Assessing Knowledge, Attitude, and Practice of Diabetes Type 2 Patients Attending Keruguya Referral Hospital

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Abstract:- The prevalence of diabetes in developing countries is relatively high and is expected to increase in the future due to lifestyle changes and unhealthy diets consumed. The objective of this study was to identify the extent of knowledge, attitude and practice carried out by diabetic patients attending Keruguya hospital. The cross-sectional study comprised a total of 80 type 2 diabetic patients recruited using a random sampling technique. A pre-tested semi-structured questionnaire was used to collect respondents' information on knowledge, attitude, and practice. The findings show that 50% of participants knew the symptoms of diabetes; 71.25% of the participants had little knowledge of the causes of type2 diabetes. The majority 57.5% did not know the complications caused by diabetes. The majority 56.25% believed that if they did not have diabetes, they would be different people. The majority 77.5% of the participants agreed that they dislike being referred to as diabetic persons. The majority 70% of the participants believed that it is not difficult to adjust to having diabetes. The majority 72.5% disagreed that there is nothing you can do if you are diabetic and 66.25% disagreed that they find it unfair to have diabetes. The majority 70% accepted they eat high calories between meals. While 90% of participants did not visit an ophthalmologist and 85% did not request retinol screening. Respondent's education level (AOR=4.21, 95%CI (2.01, 8.25), income level (AOR=2.51, 95% CI (0.47, 2.09), and residence (AOR=1.34, 95%CI (0.47, 2.50) respectively had a significant influence on knowledge, attitude and practice.

Keywords:- Knowledge Altitude; Practices; Type 2 Diabetes Mellitus; Diabetic Patients.

I. INTRODUCTION

Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Insulin is a hormone that regulates blood sugar. Hyperglycemia or raised sugar is a common effect of uncontrolled diabetes over time. It can lead to serious damage to many body systems, especially the nerves and blood vessels. Symptoms of hyperglycemia develop slowly over several days or weeks. The longer blood sugar levels stay high, the more serious symptoms may become. But some people who've had type 2 diabetes for a long time may not show any symptoms despite high blood sugar levels. Diabetes type two hypoglycemia occurs when the blood sugar levels go below normal. Diabetic hypoglycemia occurs when someone with diabetes doesn't have enough sugar (glucose) in his or her blood. Initial signs and symptoms of diabetic hypoglycemia include: looking pale (pallor), shakiness, dizziness or lightheadedness, sweating, hunger or nausea, an irregular or fast heartbeat, difficulty concentrating, feeling weak and having no energy (fatigue), irritability or anxiety

Type 2 diabetes results from the body's ineffective use of insulin and it comprises 90% of diabetes around the world (WHO, 2016, IDF-Diabetes Atlas, 2013. It is largely caused by lifestyle practices such as lack of or inefficient physical activity, excess body weight, and poor dietary choices (WHO, 2010). Diabetes Mellitus play a major role in elevating risks of hypertension, upper body obesity, coronary heart disease, blindness, and renal failure (WHO, 2006, IDF-Diabetes Atlas, 2013).

Globally it is estimated that 382 million people or 8.3% of adults who have diabetes live in low-middle-economic countries (IDF-Diabetes Atlas, 2013). International Diabetes Federation estimates that by 2030, 522 million people will be diabetic and by 2035, an estimated 577 people in the world will be diabetic. In 2015, the International Diabetes Federation (IDF) estimated the diabetes prevalence in Kenya to be 2.2% (IDF-Diabetes Atlas, 2016). According to WHO, 2019 evidence of type 2 diabetes mellitus makes up about 90-95% of all cases and the remaining 2-5% is type 1 diabetes (WHO, 2019). The incidence and prevalence rate of diabetes mellitus are higher, especially in developing countries, compared with developed countries due to early lifestyle changes (Rubino, 2008).

Lack of knowledge, negative attitude, and poor practice affect diabetes prognosis and hasten the occurrence which is preventable with early diagnosis (Levey et al., 2003). The majority of diabetes mellitus patients receive their treatment in clinics where they adhere to treatment and gain education not only to achieve glycemic control but also to halt the occurrence of complications and disabilities (Wens et al, 2005). Lifestyle modification is an integral and

crucial component of diabetes control and management. Diabetic Self-Management Education (DSME) and self-management support programs are primarily targeted to upscale individual knowledge, skill, and capability needed for self-care and management of diabetes mellitus these two are among the six important key areas recommended by the American Diabetic Association (ADA), which includes dietary therapy, physical exercise, counseling of smoking cessation, psychosocial care, diabetic self-management (DSMS) and diabetic self-management education (DSME) (ADA, 2017, Chan et al., 2013). One significant focus of nutrition therapy is promoting and supporting healthy conditions to maintain target body weight, blood glucose, blood pressure, and lipid profile(Warshaw, 2012).

Knowing, the correct altitude and practices which are positive can result in the successful management of type2 diabetes mellitus. Studies have urged that knowledge is no guarantee for healthy behavior, nor is ignorance necessarily the main cause of unhealthy behavior (Ajzee et al, 2011). Various determinants influence behavior change away from knowledge for instance the type of motivation that is fronted to change the behavior in question (Kankeu HT, et al,2013, Ajzee et al, 2011).

There is a global notion that knowledge related to diabetes management is insufficient. The knowledge, attitude, and practices of type 2 diabetes mellitus have been reported to be poor in areas where the incidence of type2 diabetes mellitus is high, especially in low economic Countries (Maretha et al., 2018).

Diabetes threatens the life of infected people and the economy due to reduced productivity, a high economic burden in terms of healthcare expenditure, and forgone economic growth. These are the same people who are expected to drive the economic engine of the countries where they reside.

There is a need to conduct healthcare interventions to curb these emerging issues of diabetes in developing countries. These interventions will lead to delayed onset of type2 diabetes mellitus and its related complications. Some of these complications include: neuropathy, nephropathy, blindness, gum disease, diabetes ketoacidosis and many more. Many people with diabetes may develop nerve damage caused by complications of high blood sugar levels. This nerve damage may occur in many forms such as sensory, motor, autonomic and or combination neuropathy. Furthermore, some people with diabetes may develop nerve damage caused by complications of high blood sugar levels. This can make it harder for the nerves to carry messages between the brain and every part of our body so it can affect how we see, hear, feel and move. This can make it harder for the nerves to carry messages between the brain and every part of our body so it can affect how we see, hear, feel and move. Diabetes can also cause damage to your kidneys over a long period of time making it harder to clear extra fluid and waste from your body. This is caused by high blood sugar levels and high blood pressure. It is known as diabetic nephropathy or kidney disease. In addition,

Diabetes foot problems are serious and can lead to amputation if untreated. Nerve damage can affect the feeling in your feet and raised blood sugar can damage the circulation, making it slower for sores and cuts to heal. That's why it's important to tell your GP if you notice any change in how your feet look or feel.

There is a need to research the level of knowledge, attitude, and practices of diabetic patients so that intervention of lifestyle modifications and aggressive treatment can be achieved. Knowledge is the greatest weapon in the fight against diabetes mellitus. Information can motivate the public to seek early diagnoses of type2 diabetes mellitus which sometimes goes unnoticed leading to complications that could otherwise be avoided. Undiagnosed cases of type2 diabetes mellitus are a public health concern with costly public health complications. The worldwide undiagnosed diabetic case was 50% in 2013 among people aged between 20-79 years. This leads to a high rate of morbidity and mortality among type2 diabetic patients (WHO, 2016, Kankeu et al, 2013).

This research was conducted to assess the level of knowledge, attitude, and practices that diabetic patients engage in, to encourage populations to develop positive health-seeking behavior in this state. The findings will help in identifying knowledge gaps, practices, and behavior toward diabetes which will guide the development of prevention and intervention programs.

II. METHODOLOGY

This was a descriptive cross-sectional study, questionnaire-based, conducted in Kiruguya hospital in Kirinyaga County. Patients were informed about their voluntary participation and their oral consent was obtained before participating in the study. The study sample size consisted of 80 type2 diabetic patients who were attending diabetic clinics between January-September 2019. These were patients diagnosed with type2 diabetes mellitus; men and women aged between 40-80 years. The inclusion criterion was all patients aged 40-80 years and receiving diabetic therapy from the hospital's diabetic clinic. The exclusion criterion was for all diabetic patients below 40 years and above 80 years. Patients with a major illness like cardiac failure, or renal failure, pregnant women, those with psychiatric illness, and all participants who were not willing to participate in the study. The random sampling technique was used.

The questionnaire was both structured and open-ended and comprised four parts. The first part comprised the socio-demographic characteristics and socio-economic status details of the respondents. The second part comprised knowledge such as awareness of diabetes symptoms, correct diet for diabetes, and such. The third part consisted evaluation of the respondents' attitudes toward diabetes. The fourth part assessed the practices employed by diabetic patients toward self-care and management. The questionnaire was first pre-tested in six participants

attending the same clinic to test for its validity and make suitable modifications.

A. Statistical Analysis

Descriptive statistics were used for all demographic variables (gender, age, residence, socio-economic status, occupation, and education). Associations between knowledge, attitude, and practice scores of demographic characteristics were evaluated using regression analysis. Beta coefficients with a 95% confidence interval (CI) were calculated after adjusting for gender, age, residence, socioeconomic status, and diabetes. Association between variables was investigated using binary regression logistic regression (adjusted odds ratio (AOR) 95% CI. All statistical analysis was conducted using SPSS (version, 20).

III. RESULTS

B. Socio-Demographic And Socio-Economic Status Of Participants

In the study majority (56.25% of respondents were female and 43.75% were males. A majority (40%) of respondents were between the ages of 40-50 years, while 33.75% were in the age group of 51-60%, 13.75% in the age of 40-50%, and 12.75% were in the age group of 70-80 years.

Marital status majority 56.25% were married, 22.5% were single and 18.75% were divorced/window. The majority 33.75% were farmers, 26.25% were employed, 26.25% were housewives and 13.75% were merchants. The majority 40% of respondents had primary education, followed by 31.25% who had acquired secondary education, 12.5% were graduates from various tertiary colleges and 11.25% were illiterates.

The majority 60% earned more than KES. 20,000.00 per month, 30% earned between KES.3,000-20,000.00 per month and only 10% earned less than KES. 3,000.00 Per month. The majority 52.5% were from urban residences while 47.5% came from rural residences.

Table 1: Participants' social-demographic characteristics and social-economic status.

Variables	Frequency	Percent
Sex		
Male	35	43.75
Female	45	56.25
Age		
40-50	11	13.75
51-60	32	40
61-70	27	33.75
71-80	10	12.25
Marital status		
Married	47	58.75
Single	18	22.5
Divorced/Window	15	18.75
Occupation		
Housewife	21	26.25
Farmer	27	33.75
Employed	21	26.25

Merchant	11	13.75
Education		
Illiterate	9	11.25
Primary	36	45
Secondary	25	31.25
Graduate	10	12.5
Income/month		
<3,000	8	10
3,000 -20,000	24	30
>20,000	48	60
Residence		
Rural	38	47.5
Urban	42	52.5

The findings in this study show that 50% of participants knew the symptoms of diabetes. The majority 71.25% of the participants had little knowledge of the causes of type2 diabetes. The majority 57.5% of participants did not know the complications caused by diabetes. While the majority 56.25% had good knowledge of diabetes treatment. The majority 75% had poor knowledge of diabetic diets, and 60% had little knowledge of diabetes eye-related complications.

Table 2: Questions regarding knowledge of type2 diabetes mellitus

Questions		Frequency (Percent)	
		Yes	No
1.	What are the symptoms of diabetes?	40(50)	40(50)
2.	What are the causes of diabetes?	23(28.75)	57(71.25)
3.	What complications does diabetes cause?	34(42.5)	46(57.5)
4.	What is the treatment of diabetes?	45(56.25)	35(43.75)
5.	How can diabetes be prevented?	32(40)	48(60)
6.	What foods, if taken frequently increase the risk of diabetes?	20(25)	60(75)
7.	How can diabetes eye-related complications be treated?	32(40)	48(60)

C. Participant's Altitude Related To Type2 Diabetes.

The majority 56.25% believed that if they did not have diabetes, they would be different people. The majority 77.5% of the participants agreed that they dislike being referred to as diabetic persons, while 57.5% believed that diabetes is not the worst thing that has happened to them. The majority 70% of the participants believed that it is not difficult to adjust to having diabetes. 65% believed that there is still hope in life even though they live with diabetes. 56.25% believed that proper control of diabetes does not involve a lot of sacrifices, and 90% agreed that they avoid telling people that they are diabetic. While 85% agreed that having diabetes for a long-time change one personality and 70% disagreed with founding it difficult to decide if they feel well or sick in their current diabetes status. The majority

72.5% disagreed that there is nothing you can do if you are diabetic and 66.25% disagreed that they find it unfair to have diabetes.

Table 3: Participants' Altitude related to type2 Diabetes Mellitus

	Questions	Agree	Disagree
1.	If l did not have diabetes l believe l would be a different person	45(56.25)	35(43.75)
2.	I dislike being referred to as diabetic	62(77.5)	18(22.5)
3.	Diabetes is the worst thing that happened to me	34(42.5)	46(57.5)
4.	Most people will find it difficult to adjust to having diabetes	56(70)	24(30)
5.	There is little hope of leading a normal life with diabetes	23(28.8)	52(65)
6.	Proper control of diabetes involves a lot of sacrifice and inconveniences	45(56.25)	35(43.75)
7.	I avoid telling people l have diabetes	72(90)	8(10)
8.	Having diabetes over a long time changes one's personality	68 (85)	12(15)
9.	I find it difficult to decide if l feel sick or well	24(30)	56(70)
10.	There is nothing you can do if you have diabetes	22(27.5)	58(72.5)
11.	I often think it is unfair that I should have diabetes when Other people are so healthy	27 (33.75)	35(43.75)

D. The Participant's Responses To Practice

The majority 70% accepted that they eat high calories between meals while 71.25% accepted that they eat them once a month. 85% reported not participating in regular physical exercise. 71.5% carried out regular diabetes tests and 82.5% did not carry out professional advice on regular body check-ups. While 90% of participants did not visit an ophthalmologist and 85% did not request retinol screening.

Table 4: Participants practice

	Practice	Frequency (percent)	
		Yes	No
1.	I eat high calories between meals	56 (70)	24 (30)
2.	I eat them out once a month	23(28.8)	57 (71.25)
3.	I do regular physical exercises	12 (15)	68(85)
4.	I carry out tests on 1.HBAIc 2. lipid profile	57(71.25)	23(28.78)
5.	I seek professional advice on regular body check-ups	14(17.5)	66(82.5)
6.	I visit an ophthalmologist	8 (10)	72(90)
7.	I regularly request retinol screening	12 (15)	68(85)

Participants in the study with education; residence and socio-economic status significantly influence their knowledge, attitude, and practices. Participants with had attained primary education level were four times (AOR=4.21, 95% CI (2.05, 8.25) more likely to have good KAP than their counterparts with illiterate education level. Similarly, those who had attained secondary level (AOR=2.79, 95%CI (1.41, 5.30) were more likely to have better KAP than their counterparts with lower education levels. Participants with higher income were more (AOR=2.52 (0.47, 2.09) 0.55(0.25, 1.26) likely to have good KAP than their counterparts with less income. Participants from the rural residence were more (1.34(0.67, 2.50) 1.34(0.47, 3.01) likely to have better KAP than their counterparts from the urban residence.

Table 5 A cross-tabulation of sociodemographic variables with participants' knowledge, attitude, and practice score

Variable (95%CI)	category	level of k/ledge	practice	altitude	(OR (95%CI)	AOR
		n(%)	n(%)	n(%)		
Age in yrs.	40- 65	47(58.75)	27(33.75)	56(70)	1	
	66-80	33(41.25)	52(65)	24(30)	2.01(1.34, 1.54.22) **	
Sex	Male	36(45)	32(40)	61(76.25)	0.72(0.20, 11.67)	2.22(1.63, 4.23)
	Female	44(55)	36(45)	29(36.25)	1	
Marital status	Married	58(72.5)	54(67.5)	65((42.5)	1	
	Single	8(10)	12(15)	46(57.5)	3.12(1.54, 2.11)	2.31(1.23, 5.40)
	Widowed/widower	7(8.75)	5(6.25)		0.81(0.34, 1.34)	0.31(0.31, 3.14)
Education	Illiterate	7(8.75)	6(7.5)	10(12.5)	7.23(5.02, 5.22)	2.64(1.32, 1.67)
	Primary	18(22.5)	4(5)	2(2.5)	4.01(1.65, 5.51)	4.21(2.05, 8.25) **
	Secondary	39(48.75)	45(56.25)	38(47.5)	4.23(1.52, 4.57)	5.10(2.45, 4.33)*

	Tertiary	16(20)	31.25)	30(37.5)	3.22(1.53, 1.5.42)	2.65(1.31, 5.60) **
Occupation	Housewife	15(18.75)	15(18.75)	15(18.75)	1	
	Employee	23(28.75)	23(28.75)	23(28.75)	1.24(0.50, 2.50)	1.32(0.47, 3.01)
	Farmer	25(31.25)	25(31.25)	25(31.25)	1	
	Business	17(21.25)	17(21.25)	17(21.25)	0.54(0.43, 1.06)	0.31(0.21, 4.39)
Residency	Urban	42(52.5)	42(52.5)	42(52.5)	1	
	Rural	38(47.5)	38(47.5)	38(47.5)	2.13(0.67, 2.50)	1.51(5.30, 3.10)
Monthly income	below 1000p/m	31(38.75)	31(38.75)	31(38.75)	1	
	1001-3000 p/m	24(30)	24(30)	24(30)	0.45(0.26, 2.60)	0.52(0.28, 1.08)
	≥ 3000 p/m	25(31.25)	25(31.25)	25(31.25)	2.52(0.47, 2.09)	0.55(0.25, 1.26)

IV. DISCUSSION

This cross-sectional descriptive study has been done to evaluate the level of knowledge, attitude and practices carried out by type2 diabetes mellitus patients attending Kiruguya Hospital in Kirinyaga County.

E. Socio-Demographic Characteristics And Socio-Economic Status Of The Participants

Socio-demographic characteristics of respondents showed that the majority 56.25% were female while 43.75% were male. This shows that more females than males in this study had diabetic type 2. This could be contributed to the fact that women in the region carry out businesses such as selling in the market or kiosks, which give them little exercise, and also by the fact that their diets contain more plantain and Irish potatoes which are made as *irio* (mashed food) and these two are known to have a high glycemic index and thus hiking blood sugars faster than other food with high fiber content. This study agrees with a study done by Mekonen, 2020, in Ethiopia on diabetic type2 patients attending the University of Gondar comprehensive specialized hospital in Northwest, which revealed that 52% of the participants were females while 48% were males. This study differs from a study done in Saudi Arabia by Tariq and Nancy, 2019 which revealed that the majority 65% of participants were males and 35% were female. It equally differs from another study done in Saudi Arabia by Noura and Muteb, 2020 which revealed that 53.1% were male and 46.9% were females. In this study majority (40%) of participants with type2 diabetes were in the age range of 51-60 years. This could have been contributed to the fact that at this age bracket people are busier with life thus lacking time and energy to carry out vigorous exercises and fat accumulation in the body is at its maximum level. This study concurs with a study done by Noura and Muteb,2020 in Saudi Arabia which also found that the majority (39.5%) of their respondents fell in the age bracket between 51-60 years. This study differs from a study done by Yitayeh et al, 2020 in Zinnen hospital Ethiopia which revealed that only 37.3% of the participants were in the age bracket of 45-70 years. This study revealed that the marital status of participants was majority 56.25% were married while 22.5% were single and 18.75% were divorced/widowed. Studies have shown that diabetic patients who are married are much more able to adhere to diabetic diets prescribed to them by clinical dietetics and follow medication regimes given by physicians (Wens et al., 2005, Khali et al, 2018). This could

be due to the peace and harmony that married couples enjoy with each other. This study agrees with a study done by Edmund (2014) in Ghana which found that the majority 87.1% of their clients were married. This study also agrees with a study done by Mistire et al, 2017, which revealed that the majority 58.2%of their participants were married. This study is equally in line with a study done in Zinen hospital in Ethiopia which found that the majority 61.3% of the participants were married.

The study also found that the majority 33.75% were farmers and 26.25% were housewives. This study concurs with a study done by Edmund et al., 2014 in Ghana, which found 64.1% of the participants had their occupation in farming. However, the current study differs from a study done in Ethiopia Zimen hospital by Yitaye, 2020 which found that only 21% of the diabetic patients were using farming as their occupation. This study revealed that the majority 40% of the participants had acquired primary education and 31.25% had a secondary education level and only 11.25% were illiterate. This study is in line with the findings of a study done in Ethiopia by Makennon, 2020 which found that the majority of their respondents 39.8% had acquired primary education level and 23.69% of their respondents were illiterate which differs from this study. This study had 52.7% of their respondents from urban residences and 47.5% from rural residences. This study is in line with a study done in Ethiopia by Makonnen, 2020 which found their participants 59.2% were from urban residences and 40.8% were from rural residences.

In this study majority, of 60% earned more than KES. 20,000.00, 30% earned between KES. 3,000.00-20,000.00.This explains why these participants had easy access to food since they could buy from the markets and they also could get from the farms since the majority were farmers. This study differs from a study done by Makonnen et al, 2020 which had a majority of their participants 49% earning between 1,000.00-3,000 ETB. A study done by Yitaye, in 2020 in Ghana revealed that a patient's residence and education status had a significant association with their attitude towards diabetes. Patients in their study who had attained a primary and secondary level of education and who resided in urban areas were more likely to have better attitudes and knowledge of diabetes than their counterparts with a lower level of education and those who resided in rural areas.

The residence and educational status of the respondents had a significant influence on their attitude. Subjects with an educational level of informal school and who can read and write were 2.3 times (AOR = 2.32, 95% CI (1.26, 4.27)) more likely to have a good attitude as compared to those who cannot read and write. Type 2 diabetic patients who attained primary school and can read and write were 4 times (AOR = 4.31, 95% CI (2.06, 9.02)) more likely to have a good attitude than those who cannot read and write. Similarly, those who conquered secondary school and above were 2.8 times (AOR = 2.79, 95% CI (1.41, 5.50)) more likely to have a good attitude than those who cannot read and write.

In the study majority (56.25% of respondents were female and 43.75% were males. A majority (33.75) of respondents were between the ages of 40-50 years, while 40% 33.75% were in the age group of 51-60%, 13.75% in the age of 40-50%, and 12.75% were in the age group of 70-80 years. Marital status majority 56.25% were married, 22.5% were single and 18.75% were divorced/window. The majority 33.75% were farmers, 26.25% were employed, 26.25% were housewives and 13.75% were merchants. The majority 40% of respondents had primary education, followed by 31.25% who had acquired secondary education, 12.5% were graduates from various tertiary colleges and 11.25% were illiterates. The majority 60% earned more than KES. 20,000.00 per month, 30% earned between KES.3,000-20,000.00 per month and only 10% earned less than KES. 3,000.00 Per month. The majority 52.5% were from urban residences while 47.5% came from rural residences.

F. Knowledge Of Respondents

Knowledge is vital in developing diabetes-related healthful attitudes which enhance the self-care skills of patients. The role of diabetic knowledge is to improve clinical outcomes and prevent complications (Shrestha et al, 2020). The assessment of knowledge of respondents showed that they had good knowledge of diabetes (50%). In this study, 71.25% had insufficient knowledge of the causes of diabetes. This study concurs with a study done in Iran by Shooka et al, 2015, which found that the participants had insufficient knowledge of the diabetes causes, control, symptoms, and complications. This shows that there is a need for education on the causes of diabetes to the general population, especially on what causes diabetes type2 as this will lead to seeking diagnoses early and also engaging in changing lifestyle behavior such as caseation of smoking, excessive drinking, and regular exercising. These findings concur with the finding of a study conducted by Bruce & Praythiesh (2018) on diabetic patients attending the tertiary care hospital at Kulasekharam which found a majority of 85% of the respondents had poor knowledge of the causes of type2 diabetes mellitus. These results differ from a study done by Mohamad et al., 2019 in Uttarakhand and Western Pradesh which found respondents had adequate knowledge (50%) of diabetes and its causes. This study differs from a study done by Shrestha et al, 2020 which found that 87.9% had positive knowledge of the consumption of carbohydrates as it could aggravate their diabetic status.

This study similarly concurs with a study done by Islam et al. which showed that the overall participants had a significantly below-average knowledge score. The differences in the findings of studies may be due to the differences in the education level of diabetic patients and the accessibility of information and diabetes education. The differences could also be contributed to the participants' socioeconomic and cultural differences. This study found that the majority 57.5% were knowledgeable that type2 diabetes mellitus cause complications in the body This study agrees with a study done by Shrestha et al, 2020 in their study they revealed that 78.8% of participants were aware that diabetes causes complications in the body such as loss of feeling in hands and extra care should be given while cutting toenails. This is an important aspect of diabetes management since it can help respondents and affected populations to seek medical care early enough before the problem becomes more complicated and dietary interventions can also be carried out early enough to prevent further complications. These findings differ from a study done by Pakistan by Ali *et al*., 2018 which found 30.2% of the respondents knew about diabetes complications. This study found that 45% of the respondents knew what diabetes treatment was and agreed that a proper diet, cessation of smoking, and regular glucose tolerance tests can help in managing diabetes.

This study agrees with a study done in Pakistan by Ali *et al,* 2018 which found a majority (70.2%) of the respondents had appropriate knowledge of diabetes mellitus control and management. This study found that majority of the respondents 60% had poor knowledge of how diabetes could be prevented. This could have contributed to the fact that the respondents had pow education on diabetes its causes and consequently its prevention. Education as an essential aspect of diabetic patients' treatment has been recommended by Bouchardat since 1975. Effective diabetes education requires training, knowledge, educational skills, communication and listening abilities, understanding, and negotiation skills from the multi-professional health team (Organizacao Pan-American, Brasilia, 2002) There is a need for the populations to be equipped with adequate knowledge of type2 diabetes mellitus prevention. This will go a long way in preventing incidences of type2 diabetes mellitus since it will lead to populations taking charge in lifestyle changes such as caseation of smoking, engaging in regular and vigorous exercise at least four times a week, and proper nutrient intake. Correct knowledge of blood glucose self-monitoring helps to achieve glucose control, contributes to recognizing hyper and hypoglycemia, as well as reduces episodes of acute complications. This consequently means that it will help to avoid the onset of chronic complications or at least reduce their incidence (Liudmila *et al.,* 2008). A majority (60%) were knowledgeable on the kind of food to consume regularly would increase the risk of getting type2 diabetes.

This knowledge is essential to enable the respondents to choose healthy diets which would lead to healthy status and improved diabetic status. This study concurs with a study done in Ethiopia by Mekonnen et al, 2020 which

revealed that 59% of the respondents were knowledgeable about diet modification as a way of lowering diabetes mellitus. This study differs from a study done in Egypt which had 30.37% of the respondents knowledge of diet modification as a way of lowering diabetes mellitus symptoms. The differences found in these studies could be contributed to the level of diabetes education on self-care and management that the respondents would be possessing. The study found a majority (60%) of the respondents had poor knowledge of eye-related complications brought about by diabetes.

The participants' poor knowledge of eye complications would have been due to limited education on diabetes self-management care and also failure to attend diabetic clinic morning session counseling on diabetes complications which include eye-related complications. This study concurs with a study done in Egypt by Khalil et al, 2018, which found that 56% of respondents had poor knowledge of eye-related complications caused by diabetes. The study also concurs with a study done in Rahdyn private hospital in Saudi Arabia on diabetic patients by Tariq Al-Asbali, which revealed that 47.5% of the participants had positive knowledge of diabetes and its symptoms.

G. Altitude Of The Respondents

This study revealed that 56% of the respondents believed that if they did not have diabetes their life would be different. This shows a poor attitude towards diabetes. A poor attitude can lead to psychological effects where the patient will always feel inadequate and not be able to put aside the disease and put effort into improving their status by following the recommendations given by the physicians for self-management and self-care. This study concurs with a study done in Ethiopia by Mekennen et al, 2020 which found that 50% of the respondents had poor altitude. It also concurs with a study done in a private hospital in Saudi Arabia by Tarig-Alsbali et al., 2019 which revealed that 72% of the respondents had a positive attitude towards self-monitoring of blood sugar and 60% had a positive attitude towards weight management. This study found that more males (43.75%) than females had a positive attitude toward diabetes.

This study concurs with a study by Makennen et al 2020 which revealed that more males (29.9%) had a positive attitude toward diabetes. This study concurs with a study done in Adis Zemen Hospital in Northwest Ethiopia by Yitayeh et al, 2020, which revealed that 65% (95%CI:60.2, 69.4) had a good attitude towards diabetes type2. This could have an explanation in that males had more information through males being more of outsiders and having more contact with the socio environment. A majority (72%) of participants said that they were not comfortable being referred to as having diabetes. This attitude is detrimental in that since one is afraid of being referred to as having diabetes, this can lead to poor health-seeking behavior which will lead to complications and even an increase in mortality rate.

This study concurs with a study done in Saudi Arabia in a private hospital by Tarig-Alsbali et al., 2019, which revealed that 61% of respondents had a poor attitude toward having type2 diabetes. In this study, 65% of the participants believed that if they have diabetes it is hard to lead a normal life. This negative attitude could interfere with the ability of the respondents to take appropriate measures to curb diabetes and its complications and also hinder their will to embark on recommended lifestyle modifications for diabetic patients such as dietary modifications and regular physical exercise which are essential in improving diabetes status. This study differs from a study done in Addis Zemen hospital in Northwest Ethiopia which found a majority of participants 74.1% thought that they could lead a normal life if they take appropriate measures to curb diabetes. In this study, 56.25% of participants said that control of diabetes involves a lot of sacrifices. This study differs from a study done in Addis Zemen hospital in Northwest Ethiopia which revealed that 33.6% said their diabetic diet spoils their social life. This attitude can lead to diabetic patients' failure to adhere to recommended diets since they will not want to reveal that they need meals that contain whole meal grains and more white meat in regulated portions since they are afraid they will not socially enjoy all meals with the rest of the people who are not diabetic. Participants 42.5% believed that diabetes is the worst thing that happened to them.

These findings agree with the findings of research done in Ethiopia which revealed that 53.2% thought that diabetes is the worst thing that happened to them. This shows a poor attitude towards diabetes type 2 which can hinder one from seeking help and adhering to health providers' advice. This study is in agreement with a study done by Kahyal et al, 2020 in a teaching hospital in Khyber-Pakhtunkhwa, Pakistan which revealed that 69.5% of the participants had an unfavorable attitude toward diabetes. The differences could be brought about by the fact that there could be varying awareness levels in respondents on the importance of controlling and preventing diabetic-related complications by accepting the fact that you have been diagnosed with it and efforts towards prevention are directly related to one's attitude towards diabetes. Cultural differences and socio-economic differences could also be at play.

Altitude=61%, practice=50% Poor practice=75%

H. Practice Of Participants

Practice regarding diet and especially regulation in the control of consumption of processed carbohydrates in this study was poor at 70%. This study concurs with a study done by Shook et al, 2019 which found poor lifestyle modification regarding diet to be poor in their participants. This study equally concurs with a study done in Adis Zemen hospital in Ethiopia (Yitayeh et al, 2020), which revealed that 86.6% of dietary modification was considered a beneficial practice in alleviating diabetic complications. The study also is consistent with a study done in Jamaica which found diet modification for the alleviation of diabetic complications was considered to agree with this study which found only a limited number of people were carrying out

diet control. This stresses the idea that still the concept related to the practice and healthcare measures is unclear among the majority of patients. Some surveys have indicated that higher education was significantly associated with better awareness (Shook et al., 2019). This study revealed that the majority of participants 72% had positive practices on cessation of smoking since they discovered they were diabetic. This study concurs with a study done in Hospital Northwest in Ethiopia by Mekonnen et al., 2020, which revealed that 95.8% of participants had stopped smoking. This shows that barriers to diabetic management such as smoking would be alleviated when participants adhere to the advice given on cessation of smoking and others.

This study found that practices of regular physical exercise and dietary modifications were poor. This study concurs with a study done in Adis Zemen hospital in Northwest Ethiopia by Yitayeh et al., 2020 which found that only 5% of the respondents conducted regular physical exercise even though they believed that regular physical exercise can help in preventing diabetes complications. This study differs from a study done in Ethiopia by Mekonnen et al., 2020 which found that regular physical exercise and diet modifications by participants were acceptable.

There are multiple barriers related to the enhancement of the quality of diabetes care and management. When patients' practice is good then this makes the care and management process even better. Dietary modification is a key aspect in the management of type2 diabetes mellitus coupled with weight loss management. Alramadan et al. demonstrated that the majority of people were prone to unhealthy lifestyles leading to other unhealthy issues such as obesity. This has provided them with greater difficulties in controlling their sugar and blood levels (Noura & Muteb, 2020). The participants had a positive practice on regular checking of blood glucose (71.25%). This study concurs with a study done by Mekonnen et al., 2020, which revealed that 55% of participants regularly checked their blood glucose levels. Another study was done in Riyadh hospital in Saudi Arabia by Tariq-Asbali et al, 2019 also reported poor practice by diabetic patients at 75%. This practice is essential in that it will enable the individual to know the direction the disease is taking and take medical action early enough before complications start setting in. Additionally, if there is no feedback on the diabetic status of the patient to the health care providers this can lead to a negative attitude towards both the physician and the patient thus creating a strenuous relationship.

Diabetes requires continued care and patients' self-management education to prevent acute complications is very important. Diabetic care is complex and requires that many issues beyond glycemic control be addressed. There exists large evidence that supports a range of interventions to improve diabetic outcomes (ADA, 2003). The American Association (ADA) note 2017 guidelines show that self-management and education are crucial aspects of diabetes care. Diabetes self-management practices can reduce blood sugar levels, mortality risk, and healthcare costs as well as

help in managing body weight in people with excess body weight (ADA, 2017). Escalation of diabetes is influenced by an aging population, sedentary lifestyles, and unhealthy diets which are believed to triple the burden of disease (Shrestha et al., 2020).

I. Association Of Socio-Demographic And Knowledge, Attitude, And Practices Of Participants

This study has reported an association between some socio-demographic and socio-economic statuses of respondents. Participants with had attained primary education level were four times (AOR=4.21(2.05, 8.25) more likely to have good KAP than their counterparts with illiterate education level. Similarly, those who had attained secondary level were three times (AOR=2.79, 95%CI (1.41, 5.30) more likely to have better KAP than their counterparts with lower education levels. This study concurs with a study done in Saudi Arabia by Naura and Matub, 2020 which revealed that the higher the levels of education among participants the strong the association with good knowledge and practice of diabetic control. The findings of this study are equally supported by previous studies conducted in low and middle-income countries by Kassahun et al, 2016, Parakh et al, 2019, and Naura and Matub, 2020.

This study agrees with a study done by Yitayeh et al., 2020 at Adis Zemen hospital which revealed that the level of education was significantly associated with good practice. This might be because educated participants have the opportunity to read some information easily from different sources. This act helps them to have an upper hand over their illiterate counterparts and thus improve their diabetic practice. Improving knowledge and developing a positive attitude, together with pharmacological intervention among diabetic patients and their family members will lead to the development of effective health-related outcomes. This study also found a positive association between high-income level and knowledge attitude and practice. The study differs from a study done in Egypt by Khalil et al., 2018 which found that the high income of respondents had no association with the positive knowledge and practices of participants. Makennen, 2020 in his study also found no association between the level of income and good knowledge, attitude, and practice of participants. The residence was found to significantly influence respondents' knowledge and altitude. In this study participants from the urban area were two times (AOR=2.13, 95%CI (1.51, 5.30) more likely to have good knowledge, attitude, and practice than their counterparts from the rural area. This study concurs with a study done by Yitayeh et al, 2020, which found that participants from urban areas were nearly two times more likely to have a good attitude than those who lived in rural areas. These residence differences could be contributed to the fact that those in urban areas have easy access to information from different sources than their counterparts in rural areas. Secondly, people living in urban areas are more likely to get access to hospitals where they can access information on diabetic care and management.

V. CONCLUSION

There is good knowledge of diabetes mellitus by participants' average practice and poor altitude. Higher education and urban residency had a significant association with good knowledge, attitude, and practices. The research recommends the need for well-organized health education programs and counseling on diabetes complications and means of improving diabetes status by improving practices such as consumption of low fat, whole grains diets and regular body exercise and also improving attitude towards diabetes. Low awareness about diabetes among patients affects their ability to self-management and therefore harm awareness program on self-care and management.

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