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FACTORS CONTRIBUTING TO NON-ADHERENCE TO ANTI-DIABETIC MEDICATION AMONG DIABETIC PATIENTS ATTENDING NDEJJE HEALTH CENTRE IV, WAKISO DISTRICT. A CROSS-SECTIONAL STUDY.

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Abstract

Introduction:

The prevalence of Non-adherence to anti-diabetic medication is on the rise across the world. The purpose of this study was to find out the factors contributing to non-adherence to anti-diabetic medication among patients attending Ndejje Health Centre IV, Wakiso district.

Methodology:

A cross-sectional research design was used on diabetic patients aged 18-88 years, selected using a simple random sampling method and questionnaires to collect data which was analyzed using Microsoft Excel, and the results were presented as tables, graphs, and pie charts.

Results:

The majority 99.1% had type 2 diabetes mellitus and 57.3% had the disease for less than five years 90.4% reported hypertension as the most experienced comorbidity. 87% reported diabetic neuropathy as the most common complication. The reasons for non-adherence were; drugs being expensive (25%), not understanding the prescriptions (17.5%), and unavailability of anti-diabetics (16%).

Conclusion:

In conclusion, even though the majority of the respondents were adherent to their anti-diabetic medication, 34.3% were non-adherent, and they mentioned drugs being expensive as the biggest reason for this.

Recommendations:

Therefore, the researcher recommends the Ministry of Health ensure that drugs are available at health facilities and prescribers should explain the use, effects, and why these drugs are essential to patients.

Keywords: Antidiabetic medication, diabetes mellitus, Ndejje Health Center, non-adherence,
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1. BACKGROUND OF THE STUDY.

In the past few years, the rise in the number of people living with diabetes and its associated complications has been posing an unprecedented burden on the healthcare system worldwide. According to International Diabetes Federation (IDF), 415 million people are living with diabetes with a prevalence of 9.3% in people aged 20-79 years. The healthcare system in low- and middle-income countries which accounts for 79%

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of the adults living with diabetes has been overstrained (Karekoona Faisal, 2021). Diabetes Mellitus is a non-communicable disease caused by a lack of insulin or resistance to it. There are four types of diabetes i.e., Type 1, Type 2, gestational and nutritional (MOH, 2022). And the current diabetes treatment is oral Metformin and injectable Insulin.

The WHO defines adherence to medication as the extent to which a patient's behavior of taking medication is in line with that recommended by his physician (WHO, 2003). Non-Adherence to medication has always been a challenging aspect of controlling Non-Communicable Diseases (NCD). Due to resistance, the therapeutic effects of the treatment are reduced, which causes the patient to need multiple hospital visits because their health remains unchanged. This eventually leads to overburdening the health system and high healthcare expenditure on the part of the patient (Rekha Thapar, 2020).

As mentioned by (Rekha Thapar, 2020), increasing the dose or altering the regimen could be harmful to the patient if the doctor mistakenly interprets a decline in therapeutic impact or lack of response to the therapy as therapeutic ineffectiveness rather than non-adherence to medicine.

Many advances have been made in the treatment and monitoring of diabetic progression. However, ensuring patient adherence to therapy is a major challenge for doctors. Good adherence to anti-diabetic medications results in fewer hospital admission due to complications such as hypoglycemia, Stroke, Amputation, and death which can surely be delayed if not prevented if adequate control of blood sugar level is maintained. Poor compliance results in patients having to spend copious amounts of money on hospitalization and chronic illness care.

According to (Faisal K, 2022) a study carried out in India revealed that 55.14% of study participants were non-adherent, with ignorance of lifestyle adjustment accounting for the majority of the reasons (83.78%) for non-adherence to anti-diabetic treatment. Among them, 59.48% didn't take the prescribed medicine in time, most of them 85.71% didn't follow a diabetic diet and less than half 46.61% didn't monitor their blood glucose level regularly due to poor self-discipline. Gender, occupation, and educational status were significant contributors to non-adherence.

In Saudi Arabia (Khan AR, 2013) discusses that a therapeutic non-compliance prevalence of 67.9% (i.e. 69.34% in the males and 65.45% in females) was largely associated with females, illiteracy, urban population, irregularity of follow-ups with oral Metformin.

In another study conducted in Ghana among 259 patients 34.7% of the patients did not adhere to anti-diabetic medication and associated factors that turned out to be statistically significant for non-adherence included; Age, Educational level, presence of comorbidities, and financial support (G, 2019). While in Ethiopia at Adama Hospital medical college, the prevalence of non-adherence was 58.6%, with major depressive disorder, one or more diabetes mellitus complications, and average income greater than 1000 Birr were found to be independent predictors of medication non-adherence respectively. (Kusa W, 2019)

A general hospital in Ethiopia (Kassahun A, 2016) found that non-adherence to anti-diabetic medication prevalence of 31.2% amongst diabetic mellitus was established. Whilst side effects of medications complexity of regimen, failure to remember, educational level and monthly income were major associated factors identified in the study.

Very few studies had been carried out in Uganda about the factors contributing to non-adherence to anti-diabetic medication and that's why I have come out to carry out this study.

1.1. General Objectives.

To determine the factors contributing to non-adherence to anti-diabetic medication among diabetic patients attending Ndejje Health Centre IV.

1.2. Specific Objectives.

- To assess the social -Demographic factors contributing to non-adherence to anti-diabetic medication among diabetic patients.

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- To determine patient factors contributing to non-adherence to anti-diabetic medication among diabetic patients.

2. METHODOLOGY.

2.1. Study design.

This was a cross-sectional descriptive study design that employed both quantitative and qualitative methods of data collection.

2.2. Study area.

The study was conducted in Ndejje Health Centre IV located in Ndejje in Wakiso district. Ndejje Health Centre IV was chosen for the study with the reason that it has a diabetic clinic and was easy to reach and the fact that it is in Kampala it received many diabetic patients of various age groups.

2.3. Study population.

The study population was diabetes mellitus patients (both type 1 and type 2) who attended the diabetes clinic at Ndejje Health Centre IV between 1st February and 2nd March 2023 aged 18–88 years.

2.4. Sample size determination.

The sample size was determined using the Kish and Leslie formula of sample size determination. Sample size: $N = Z\alpha^2$ P (1-P)

N = the required sample size

P = assumed population of diabetes mellitus patients who are non-adherent to treatment is 28.9%

1-P =is the probability of diabetes mellitus patients who are adhering to their anti-diabetic medication 1-P =71.1%

The calculated sample size N

= 316

Since the total population of the respondents that were involved would be less than 800. The sample size was determined using the modified Kish and Leslie formula of 1988. This is because of the limited time and resources.

n_f = required sample size N = estimated diabetic patients = 316Therefore n316

1+ (316/800) =227

n = sample size of the population <800 =227

Therefore, a total of 227 patients would be sampled in this study.

Adding the 5% for incomplete information and withdrawing from the study, 245 x 0.05 =12 Total target sample= 227+ 12 = 239

Sampling interval 800 / 239 = 3, interviewed every third member on the clinic appointment list starting from a number randomly selected from 1 to 3.

2.5. Sampling technique.

The researcher used cluster sampling method and simple random sampling to collect relevant information about the Factors contributing to non-adherence to anti-diabetic medication among diabetic patients in Ndejje Health Centre IV. According to the cluster sampling method, the researcher would choose diabetic patients from the diabetic clinic randomly to get information concerning the problem statement of the study.

The researcher used simple random sampling to select the particular individuals who answered the questionnaires to obtain information about the factors contributing to non-adherence to anti-diabetic medication among diabetic patients in Ndejje Health Centre IV.

2.6. Sampling producer.

Systematic Random sampling was used because it was easy to conduct, cheap, and avoided bias. The diabetic patients were assigned numbers according to the registration list. Then randomly selected. This would be done after calculating the sampling interval which was 3. Every third patient on the list would be chosen. Starting with the first respondent would be chosen randomly between the fast and third, then every third respondent would be chosen until the required sample size was obtained. The respondents would be given questionnaires and data was collected.

2.7. Data collection method.

Data was collected using both well-designed and tested structured questionnaires.

2.8. Data collection tool(s).

A questionnaire set in English was used for data collection and translated where necessary for patients who do not understand English. The questionnaires contained both structured and semi-structured questions with both closed and open questions and 30 questions only. The questionnaires were chosen in this study because it was the least expensive method, the questionnaires would be filled at the respondents' convenience. It produced quick and accurate results.

2.9. Data collection procedure.

After seeking permission from the in charge of Ndejje Health Centre IV, the data was collected from diabetic patients attending the diabetic clinic at the facility by distributing questionnaires to them. They answered the questionnaires in private and would only be helped by the researcher or assistant where necessary. The questionnaire was then kept in a bag under a key and lock.

2.10. Piloting the study.

The study tool was pre-tested on 10 diabetic patients in Ndejje Health Centre IV. Thereafter, the tools were edited to fill in all the missing gaps. The comments of the respondents helped in improving the sequence and layout of the questionnaire and to know the time that would be taken for the interview.

2.11. Quality control.

To ensure accuracy in the results, the items in the instruments were adequately and appropriately organized according to the objectives of the study. For consent and reliable results from the research, the instrument was constructed using simple language and appropriate vocabulary for easy understanding for the selected respondents. Also, to ensure quality, I would include research assistants to ensure that questionnaires were filled in private and allow each patient a space to sit alone to obtain the best results.

2.12. Data analysis and presentation.

This involved collection of data, data cleaning, coding and designing, processing, and analyzing using computer programs like Microsoft Excel. After analysis, the data was converted into percentage, and frequency distribution tables and presented using tables and figures (graphs and pie charts) which were interpreted to give meaningful information.

2.13. Ethical consideration.

Ethical clearance to execute data collection in Ndejje Health Centre IV Wakiso district was obtained by getting an introductory letter from the principal of Kampala School of Health Sciences addressed to the in charge of Ndejje Health Centre IV who in turn permitted to reach the diabetic patients using my research process. The photocopy of the letter was carried along by me to assure respondents of legal permission to carry out data collection and the questionnaires would be kept under key and lock.

Consent was obtained from each respondent during data collection after my introduction and explanation before interviewing the respondents. The researcher would observe confidentiality, privacy, and dignity by use of codes not the names of the respondents. This ensured that the respondents' participation would have no effect in any way on them.

3. STUDY FINDINGS.

3.1. Social Demographic Characteristics Of participants.

The study involved 239 participants consisting of 169 (70.7%) females and 70(29.3%) males. The majority of the participants were in the age range of 25-60 years 180(75.3%); about half 121(50.6%) had no formal education and more than half 133(55.6%) were Muslims and more than quarter 106(44.4%) were Christians and the majority 180(75.30%) had no history of diabetes Mellitus one third 80(33.5%) were farmers and less than one quarter (19.7%) were unemployed.(Table 1)

Table 1: **Socio-demographic characteristics of participants in the Diabetic clinic at Ndejje Health Centre IV from January to February 2023.**

Variable	Categories	Frequency	Percentage (%)
Age	18-24	8	3.3
	25-60	180	75.3
	Above 60	51	21.3
Gender	Female	169	70.7
	Male	70	29.3
Education	Not educated	121	50.6
	Primary	61	25.5
	Secondary	42	17.6
	Tertiary	15	6.3
Religion	Muslims	133	55.6
	Christians	106	44.4
Tribe	Baganda	99	51.5
	Basoga	86	36
	Banyakole	24	10
	Others	30	12.6
Family History of Diabetes	Yes	59	24.7
	No	180	75.3
Employment Status	Farmer	80	33.5
	Unemployed	47	19.7
	Employed	53	22.2
	Entrepreneur	59	24.7

Table 2: **Alcohol intake among patients in the diabetes mellitus clinic at Ndejje Health Centre IV from January to February 2023.**

Variable	Category	Frequency	Percentage (%)
Alcohol intake	Yes	20	8.4
	No	219	91.6

3.2. Life Style and Disease Characteristics.

Table 2 shows that the majority (91.6%) of the respondents said that they didn't take alcohol whereas the least (8.4%) said they take alcohol.

Table 3 indicates that the majority (73.6%) did physical exercise while one quarter (25.1%) didn't do physical exercise.

Figure 1 shows that the majority (87.4%) didn't smoke tobacco whereas the least (12.6%) smoked tobacco.

While Table 4 indicates that more than half (57.3%) of the respondents had been diagnosed with diabetes 5 years and below whereas almost a quarter (42.7%) had been diagnosed with diabetes above 5 years.

Table 5 shows that more than three-quarters (92.5%) of the respondents had comorbidity whereas the least (7.5%) had no comorbidity.

As for Table 6, the majority (90.4%) of the respondents had Hypertension whereas the least (3.3%) was others.

Figure 2 illustrates that the majority (78.2%) of the participants had diabetes mellitus-related complications whereas the least (21.8%) had no diabetes mellitus-related complications.

Table 7 shows that more than half (68.2%) of

Table 3: **Physical exercise among patients in the diabetes mellitus clinic at Ndejje Health Centre IVfrom January to February 2023.**

Variable	Category	Frequency	Percentage (%)
Physical exercise	Yes	179	73.6
	No	60	25.1

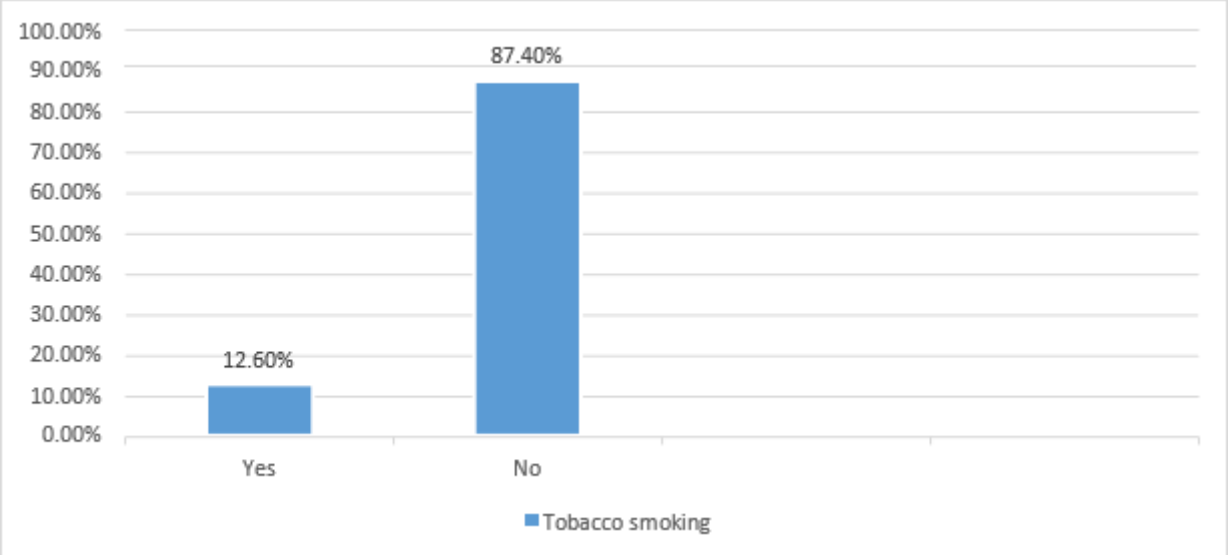

Figure 1: **Tobacco smoking among patients in the diabetes mellitus clinic at Ndejje Health Centre IV from January to February 2023.**

Table 4: **Duration of disease among patients in the diabetes mellitus clinic at Ndejje Health Centre IV from January to February 2023.**

Variable	Category	Frequency	Percentage (%)
Duration Diabetes	5 years and below	137	57.3
	Above 5 years	102	42.7

Table 5: **Presence of comorbidity of disease among patients in the diabetes mellitus clinic at Ndejje Health Centre IV from January to February 2023**.

Variable	Category	Frequency	Percentage (%)
Presence of comorbidity	Yes	221	92.5
	No	18	7.5

Table 6: **Showsmore than three-quarters (92.5%) of the respondents had comorbidity whereas the least (7.5%) had no comorbidity.**

Type of comorbidity	Hypertension	216	90.4
	HIV	15	6.2
	Others	8	3.3

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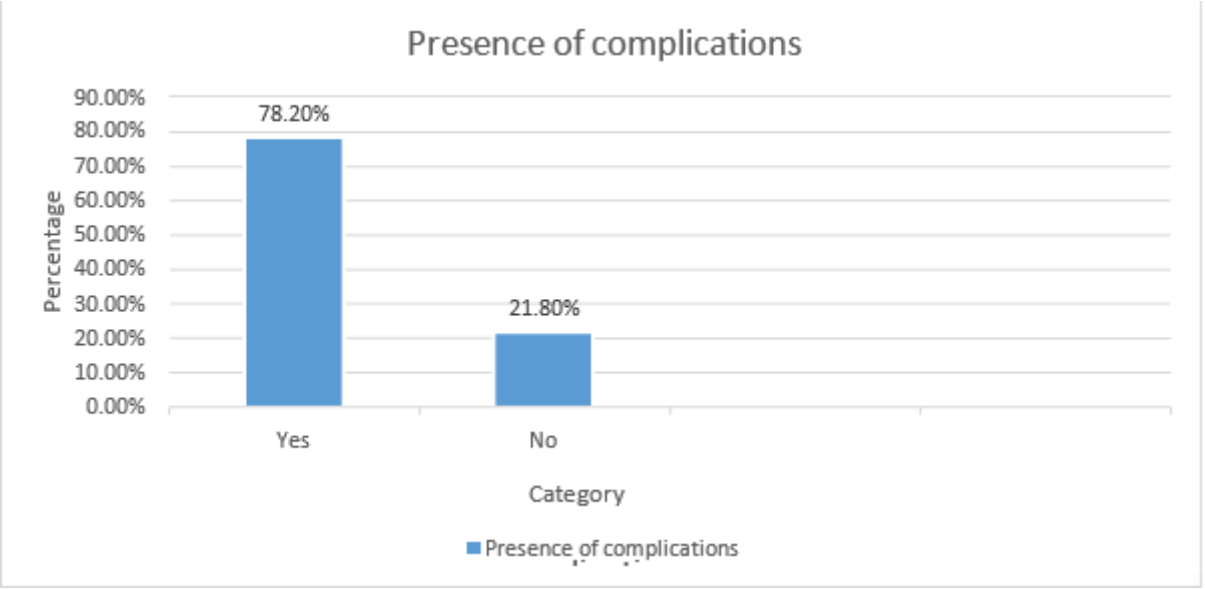

Figure 2: **The presence of complications among patients in the diabetes mellitus clinic at Ndejje Health Centre IV from January to February2023.**

Table 7: **Antidiabetic medication used among patients in the diabetes mellitus clinic at Ndejje Health Centre IV from January to February2023.**

Variable	Category	Frequency	Percentage (%)
Antidiabetics used	Metformin	25	10.5
	Insulin	19	7.9
	Glibenclamide	2	0.8
	Metformin and Insulin	30	12.6
	Metformin and Glibenclamide	163	68.2

the participants were onMetformin and Glibenclamide antidiabetic regimen whereas the least (0.8%) were on Glibenclamide regimen only.

Figure 3 illustrates that quarter (25.0%) of the study participants reported that drugs being expensive was the cause for antidiabetic medication non-adherence and less than a quarter (17.5%) ascribed non-adherence to not understanding instruction(s) on how to take prescribed medicine(s). Less than one quarter (16.0%) of the study participants attributed non-adherence to unavailability of the drug to them and less than one quarter (12.0%) of the study participants attributed non-adherence to forgetfulness to take the medication. Less than one quarter (12.0%) of the study participants preferred not to take the drug(s) while less than one quarter (7.5%) were not willing to take the drug(s) and less than one quarter (5.0%) ascribed non-adherence due to not being able to swallow or administer the drug whereas the least (2.5%) attributed non-adherence to other factors.

4. DISCUSSION.

4.1. Patient factors contributing to non-adherence to anti-diabetic medication.

Of our total 239 study participants, 99.1% had type 2 diabetes and this shows why there are very few people on Insulin. This is in line with a study carried out in Cameroon by (Leopold Ndemnge Aminde, 2019) that showed that type 2 is the most prevalent form of diabetes. Most (57.3%) of the patients had the disease for less than five years but they experienced diabetic complications with the highest (87%) being diabetic

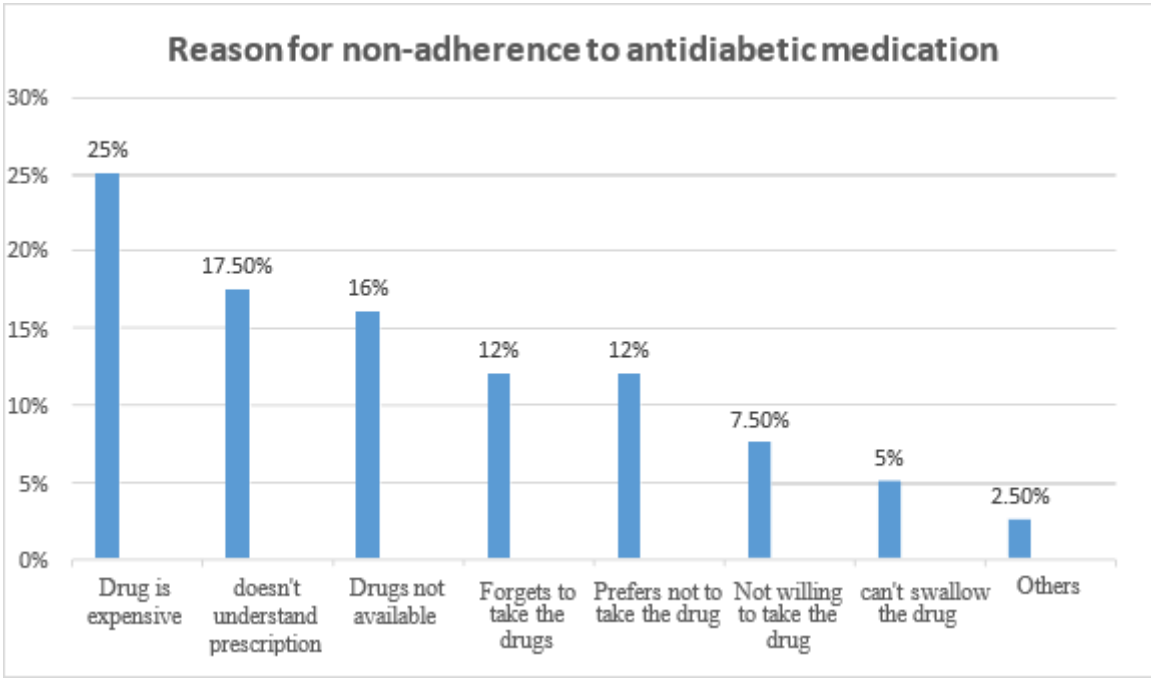

Figure 3: **Reason for non-adherence to antidiabetic medication among patients in the diabetes mellitus clinic at Ndejje Health Centre IV from January to February 2023**.

neuropathy. The high incidence of complications is indicative of a high rate of non-adherence to the medication. The advanced age (most respondents were between 25 and 60) and the presence of HIV as a comorbidity severely lower the patient's immune system paving the way for severer complications. This is cemented by a study done in Tanzania by (Jafer Siraj BPharm, 2021). The respondents mentioned the biggest reason for non-adherence as the drugs being expensive and unavailable at the health facilities. The average price of medication for someone with the most common antidiabetic regimen (Metformin and Glibenclamide) is 16500 UGX. In addition, the presence of comorbidities like hypertension (90.4%) further raises the medical bill. Yet, more than a third of the respondents (33.5%) are substantial farmers and 19.7% are unemployed which is clear evidence that they cannot afford it daily. This is further cemented by Uganda's GDP which is 0.02% of the world economy. This shows that most Ugandans are below the poverty line which would make it impossible to afford essential health care. To make matters even worse, sometimes the medications are not available at the government health facilities due to the big demand as compared to the supply of the drugs. This is evidenced by the 16% that didn't take their medication because drugs were not available at the facility. The low levels of education (50.6% of the respondents were not educated at all) could also be a big reason for non-adherence as a big number didn't understand their prescription and health workers do not explain to the patients what they have prescribed and how useful it is to their health. Forgetfulness and laziness are some of the other factors which have increased the non-adherence level because some patients do not care about their health once they see improvement in their well-being. All these are evidenced in a study carried out in Cameroon and Northern Ethiopia by (Leopold Ndemnge Aminde, 2019) and (Aster Wakjira, 2020) respectively. Alcohol intake among the respondents was low although some few did drink while on medication which affected their adherence. Most of the respondents did physical activities although they did not diet well due to their low standards of living and some were smoking tobacco which interfered with the drugs. All this is ascribed in a study done in

Ethiopia by (Wote Amelo Rike, 2015). Since my study population majorly consisted of the female gender (70.7%); my study relieved that females are most likely to adhere to their antidiabetic medication and are thus more likely to follow prescription instructions agreed upon with the prescribers. The majority didn't have diabetes mellitus in their family and this shows how big the disease is spreading throughout the district because most of them do not diet, and dislike exercising thus leaving them more prone to the disease and its associated complications. All of the above is evidenced by a study carried out in Ethiopia by (Muhammad Ali, 2017).

5. CONCLUSION.

Based on the general results of the study the researcher concluded; More than one-third of the study population was non-adherent to their antidiabetic medication, with medication expense being the most frequent reason mentioned for non-adherence to antidiabetic medication. Patients aged 60 years and above and those having more than 5 years of disease since diagnosis, were more likely to be non-adherent to their antidiabetic medication.

6. STUDY LIMITATIONS.

- The main study limitation was biasiness in answering the question due to the social, cultural, and religious differences among diabetic patients. This was a sensitive topic and some patients found it awkward to answer some of the questions therefore some respondents intentionally or unintentionally did not give the right information.
- Distance from the school of the researcher that is more than 100km away from the study site was a great deal of limitations as frequent visits would not be possible for the researcher to do data collection.
- Some respondents were not cooperative and lacked general knowledge of the value of medication adherence.
- The funding was also a limitation to carry out an effective study in the Health Centre.

7. RECOMMENDATIONS.

The Ministry of Health should make further studies on non-adherence to antidiabetic medication. Carry out more health talks about the dangers of not adhering to medication and also educate the patients about the drugs they are taking. The prescribers should explain the prescription i.e., OD, and BD to the patients to improve compliance and time towards taking medication. More time should be given to these patients so that they can ask and report any effects of the drugs.

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9. ACRONYMS/ABBREVIATIONS.

WHO: World Health Organization
IDF: International Diabetes Federation
NCD: Non-Communicable Disease
HHS: Hyperosmolar Hyperglycemic State
DM: Diabetes Mellitus
SPSS: Statistical Packages for the Social Sciences

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