Assessment of the level and associated factors with knowledge and practice of Diabetes Mellitus among Diabetic Patients attending at FelegeHiwot Hospital, Northwest Ethiopia

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Abstract: Introduction: Diabetes mellitus was perceived as the problem of the developed world but currently developing countries like Ethiopia are suffering chronic diseases of which diabetes is the major one.Objective: The aim of this study wasto assess of the level and associated factors with knowledge and practice of diabetes mellitus among diabetic patients attending at FelegeHiwot hospital. Methods: Institution based cross sectional study was conducted using interviewer administered questionnaire among 410 diabetic patients. Systematic sampling technique was used to select study subjects. Data was entered to EPI info 3.5.1 and then transferred to SPSS for analysis. Descriptive and analytical statistics including bivariate and multivariate analysis were applied. Result: Among 410 respondents, Half (49.8%) of them had good knowledge and one hundred fifty four (36.8%) participants had good practice on diabetes. Lower age was significantly associated with good knowledge and practice. Age group 18-32 yrs, 33-41 yrs and 42-50 yrs were 6.2 times, 3.3 times and 3.1 times respectively more likely to had good knowledge compared to individuals who were at the age of 50 yrsand above. Similarly, age group between 18-32 yrs was 6 times more likely to have good practice. Higher educational status was also associated with good knowledge and practice. Participants in grade 1-8, grade 9-12 and higher education and above were 3.4 times, 4.7 times and 7.2 timesrespectively more likely to had good knowledge compared to those who were unable to read and write.Likewise, those in grade 1-8, grade 9-12 and higher education and above were 3.5, 4.3 and5.4 times respectivelyto have good practice.Increased duration of diabetic therapy was positively associated with good knowledge and practice. Increased level of income was positively associated with good practice.Conclusion: This study demonstrated low level of knowledge and practice among DM patients. Age, educational status and duration of DM therapy were associated with good knowledge and practice of participants. Monthly income was also associated with good practice. Improving knowledge and practice of diabetic patient through active education is advisable. Involvement of both governmental and non-governmental organizations is also crucial to help patients receive maximum benefit from the health care service.

Keywords: Diabetes Mellitus, Knowledge, Practice, Factors

1. Introduction

The burden of diabetes and diabetic related mortality and disability are rising in Africa. Increasing sedentary lifestyles, coupled with rapidly growing urban cultures and modified diets, are predicted to triple the prevalence of diabetes mellitus in the next 25 years (1, 2).

Ethiopia is the second most populous country in sub-Saharan Africa where more than 80% of the population lives in the country side. The country experiences a heavy burden of disease mainly attributed to communicable infectious diseases and nutritional deficiencies. Currently,

Ethiopia is also challenged by the growing magnitude of chronic non communicable diseases. Despite major progresses in education, the literacy status of the population of Ethiopia is still low with total adult literacy rate of 36% (62% for male and 39% for female).The education level in the country is still a significantly marker influencing the spread of disease, shaping the health seeking behavior of individuals and communities including the utilization of modern health care service (3).

In Ethiopia, national data on prevalence and incidence of diabetes are lacking. However, patient attendance rates and medical admissions in major hospitals are rising. The estimated prevalence of DM in adult population of Ethiopia is 1.9% (4, 5). Moreover, Cohen et al reported a high prevalence of diabetes (8.9%) among young (age < 30 years) in Ethiopian Jews who have been to Israel for less than 4 years (6).WHO estimated the number of diabetic cases in Ethiopia to be 800,000 by the year 2000, and the number is expected to increase to 1.8 million by 2030(7).

Due of the nature of the disease, health professionals alone can't provide high quality care. Diabetes being a chronic illness requires sound knowledge of self-care by patients so that they can contribute meaningfully in the management of their lives .Control of the DM through a tight schedule of blood glucose and urine sugar monitoring, medication and adjustment to dietary condition need patient's regular attention and discipline. The disease condition requires competent self-care, which can be developed from a thorough under-standing of the disease process and the management challenges by the patient and family members. As a result of this, diabetic education and counseling for the patient and family members are becoming important goals of diabetic patients care today. Unfortunately, about a third of the people suffering from diabetes may not be aware of it early considering the insidious onset and development(7, 8).

Knowledge and practice study are therefore necessary in providing baseline evidence for evaluating intervention programs and to design future programs and techniques for effective health education (9). Especially such evidences are highly relevant in countries like Ethiopia where there is high level of illiteracy rate and where most people are rural residents as the findings from such studiesmay help in identifying diabetic patient's knowledge and practice gaps which will guide the development of prevention programs in the country. Hence the purpose of this study was to assess the patient's knowledge, practice and associated factors of diabetes mellitus among diabetic's people.

2. Objective

2.1. General Objective

- To assess of the level and associated factors with knowledge and practice of diabetes mellitus among diabetic patients attending at FelegeHiwot hospital, Northwest Ethiopia, North West Ethiopia

2.2. Specific Objectives

- To determine level of knowledge regarding diabetes among diabetic people
- To determine practice of diabetic people on diabetes mellitus
- To identify factors associated with knowledge of diabetes mellitus
- To identify factors associated with practice on diabetes mellitus

3. Methods

3.1. Study Design and Period

Institution based cross sectional study was conducted from July 2012-August 2012

3.2. Study Area

Bahir-dar is a capital city of Amhara region and located 565kms from Addis Ababa, North west Ethiopia. Based on central statistical agency in 2010 this city has an estimated total population of 274,836. Felege Hiwot hospital is the only government hospital in the city and it is the regional referral hospital serving the population in the region as referral center.

3.3. Population

The source populations were all diabetics' patients who have follow up in Felege Hiwot hospital in Bahir-dar town. The study populations were all diabetics' patients who were coming to Felege Hiwot hospital for follow up during the study period.

3.3.1. Inclusion and Exclusion Criteria

All diabetics' patients aged ≥ 18 years were included in the study. Patients who were severely ill and not able to communicate were excluded from the study.

3.4. Sample Size and Sampling Procedure

The sample size was determined by EPI INFO statcalc using a single population proportion formula by considering 50 % proportion and .5% marginal error. The sample size becomes 384 and adding 10% for non-response rate the final sample size is 422.Systematic sampling technique was used to select study participants based the flow rate of patients during the study period.

3.5. Variables of the Study

Knowledge and practice of patients regarding diabetes are dependent variables. Independent variables include socio-demographic variables (age, sex, income, marital status, education, religion, occupation, and ethnicity) and health profile related variables (duration of treatment, type of medication used, co morbidity, DM association membership, family history of diabetics, Types of DM)

3.6. Operational Definition

Regular checkup: All patients who were undertaking investigations within one month. Those who were undertaking check up with in one month or less given a score of one and otherwise zero (9).

Regular exercise: 20 min – 30 minutes of aerobic exercise such as walking or swimming 3–4 days per week(17).

Good Knowledge: when patients respond themean or above the mean score on knowledge questions.

Poor Knowledge: when patients respond below the mean score on knowledge questions.

Good Practice: when patients respond the mean or above the mean score on practice questions.

Poor practice: when patients respond below the mean score on practice questions.

3.7. Data Collection Procedures

The data were collected by six diploma nurses using structured and pre tested questionnaire The data collectors were given two days training on data collection techniques before starting data collection. The knowledge and practice questionnaire was adapted from Medi media USA (16) and has been used in previous Knowledge and practice studies among diabetics and has proven to be reliable in other countries. It had been pretested on 21 diabetic patients in a similar set up and modified as necessary for clarity, sensitiveness and completeness. Data regarding knowledge and practices related to DM,socio –demographic variables such as age, sex, income, marital status, education, religion, occupation, ethnicity, health profile variables such as family history of diabetic's, duration of diabetics, duration of treatment, co morbidity, DM association membership were collected. A scoring system was developed for each knowledge and practice questions. The knowledge part of the questionnaire have 11 questions with a maximum of 29 correct response which was calculated by given one for each correct response and zero for each wrong response. The practice part of the questionnaire have 8 questions with a maximum of 8 correct responses which was calculated by given one for patients having regular checkup and life style practice and zero for not. Two categories were defined on the bases of the score obtained by each participant: Good (greater than or equal to the mean of knowledge or practice score) and poor (less than the mean of knowledge or practice score).

3.8. Data Quality Control Measures

The questionnaire was pre-tested for their accuracy and consistency prior to actual data collection. Furthermore, the supervisor and the principal investigator gave feedback and corrections on daily basis to the data collectors. Completion, accuracy, and clarity of the collected data were checked carefullyon aregularly basis.

3.9. Data Processing and Analysis

The collected data was checked for its completeness and entered to EPI info 3.5.1 and then transferred to SPSS for analysis. Descriptive and analytical statistics including bivariate and multivariate analysesweredone. Proportion, percentage, ratios, frequency distribution, measure of central tendency and measure of dispersion were used to describe data on knowledge and practice.Bivariate analysis and chi- square test weredone to examine association between dependent and independent variables (socio demographic variables and health profile variables); after running logistic regression, all variables with $p < 0.2$ were entered in to the final model and corresponding p-value of <0.05 was considered statistically significant. To identify the independent factor that influences knowledge and practice towards DM, multivariate logistic regression analysis was carried out.

Table 1: Socio demographic characteristics of participants, FHH, 2012

Variable	Frequency	Percent
Age		
18-32	105	25.6
33-41	93	22.7
42-50	106	25.9
≥ 51	106	25.9
Sex		
Male	198	48.3
Female	212	51.7
Religion		
Orthodox	363	88.5
Muslim	40	9.8
Others	7	1.7
Ethnic group		
Amhara	358	87.3
Tigray	42	10.2
Oromo	6	1.5
Others	4	1.0
Marital status		
Married	324	79.0
Single	47	11.5
Divorced/Widowed	39	9.5
Educational status		
Unable to read and write	57	13.9
Read and write	53	12.9
Grade 1-8	121	29.5
Grade 9-12	104	25.4
Higher education and above	75	18.3
Work status		
Civil servant	77	18.8
Merchant	127	31
Daily laborer	22	5.4
House wife	48	11.7
Farmer	136	33.2
Monthly income(in birr)		
≤ 500	205	50
>500	205	50

3.10. Ethical Consideration

Ethical approval and clearance was obtained from Institutional Review Board of University of Gondar prior to enrolment. Permission to conduct the study was obtained

from FelegeHiwot Hospital prior to data collection. Objective of the study was clearly explained to participants before conducting the interview and informed consent was obtained from each participant.Data was kept confidential throughout the conduct of the study.

4. Results

4.1. Socio Demographic Characteristics of Study Subjects

Out of the total 422 study participants planned, 410 were participated in the study yielding a response rate of 97.2%. More than half (51.7%) of them were female. The mean age of respondents was 41.9(SD=1.4 yrs). More than three fourth (79.0%) of the participants were married. The majority (88.5%) of the participants were orthodox Christian followers. Regarding the ethnic profile of study subjects, Majority (87.3%) of them were Amhara in ethnicity. Concerning the educational status of study subjects, 57(13.9%) were unable to write and read. One hundred thirty six (33.2%) were farmers in occupation. Half of them (50%) had ≤ 500 birr monthly income. See table 1.

Table 2: Health profile of participant,FHH, 2012

Variable	Frequency	Percent (%)
Duration of DM therapy		
<1 year	176	42.9
1-2 year	74	18.0
3-5 year	83	20.0
>5 year	77	18.8
Current medication		
Insulin	312	76.2
Metformine	62	15.1
Glibenclamide	34	8.3
Glibenclamide and Metformine	2	0.5
Family history of DM		
Yes	44	10.7
No	366	89.3
Other chronic illness		
Yes	162	39.5
No	248	60.5
Type of DM		
Type I	305	74.4
Type II	105	25.6
DM association member ship		
Yes	30	7.3
No	380	92.7

4.2. Health Profile of Study Subjects

One hundred seventy six (42.9%) of study subjects were on diabetes drug treatment for less than one year. Concerning the type of medication they were taking, more than three fourth (76.2%) of the participant were taking insulin injection. One hundred sixty two (39.5%) study subjects had additional one or more chronic illness. Out of

the 162 subjects who had additional chronic illness, 89 (55.2%) had hypertension, 17 (10.5%) had dislipedemia, 21(12.8%) had cardiac disease and 3 (1.6%) of them had renal diseases.Majority (89.3%) had not family history of DM. Majority (92.7%) of participants were not member of diabetic association found in their area. Three hundred five (74.4%) study subjects had type I DM. See table 2.

4.3. Knowledge Regarding Diabetes

The mean (+SD) knowledge score of study subjects was 12.71(±3.73) with a maximum possible score of 29. Two hundred four (49.8%) participants had good knowledge and 206 (50.2%) participants had poor knowledge regarding diabetes.

More than half (66.6%) of study subjects didn't know the definition of diabetes. Less than 5 % study participants knew about risk factor relatedto alcohol and cigarette smoking. Nearly three fourth (70%) of the study participants consider orally taken tablets and injection alone as treatment options and nearly 20 % study participants knew about exercise and dietary management as a treatment option. The correct responses on complication of DM like hypoglycemia, nephropathy, retinopathy, and neurologic were 49.8 %, 20.2 %, 54.4% and 37.0 % respectively. The correct responses on risk factor of DM like Hypertension, hyper lipidemia, sedentary life style, cigarette smoking and obesity were 59.5 %, 38.5%, and 18 %, 3.4 % and 5.6 % respectively.

Exercise and diet were reported as a life style modification for prevention of DM in 300(73.2 %) and 195(47.6%) respondents respectively. However, less than 10 % of study participants knew weight reduction as life style modification for prevention of diabetes related complications.

One hundred twenty seven (31%) study participants had knowledge on advisable dietary intake. They reported that 10-20% carbohydrate (grains and fruits), 40-60% proteins (meat, egg and fish), 20-30% fat, small amount vitamins and minerals are advisable food for diabetic patients.

More than three fourth (82.0%) of study participants knew about the importance of control of blood glucose to reduce complication of DM. Two hundred seventy two (62 .7%) knew the importance of control of blood pressure for prevention of DM complications.

One hundred ninety four (42.3%) study subjects didn't know regarding the importance of screening of family members.

4.4. Source of Information and Appraisal of Treating Doctors

Majority, (85%) of the respondents reported that their source of knowledge was medical staffs. The remaining participants sited friends and relatives,and media with 37(9%) and 6% respectively as their source of information.

The time their doctors devote for them was five minutes for 238 (58%) patients, ten minutes for 110(27%) and more

than ten minutes for 37 (9%) of respondents.

Table 3: *Frequency distribution of participants response on knowledge toward diabetes, FHH, 2012 (n= 410)*

Variable	Frequency	Percent (%)
What is diabetes?		
Diabetes is a raised blood sugar only		
Diabetes is a disease which affects any part of the body	218	53.2
	139	33.9
I don't know	55	13.4
Identify risk factor for DM		
Over eating	262	63.9
Family history	256	62.4
Eating too much fat and sugar	144	35.1
Alcohol	9	2.2
Cigarette smoking	6	1.5
No response	7	1.7
Know treatment options of DM		
Injection/Insulin therapy	284	69.3
Orally taken tablets	192	46.8
Dietary management	43	10.5
Exercise	33	8.0
Don't know	31	7.6
Know symptom of poorly controlled DM		
Passing lots of urine	340	82.9
Loss of appetite	285	69.5
Excess thirst	250	61.0
Tiredness	111	27.0
Weight loss	12	2.9
Don't know	42	10.2
Know complications of DM, if not treated		
Ophthalmologic	223	54.4
Hypoglycemic	204	49.8
Renal	83	20.2
Neurologic	37	9.0
Don't know	56	13.7
No response	3	0.7
Identify health risk factors for DM		
Hypertension	244	59.5
Hyper-lipidemia	158	38.5
Sedentary life style	74	18.0
Obesity	23	5.6
Cigarette smoking	14	3.4
Don't know	45	11
Know regarding life style modification		
Exercise	300	73.2
Dietary modification	195	47.6
Weight reduction	32	7.8
Don't know	34	8.3
No response	13	3.2
Control of your blood glucose levels is an important reducing Complication of DM?		
Yes	336	82.0
N0	74	18.0
Diabetes patient should measure his or her B/P?		
Yes	257	62.7
No	153	37.3

Table 4: *Source of information, appraisal of their treating doctors and their need of information about diabetes among DM patients in FHH, 2012*

Question	Frequency	Percent (%)
Source of information		
Medical staff	348	85
Media	25	6
Relatives and friend	37	9
How much time your doctors devote to you?		
Five minutes	238	58
Ten minutes	110	27
More than ten minutes	37	9
Your doctor explains you diabetes thoroughly?		
Yes	238	58
No	172	42
Does your doctor explain diet?		
Yes	221	54
No	189	46
Does your doctor explain exercise?		
Yes	197	48
No	213	52
How would you like this information given to you?		
Handouts or leaflet	332	81
Videos or tapes	137	33.4
Other (please specify)	5	1.2

Among the total respondents, 54%, 48%, 32% received explanation about diet, exercise and regular checkup from health professionals. One hundred nineteen (29%) of respondents reported thatthey received motivation from health professional about self-care. Foot care checking and self-care motivation, the two main aspects of diabetes care were ignored by most of the treating practitioners.

Among respondents 332(81.0%) and 137(33.4%) of them would like to receive information through leaflet and audio visuals respectively.

4.5. Factors Associated with Knowledge Regarding Diabetes

Age, marital status, education status, duration of DM cases, duration of DM therapy, types of DM and being DM membership were significant at 0.2 and were entered in to the final regression model. Age, educational status, duration of DM therapy and types of DM showed a significant association with good knowledge at a 5% level of significance.

Participants who were in the age group of 18-32 yrs, 33-41 yrs and 42-50 yrs were 6.2 times (AOR=6.17, 95% CI: 2.89 -13.18), 3.3 times (AOR=3.29, CI: 1.53- 7.08) and 3.1times (AOR=3.14, 95% CI: 1.50-6.57) respectively more likely to have good knowledge as compared to individuals who were at the age of 50 and above.

Similarly, those participants were in grade 1-8, grade 9-

12 and those who attended higher education and above were 3.4 times (AOR= 3.41,95 % CI: 1.46-7.95), 4.7 times (AOR=1.92, 95 % CI: 1.92-11.31) and 7.2 times (AOR=7.24, 95%CI: 2.86-18.34) respectively more likely to have good knowledge as compared to those who were unable to read and write.

The likely hood of good knowledge among individuals who were on DM therapy for 3-5 years,> 5 years were 6 (AOR=6.01, 95% CI: 1.2.93-12.32) times and 6.3 times (AOR= 6.34, 95 5 CI: 3.18-12.63) respectively higher compared to individuals who were on treatment for < 1 year.The likelihood of good knowledge among individuals who had type II DM were nearly 47 % less compared to individuals who had type I DM.

Table 5: factors associated with knowledge about diabetes, FHH, 2012 (n= 410)

Variable	Knowledge Good n (%)	Poor n (%)	COR(95% CI)	AOR(95% CI)
Age category				
18-32	74(70.5)	31(29.5)	6.98(3.81-12.79)	6.17(2.89-13.18)**
33-41	46(49.5)	47(50.5)	2.86(1.57-5.20)	3.29(1.54-7.09)**
42-50	57(53.8)	49(46.2)	3.40(1.90-6.08)	3.14(1.50-6.57)**
≥50	27(25.5)	79(74.5)	1	1
Marital status				
Married	161(49.7)	163(50.3)	1	1
Single	18(38.3)	29(61.7)	0.63(0.34-1.18)	1.82(0.81-4.07)
Divorced/widowed	25(64.1)	14(35.9)	1.80(0.91-3.6)	2.2(0.98-5.03)
Educational status				
Unable to read and write	12(21.1)	45(78.9)	1	1
Read and write	16(30.2)	37(69.8)	1.62(0.68-3.85)	1.27(0.46-3.51)
Grade 1-8	60(49.6)	61(50.4)	3.69(1.78-7.65)	3.41(1.46-7.95)**
Grade 9-12	66(63.5)	38(36.5)	6.51(3.07-13.81)	4.66(1.92-11.31) **
Higher education and above	50(66.7)	25(33.3)	7.5(3.38-16.65)	7.24(2.86-18.34)***
Duration of DM therapy				
<1 year	51(29.0)	125(71.0)	1	1
1-2 year	32(43.7)	42(56.8)	1.87(1.06-3.28)	1.55(0.83-2.93)
3-5 year	61(73.5)	22(26.5)	6.79(3.78-12.21)	6.01(2.93-12.32)***
>5 year	60(77.9)	17(22.1)	8.65(4.61-16.23)	6.34(3.18-12.63)***
Types of DM				
Type I	161(52.8) 43	144(47.2)	1	1
Type II	(21.1)	62(59.0)	0.62(0.39-0.97)	0.53(0.29-0.94) *

*p<0.05   **p<0.01   ***p<0.001

Table 6: *Response to practice question about diabetes, FHH, 2012 (n= 410)*

Variable	Frequency	Percent
When was your B/P checked last?		
One week ago	43	10.5
Within one month	64	15.6
Two month ago	227	55.4
Six month ago	76	18.5
When was your last urine exam done?		
Within one month	78	19.0
Two month ago	112	27.3
Six month ago	134	32.6
One years ago	21	5.1
When was your last visit with your physicians?		
One week ago	66	16.1
Within One month	2 9	7.1
Two month ago	302	73.7
Six month ago	13	3.4
When was your last Blood Sugar checked?		

Variable	Frequency	Percent
One week ago	19	4.6
With in one month	78	19
Two month ago	303	73.9
Six month ago	10	2.4
Follow a dietary modification?		
Yes, many times	234	57.1
No, never	67	16.3
Yes, occasionally	109	26.6
Have you tried to lose weight in the past?		
Yes, many times	207	50.5
No, never	123	30
Yes, occasionally	57	13.9
When was your last eye examination?		
Within one month	12	2.9
Six month ago	52	12.7
Within one year	114	27.8
One years ago	74	18.0
Two years ago	24	5.8
Note done at all	134	32.7

4.6. Practice on Diabetes

The mean (+SD) practice score of study subjects was 3.20(± 2.02).One hundred fifty four (36.8%) participants had good practice and 256 (63.2%) participants had poor practice regarding diabetes.

Among respondents, the last time to check B/P, urine exam and blood sugar with in one months or less were 26.1%, 19.0 % and 23.6% respectively. Two hundred thirty four (57.1%) participant were managing their diet regularly and 207(50.5%) participants were controlling their weight regularly. Among respondents 12(2.9 %) were checking their eye with in one month duration and 178(43.4%) were checking their eye with in one years or less duration.

4.7. Factors Associated with Practice on Diabetes

Age, sex, religion, marital status, educational status , work status ,monthly income ,duration of DM ,duration of DM therapy , currentlyusing drug, family history of DM and types of DM were significant at 0.2 on binary regression model and were entered in to multivariate analysis.Age, sex, marital status, educational status, monthly income and duration of DM therapy maintained their significance in the multivariate analysis at a 5% level of significance.

Those who were in the age of 18-32 were 6 times (AOR=6.05, 95% CI: 2.44-15.03) more likely to have good practice as compared to those who were in the age of ≥ 51 years.The likelihood of good practice among female participants were nearly 54 % less (AOR=0.45, 95% CI: 0.25-0.82) as compared to male participants. The likelihood of good practice among widowed and divorced were nearly 90 % less (AOR=0.10, 95% CI: 0.02-0.44) as compared to who were married.

Participants in grade 1-8 were 3.5 times (AOR= 3.54,95 % CI: 1.16-10.82), those in grade 9-12 were 4.3 times (AOR=4.27, 95 % CI: 1.37-13.25) and those who had higher education and above were 5.4 times (AOR=5.45, 95% CI: 1.67-17.82) more likely to have good practice as compared to those who were unable to read and write.The likelihood of good practice among individuals who had ≤ 500 Eth Birr income were nearly 85 % less (AOR=0.15,95% CI: 0.09-0.27) as compared to individuals who had >500 Eth. birr income.

Participants who were on DM therapy for 1-2 years were 2.8 times (AOR=2.86, 95% CI: 1.27-6.46), those who were treated for 3-5 years were 5.4 times (AOR= 2.35,95% CI: 2.35-12.55) and those who were treated for > 5 years were 4.2 times(AOR=4.16,95% CI: 1.85-9.37) more likely to have good practice as compared to individuals who were on DM therapy for < 1 year.

Table 7: factors associated withpractice of DM patients, FHH, 2012

Variable	Practice Good(%)	Poor (%)	COR(95% CI)	AOR(95% CI)
Age category				
18-32	65(61.9)	40(38.1)	7.94(4.18-15.09)	6.05(2.44-15.03)***
33-41	42(45..2)	51(54.8)	4.03(2.10-7.72)	2.36(0.93-6.0)
42-50	26(24.5)	80(75.5)	1.58(0.81-3.11)	1.32(0.51-3.46)
≥50	18(17.0)	88(83.0)	1	1
Sex				
Male	81(40.9)	117(59.1)	1	1
Female	70(33.0)	142(67.0)	0.71(0.48-1.06)	0.46(0.25-0.82)**
Educational status				
Unable to read and write	6(10.5) 16(30.2)	51 (89.5)	1	1
Read and write	42(34.7)	37 (69.8)	3.68(1.31-10.29)	2.58(0.72-9.27) 3.54(1.16-10.82)*
Grade 1-8	48(46.2)	79(65.3)	4.52(1.79-11.39)	
Grade 9-12	39(52.0)	56(53.8)	7.29(2.88-18.46)	4.27(1.37-13.25) * 5.46(1.67-17.82)**
Higher education and above		36(44.4)	9.21(3.53-24.04)	
Marital status				
Married	131(40.4)	193(59.6)	1	1
Single	17(36.2)	30(63.8)	0.83(0.44-1.57)	1.28(0.47-3.47)
Widowed/Divorced	3(7.7)	36(92.3)	0.12(0.04-0.41)	0.10(0.02-0.45)**
Monthly income				
≤ 500 Eth.Birr	37(18)	168(82)	0.18(0.11-0.28)	0.15(0.09-0.27)***
>500 Eth.Birr	114(55.6)	91(44.4)	1	1
Duration of DM				
<1 year	43(24.4)	133(75.6)	1	1
1-2 year	30(40.5)	44 (59.5)	2.11(1.18-3.76)	2.86(1.26-6.46)*
3-5year	47(56.6)	36(43.4)	4.04(2.32-7.02)	5.43(2.35-12.55)***
>5 year	31(40.3)	46(59.7)	2.08(1.18-3.69)	4.16(1.85-9.37)**

*p<0.05   **p<0.01   ***p<0.001

5. Discussion

This study was conducted with the intention to assess the level and associated factors with knowledge and practice about diabetic mellitus.The study showed that the mean (±SD) knowledge score of study subjects was 12.71(±3.73). Two hundred four (49.8%) study participants had good knowledge regarding diabetes. This study had demonstrated lower level of knowledge regarding diabetes. The prevalence of knowledge was lower compared to studies done in Pakistan and Saudi which were 60% and 77% respectively (7, 9). This difference might be due to high illiteracy rate of the study participant, less devoted time with the patients by physicians, lack of organized diabetic education facilities and less participation of media and NGO in awareness creation about diabetes in our setting.

Two hundred eighteen (53.2 %) of the study participants thought that diabetes doesn'taffect all part of the body and is characterized by raised blood sugar only. This study was supported by similar study in Pakistan and India which reported that 54 % and 57.8 % of participant didn't know what diabetes mean (7,20). Similarly, passing lots of urine which was reported as the most common diabetes symptom by 82.9% of participants was consistent with the study conducted in Indian (20).

Cigarette smoking is associated with poor control of blood glucose and strongly causally related to hypertension and heart disease in people with diabetes (20). However knowledge on risk factor of smoking and overweight was very low in this study. This could be due to inadequate level of information given by the physicians on risk factors and their consequences.

Another finding of this study was limited knowledge on complications related to DM. Knowledge about brain(Neuropathy) and renal (Nephropathy) complications were 9.0% and 20.2% respectively. This was consistent with the study conducted in Gujarat 5% and 25% respectively (12). However, this level of inadequate knowledge regarding risk factor and complication may lead to decrease precaution of patient for complication and these are high economic burden for the country in the management of complication which comes due to in adequate precaution for the complication. This finding highlights the need for emphasizing diabetic's complicationsduring diabetes education.

Most patients (51.2%) did not realize the importance of screening the other family members for diabetes and according to some literatures this might probably indicates for a large number of people remaining undiagnosed (26).

In this study the main sources of information was health professional (86%) which include nurses and physicians. This study was supported by study in Pakistan and Saudi which reported that health professionals was the main source of information in 78% and 68% of participants (7, 9).This finding indicated that medias contribution for diabetes related information was very low(6%) compared to study in Gujarat (12). This indicated that a lot should be done for involvement of Medias in diabetes education.

The time devoted by the doctor for examination and counseling was less than 5 minutes in 58% study participant. This is better than Pakistan study which was 65%, however, this finding was higher compared to Gujarat study which was 43 % (7, 12). The difference with Gujarat study might be physician's spare very limited time for their patients due to the rush in the out-patient department and negligence.

The mean (±SD) practice score of study subjects was 3.20 (±2.02). One hundred fifty four (37.6%) participants had good practice and 256(63.2%) study participants had poor practice regarding diabetes. This finding was lower compared to study conducted in Saudi (9).This difference may be due to high illiteracy rate of the study participants, lack of health care access, poor patient attendance at health clinics. Another explanation might be physician's barriers like constrain of time and facilities focus on acute rather than preventive care and competing care demands (20).

Among respondents, the last times to check their blood pressure within one months or less were 26.1 % .This study was different from study conducted in Nepal which was 66%. This could be due to poor experience in the patient and business orientation and negligence of the physicians. The last time to check their urine exam with in one months or less were 19 %, which was slightly lower than the study done in Nepal which was 26.9%(16).Only 57.1 % of participants managed their diet regularly which was supported by study in jimma university (17), However it was less compared to study conducted in India which showed that 82.8 % of study participant had compliance to dietary modification (20). A study done in Saudi to assess KAP in women toward diabetes mellitus showed 16 % were not at all following the dietary plan. Poor state of practice regarding nutrition has also been reported in several other studies (18, 19).

Among respondents 50.5% were controlling their weight regularly. This finding was lower than the study conducted in Pakistan which was 66%.This could be due to low knowledge about the importance of managing their weight in reduction of complication and less dietary management and exercise experience by the patients.

Lower age was significantly associated with knowledge. This finding was supported by other different literatures (11, 22, 25) and with West and Goldberg principles which reported that a decrease of 3% in the knowledge score of diabetic patients for every 10-year increase in age (27).This could be due to older persons have less education, worse cognitive function and have more co-morbidities, which might lead to confusion (25). Another explanation might be younger patients were more likely to be more educated, faster in remember and recall and they might be new sufferers of diabetes and they were eager to have more knowledge about their disease (22).

Good knowledge had a significant association with

educational status of the respondent.This finding was in line with different studies conducted in different countries (10,11,22,23,and 24).This could be explained by respondents who had at least primary educational status have higher chance of exposure to different IEC material like leaflet, manual and that they have no barriers in communicating with the health care team beside their potential to grasp information's already communicated (22).

The likely hood of good knowledge increases with increasing in duration of DM treatment. This finding was not inline with West and Goldberg study, who found no significant increase in knowledge scores with the number of year patients started treatment(27). However,this finding was consistent with study conducted in South Africa and Nigeria (11, 25). This could be due to frequent contact with health provider which creates opportunity to get information regarding diabetes. The difference with USA finding might be due to the difference in access for information between countries during the course of treatments (24).

Those participants who were in the age of 18-32 had 6 folds increase in practice level compared to age >50.This could be attributed to lack of motivation and lack of social support in elderly individuals compared to young adults. Social supports are vital for patient empowerment which would enable them to have a better understanding and self-management of their illness (30).

The likely hoods of good practice among females were nearly 54 % less compared to male participants. This finding was consistent with study in Egypt, India and Pakistan (7, 22, and 29).This might be due to high level of illiteracy among the females and less self-empowerment and social status in females. Another explanation could be women have low priority to health care seeking and present late for checkupwhen compared to men.

Educational status had significant association with good practice like that of knowledge. This finding was consistent with study in Egypt (22).This could be attributed that participant who had education have good chance to modify their life style and their health status by finding different alternatives for checkup. Educated people may also have better income better income status. This could also be their accessibility for manual of dietary management, weight reduction increases.

Good practice among respondents who had ≤ 500 Eth Birr income was lower compared to respondents who had >500 Eth.birr incomes. This finding was consistent with study conducted in Gujarat and Malaysia (12,30). This might be explained by participant who had low income, cannot afford to check up in private clinic without waiting the regular consultation time arranged by the hospital.They could also difficulty to manage their diet properly because of affordability issues. Moreover, Resources are necessary for sustained life style modification or behavior change and lack of resources could be a barrier for life style modification.

Duration of diabetes treatment was positively associated with practice. This finding was supported by Nigerian finding (25).This could be due to continued counseling and health education programs.

6. Conclusion

This study revealed a low level of knowledge and practice among the diabetes patients.

Age, Educational status, duration of DM therapy and DM types were the factors associated with good knowledge of participants. Ages, Sex, educational status, marital status, monthly income, duration of DM therapy were the factors associated with good practice of participants.

Recommendation

Both literate and illiterate people tailored I.E.C materials on diabetes symptom, risk factors, complication and life style modification for diabetic patient should be developed and disseminated.Establishing mechanisms where by diabetics patient with different age group, educational status and duration of DM therapy share their experiences is valuable.Media and non-governmentorganization involvement to enhance knowledge and practice about DM is highly recommended.Research with different settings by considering larger sample sizes arealso advisable

Limitation of the Study

The following are some of the limitations of this study.The study design it applied; as cross-sectional studies are poor in establishing temporal relationships between cause and effect and the fact that it was conducted among the outpatients in only one hospital could limit our understanding regarding knowledge and practice of the general diabetic population in the region.

Abbreviations

AOR, Adjusted Odds Ratio; CI, Confidence Interval; COR, Crude Odds Ratio; DM, Diabetes Mellitus; FHH, Felege Hiwot Hospital; GUH, Gondar University Hospital; IEC, Information, Education and Communication; IRB, Institutional Review Board; KAP, Knowledge, Attitude and Practice; OR, Odds ratio; SD, Standard deviation; WHO, World Health Organization

Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

SA contributes in the design, data collection, and data entry and also made the data analysis and interpretation of

References

[1] Fauci, Braunwald, kaiser, Longo, James et al. Harrison's principles of Internal medicine. 17th ed.United States of America. The McGraw-Hill companies; 2008.

[2] Motala AA, Omar MA, Pirie FJ. Diabetes in Africa. Diabetes micro vascular and macro vascular disease in Africa. J Cardiovascular Risk 2003; 10(2).

[3] Healthcare in Ethiopia, http://www.moh.gov.et/; http://www.ethiomedic.com/(

[4] AlemuS,DessieA,SeidE,BardE,LeePT,TrimpleER,et al.Insulin requiring diabetes in rural Ethiopia, Should we reopen the case for malnutrition –related diabetes?Diabetologia, 2009:52(1842-1845).

[5] Gill GV, Mbanya JC, Ramaiya KL, Tesfaye S.A sub Saharan African prospective of diabetes, Diabetologia, 2009:52(8-16).

[6] Cohen MP *et al.* High Prevalence of Diabetes in Young Ethiopian Immigrants Israel, Diabetologia 1988; 37:824-827.

[7] Naheed G. Knowledge, Attitudes and Practices of Type 2 Diabetics Mellitus, J Ayub Med Coll Abbottabad. 2010:22(3).

[8] Okolie, Uchenna V, Ehiemere,IjeomaO,Ihanacho,Peacen,etal.Knoweledge of diabetes management and control by diabetic's patients at Federal Medical Center UmuahiaAbia State Nigeria. International Journal of medicine and Medical sciences.2009:1(9).

[9] Saadia Z Rushdie, Alsheha M, SaeedH, Rajab M.A .study of knowledge, Attitude and Practices of Saudi Women towards Diabetes Mellitus a (KAP) study in Al- Qassim Region, The Internal Journal of Health.2010:11(2)

[10] Maina WK, NdegwaZM,Njenga EW, Muchemi EW. Knoweledge, attitude and Practices related to diabetes among community members in four provinces in Kenya, Pan African Medical Journal.2010:7(2).

[11] Moodley L, Rambiritch V. An assessment of the level of knowledge about diabetes mellitus among diabetic patients in a primary healthcare setting, SA Fam Practice.2007:49(10).

[12] Viral N, Shah P, Kamdar K, Nishit S. Assessing the knowledge, attitudes and practice of type 2 diabetes among patients of Saurashtra region, Gujarat Int J Diabetes Dev. 2009 Jul-Aug; 29(3): 118–122.

[13] Gunay T, Ulusel B, Velipasaoglu S, Unal B, Ucku R, Ozgener N. Factors affecting adult knowledge of diabetes in Narlidere Health District, Turkey, 20(pub.med)

[14] Kheir N, Greer W, Yousif A, Al Geed H, Al Okkah R. Risk factors, knowledge and health status in diabetic patients. Saudi Med J 2003: 24 (11).

[15] Kheir N, Greer W, Yousif A, Al Geed H, Al Okkah R. Knowledge, attitude and practices of Qatari patients with type 2 diabetes mellitus.

[16] Dineshk,subishP,RavisS,Paranaya. Knowledge, attitudes and practice about diabetes among diabetes patient in western Nepal. Rawal Med J 2008; 33:8-11.

[17] Hailu E, Mariam WH, Belachew T, Birhanu Z. Self-care practice and glycemic control amongst adults with diabetes at the Jimma University Specialized Hospital in south-west Ethiopia: A cross-sectional study. Afr J Prm Health Care Fam Med. 2012; 4(1).

[18] Upadhyay DK, Palaian S, Shankar PR, Mishra P. Knowledge, Attitude and Practice about Diabetes among Diabetes Patients in Western Nepal.Rawal Med J 2008; 23(1):1–12.

[19] Rafique G, Azam SI, White F. Diabetes knowledge, beliefs and practices among people with diabetes attending a university hospital in Karachi, Pakistan. East Mediterr Health J 2006; 12(5): 590–8.

[20] Mukhopadhyay, et.al: perceptions and practice of patients with diabetes mellitus type II.Int J DiabDev /July-September 2010/30/3.

[21] Sandeeps,GanesanA,MohanV.Development and updated of the diabetes atlas of India.Madras Diabetes Research foundation,Chennai.

[22] Naglaa MA, Mohamed EM .Effectiveness Of Health Education Program for Type 2 Diabetes Mellitus Patients Attending Zigzag University Diabetes Clinic, Egypt. Egypt Public Health Assoc. Vol. 85 No. 3 and 4,2010.

[23] KhaldonK.,Mohammad H., Fares H ,Ibrahim I. Diabetes Knowledge among Patients with Diabetes Mellitus at King Hussein Hospital .JRMS March 2012; 19(1): 72-77.

[24] Baradaran H, Knill JR .Assessing the knowledge, attitudes and understanding of type 2 diabetes amongst ethnic groups in Glasgow, Scotland PractDiabInt May 2004 Vol. 21 No. 4.

[25] Maxwell O., Cletus N., Chinwe V., Jegberime M, ObinnaP.Diabetes self-care knowledge among type 2 diabetic outpatients in south-eastern Nigeria, IntJ.Drug Dev.& Res. | Sept-December 2009 | Vol. 1 | Issue 1 | 85.

[26] Abera E. Patterns of chronic complications of diabetic patients in Menelik II Hospital, Ethiopia.Ethiop.j.Health dev.2000;14(1):113-116

[27] West JD, Goldberg KL. Diabetes self-care knowledge among outpatients at a veteran's affairs medical center. American Journal of Health-system Pharmacy 2002; 59 (9):849 –52.

[28] Hu J,GruberK,LiuH,Zaho H, Garcia A.Diabetes knowledge among older chinese adults with diabetes in Beijing,China.Journal of Clinical Nursing,2013,22(1-2),51-60.

[29] Shrestha A, Kosalram K, GopichandranV.Gender Difference in Care of Type 2 Diabetes, .JNMA Nepal Med Assoc, 2013; 52(189):245-50.

[30] AmudhaK.Knoweledge, attitude and practice among diabetic patient in Malysia.International journal of collaborative research on internal medicine and public health.2012.4 (5).