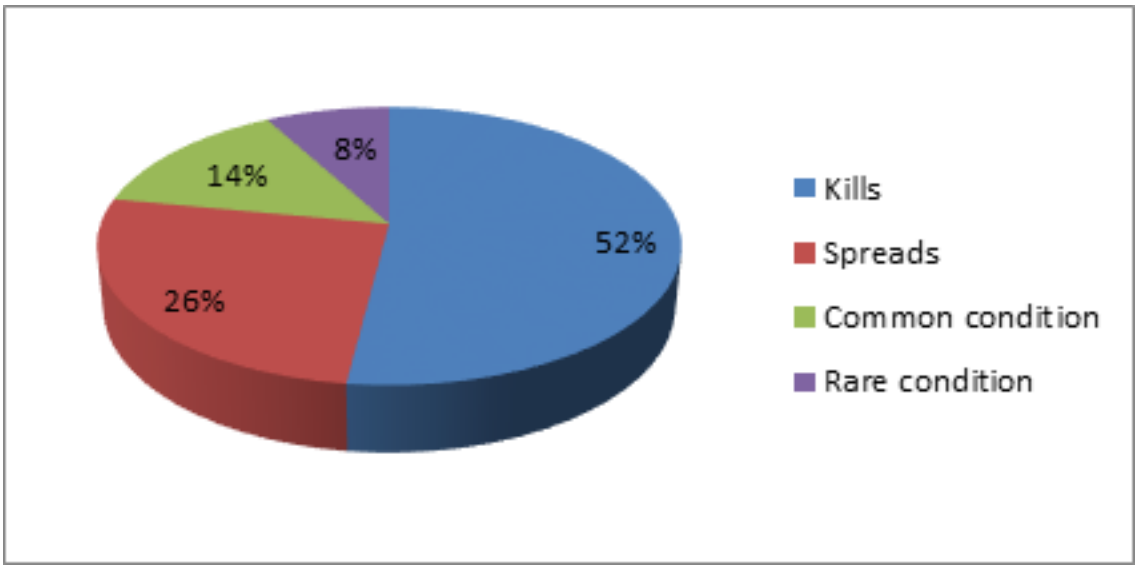

Figure 5: Shows distribution of patients according to what they know about diabetes mellitus type 2. (n=80)

about testing for diabetes mellitus, inadequate knowledge about T2DM by patients, hence increasing the number of those who report with complications, this being in line with study done in Qassim University, Saudi Arabia by (Sami & Ansari, 2017), indicated that T2DM is at present one of the most common diseases and its levels are progressively on the rise. It has been evaluated that around 366 million people worldwide or 8.3% in the age group of 20-79 years had T2DM in 2011. This figure is expected to rise to 552 million (9.9%),Hence there being need for community mass testing so as to identify those with diabetes mellitus before them presenting with severe complications.

6.2. Individual factors associated with diabetes mellitus type 2.

The majority of respondents 36 (45%) were weighing between 41 and 60 kgs and of which 50 (62%)say they had gained weight and the majority 57 (71%) don't do body exercise, this characteristics put the individuals in those groups at a very high risk of being diagnosed with prediabetes 2, this is because gain of weight without doing exercise makes one become easily obese with very high Body Mass Index [BMI]a strongest risk factor for T2DM, this correlates with a study

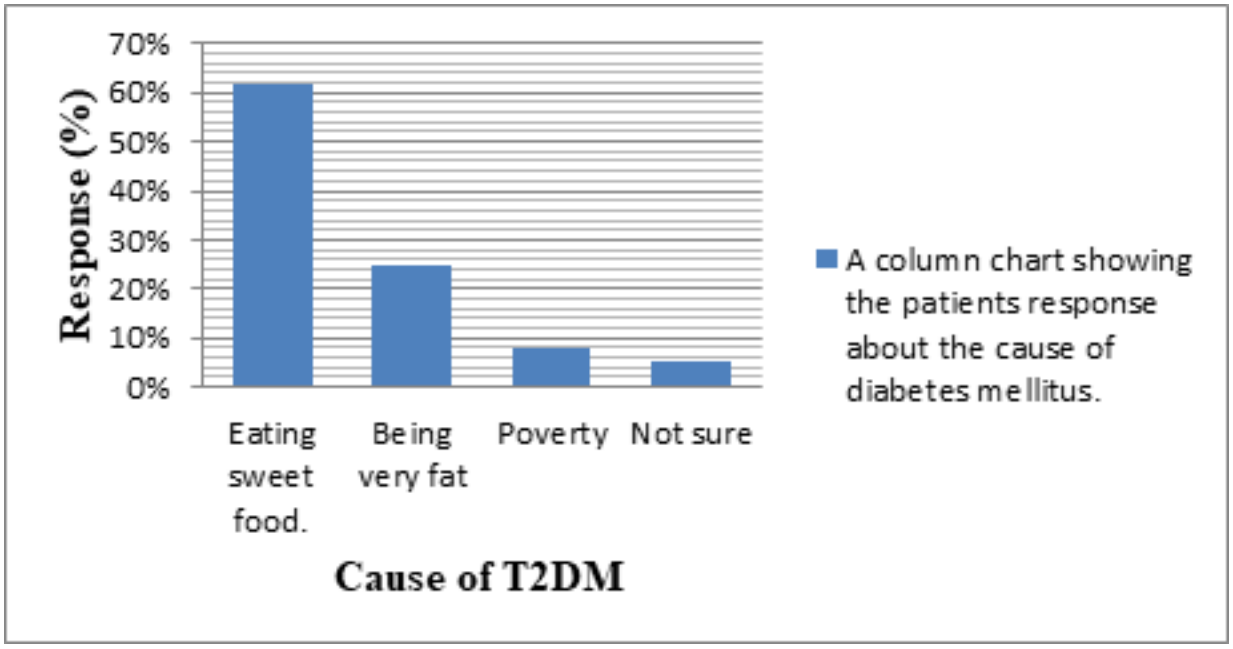

Figure 6: Shows distribution of patients according to their knowledge about the cause ofdiabetes mellitus type 2 (n=80)

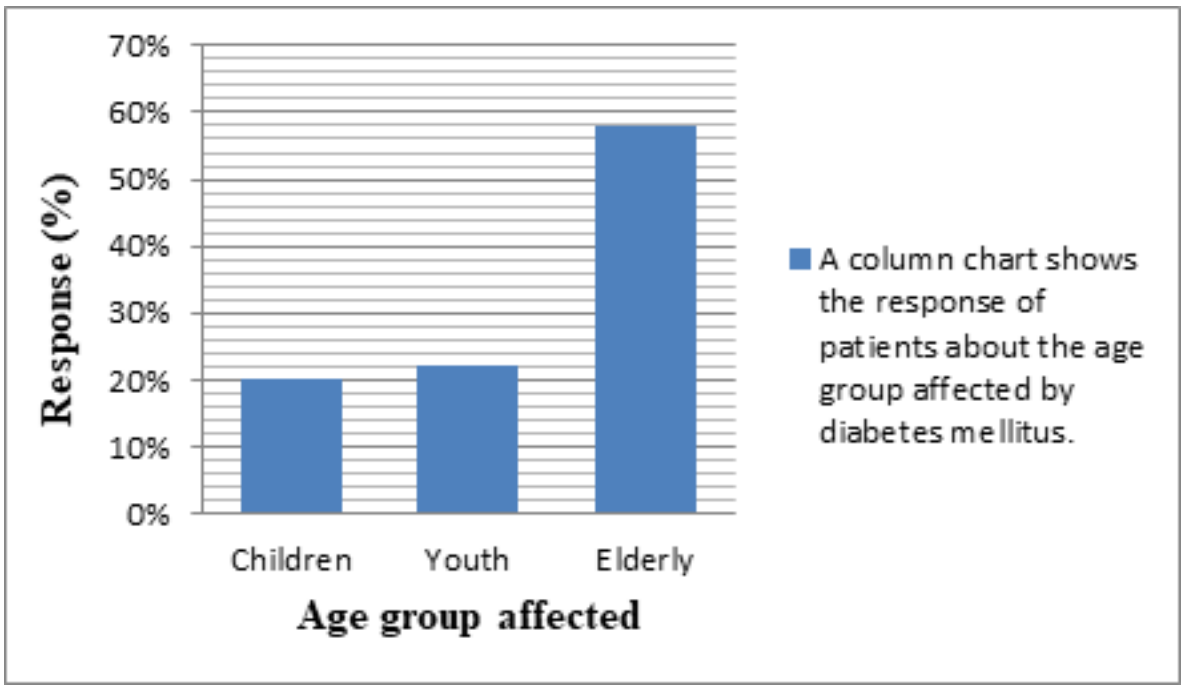

Figure 7: Shows distribution of patients according to their knowledge about the age that easily gets diabetes mellitus type 2. (n=80)

done in Africa by (Getenet et al ., 2020) which showed that the Risk factors for type 2 DM include unhealthy diet, Obesity and physical inactivity which have increasingly become more prominent in many LMIC due to the notable change in diety and lifestyle following urbanization and industrialization, hence T2DM prevalence increased faster in LIC and LMIC. This still agrees with the study conducted by (Galicia – Garcia et al ., 2020) which indicated obesity (body-mass index [BMI] ≥30 kg/m2) is the strongest risk factor for T2DM and is associated with metabolic abnormalities resulting in IR,A sedentary lifestyle is another risk factor for T2DM as shown by the Women's Health Study and in the Kuipio Ischemic Heart Disease Risk Factor Study, which showed a reduction of 34% and 56% reduction of developing T2DM in participants walking 2–3 h a week or at least 40 min a week, respectively.

6.3. Knowledge of patients on the prevalence of diabetes mellitus type 2.

Of the 80 respondents, 68 (85%) had knowledge about diabetes mellitus type 2 and thus the majority 42 (52%) know diabetes mellitus as a disease that kills, and of which 50 (62%) said that diabetes mellitus is caused by eating sweet food and 46 (58%) say that it's a condition common in the elderly, this results show that a slight majority of respondents had clear knowledge about T2DM but still needed to be sensitized and educated about the risk factors, causes, prevention and complications of T2DM, This findings agree with the results of a study conducted in Dhaka, Bangladesh by (siddique et al., 2017) which showed that the majority of the patients reported to be having knowledge on diabetes risk factors, prevention, control and complications, which were 83%, 81%, 95% and 91% respectively. After compiling all four knowledge domains the frequency of Good, Average and Poor knowledge was 13%, 66% and 21% respectively. The highest number of patients (43%) reported that genetic factors were responsible for the development of T2DM, while others mentioned obesity, physical inactivity and food habits.

6.4. Conclusions:

A majority of respondents had ever been diagnosed with diabetes mellitus type 2. And few had a family member diagnosed with diabetes mellitus type 2; these results indicate a moderate but increasing prevalence of diabetes mellitus type 2 in the community.

The majority of the respondents had gained weight, and some had weighed 60kgs and above, majority of respondents still don't do body exercise, this means that those individuals in those groups were having a high Body Mass Index [BMI] which is a very high risk factor for T2DM.

The majority of the respondents had knowledge about diabetes mellitus type 2 and of those, a majority knew diabetes mellitus type 2 as a killer disease which is caused by eating very sweet food and very common in the elderly,

7. Study limitations:

Study limitations such as inadequate resources like funds to fully run the activities were over come through fund raising by family members and relatives.

Non-compliancy by some of the respondents was expected and might have lead to inaccurate results; however this was countered by ensuring willingness of the respondents and thorough explanation and educating the respondents about the relevance of study.

8. Recommendation:

Health education or orientation should be given to care givers on how to properly handle their diabetic members and reduce the incidence of relapse

Awareness on the possible causes of diabetes mellitus must be given by health professionals to the local community using different media of communication.

9. Acknowledgement:

With great pleasure, I would like to express my sincere gratitude to the following people and institutions without whose efforts, this research would not have been a success.

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Lastly to my fellow students for their guidance, support and company during my time of studies.

10. List of Abbreviations:

BMI : Body Mass Index.
DHO : District health officer
DM: Diabetes Mellitus
DM2 : Diabetes mellitus type 2.
HC : Health Center
HDL : High Density Lipoprotein
HIC : High income country.
IDF : International diabetes federation
LIC : Low-income country
LMIC : Low Middle Income Countries
LMIC : Low middle income country
OPD : Out Patient Department.
SES : Social Economic Status
SSA : Sub Saharan Africa.
UAHEB : Uganda Allied Health Examination Board

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12. Conflict of interest:

The authors have no conflict of interest to disclose

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