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Original article

FACTORS INFLUENCING THE ADHERENCE TO ANTIDIABETICS AMONG ADULT DIABETIC PATIENTS ATTENDING THE DIABETIC CLINIC OF GOMBE HOSPITAL BUTAMBALA DISTRICT. A CROSS-SECTIONAL STUDY.

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Abstract

Introduction:

Objectives: The major objective was to determine factors affecting adherence to antidiabetic drugs among diabetic patients attending Gombe Hospital.

Methodology:

The research design was a cross-sectional study where quantitative approaches were used, the sample size was 86 patients and was determined using Kish and Leslie formula. The sampling method used was random sampling. Data were analyzed using pencils, pens, and a calculator and then presented using figures, tables, and pie charts.

Findings:

44(51.20%) reported that age affected their medication adherence.79 (91.86%) patients said that education levels did not affect their medication adherence. 58(67.4%) reported that the drugs prescribed to them were expensive. 56 (65%) respondents said that doctors took time to explain to them medication side effects and pill burden management. The majority of the respondents 52 (60%) said that most of the medications prescribed to them were not always available at the facility.58(67.4%) patients reported that it was so discomforting to swallow the medication prescribed by the doctors. 58(67.40%) said that they visit the hospital once a month,

Conclusions:

The major health system-related factors affecting adherence were the availability of the prescribed medication in the hospital. In addition, taking a lot of pills a day lowered patients' adherence and this could be improved by monotherapy. Economic status played a vital role in adherence to antidiabetes medication for patients to afford the prescribed medication and that patient age played a role in patients adherence.

Recommendations:

Continuous education of the patients on the importance of adherence to diabetic medication whenever they go for clinic appointments. The government and partnering agencies should always ensure the timely supply of antidiabetic medicines to health facilities to facilitate easy accessibility and continuous availability of drugs to patients. Patients should visit hospitals regularly to avoid escalating complications due to reduced hospital reviews.

Keywords: Adherence, Antidiabetics, Gombe Hospital, Diabetic patients, Butambala district,
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1. Background of study.

Adherence to anti-diabetic drugs is a challenge faced by many diabetic patients and it has been estimated to be ranging from 23% to 77% worldwide, ranging from 18% to 50% in sub-Saharan Africa and East Asia whereas in Uganda the adherence has been estimated to be about 27% according to the International Diabetes Federation. (Delamater et al 2015)

The number of people with diabetes rose from 108 million in 1980 to 422 million in 2014.(WHO, 2023) Prevalence has been rising more rapidly in low- and middle-income countries than in high-income countries(Shukri et al, 2018) Diabetes is a major cause of blindness, kidney failure, heart attacks, stroke, and lower limb amputation. Between 2000 and 2019, there was a 3% increase in diabetes mortality rates by age in 2019, diabetes and kidney disease due to diabetes caused an estimated 2 million deaths(WHO, 2023)

Diabetes mellitus commonly known as diabetes is a chronic condition characterized by abnormally high levels of glucose in the blood, diabetes is associated with risk factors like obesity positive family history, and pregnancy in terms of gestational diabetes (WHO, 2016). Diabetes is caused by inadequate production of insulin by the islets in the pancreas or the inability of the body cells to respond to the produced insulin (Weatherspoon, 2019).

There are two major types of diabetes, type 1 and type 2, type 1 was formally called insulin-dependent diabetes mellitus or juvenile-onset diabetes mellitus.In type 1 the pancreas undergoes auto-immune reactions from the body itself and these patients rely on insulin medication for survival. 8.5% of adults aged 18 and above had diabetes type one (WHO, 2016), and about a 1.5million deaths were a result of diabetes directly (WHO, 2019)Type 2 diabetes formally called noninsulin-dependent results from the body's dysfunctions characterized by a combination from resistance to insulin action and excessive inappropriate glucagon secretion (Khardori, 2021).

Diabetes mellitus is one of the most common chronic diseases in the world. The burden of diabetes mellitus is increasing rapidly in developing countries, including Uganda. Diabetes information seeking is essential for patients with diabetes to better manage and control their diabetes.(Mengiste et al, 2021) However, information seeking about disease prevention and treatment is low in developing countries. (Muluken et al, 2021) Diabetes complications are on the rise glob- ally but can be prevented or delayed by the use of lifestyle modifications and oral hypoglycemic agents therefore patients' adherence to the medication is key in achieving health outcomes. Between 2000 and 2016 there was a 5% increase in premature diabetes mortality and it was attributed to poor adherence to medication and poor lifestyle. (Charity et al 2017)

Therefore adherence to diabetes medication continues to be a serious healthcare issue in various cultures and communities in Africa, including those in Uganda (WHO, 2017). Increasing the rate of medication adherence among diabetic patients in Ugandan communities may help to reduce the clinical risk associated with diabetes. The study carried out by Walker in 2013 revealed that adherence to diabetes management in various communities is influenced by several factors amongst which are failure to keep appointments 76% poor health provider-patient communication 65%, taking several different pills 27%, and low levels of patient education 37% have been identified as factors in poor adherence to diabetes medications (WHO, 2013).

Many diabetic patients in Gombe Hospital with complications due to diabetes have been found to have poor medication adherence and this has been greatly influenced by religious and cultural beliefs. Some patients report that starting medication early is bad because they will have to depend on drugs every day for their daily activities which leads to resorting to local herbs instead of recommended medications, these patients later report to the hospital with complications like cellulitis and diabetic ketoacidosis (Jochen,2016).

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Non-adherence to anti-diabetic medication is an important cause of uncontrolled blood glucose that leads to complications of diabetes.(M Azharuddin et al, 2021) However, there is a lack of evidence on the burden of and factors associated with non-adherence to anti-diabetic medication among individuals living with diabetes in low-and middle-income countries (LMICs). Non-adherence to anti-diabetic medication remains an ongoing challenge in LMICs and several factors operating at different levels were cited as reasons. Comprehensive intervention strategies are urgently needed to address these factors in effectively tackling medication non-adherence in LMICs. (M Azharuddin, 2021)

1.1. General objective.

To determine factors affecting adherence to anti-diabetes drugs by diabetic patients attending Gombe Hospital.

1.2. Specific objectives.

- To determine demographic factors influencing adherence to anti-diabetes drugs among diabetic patients attending Gombe hospital
- To assess social economic factors affecting adherence to anti-diabetes drugs among diabetic patients attending Gombe Hospital, Butambala District.
- To determine health system-related factors influencing adherence to anti-diabetes drugs among diabetic patients.

2. METHODOLOGY.

2.1. Study design.

The study used a cross-sectional study research design with quantitative approaches. The study design will be used because it allows the researcher to capture a wide variety of views from the respondents.

2.2. Study area.

The study was carried out at Gombe Hospital, Butambala district. The hospital is located off of the Mpigi–Kabulasoke–Maddu–Sembabule Road, in the central business district of the town of Gombe, approximately 70 kilometers (43 miles) southwest of Mulago National Referral Hospital. This is about 81 kilometers (50 mi) northeast of Masaka Regional Referral Hospital. It will be carried out for one month from 16th December 2022 to 16th January 2023.

2.3. Study population.

The study consisted of all adult patients seeking anti-diabetic medication attending Gombe hospital.

2.4. Sample size determination.

Sample size was estimated using the formula by Kish Leslie (1965).

Sample size, $N = \frac{Z^2Pq}{d^2}$

Where,

Z= standard normal distribution taken at 95%=0.95

N= sample size

P= estimated prevalence 28%

q = 1-p = (1-0.28) = 0.72

d = allowable error = 7% or 0.07

Therefore, $n = \frac{0.95^2 \times 0.64 \times 0.72}{0.07 \times 0.07}$

$= 0.9025 \times 0.4608$

0.0049

$=84.87$

$=85$

Due to some errors which would be encountered during data collection one respondent was added to make a total of 86 respondents.

2.5. Sampling technique.

Random Sampling technique was employed to save time and since it gives every patient an equal chance to participate in the study.

2.6. Sampling procedure.

A simple random sampling method was used which involved selecting respondents from the study population by chance. A lottery technique was applied where the codes of all diabetic patients picked were put on one folded paper at a time until the needed number was obtained.

2.7. Data collection method.

The questionnaire data collection method was used in the study to collect quantitative data from the patients who were able to read and write.

2.8. Data collection tool.

Data was collected using the researcher-administered questionnaires. The questionnaire had close-ended questions about the topic. The respondents were required to answer the questions following the instruction given to them.

2.9. Data collection procedure.

It involved administering questionnaires to the respondents, and they were required to answer the questions following the instruction given to them. The answer to the questionnaire was compiled, analyzed, and processed by the researcher to get the information needed.

2.10. Piloting of the study.

The researcher pretested the questionnaire on 15 patients at the outpatient department with diabetes. This was because the area was convenient and patients could be easily followed up. Piloting was done to ensure the validity, credibility, and reality of the questions in the questionnaire.

2.11. Quality control.

Quality control measures were put in place to ensure the validity and reliability of the collected data. The questionnaires were written in English and interpreted in Luganda. Furthermore, ample time was allocated for data collection to prevent errors brought about by limited time, and the confidentiality of the patients was kept by coding the patients to avoid their real names.

2.12. Selection criteria.

2.12.1. Inclusion criteria.

Only diabetic patients of any age who accepted consent to participate in the study and who were present at Gombe Hospital during the data collection days were included in the study.

2.12.2. Exclusion criteria.

Diabetic patients who were mentally ill, severely sick, and those who did not consent did not participate in the study.

2.13. Ethical consideration.

The permission was sought first from the research committee of Medicare health professionals college introducing me to the Medical Superintendent of Gombe hospital to allow me access to the diabetes care clinic and lastly from the willing participants. Patients who met the inclusion criteria and were willing to participate voluntarily were given a consent form. The participants who accepted to participate in the study were interviewed using a structured questionnaire primarily phrased in English and translated by the interpreter into Luganda for those who couldn't read or speak English. The researcher interviewed the patients who could not speak English and those who could read and speak English filled in the questionnaire by themselves.

3. RESULTS.

3.1. Demographic data of respondents.

According to table 1, majority of the patients were females 51 (60%) and 35 (40%) were males. Majority of the patients were 50 years and above 44 (51%) between 31 and 49 years were 30 (35%) while between 10 and 30 years were 12 (14%). 50(58%) patients were married, 11(13%)were single,5(6%) divorced and 20 (23%) were widowed. Most of the patients had at least secondary level education 51.1% (44), 23(26%) had primary level education ,17 correspondents had university or college certificate education and 2 patients had never attended school.

Table 1: **Distribution of respondents by biodata. (n=86)**

Variable	Category	Frequency	percentage
Gender	Male	35	40%
	Female	51	60%
Age group	18-30	12	14%
	31-49	30	35%
	50 and above	44	51%
Marital status	Married	50	58%
	Single	11	13%
	Divorced	5	6%
	Widowed	20	23%
Education level	Never attended school	2	2%
	Primary level	23	26.7%
	Secondary level	44	51.1%
	College or university	17	19.7%

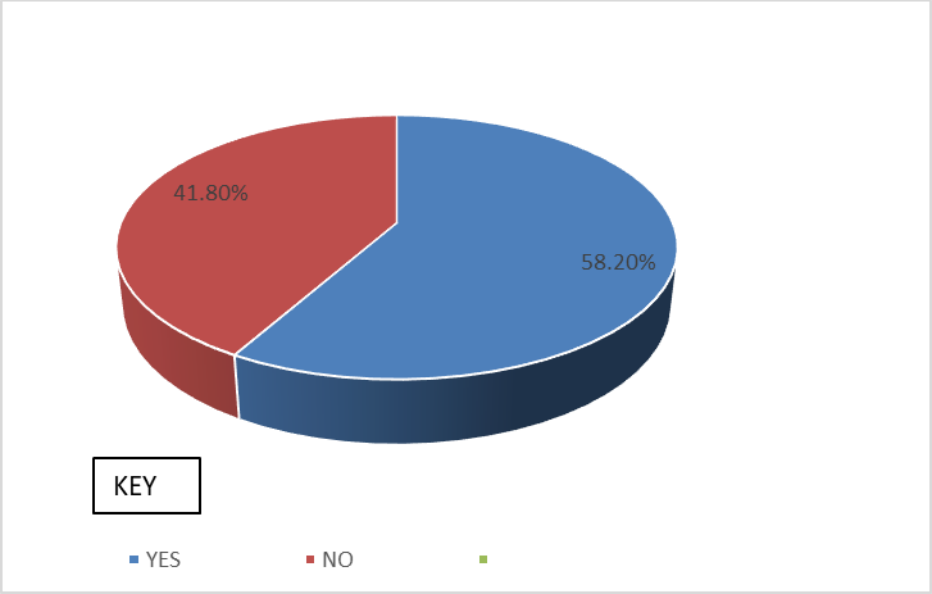

Figure 1: **Respondent by whether age affected adherence to anti diabetes medication. n=86**

3.2. Demographic factors affecting adherence to anti diabetic medication.

Majority of the patients 50(58.20%) reported that age affected their medication adherence, 36(41.80%) said that age did not affect their medication adherence.(Figure 1)

According to the study majority of the patients 79 (91.80%) said that education levels did not affect their medication adherence,7(8.2%) said that education levels affected their adherence to anti diabetes drugs.(Figure 2)

According to the results of the study, majority of the patients 46(53.5%) said their adherence levels were affected due to their gender, 40(46.5%) said that their adherence was not affected by their gender.(Table 2)

3.3. Social economic factors affecting adherence to anti-diabetes medication.

Majority of the patients 58(67.4%) reported that the drugs prescribed to them were expensive, 19(22.0%) said that sometimes these drugs

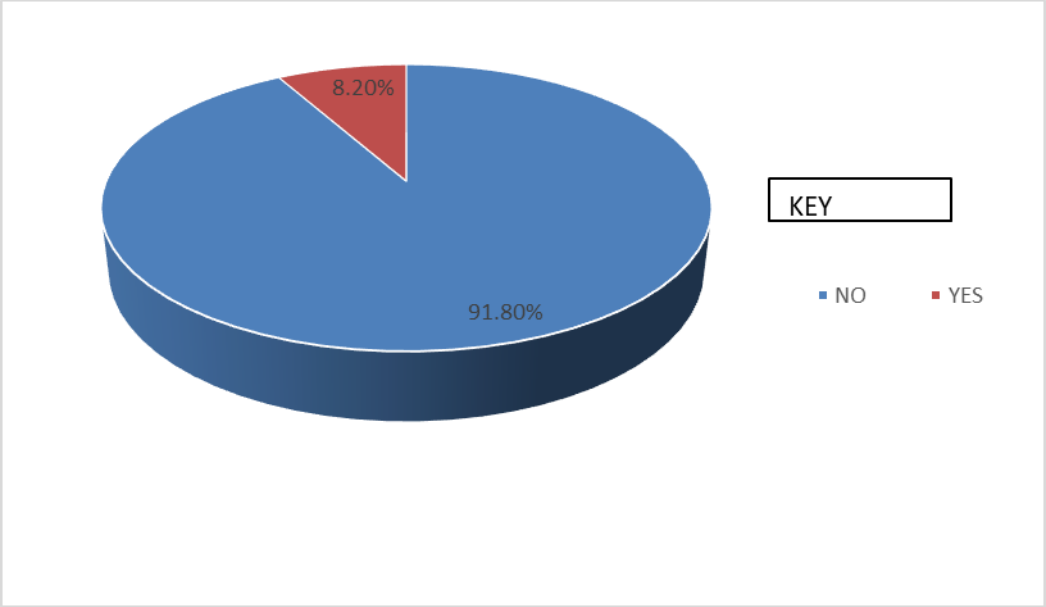

Figure 2: **Respondent by whether education levels affected patients adherence to anti-diabetes medication. n=86**

Table 2: **Respondent by whether gender affected patients adherence to anti diabetes medication. n=86**

Patient's response	Frequency	Percentage
yes	46	53.5%
No	40	46.5%
Total	86	100%

Table 3: **Respondent by how the prices of the drugs being prescribed to them are by the doctors. n=86**

Cost	Frequency	Percentage
Expensive	58	67.5
At times expensive and sometimes affordable	19	22.0
Affordable	9	10.5
Total	86	100

are expensive to them and sometimes affordable while 9(10.5%) patients reported that the drugs prescribed to them were affordable.(Table 3)

Majority of the patients 80(93%) said that culture did not influence their anti-diabetes medication intake, while 6(6.90%) patients said that it influenced their anti-diabetes medication in take.(Figure 3)

According to the study, majority of the patients 60(69.7%) said that the economic factor that affected their medication adherence was the purchase of food for a good diet while 26(32.5%) patients reported that the other factor that affected their mediation adherence economic wise was the transport fares to hospital.(Figure 4)

3.4. Health system related factors associated with adherence to anti-diabetes drugs.

Most of the respondents 65%(56) respondents said that doctors took time to explain to them medication side effects and pill burden management while 35% (30) patients said that doctors did not spend time to educate them on medication

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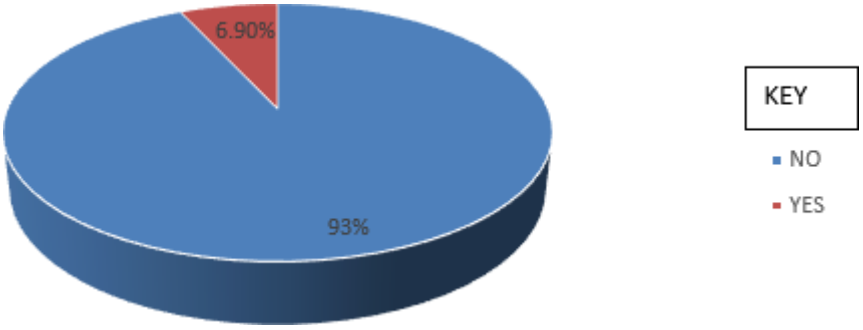

Figure 3: **Respondent by whether culture influences anti-diabetes drugin take. n=86**

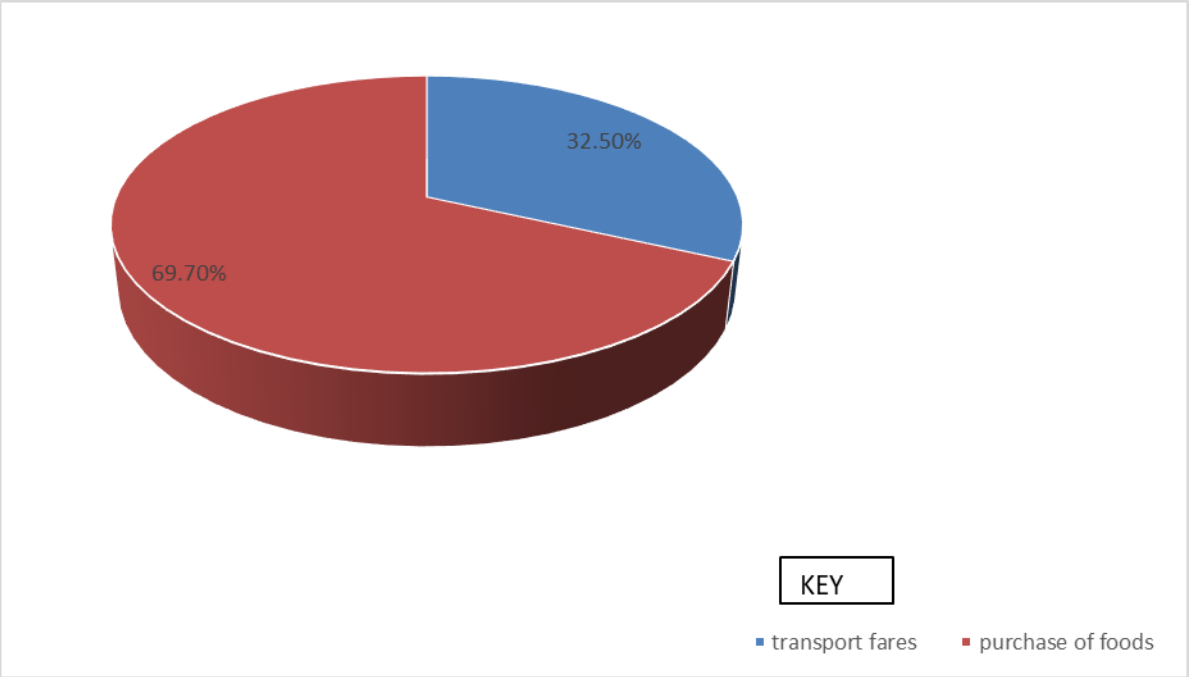

Figure 4: **Respondent on which of these two economic factors apart fromthe prices of drugs affects adherence to their anti-diabetes medication. n=86**

side effects and pill burden management.(Figure 5)

Most of the respondents 60% (52) patients said that most of the medications prescribed to them were not always available at the facility while 40% 34 patients said that the drugs often prescribed are always available at the facility.(Figure 6).

Majority of the patients 58(67.4) reported that it was so discomforting to swallow the medication prescribed by the doctors, 16(18.6%) reported that there was no effect of the number of the pills or drugs on their medication use while 12 (13.9%) patients said they were not aware of how the number of drugs affected their medication adherence. (Table 4)

Majority of the patients 58(67.40%) said that they visit hospital once in a month, 12(13.9%) patients also reported that they visit hospital once in two weeks ,10(11.6%) patients reported that they visit hospital once in a week while 6(6.9%) patients said that they visit hospital once in more than one month. (Figure 7)

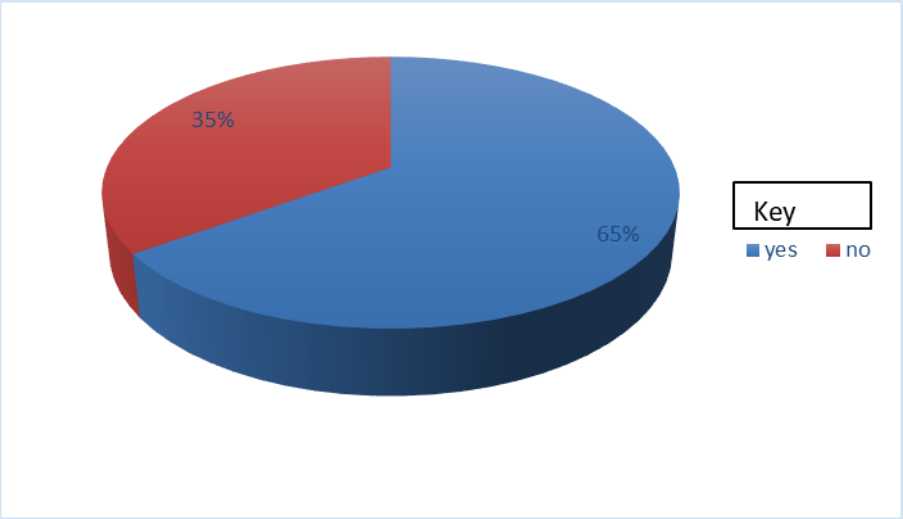

Figure 5: **Respondent bywhether doctors spend some time educating them on medication side effects and how to managepill burden. (n=86)**

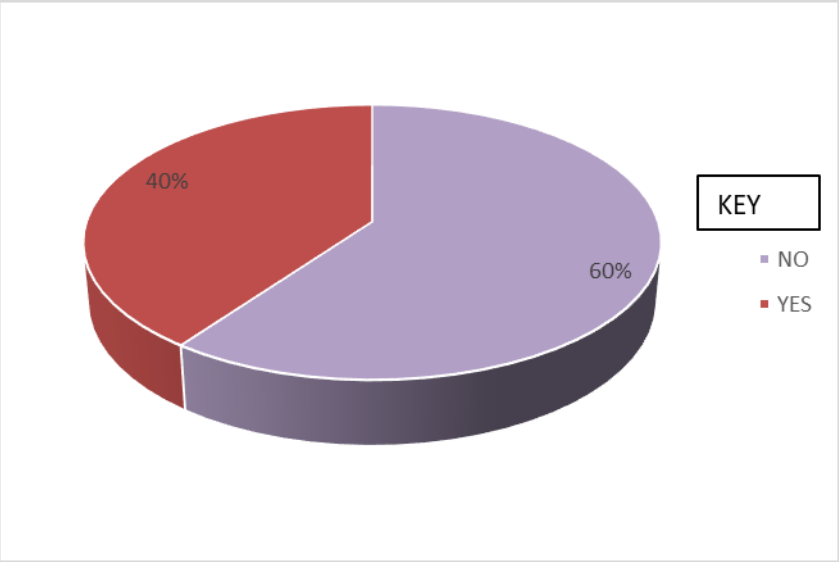

Figure 6: **Respondents by whether the medicines prescribed to them werealways available at the facility. n=86**

Table 4: **Distribution on how the number of pills(drugs) prescribed in hospital affected their medication adherence. n=86**

Patients characteristic	Frequency	Percentage
No effect	16	18.6
Discomforting to swallow	58	67.4
Unknown	12	13.9

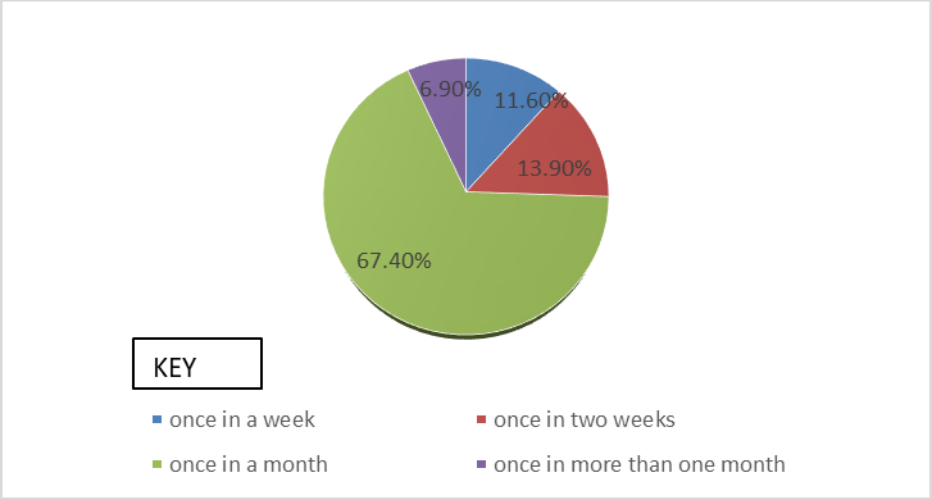

Figure 7: **Respondent by how often patients visited hospital for reviewby doctors. n=86**

4. Discussions.

4.1. Demographic factors affecting adherence to anti-diabetes medication.

According to the results of the study,50(58.20%) of the patients reported that age affected their medication adherence. This is probably because the majority of the patients were 50 years and above these patients received a lot of difficulties in accessing the hospital for refills and reviews as they mentioned that they were old and barely have enough energy to go to the hospital. The findings of this research are in line with the results of research findings by Mirghini, (2019) conducted in South Sudan which revealed that 67% of elderly Sudanese patients had age affecting their adherence levels compared to the young patients.

The study also revealed that 79 (91.86%) of the patients said that education levels did not affect their medication adherence. This is probably because patients took a lot of advice from the health workers than any other person and this relieved them of the misinformation that could affect their drug adherence. These findings differ from the results of a research study conducted by Abebaw et al,(2016) which concluded that 85% of patients with higher education levels were more adherent than the patients with lower education qualifications and showed that education levels greatly affected patient's adherence to anti-diabetes medication.

Furthermore, the study showed that 70.5% of females said their adherence levels were affected due to their gender. This is probably because of the gender roles sometimes the females play at home where they are caught up on the days they must report to the hospital for review delaying and sometimes not being able to make it to the hospital, they miss the medications hence affecting their adherence. The majority of the men ie 94.29% reported no effect of their gender or their being male on their adherence levels. This is probably because they gave the hospital priority before doing any other work at home. These findings agree with the study which was conducted in Ethiopia by Gebre Teklemariam Demoz et al (2020) which revealed that females had fewer adherence levels compared to males and that gender had a 95% role to play in adherence because females have a lot of destruction that may hinder them from effectively accessing the hospital or the medication.

4.2. Social economic factors affecting adherence to anti-diabetes medication.

According to the study, Data Analysis and Interpretation, 58(67.4%) of patients reported that the drugs prescribed to them were expensive. These findings indicate that the majority of the drugs prescribed to the patients are expensive to afford. This is probably because of the low-

income earnings that can't allow them to support all the costs of the drugs prescribed and the lack of health insurance that covers all the medical bills. These findings agreed with a study done in Kampala by Fahlen, (2016) which revealed that 68% of patients reported abilities to afford the regimens they took. Therefore, the economic status of the patients had a lot to play in ensuring adherence to the prescribed medications where patients with a stable income and jobs could easily access the medications as compared to patients with unstable income flows.

80(93%) of the patients said that culture did not influence their anti-diabetes medication intake. These findings indicate that culture has less influence to play in the anti-diabetes medication according to this study. This is probably because of the digitalization of the world that people no longer think so much about cultural beliefs and probably because Butambala where the majority of the patients come from is a diversity of culture and there is less influence by cultural norms. These findings contrasted with a study conducted by Abebaw,(2016) in Pakistan where he found out that 67% of patients said that cultural beliefs had a bigger role to play in influencing their adherence to anti-diabetes drugs.

According to the study, data analysis and interpretation revealed that the majority of the patients 60(69.7%) said that the other economic factor that affected their medication adherence was the purchase of food for a good diet while 26(32.5%) patients reported that the other factor that affected their mediation adherence economic wise was the transport fares to hospital. These findings indicate that patients' economic freedom and independence is so crucial in maintaining good adherence this is probably because the patients need money to travel from home to the hospital whenever the need comes and probably also have to feed on a good diet which requires some input. These findings agree with a study conducted by Kirkman, (2016) which revealed that 67% of patients said that annual income earnings of patients contributed to patient's adherence and this was through their economic independence and how they could afford the prescribed medication and other bills in the family.

4.3. Health system-related factors associated with adherence to anti-diabetes drugs.

Data analysis and interpretation revealed that 65% of the patients said that doctors took their time explaining to them medication side effects and how to handle pill burden. These findings indicate that the majority of the patients received information from the doctors explaining to them medication side effects and pill burden. This is probably because doctors know that with this patient education, a few admission cases on the complications of diabetes can be obtained reducing the costs of management. With the other patients, it is probably because these patients gave less waiting time for the health education and after receiving their medications they probably go home and miss the sessions despite this information being available to the majority of the patients still there were low adherence levels as expected. This study finding is in line with a study by Polansky et al (2016) on 100 patients which revealed that 55% of patients were educated on the side effects. Therefore, the availability of prior knowledge on medication side effects and pill burden led to increased levels of adherence to anti-diabetes drugs.

52(60%) of patients said that most of the drugs prescribed to them were not always available at the facility. These findings indicate that the majority of the prescribed drugs to the patients were not always available at the facility. This is probably because of delayed stocking of these drugs commonly taken by the patients where some end up not receiving the medications because they are not available in stock, The other patients said that the drugs were always available at the facility this is probably because they lived near to the hospital and could travel faster on the days of refills compared to other members who may report late when the drugs are out of stock. This contrasted with a study carried out by Hashimi,(2017) which said that 69% of patients had their prescribed anti-diabetes drugs readily available at the facility by the majority of the patients which differed

in this study where the majority said the drugs were not always readily available in the facility.

58(67.4%) of patients reported that it was so discomforting to swallow the medication prescribed by the doctors. This is probably because of the many drugs that some of the diabetic patients take, when a patient has hypertension together with diabetes with its complications like neuropathies these patients swallow a lot of tablets daily which becomes discomforting to them. These findings agree with a study by Hashmi,(2016) done in AGHA KHAN HOSPITAL which found out that 63% of patients were taking few drugs. Suggesting that monotherapy improves patients' adherence and the majority of the patients hated taking many pills in a day.

Data analysis and interpretation revealed that 58(67.40%) patients said that they visit the hospital once a month. These findings indicate that the majority of the patients visit the hospital at least only once a month. This is probably because of the schedules given by doctors when prescribing drugs where drugs are given for one full month and unless the drugs are done these patients will not come back for review at the hospital. These findings agree with a study done by Nanogaki,(2019) in Cambodia on 773 patients which revealed that adherence attributed to the number of hospital visit reviews and 51% of patients who visited the hospital more than once a week had good glycemic control compared to other patients for this study less glycemic control was achieved because majority of the patients reported for review once in a month.

5. Conclusions.

The study observed that the major demographic factors affecting adherence were age, education level, and gender since it was observed that patient age played a role in patients adherence where patients 50 years and above reportedly had a low adherence compared to other age groups. Gender also played a role in patient adherence where the majority of the females reported difficulties in accessing the hospital hence affecting their levels of adherence. The study also observed that patient economic status played a vital role in adherence to anti-diabetes medication for patients to afford the prescribed medication. The major health system-related factors affecting adherence to anti-diabetes medication by the patients were the availability of the prescribed medication in the hospital facility and patients' ability to access the hospital for reviews more than once a week In addition it was also observed that taking a lot of pills a day lowered patients adherence and this could be improved by a monotherapy.

6. Recommendations.

Continuous education of the patients on the importance of adherence to diabetic medication and the consequences of non-adherence whenever they go for clinic appointments and assessment of the level of non-adherence to oral hypoglycemic medications should be done from time to time including educating the patients on myths surrounding diabetes and its treatment.

Healthcare workers should dispel negative perceptions surrounding diabetes and its treatment by giving health talks to patients during diabetic clinic days.

The government and partnering agencies should always ensure the timely supply of antidiabetic medicines to health facilities to facilitate easy accessibility and continuous availability of drugs to patients.

Patients should be always advised to visit the hospital regularly to avoid escalating complications due to reduced hospital review dates

The hospital should put up support groups for the diabetic patients these support groups will help in the psychosocial rehabilitation of the patients and overcoming financial problems regarding access to their medication.

7. Acknowledgement.

First and foremost I would like to thank the almighty God for enabling me to go through the course successfully and for the generous provision throughout. I am grateful to my lovely parents,

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8. Acronyms and abbreviations.

DKA : Diabetic Keto Acidosis
MOH : Ministry of Health
MMAS : Morinsky Medication Adherence Scale
PAMJ : Pan African Medical Journal
UAHEB : Uganda Allied Health Examination Board
WHO : World Health Organization

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