

Knowledge and Attitude About Diabetes Mellitus and Its Associated Factors Among People in DebreTabor Town, Northwest Ethiopia: Cross Sectional Study

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Abstract: Background: Diabetes mellitus is recognized as one of the emerging public health problems in developing countries. However, people's knowledge and attitude about diabetes mellitus have not been efficiently investigated in Ethiopia. Objective: This study was conducted to assess the knowledge and attitude about diabetes mellitus and its associated factors among people in Debre Tabor town, Northwest Ethiopia. Methods: A community based cross-sectional study design was conducted among people age 18 years and above in Debre Tabor town during June 10 to August 20, 2014. A total of 832 participants were selected by systematic random sampling technique. Data were collected using a pretested structured interviewer administered questionnaire and Epi info version 3.5.1 for data entry and SPSS version 20 for analysis used. Bivariate and multivariate analyses were used. Results: -Among 832 respondents, 408 (49%) participants had good knowledge and 329 (39.5%) participants had good attitude about diabetes mellitus. Educational status (Grade 1-8 AOR=2.6, 95% CI: 1.22-5.22, Grade 9-12 AOR=3.49, 95%CI: 1.68-7.22, and Certificate and above AOR=5.58;95%CI:2.73-11.44), family income per month (501-800Birr AOR=1.59,95%CI:1.07-2.40), 801-1450Birr AOR=1.61;95%CI:1.05-2.48, and ≥ 1451 Birr AOR=2.14; 95%CI:1.36-3.36) and family history of diabetes mellitus (AOR=3.89,95%CI :1.27-11.88) were significantly associated with good knowledge about diabetes mellitus. Educational status (Grade 1-8 AOR =2.53, 95 %CI: 1.24- 5.16, Grade 9-12 AOR=2.17, 95 % CI: 1.08-4.31 and Certificate and above AOR=3. 39, 95 % CI: 1.78-6.47) was significantly associated with good attitude towards diabetes mellitus. Conclusion and recommendation:- This study revealed a limited status in good knowledge and low in good attitude about Diabetes Mellitus. Comprehensive community based health education program about diabetes mellitus is necessary to improve this situation.

Keywords: Diabetes Mellitus, Knowledge, Attitude

1. Background

Diabetes mellitus has become a cause of growing public health concern in developing countries, as it has been for a long time in the most developed ones (1-3). Diabetes mellitus is also an important risk factor for blindness, vascular disease, brain diseases renal failure, and limb amputations (4, 5).

Diabetes is a major and growing public health problem affecting more than 171 million people worldwide and the number is expected to rise to 366 million by 2030 (3-5). The African region is expected to experience the highest increase in coming years with estimated increase in prevalence rates of 98%

for Sub-Saharan Africa and 94% for North Africa and the Middle East (6). Type 2 diabetes is responsible for 85-95% of all diabetes in high-income countries and over 90% of diabetes in Sub-Saharan Africa (5).

WHO estimated the number of diabetics cases in Ethiopia to be 800,000 by the year 2000, and the number is expected to increase to 1.8 million by 2030 (6). According to the 2011 report of the International Diabetes Federation (IDF), the number of adults living with diabetes in Ethiopia was 3.5% (7). A study done in Northwest Ethiopia shows the prevalence of diabetes mellitus among adults aged 35 years and above was 5.1% for urban and 2.1% for rural dwellers (8).

Many studies have generated varied results related to factors associated with knowledge and attitude about diabetes; however it is carried out in developed countries, leaving a gap in knowledge and attitude about the factors on diabetes mellitus in developing countries. There are gaps in knowledge and attitude relating to the diabetes mellitus and its factors which influence prevention and control of diabetes mellitus among people in Ethiopia. The greatest weapon in the fight against diabetes mellitus is knowledge. Information can help people to assess their risk of diabetes, motivate them to seek proper treatment and care, and inspire them to take charge of their diseases for their life time (9-11). Therefore, assessment of knowledge and attitude about diabetes mellitus and its associated factors is critical in the prevention and control of the diseases.

A community based study conducted in Waghodia, India (56%), Pakistan (60%) and Saudi-Arabia (77%) had good knowledge about diabetes mellitus (10, 12, 13).

The study conducted among people in Pakistan showed that knowledge regarding risk factor of sedentary life style; increased body weight and smoking were 76%, 66% and 70% respectively (12).

A population based study in Gujarat, India stated that knowledge on diabetes mellitus complications and importance of life style modification was low which is 5.0% and 2.5% respectively (14). A study done in Saudi- Arabia indicates that 88% of respondents knows about DM, 84% knows the causes of DM and 78% knows DM affects all parts of the body (15).

A cross-sectional study done in India shows that 85.9% of participant had good knowledge about DM, 64 % had poor attitude regarding diabetes mellitus, and 87.6% knew about what to eat, 11.8% knew about normal blood Glucose level, 24.7 % knew about body mass index related to diabetes mellitus and 48.6 % knows about complication of diabetes mellitus, and regarding the attitude 59.4 % of the respondents think that DM affects all daily activity, 30.9% respondents believe DM patient can eat all types of food at any time (16).

A study done in Tarlai, Pakistan showed 43% respondents had awareness about diabetes mellitus, but 85.3% had poor healthy eating habits, 77 % respondents which reported as never going for regular checkups to any health care organizations (17).

A study done in Semi-Urban community of Omani population showed respondents had good knowledge about definition of DM (46.5%), symptoms of DM (57%) , complications of DM (55.1%) and 49.9% of respondents perceived that high consumption of dietary sugar is an important risk factors for developing diabetes mellitus (18) .

The community based study done in Wagodia, India showed that good attitude (17.6%), and they respond positively on uses of planned diet (35%), checking blood glucose level (84%), and regular exercise (74%) for prevention and control of diabetes mellitus (10).

The community based study done in South Africa showed had good knowledge (66.9%) and had good attitude regarding diabetes (52%) (11). As study conducted in Nigeria,

showed that 80.2% participants knew what diabetes is, its sign, symptoms and complications, however 75.0% of subjects did not know the major causes of diabetes and regarding knowledge of management of diabetes, 88.5% and 74.0% did not know how to avoid complications and prevent/control diabetes respectively (19).

A community based study done in Kenya showed that respondents had good knowledge (27.2%) and had good attitude(49%),and had good practices (41%) towards diabetes mellitus, 50.7% of people with good knowledge of diabetes had good practices as compared to 37.4% of people with poor knowledge of diabetes had good practices. Conversely, 49.3% of those with good knowledge had bad practices compared to 62.6% of those without knowledge and 49% of the respondents had a positive attitude towards diabetes (20).

A cross- sectional study done in Bahir Dar ,Northwest Ethiopia showed that 49.8% of respondents had good knowledge about diabetes mellitus, 53.2 % of respondents thought that diabetes mellitus can affected all part of the body which raised blood glucose level , 60% of the respondents knew life style modification is the management of diabetes mellitus (21).

A community based study in India showed that male being more active in self care and information seeking about diabetes mellitus than females (16). Although different studies showed contradictory results about gender and level of knowledge, which stated that female had lower level of knowledge regarding different aspects of diabetes related question compared with male (16,22).

A community based study done in Jordan showed that low level of knowledge and poor attitude was related to illiteracy, low income and low self care(23, 24).

A study done on Scotland showed that there was statistically significant association between good knowledge and educational status (25,26). A community based study done on Nepal showed that the difference in the literacy, training received by health provider and availability of information on diabetes was factors contributed to high level of knowledge and attitude about diabetes (27).

A study done in Tarlai , Pakistan indicates a positive family history diabetes mellitus was found to be associated with high level of awareness about DM , as 65% of adults with a family history were aware of Diabetes Mellitus, while only 32% of people without a positive family history were aware of the disease (17).

A cross-sectional study done on Knowledge, Attitude and Practices about DM in Sarastha region, India showed that poverty, few number of endocrinologist and low level of education may be responsible for low level knowledge and poor attitude about DM Very limited time spared by physicians for education and early detection of complication was a factor for poor knowledge, attitude and practice of diabetes mellitus (14).

A study conducted in South Africa showed that a higher knowledge in female than male and decreased of 3% in knowledge score of diabetic mellitus for every 10 year

increase in age (22). A community based studies in Egypt showed elders had low level of knowledge and poor attitude about diabetes than younger ones and it reports that a significant positive relationship between high level of education, working status and income with good knowledge about diabetes mellitus (23).

A community based study done in Kenya showed that a significant association between level of education and good knowledge and good attitude of diabetes was demonstrated, which 52% of those who had good knowledge had tertiary education, 25% had secondary education, and 14% had primary education while 9% had no formal education (20).

Across sectional study done in Bahir Dar, Northwest Ethiopia showed that Age, educational status, income, family history of diabetes mellitus, occupational status, urban residence, sources of information form health professional a significant association with good knowledge(21).

2. Participants and Methods

2.1. Study Design, Period and Area

A community based cross-sectional study using quantitative method was conducted. The study was conducted in Debre Tabor town, South Gondar zone, Northwest Ethiopia from June 20- August 10, 2014 and 99kms away from Bahir Dar City and 667 Kms away from Addis Ababa, capital of Ethiopia.

2.2. Study Population

Selected households found in Debretabor town during the study period. Individual household that lives in the town for at least 6 months and above, during the study period was included.

2.3. Variables

Knowledge about diabetes mellitus and Attitude about diabetes mellitus was dependent variable. Age, sex, marital status, educational status, occupational status, family income, have television and/or radio, personal history of diabetes mellitus, Family history of diabetes mellitus, exposure to health education about diabetes mellitus were independent variables.

2.4. Sample Size Determination and Sampling Procedures

Sample size was calculated using single population proportion formula. By taking the assumption 50% of respondents has good knowledge about diabetes mellitus, 95% confidence interval and setting alpha at 5% and design effect 2 , a total of 845 sample size was calculated. The sample size was allocated proportional to the size of households in each selected kebeles (the smallest administrative unit in Ethiopia). The number of households was taken from each kebele administrative office. The sampling interval of households in each kebeles was determined by dividing the total number of households to the allocated sample size. The initial

interviewed households were selected by lottery method from the sampling interval nearest to each kebele administrative offices, using a number between one and sampling interval. After selecting the first household, the subsequent households were selected using systematic sampling technique. If there were no respondent in the household around in the selected HHs in two visits the next household was interviewed till the number of sample size achieved.

2.5. Data Collection

Data were collected using a structured questionnaire adopted from reviewing literatures. The instrument consisted of three sections: background information, general questions on knowledge about diabetes mellitus and respondent's attitude about diabetes mellitus. Four data collectors and two supervisors were recruited and face to face interview was the technique of data collection; if the selected respondent was not found at home during the first visit, one additional visit was undertaken by data collectors. Data collection tool were initially prepared in English and were translated in to Amharic (local language) and again re-translated back to English to check for any inconsistencies in the meaning of words and concepts.

2.6. Scoring

A set of questions about knowledge and attitude about diabetes mellitus and its associated factors was used to obtain the mean scores. The mean score was used to classify the knowledge level of the respondents in to two groups (good and poor). Respondents who scored mean ≥ 9.86 of the correct answers were classified as good knowledge, less than 9.86 of correct answers were classified as poor level.

Likert's scale was applied to measure the attitude. All individual answers to attitudinal questions was computed to obtain total scores and calculated for means. The mean scores were used to divide the participants into two groups; good, and poor. Respondents scored mean 3.21 was considered as having good attitude, and less than 3.21 as poor attitude.

2.7. Data Quality Assurance

To assure quality, data collectors and their supervisor were trained for two days in role play form and pretesting of the instrument was conducted before the actual data collection. The supervisor and principal investigator closely supervised the performance of the data collectors on a daily basis and the collected record sheets were thoroughly scrutinized every day at the end of data collection session. The data were thoroughly cleaned just before coded and carefully entered in to EPIinfo to minimize the error.

2.8. Data Management and Analysis

The data were coded, checked for completeness and consistency. The data were entered into EPI Info version 3.5.1 and exported to SPSS version 20 statistical software for its analysis. Cronbach's alpha was used to test internal reliability of attitude items and a factor loading of 0.3 or

greater was the criterion used to retain items. Both bivariate and multivariate analyses were done. All variables with a p-value <0.2 in the bivariate analysis were further fit to multivariate logistic regressions for better prediction of determinants. The Hosmer-Lemeshow goodness-of-fit statistic was used to assess whether the necessary assumptions for the application of multiple logistic regression were fulfilled. Crude and adjusted odds ratio with 95% confidence intervals were computed. P- Value less than 0.05 was taken as statistically significant.

2.9. Ethical Consideration

The study was ethically approved by research ethical committee review board of University of scGondar. Before commencing data collection legal permission with letter of support was obtained from Debre Tabor town health office. All the study participants were informed about the purpose of the study and their right to refuse. Informed consent was obtained from every respondent. Strict confidentiality was also maintained through coding of questionnaire anonymously.

3. Results

3.1. Socio Demographic Characteristics

Out of 845 study participants planned 832 were participated in the study giving response rate 98.5 %. More than half 470(56.5%) of them were male. The mean age of the respondents was 32.9years (SD=11.92). With respect of marital status 51.1%, were married .Majority (84.4%) of the participants were orthodox christen followers. Regarding the ethnic profile of study, majority (98.7%) of them were

Amhara in ethnicity. Concerning the educational status 47.4% had certificated and above. Two hundred ninety (34.9%) were civil servant. Majority, 214 (25.7%) had 501-800 birr family income per month. Ninety (2.3%) and eight (1.0%), had family and personal history of diabetes mellitus respectively. Majority 721 (86.7%) have television and /or radio. Seven hundred nine (85.2%) had exposure of health education about diabetes mellitus by health care providers

3.2. Respondents Awareness and Source Information about Diabetes Mellitus

All respondents heard of diseases called diabetes mellitus. Regarding sources of information about diabetes mellitus, the respondents had information from multiple sources such as 51.2%,48.8%,48.2% and 3.8% of the respondents have heard about diabetes mellitus from Media ,health care providers, relatives /friends and others(Religious leader, Teachers etc...) respectively.

3.3. Knowledge and Attitude about Diabetes Mellitus

A total of 408 (49%) participants had good knowledge about diabetes mellitus. The mean (+SD) knowledge score about diabetes mellitus of study subjects was 9.86 (+4.28) with a maximum possible score of 25. More than half 501(60.3%) of study subjects know about the definition of diabetes mellitus while 225 (39.1%) had good knowledge about symptoms of DM. 391(49%) of participants could correctly identify the cause /risk factors of DM while 441(53%) could not. Only 366(44%) respondents had good knowledge on control and management of DM. Four hundred eighty one (57.8 %) participants had good knowledge about complication diabetes mellitus (Figure 1).

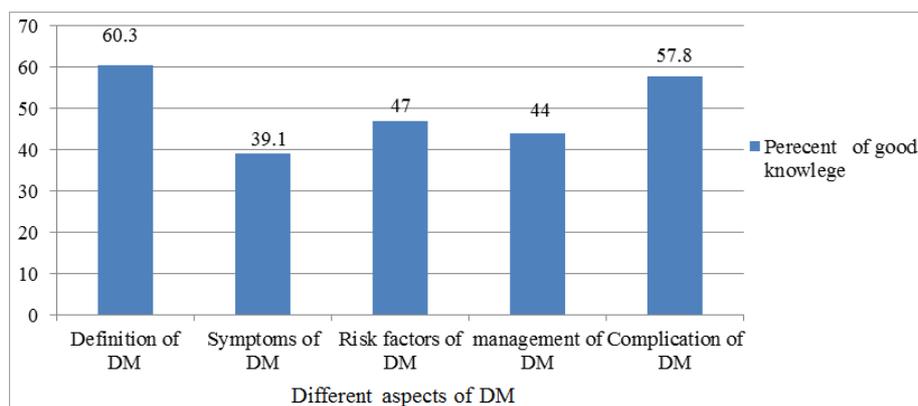


Figure 1. Percentage distributions of respondents by level of knowledge on different aspects of diabetes mellitus, Debre Tabor town, 2014.

As Table 1 Showed, respondents correctly stated that diabetes mellitus are not curable (51.3%), diabetes can affects all parts of body (43.3%), and diabetes is a condition of high level of sugar in the blood (41.2%).Most 649 (78%) of respondents correctly stated that frequent hunger is a symptom of diabetes mellitus, while 399(48%) said frequent thirst is a symptom of diabetes. The correct answer on risk factors of diabetes mellitus for obesity, sedentary life, and family history of diabetes mellitus, older age and pregnancy

were 35.9%, 33.7%, 32.6% 26% and 21.9% respectively. Regarding to the control and management of diabetes mellitus, the correct response was mentioned by respondents include insulin injection 477 (57.3%), practices healthy diet 466 (56%), orally taken tablets 276 (33.2%), regular exercise 270(32.5%), weight reduction 249 (29.9%), medical checkup of feet and toes 194 (23.3%) and medical eye check up and care 138 (16.6 %).

The correct answers on complication of DM mentioned by

respondents for brain diseases , hypertension ,blindness , 35.3%, 33.2%, and 29.3 % respectively (Table 1). amputation of limb and kidney problem were 47.5%, 37.9%,

Table 1. Frequency distribution of participants response of knowledge towards diabetes mellitus, Debre Tabor town, 2014(n=832).

Variables	Yes No. (%)	No No. (%)	Don't know No. (%)
What is/are diabetes mellitus			
DM is a condition of insufficient insulin production	259 (31.1)	396(47.6)	177(21.3)
DM is a condition of high level of sugar in the blood	343(41.2)	315(37.9)	174(20.9)
DM is not curable	427(51.3)	300(36.1)	105(12.6)
DM is a condition of the body which not responding for insulin	194(23.3)	425(51.1)	213(25.6)
DM is diseases which affect any part of body	360(43.3)	305(36.7)	167(20.1)
What is/are the symptoms of diabetes mellitus			
Frequent hunger	649(78.0)	124(14.9)	59(7.1)
Frequent thirst	399(48.0)	310(37.3)	123(14.8)
Frequent urination	372(44.7)	329(39.5)	131(15.7)
Blurred vision	164(19.7)	488(58.7)	180(21.6)
Slow healing of cuts and wounds	239(28.7)	424(51.0)	169(20.3)
Risk factors of diabetes mellitus			
Older age	216(26.0)	404(48.6)	212(25.5)
Genetic or family history of diabetes mellitus	271(32.6)	383(46.0)	178(21.4)
Obesity	299(35.9)	363(43.6)	170(20.4)
Pregnancy	182(21.9)	404(48.6)	246(29.6)
Sedentary life	280(33.7)	363(43.6)	189(22.7)
Control and management DM			
Insulin injection is available for control and mgt of diabetes mellitus	477(57.3)	261(31.4)	94(11.3)
Tablets and capsule are available for control and mgt of diabetes mellitus	276(33.2)	380(45.7)	176(21.2)
Regular Exercise	270(32.5)	383(46.0)	179(21.5)
Practices healthy diet	466(56.0)	234(28.1)	132(15.9)
Medical eye check up and care	138(16.6)	469(56.4)	225(27.0)
Feet and toes medical check up and care	194(23.3)	430(51.7)	208(25.0)
Weight reduction	249(29.9)	392(47.1)	191(23.0)
Complication of diabetes mellitus			
Blindness	294(35.3)	352(42.3)	186(22.4)
Vascular diseases and hypertension	315(37.9)	359(43.1)	158(19.0)
Kidney problem	244(29.3)	398(47.8)	190(22.8)
Brain diseases	395(47.5)	286(34.4)	151(18.1)
Amputation of limb	276(33.2)	383(46.0)	173(20.8)

Respondents were asked about their attitude towards selected statements that other people usually makes regarding the consequences of diseases in the family and society , management of diabetes mellitus . Their responses were organized under five categories; strongly agree, agree, neutral, disagree, and strongly disagree. Three hundred twenty nine (39.5%) respondents were had good attitude towards diabetes mellitus .The mean (+SD) attitude score of respondents was 3.21+ 1.7 with maximum score of 7. The survey results were summarized based on the frequency distribution data. Among respondents 178 (21.4%) strongly agreed and 166 (20%) agreed to the statement “I don’t mind if others know that I am with diabetes mellitus” and 287(34.5%) of respondents disagreed to the same statement.

For the question “Do you think that you should be examined for diabetes mellitus”, 32.1%, 29.2%, 20.8%,11.2%, and 6.7% of the respondents agreed, disagreed , strongly agreed, strongly disagreed and neutral respectively. Among respondents 246 (29.6%) agreed and 130 (15.6 %) strongly agreed to the question of “ Do you think that family members should be examined or screened

for diabetes mellitus” where as 281 (33.8%) disagreed and 106 (12.7%) strongly disagreed for the same statement.

Among respondents 269(32.3 %) agreed and 246 (29.6%) disagreed for the question of “Do you think support from family and friends is important in dealing with diabetes”.

The respondents were asked to give their perception about control of DM by statements of “ Do you think that we follow avoiding of consumption too much sugar to control DM” , 31.7% ,25.1%,23.3% 11.4% and 8.4% of respondents disagreed, agreed, strongly agreed , strongly disagreed and not sure respectively .

The respondents were asked to give their perception about the effect of DM on various socio-economic issues. To the statement “Diabetes mellitus is not seriously affects the marital relationship “. 241(29. %) agreed, 221(26.6%) disagreed, 213 (25.6 %) strongly agreed and 85(10.2%) strongly disagreed. Similarly for the statement “ I don’t think diabetes mellitus affect seriously daily activities/income generation activities “, 447(53.7%) disagreed, 118(14.2%) agreed, 108(13 %) Strongly agreed and 76 (9.1%) were strongly disagreed (Table 2).

Table 2. Frequency distributions of respondents of attitude towards diabetes mellitus, Debre Tabor town, 2014 (n=832).

Response to attitude questions	Description	Frequency	%
I don't mind if others know that I am with diabetes mellitus	Strongly agree	178	21.4
	Agree	166	20
	Neutral	37	4.4
	Disagree	287	34.5
	Strongly disagree	164	19.7
	Total	832	100
Do you think that you should be examined for diabetes mellitus	Strongly agree	173	20.8
	Agree	267	32.1
	Neutral	56	6.7
	Disagree	243	29.2
	Strongly disagree	93	11.2
	Total	832	100
Do you think family members should be screened for diabetes mellitus	Strongly agree	130	15.6
	Agree	246	29.6
	Neutral	69	8.3
	Disagree	281	33.8
	Strongly disagree	106	12.7
	Total	832	100
Do you think support from family and friends is important in dealing with diabetes mellitus	Strongly agree	176	21.2
	Agree	269	32.3
	Neutral	50	6.0
	Disagree	246	29.6
	Strongly disagree	91	10.9
	Total	832	100
Do you think should we follow avoiding of consumption of too much sugar for controlling of DM	Strongly agree	194	23.3
	Agree	209	25.1
	Neutral	70	8.4
	Disagree	264	31.7
	Strongly disagree	95	11.4
	Total	832	100
Diabetes mellitus is not seriously affects the marital relationship	Strongly agree	213	25.6
	Agree	241	29.0
	Neutral	72	8.7
	Disagree	221	26.6
	Strongly disagree	85	10.2
	Total	832	100
I don't think diabetes mellitus seriously affect daily activities	Strongly agree	108	13.0
	Agree	118	14.2
	Neutral	83	10.0
	Disagree	447	53.7
	Strongly disagree	76	9.1
	Total	832	100

3.4. Factors associated with Knowledge Attitude about Diabetes Mellitus

Educational status, Family income and Family history of diabetes mellitus were significant association with good knowledge at 5% level of significance.

Participants in grade 1-8 were 2.6 times (AOR =2.60, 95 % CI: 1.22-5.52), those in grade 9-12 were 3.5 times (AOR=3.49, 95 % CI: 1.68-7.22), and those with certificate and above were 5.6 times (AOR=5.58, 95 % CI: 2.73-11.44) more likely to have good knowledge as compared to those who unable to read and write.

The likelihood of good knowledge among individuals who had family income per month 501-800 Birr 1.6 times (AOR=1.59, 95 % CI: 1.07-2.40), those who had 801-1450 Birr 1.6 times (AOR =1.61, 95% CI: 1.05-2.48) and those who had \geq 1451 birr 2.1 times (AOR=2.14, 95%CI: 1.36-3.36) higher compared to those who had family monthly income \leq 500 Birr.

The likelihood of good knowledge about diabetes mellitus among individuals who had family history of diabetes mellitus 3.9 times (AOR =3.89, 95%CI: 1.27-11.88) higher compared to individuals who haven't family history of diabetes mellitus (Table 3)

Table 3. Binary logistic regression output showing factor affecting knowledge about diabetes mellitus, Debre Tabor town, 2014 (n=832).

Variables	knowledge		COR(95%CI)	AOR(95%CI)
	Good No. (%)	Poor No.(%)		
Sex				
Male	260(55.3)	210(44.7)	1	-
Female	148(40.9)	214(59.1)	0.55(0.42,0.74)	
Age category				
≤24	105(48.6)	111(51.4)	1	-
25-30	141(54.9)	116(45.1)	1.28(0.89,1.84)	
31-40	87(46.8)	99(53.2)	0.93(0.62,1.37)	
≥41	75(43.4)	98(56.6)	0.81(0.54,1.21)	
Marital status				
Single	177(51.3)	168(48.7)	1	-
Married	206(48.5)	219(51.5)	0.89(0.67,1.18)	
Divorced/Separated	16(38.1)	26(61.9)	0.58(0.30,1.12)	
Widowed	9(45)	11(55)	0.77(0.31,1.92)	
Educational status				
Unable to read and write	11(17.5)	52(82.5)	1	1
Read and write	15(20.5)	58(79.5)	1.22(0.51,2.89)	1.03(0.43,2.47)
Grade 1-8	51(40.5)	75(59.5)	3.21(1.53,6.74)	2.6(1.22,5.52)*
Grade 9-12	81(46)	95(54)	4.03(1.97,8.23)	3.49(1.68,7.22)**
Certificate and above	250(63.5)	144(36.5)	8.21(4.15,16.23)	5.58(2.73,11.44)**
Occupational status				
Unemployed	50(42.4)	68(57.6)	1	-
Civil servant	186(62.1)	110(37.9)	2.23(1.44,3.44)	
House wife and farmer	41(33.9)	80(66.1)	0.69(0.41,1.18)	
Merchant	72(44.4)	90(55.6)	1.09(0.68,1.76)	
Private worker	65(46.1)	76(53.9)	1.16(0.71,1.90)	
Family income per month				
≤500	72(33.8)	141(66.2)	1	1
501-800	95(44.4)	119(55.6)	1.56(1.05,2.31)	1.59(1.07,2.40)*
801-1450	107(53.8)	92(46.2)	2.27(1.53,3.39)	1.61(1.05,2.48)*
≥1451	134(65)	72(35)	3.64(2.43,5.45)	2.14(1.36,3.36)**
Family history of DM				
Yes	14(73.7)	5(26.3)	2.94(1.05,8.24)	3.89(1.27,11.88)*
Don't know	14(41.2)	20(58.8)	0.73(0.36,1.47)	0.87(0.41,1.83)
No	380(48.8)	399(50.2)	1	1
Exposure to health education about DM				
Yes	357(50.4)	352(49.6)	1.43(0.97,2.11)	-
No	51(41.5)	72(58.5)	1	
Have television/radio				
Yes	370(51.3)	351(48.7)	2.02(1.33,3.07)	-
No	38(34.2)	73(65.8)	1	

* P <0.05, ** P<0.01

Educational status was significant association with good attitude towards diabetes mellitus at 5% level of significance.

Participants in grade 1-8 were 2.5 times (AOR

=2.53,95 %CI :1.24- 5.16),those in grade 9-12 were 2.2 times (AOR=2.17,95 % CI :1.08-4.31), and those with certificate and above were 3.4 times (AOR=3.39 ,95 % CI :1.78-6.47)

more likely to have good attitude as compared to those who unable to read and write (Table 4).

Table 4. Binary logistic regression output showing factor affecting attitude about diabetes mellitus, Debre Tabor town, 2014 (n=832).

Variables	Attitude		COR(95%CI)	AOR(95%CI)
	Good No. (%)	Poor No. (%)		
Sex				
Male	194 (41.3%)	276 (58.7)	1	-
Female	135(37.3)	227(62.7)	0.85(0.64, 1.12)	
Age category				
≤24	93(43.1)	123(56.9)	1	-
25-30	102(39.7)	155(60.3)	0.87(0.63,1.26)	
31-40	79(42.5)	107(57.5)	0.98(0.66,1.45)	
≥41	55(31.8)	118(68.2)	0.62(0.41,0.94)	
Marital status				
Single	142(41.2)	203(58.8)	1	-
Married	161(37.9)	264(62.1)	0.87(0.65,1.17)	
Divorced /Separated	18(42.9)	24(57.1)	1.07(0.56,2.05)	
Widowed	8(40.0)	12(60.0)	0.95(0.38,2.39)	
Educational status				
Unable to read and write	13(20.6)	50(79.4)	1	1
Read and write	24(32.9)	49(67.1)	1.88(0.86,4.12)	2.01(0.92,4.43)
Grade 1-8	48(38.1)	78(61.9)	2.37 (1.17,4.80)	2.53(1.24,5.16)*
Grade 9-12	62(35.2)	114(64.8)	2.09(1.05,4.15)	2.17(1.08,4.31)*
Certificate and above	182(46.2)	212(53.8)	3.30(1.74,6.27)	3.39(1.78,6.47)**
Occupational status				
Unemployed	44(37.3)	74(62.7)	1	-
Civil servant	128(44.1)	162(55.9)	1.33(0.86,2.06)	
House wife/farmer	41(33.9)	80(66.1)	0.86(0.51,1.46)	
Merchant	62(38.3)	100(61.7)	1.04(0.64,1.70)	
Private worker	54(38.3)	87 (61.7)	1.04(0.63,1.73)	
Family income				
≤500	71(33.3)	142(66.7)	1	-
501-800	80(37.4)	134(62.6)	1.19(0.80,2.1.78)	
801-1450	82(41.2)	117(58.8)	1.40(0.94,2.09)	
≥1451	96(46.6)	110(53.4)	1.74(1.18,2.59)	
Family history of DM				
Yes	6(31.6)	13(68.4)	0.70(0.26,1.86)	
Don't know	13(38.2)	21(61.8)	0.94(0.46,1.90)	
No	310(39.8)	469(60.2)	1	-
Exposure to health education about DM				
Yes	280(39.5)	429(60.5)	1.14(0.75,1.72)	
No	49(39.8)	74(60.2)	1	-
Have television/radio				
Yes	288(39.9)	433(60.1)	1.14(0.75,1.72)	
No	41(36.9)	70(63.1)	1	-

* P <0.05, ** P<0.01

4. Discussions

Overall 408 (49%) participants had good knowledge about diabetes mellitus. This study demonstrated lower level of knowledge about diabetes mellitus, as compared to a study done in Waghodia, India (56%), Pakistan (60%) and Saudi-Arabia (77%)(10,12, 13), and it is higher as compared to a community based research done in Kenya (27%) (20). This difference may be due to the study area not include the rural area as a study done in Kenya is both urban and rural area ,and lack of organized diabetics education facilitates and less participations of media and NGO in awareness creation

about diabetes mellitus as compared to Pakistan and Saudi-Arabia.

More than half 501(60.3%) of study subjects knew about the definition of diabetes mellitus, while 225(39.1%) had good knowledge about symptoms of DM. Three hundred ninety one (49%) could correctly identify the cause /risk factors of DM while 441(53%) could not. Only 366(44%) respondents had good knowledge about control and management of DM. 481 (57.8 %) had good knowledge about complication diabetes mellitus.

This study was consistent with a study done in Semi-Urban community of Omani population showed respondents had

good knowledge about definition of DM (46.5%), symptoms of DM (57%) and complications of DM (55.1%) (18).

This study demonstrated higher knowledge on different level of knowledge about diabetes mellitus as compared to a similar study in Kenya, which showed respondents had good knowledge on definition of DM (29%), signs and symptoms of diabetes (29%), risks of diabetes mellitus (26.1%) and complications of diabetes (26.4%) (20) and the finding is lower compared to a study done in Nigeria, which showed that 80.2% participants knew what diabetes is, its signs & symptoms and complications (19).

This study showed that respondents correctly stated that diabetes mellitus is not curable (51.3%), diabetes can affect all parts of body (43.3%), and diabetes is a condition of high level of sugar in the blood (41.2%). This study is supported by a study done in Bahir Dar which 53.2% study participants knew that diabetes mellitus can affect all parts of the body (21).

In this study respondents correctly stated that frequent hunger (78%), frequent thirst (48%) are a symptom of DM and obesity (35.9%), sedentary life (33.7%), family history of DM (32.6%), older age (26%) and pregnancy (21.9%) are risks of DM. This study results regarding knowledge about risk factors about DM was lower compared to a study conducted in Pakistan which showed that participants had good knowledge regarding risk factors of sedentary life style (76%) & body weight (66%) (16).

The finding of this study showed that insulin injection (57.3%), practices healthy diet (56%) and orally taken tablets were ways of controlling and management of diabetes mellitus. Another finding of this study was indicated limited knowledge on complications of diabetes mellitus, which are brain diseases (47.5%), hypertension (37.9%), blindness (35.3%), amputation of limb (33.2%) and kidney problem (29.3%).

This could be occurred due to inadequate level of information, poor source of information, poor enrolment of Media and NGOs to community on risk factors and consequences of the diseases compared to other countries. Because respondents had disparity of knowledge about the ways of preventing & control of DM and diabetic related complications, thus preventing measures included complying drug treatment, dietary management and regular exercise, medical check of eye and extremity is important.

Over all 329 (39.5%) respondents were had good attitude towards diabetes mellitus. This study demonstrated lower level of attitude regarding diabetes mellitus compared to a study conducted in Kenya (49%) & South Africa (52%) and higher in Waghodia, India (17.6%) (10,11,20). This difference may be due to different in illiterate of the study participants, lack of health care access, poor health education and behavioral change regarding diabetes mellitus.

The finding of this study showed, 344 (41.4%) of the respondents had had strongly agreed and agreed that "they don't mind if others know that they are with diabetes mellitus". and 403 (48.4%) respondents had good attitude that "they think that they follow avoiding of consumption too much sugar

to control DM". This result is consistent with a study done in Omani population which indicated 49.9% of respondents perceived that high consumption of dietary sugar is an important risk factor for developing diabetes mellitus (18).

On the other hand respondents had good attitude on importance screening of diabetes mellitus (52.9%), importance of screening for family members on DM (45.2%), importance of support from friends and family about DM (54.5%) and DM is not seriously affect the marital relationship (54.6%) and DM is not seriously affect the daily activities (27.2%). This would be important status for health education programs by making respondents less feel of potential stigma for diabetes, advice about risk of high consumption of sugar, advice the importance of early identifying the disease condition and the need of support from others.

Good knowledge had a significant association with educational status of the respondents. Respondents having certificate and above had six fold, those grade 9-12 had four fold and those in grade 1-8 had three fold increased knowledge level when compared to those who were unable to read and write. This study was supported by study conducted in Punjab were five times more good knowledge about DM who had high education as compared to the unable to read and write illiterate (28), and a study conducted in Bahir Dar, which those participants were in grade 1-8, grade 9-12, 12 and those who attended higher education and above were three times, five times and seven times respectively more likely to have good knowledge as compared to those who were unable to read and write (21). This could be used for respondents who had at least primary educational status having higher chance of exposure to different IEC materials like leaflet, manual and they have no barriers in communicating with health care team, and they may grasp knowledge correctly.

Good knowledge among respondents who had family income per month \geq 1451 Eth Birr three folds, those who had family income per month 801-1450 Eth. Birr two folds and those who had family income per month 1.6 folds increased as compared to who had family income per month \leq 500 Eth. Birr. This finding was consistent with study conducted in Gujarat, India and Malaysia (9, 14). This might be explained participant who had low income, cannot afforded to check up in private clinic without waiting the regular consultation time arranged by health institution and by community. Resources are necessarily for sustained life style modification or behavioral change and lack of resources could be a barrier for life style modification.

Good knowledge had a significant association with family history of diabetes mellitus of the respondents. The likelihood of good knowledge among individuals who had family history of diabetes mellitus four folds increased knowledge level when compared to those who haven't family history diabetes mellitus. This may be due to sharing of information about diabetes mellitus among family members and used to enhancing the awareness and support each other.

Good attitude towards DM had a significant association

with educational status of the respondents. Respondents having certificate and above had four fold, those grade 9-12 had three fold and those in grade 1-8 had two fold increased knowledge level when compared to those who were unable to read and write. This used to proper education and awareness programs have previously been shown to change the attitude of the public regarding diabetes. Improving knowledge of the people can improve their attitude towards diabetes and in the long run change their practices to embrace healthier lifestyles such as eating healthy foods, and engaging in physical activity (29,32). Such practices will minimize the risks for diabetes in the general public and delay the onset of complications in those already diabetic.

5. Strength and Weakness

5.1. Strength

To enhance the quality of the data we used community based data collection that can represent the community.

5.2. Weakness

Like most other health studies data from cross sectional studies, by its nature has a defect to detect causes and affect relationship. The study did not include homeless and street people.

6. Conclusions

This study revealed a low status of knowledge and attitude about diabetes mellitus among people in Debre Tabor town. Educational status, family income and family history of diabetes mellitus were the factors associated with good knowledge of participants about diabetes mellitus. Educational status was factors associated with good attitude of participants towards diabetes mellitus

Authors' Contribution

AA: Conceptualized the research problem, designed the study, prepared the proposal, conducted field work, and analyzed the data, manuscript writing.

GA: Revised the proposal, participated in data analysis and the report revision

DN: Revised the proposal, participated in data analysis and the report revision

AF: Revising the proposal, participated in data analysis and preparing the manuscript for publication

GA: Revising the proposal, participated in data analysis and preparing the manuscript for publication

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References

- [1] Eugene Braunwald, Kurt J. Isselbacher, Jean D Wilson. Harrison's Principle of Internal medicine, *Mcgraw-Hill*, 14th Edition, 1998 ;2:2060-2080
- [2] WHO, Prevention of diabetes mellitus, Geneva ,199 ;844:5-18
- [3] Hall et.al. Diabetes in Sub-Sahara Africa 1999-2011:Epidemiology and public health implication ,a systematic review , *BMC public health*, 2011;11(564):1-12
- [4] WHO, Definition, Diagnosis and Classification of Diabetes Mellitus and its complications. Report of a WHO Consultation (Part 1). Geneva ,1999;18:31-33
- [5] Motala AA,Omar MA, Pirie FJ. Diabetes in Africa, Diabetes micro vascular and macrovascular disease in Africa. *J Cardiovascular Risk*. 2003;10(2):97-102
- [6] Gill GV, Mbanya JC, Tesfaye S, ASub-Sahara African prospective of diabetes, *Diabetologia* ,2009;52:8-16
- [7] Whiting DR, Guariguata L, Weil C, Shaw J: IDF diabetes atlas: Global estimates of the prevalence of diabetes for 2011 and 2030.*Diabetes Res Clin Pract* ,2011,94(3):311-321.
- [8] Abebe et.al. Diabetes mellitus in Northwest Ethiopia: A community based study , *BMC Public Health* 2014,14(97):1-8 <http://www.biomedcentral.com/1471-2458/14/97>
- [9] Amudha K,knowledge, Attitude, and Practices among diabetic patient in Malaysia, *International Journal of Collaborative Research on Internal medicine and Public Health*,2012; 4(5):723-732
- [10] Gunvanti B Rathod et.al.,Study of knowledge, Attitude and Practices of general population of Waghodia towards diabetes mellitus, *IJCRR* , 2014;(1):63-68
- [11] Moodley L, Rambiritch V, Assessment of the level of knowledge about Diabetes patients in primary health care setting, *SA Fam Practives*,2007;49(10):16-21
- [12] Naheed G, Knowledge, Attitude and Practices of type 2 Diabetes Mellitus *J Ayub Med Coll Abbottabad* , 2010;22(3):128-131
- [13] Saadia Z Saadia Z, Rusdi S, Alsheha M, Saeed H, Rajab M: A study of knowledge, attitude and practices of Saudi women towards diabetes mellitus. A KAP STUDY IN AL- QASSIM REGION. *The Internet Journal of Health* 2011, 11:1-9
- [14] Viral N, Shah P, Assessing the knowledge ,attitude, and practices of type 2 diabetes mellitus patients of Saurashtra Region ,*Gujrat Int J Diabetes Dev* 2009;29(3):118-122
- [15] Syed S.Habib ,Risk factors ,Knowledge and Health status in Diabetes patients ,*Saudi Med J* 2003; 24 (11):1219-1224
- [16] Mukhopadhyay, et.al, Perception and Practices of patients with type II diabetes mellitus, *International Journal of Dev*, 2010:30(3).

- [17] Osman S, Raheel Y, Tanya A, Investigating the awareness level about Diabetes Mellitus and associated factors in Tarlai (Rural Islamabad), *JPMA*, 2009;59(11):798-802
- [18] Mohammed A Al Shafae *et al.* Knowledge and perceptions of diabetes in a semi-urban Omani population. *BMC Public Health*, 2008;8(24):1-8 <http://www.biomedcentral.com/1471-2458/8/249>
- [19] Oklie V, knowledge of diabetes management and control by diabetes patients at federal medical center Nigeria, *International journal of medicine and medical science*, 2009;7(2)
- [20] William K. Knowledge, Attitude and Practices related to diabetes among community members in four provinces in Kenya: *Pan African Medical Journal*, 2010;7(2):1-10 <http://www.panafrican-medjournal.com/content/article/7/2/full>.
- [21] Solomon A, Chalachew M, Hawult T. Assessment of the Level and Associated Factors with Knowledge and Practice of Diabetes Mellitus among Diabetic Patients Attending at Felege Hiwot Hospital, Northwest Ethiopia. *Clinical Medicine Research*, 2013;(2):6;110-120
- [22] Alla MA: Diabetes in Sub-Saharan Africa: Kenya, Mali, Mozambique, Nigeria, South Africa and Zambia. *Int J Diabetes Dev Ctries* 2008, 28(4):101-108.
- [23] Naglaa MA ,Mohamed EM, Effectiveness of health education program for type 2 diabetes mellitus patients attending Zigzag University Dibatec clinic in Egypt ,*Egypt Public Health Association* , 2010:85 (3)
- [24] Khaldon K , Mohmmmed H, Fares H, Diabetes knowledge among diabetes mellitus at king Hussien Hospital ,*JRMS*, 2012;19(1):72-77
- [25] Baradaran H, Knil JR, Assessing the knowledge ,Attitude and Understanding of type 2 diabets amongst ethnic group in Glasgow, *Scotland pract Diab Int*, 2004;21 (4):143-148
- [26] Maxwell O, Cletus N ,Diabetes self care knowledge among type 2 diabetes patients outpatient south Eastern Nigeria, *Int j Drug Dev and Research* ,2009; 1(1):85-104
- [27] Dinsh K, Knowledge , Attitude, practices about diabetes mellitus patient western Nepal *Rawal Med J* ,2008 :33(1):8-11
- [28] Farooq M Dien *et al.*, Awareness about diabtes risk factors and complications in diabetic patients, Nisthar Medical College, *Multan, Nishtar Medical Journal* ,2010;2(3):84-88
- [29] Gagliardino J, González C, Caporale J. The diabetes-related attitudes of health care professionals and persons with diabetes in Argentina. *Rev Panam Salud Publica*. 2007; 22(5):304-321.
- [30] Catherine C *et al.* Prevalence of Diabetes and Impaired Fasting Glucose in Adults in the U.S Population, National Health and Nutrition Examination Survey 1999–2002 , Maryland .*Diabetic care epidemiology research*; 2006;29(6):1263-1268
- [31] Trisha G, Cecil H, Mu'min C. Health beliefs and folk models of diabetes in British Bangladeshis: a qualitative study. *BMJ*. 1998;28; 316(7136):978-83.
- [32] Maryam P, Ozra Tabatabaei-M. Knowledge, Attitude and Practice of physicians in the field of diabetes and its complications; *Iranian Journal of Diabetes and Lipid Disorders*; 2010; 9,1- 7
- [33] El-Deirawi KM, Zuraikat N. Registered nurses' actual and perceived knowledge of diabetes mellitus. *Journal for Nurses in Staff Development*, 2001; 17: 5-11.