Exploring Knowledge, Attitudes and Practices toward Diabetes in Rural Communities in Bangladesh

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Abstract

Background: Diabetes has been considered globally as a paradigmatic chronic disease, affecting millions of people of all ages. It is an emerging chronic disease that significantly impacts patients' quality of life.

Objective: To assess the levels of knowledge, attitudes and practices on diabetes mellitus among rural residents of Sylhet, Bangladesh.

Methods: A hospital-based cross-sectional study was directed among the conveniently selected 183 out-patients aged ≥18 years who were clinically diagnosed with diabetes mellitus and interviewed through a pre-tested semi-structured questionnaire in the purposively selected hospital named Moulvibazar 250 Bed District Sadar Hospital, Sylhet, Bangladesh.

Results: The mean knowledge score was 4.3±2.2, attitude was 4.0±1.6 and practices were 1.8±1.8. Most rural individuals had poor knowledge (53.6%), average attitudes (54.6%) and poor practices (63.4%) on DM. The knowledge scores were statistically significant with the attitude and practice scores ($P<0.05$). Within the knowledge, attitude and practice scores, there was also a statistically significant correlation present ($P<0.05$). There were also a statistically significant effects for knowledge and attitude levels on their practice levels ($P<0.05$).

Conclusion: On the basis of the study findings, participants had average attitudes but low levels of diabetes mellitus knowledge and practice.

Key-words: KAP study, Diabetes mellitus, Rural residents, Moulvibazar, Bangladesh.

Introduction

Diabetes mellitus (DM) is a rapidly rising non-communicable disease (NCD) that stances a significant intimidation to public health worldwide.[1] The prevalence of diabetes is increasing inexplicably in developing countries, driven by rapid demographic transitions from traditional lifestyles.[2]

According to estimates from the International Diabetes Federation (IDF), 465 million people (9.3% of the world's population) had diabetes in 2019 and by 2045, that number will likely rise to 700 million people (10.9%).[3] Between 2010 and 2030, the proportion of adults with diabetes will increase by 69% in developing countries and by 20% in developed ones.[4,5] Bangladesh is one the of seven South-East Asian (SEA) countries depicted by the IDF. Currently, 537 million people worldwide have diabetes, with 90 million of them in the SEA region. This figure is predicted to reach 151.5 million by 2045.[6]

Knowledge is indispensable for any disease's early detection, prevention and development in the future.[7] Patients with diabetes can significantly enhance their quality of life by preventing the development of chronic comorbidities through education on the disease. People who have access to knowledge are better able to assess their risk, are more inclined to seek out the right care and treatment and are inspired to effectively manage their illness for the rest of their lives.[7,8]

The main goal of diabetes management is early prevention and control or treatment of the complications. To achieve these goals in individual's level is needed to investigate knowledge, attitude and practices (KAP) levels among person living with diabetes.

Materials and Methods

This hospital-based cross-sectional study was carried out to explore the level of knowledge, attitudes and practices on diabetes mellitus among rural residents of Moulvibazar attending in the outpatient department of the purposively selected a secondary level hospital named Moulvibazar 250 Bed District Sadar Hospital, Sylhet 3200, Bangladesh.

The study include conveniently selected 183 patients clinically diagnosed with diabetes mellitus, aged ≥18 years, residing outside of Moulvibazar Sadar and attending in the outpatient department (OPD) for seeking treatment of the hospital. Individuals with critical conditions (e.g., diabetic coma and altered conscious level etc.) were excluded from the study.

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From January to July 2022, a pretested face-to-face, semi-structured questionnaire was used to interview study participants at their convenience. The questionnaire was constructed by the socio-demographic profile of participants, health-related information, knowledge regarding DM, attitude towards DM and practices on DM.

Data were entered, curated and analyzed using IBM SPSS Version 26 (New York, USA). Descriptive statistics were expressed as frequency (percentage) and mean (±standard deviation, or SD) for categorical and continuous data, respectively. Chi-square test and Fisher exact test were used to assess the significance of associations between two nominal variables. Paired 't' test and Linear regression test was done to assess the significance of associations. A p-value of <0.05 at a 95% confidence interval (CI) was considered significant for all statistical tests.

The participant's knowledge towards DM was scored based on 11 questions. Here, the score for an incorrect answer was '0' and the score for a correct answer was '1'. The total range of scores was 0-11. Scores 0-4 were considered poor (<40%), 5-8 were considered average (40-79%) and 9-11 were considered good (≥80%).

The participant's attitude towards DM was scored based on 6 questions. Here, the score for an incorrect answer was '0' and the score for a correct answer was '1'. The total range of scores was 0-6. Scores 0-2 were considered poor (<40%), 3-6 were considered average (40-79%) and >6 were considered good (≥80%).

The participant's practice towards DM was scored based on 10 questions. Here, the score for an incorrect answer was '0' and the score for a correct answer was '1'. The total range of scores was 0-6. Scores 0-2 were considered poor (<40%), 3-6 were considered average (40-79%) and >6 were considered good (≥80%).

The interviewer obtained informed consent and permission to take the interviews from participants before commencing the interviews. Participation was voluntary and participants were informed that they have the right to withdraw at any point without any negative consequences. The participants' confidentiality was maintained throughout the study. Ethical approval was obtained from the 'Research Ethical Committee' of Sylhet MAG Osmani Medical College, Sylhet 3100, Bangladesh. All procedures were conducted according to the guidelines of the Declarations of Helsinki 2013.

Results

Table-I: Socio-demographic and health-related information of the participants (n=183)

		Frequency (n)	Percent (%)
Socio-demographic profile of Participants	**Age groups (in years)**		
	<45	69	37.7
	45-60	109	59.6
	>60	5	2.7
	Mean±SD		49.1±8.6
	Gender		
	Male	124	67.8
	Female	59	32.2
	Education		
	Illiterate	31	16.9
	Primary	74	40.4
	SSC	46	25.1
	HSC & above	32	17.5
	Occupation		
	Agricultural worker (AW)	54	29.5
	Homemaker	52	28.4
	Businessman	24	13.1
	Day laborer	24	13.1
	Others	29	15.8
	Family type		
	Nuclear	62	33.9
	Joint	121	66.1
	Family income (in taka)		
	≤20,000	119	65.0
	20,001-40,000	51	27.9
	>40,000	13	7.1
	Mean±SD		21,562.8±11,400.6
Health-related information	**BMI (in kg/m²)**		
	Underweight (<18.5)	8	4.4
	Normal weight (18.5-24.9)	87	47.5
	Pre-obesity (25.0-29.9)	63	34.4
	Obesity (>30)	25	13.7
	Mean±SD		25.0±4.3
	Positive family history of diabetes		
	No	96	52.5
	Yes	87	47.5
	History of other chronic diseases		
	No	113	61.7
	Yes	70	38.3
	Chronic diseases (n=70)		
	Hypertension	51	72.9
	COPD	22	31.4
	Bronchial asthma	18	25.7
	Cancer	2	2.9
			*Multiple responses

Table-I depicts the socio-demographic profile and health-related information of the participants. The mean age was 49.1±8.6 years; and most of them were from the age group 45-60 years, but a significant number of people (37.7) were <45 years. The majorities were male (67.8%) and completed upto SSC level of education (65.5%) and a significant number were illiterate (16.9%). The most of them were agricultural workers (29.5%), homemakers (28.4%) and the rest were from different occupations. The most of them lived in joint families (66.1%). The mean family income was 21,562.8±11,400.6 taka. Approximately two-thirds (65.0%) had a monthly family income of ≤20,000 taka.

Regarding the health-related information of diabetic patients, the mean body mass index (BMI) was 25.0±4.3 kg/m2; and one-third of the participants were pre-obese (34.4%) and 13.7% were obese. 47.5% had a family history of DM within their 1st degree relationship. A significant number of people (38.3%) had a history of chronic illness; and the most prevalent illness was HTN, COPD and bronchial asthma.

Knowledge, attitudes and practices on DM

There were 67.2% total participants who declared to know about diabetes, 35.0% knew the risk factors and 50.8% participants had positive family history of risk factors. Among the participants, 62.3% knew that obese parsons and 61.7% knew that less physically active are at risk of diabetes. There 59.6% knew regular exercise can control diabetes and 25.1% participants regularly checked their diabetes at home. There 47.0% participants knew about the features of diabetes and 25.7% participants knew about the complications of diabetes.

There were 59.0% participants believed that diabetes is a preventable disease. There 73.2%, 74.3%, 63.4% and 65.6% believed that regular exercise, regular taking of medication, diabetes eating plan and maintaining normal body weight respectively help to control diabetes. There were 66.7% participants who believed that proper management of diabetes helps to minimize the complications of diabetes.

There were 32.2% participants checked their blood glucose level routinely, 39.3% participants took diabetes medications regularly, 27.3% participants exercised regularly, 24.0% participants followed a diabetes eating plan, 32.2% maintained normal body weight and 28.4% visited routinely to the doctor for diabetes management.

Most rural individuals had poor knowledge (53.6%), average attitudes (54.6%) and poor practices (63.4%) on DM. A nominal number of participants had good knowledge (16.4%), attitudes (27.9%) and practices (3.8%) about DM. The mean knowledge score was 4.3±2.2, attitude was 4.0±1.6 and practice was 1.8±1.8 (Table-II).
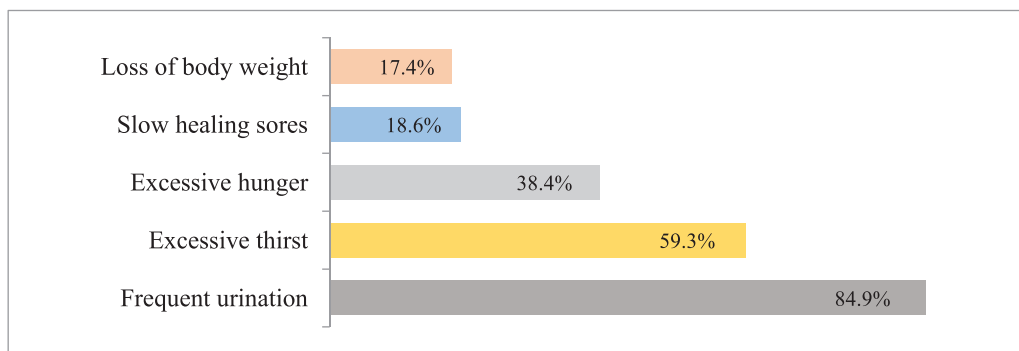

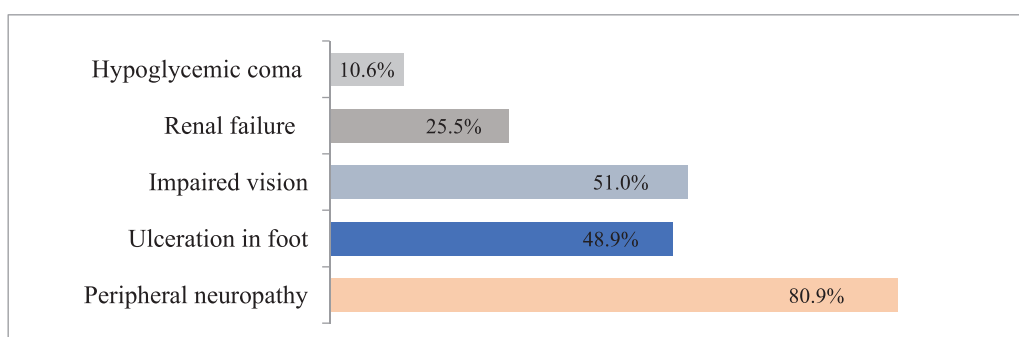**Figure-1:** Knowledge about symptoms of diabetes mellitus (n=86)

Figure-2: Knowledge about complications of diabetes mellitus (n=47)

Table-II: Knowledge, attitudes and practices on DM (n=183)

Attributes	Positive responses
	n (%)
Knowledge regarding DM	
Do you know about Diabetes Mellitus?	123(67.2)
Do you know the risk factors are responsible to develop DM?	64(35.0)
Do you know positive family history as a risk factor?	93(50.8)
Do you know obese persons are more vulnerable to be affected with DM?	114(62.3)
Do you know less physical activity increase the risk of developing DM?	113(61.7)
Do you know regular exercise have a role in control of DM?	109(59.6)
Do you know how to checkup DM at home?	46(25.1)
Do you know the symptoms of DM?	86(47.0)
Do you know the complications of DM?	47(25.7)
Attitudes on DM	
Do you think DM is a preventable disease?	108(59.0)
Does regular physical exercise help to control DM?	134(73.2)
Taking diabetes medication regularly helps to control DM?	136(74.3)
Does following diabetes eating plan helps to control DM?	116(63.4)
Does maintain normal body weight helps to control DM?	120(65.6)
Proper management of DM helps to minimize the complications?	122(66.7)
Practices regarding DM	
Do you check blood glucose level routinely?	59(32.2)
Do you take diabetes medication regularly?	72(39.3)
Do you exercise regularly?	50(27.3)
Do you follow diabetes eating plan?	44(24.0)
Does maintain your normal body weight?	59(32.2)
Do you visit routinely to doctor for diabetes management?	52(28.4)
Level of knowledge	
Poor	98(53.6)
Average	55(30.1)
Good	30(16.4)
Mean±SD	4.3±2.2
Level of attitudes	
Poor	32(17.5)
Average	100(54.6)
Good	51(27.9)
Mean±SD	4.0±1.6
Level of practices	
Poor	116(63.4)
Average	60(32.8)
Good	7(3.8)
Mean±SD	1.8±1.8

Level of knowledge were statistically significant with their lower levels of education, agricultural workers (AW) & homemakers as occupation, family income ≤20,000 taka, negative family history of DM and who had no DM (P<0.05). Level of knowledge were statistically significant with their education levels, having a positive family history, who diagnosed with DM and levels of knowledge (P<0.05). Level of practices were statistically significant with their occupation, family income, who had not DM, level of knowledge and attitudes (P<0.05) (Table-III). Table-IV depicts that the knowledge scores were statistically significant with the attitude and practice scores (P<0.05). Within the knowledge, attitudes and practice scores, there was also a statistically significant correction present, as shown in Figure-3.

A two-way between groups analysis of variance was conducted to explore the impact of knowledge and attitudes level on practices level among the adult rural residents. Levels were divided into three groups (poor, average and good) according to their knowledge, attitudes and practices. The interaction effects between knowledge and attitudes level were not statistically significant (F=1.220, p=0.304). There were statistically significant effects for knowledge level (F=14.014, p=0.000) and attitudes level (F=3.038, p=0.05). The adjusted R squared was 25.5%, which showed that variation in practices level was found due to their knowledge and attitudes (Table-V). A two-way between groups analysis of variance was conducted to explore the impact of knowledge and attitudes level on practices level among the adult rural residents. Levels were divided into three groups (poor, average and good) according to their knowledge, attitudes and practices. The interaction effects between knowledge and attitudes level were not statistically significant (F=1.220, p=0.304). There were statistically significant effects for knowledge level (F=14.014, p=0.000) and attitudes level (F=3.038, p=0.05). The adjusted R squared was 25.5%, which showed that variation in practices level was found due to their knowledge and attitudes (Table-V).

Table-III: Association of the level of knowledge, attitudes and practices with different variables (n=183)

Attributes		Level of knowledge				χ2 value	p-value
		Poor	Average	Good	Total		
		n(%)	n(%)	n(%)	n(%)		
Education	Illiterate	24(77.4)	5(16.1)	2(6.5)	31(100)	21.980	*0.002
	Primary	43(58.1)	23(31.1)	8(10.8)	74(100)		
	SSC	20(43.5)	18(39.1)	8(17.4)	46(100)		
	HSC & above	11(34.4)	9(28.1)	12(37.5)	32(100)		
Occupation	A. worker	34(63.0)	13(24.1)	7(13.0)	54(100)	28.816	*0.000
	Homemaker	34(65.4)	14(26.9)	4(7.7)	52(100)		
	Businessman	5(20.8)	12(50.0)	7(29.2)	24(100)		
	Day labor	14(58.3)	9(37.5)	1(4.2)	24(100)		
	Others	11(37.9)	7(24.1)	11(37.9)	29(100)		
Family income (in taka)	≤20,000	76(63.9)	32(26.9)	11(9.2)	119(100)	22.138	*0.000
	20,001-40,000	18(35.3)	20(39.2)	13(25.5)	51(100)		
	>40,000	4(30.8)	3(23.1)	6(46.2)	13(100)		
Family history of DM	No	59(61.5)	27(28.1)	10(10.4)	96(100)	7.007	*0.030
	Yes	39(44.8)	28(32.2)	20(23.0)	87(100)		
Diagnosed with diabetes	No	67(71.3)	20(21.3)	7(7.4)	94(100)	25.731	*0.000
	Yes	31(34.8)	35(39.3)	23(25.8)	89(100)		
		Level of attitudes					
		Poor	Average	Good	Total		
		n(%)	n(%)	n(%)	n(%)		
Education	Illiterate	10(32.3)	17(54.8)	4(12.9)	31(100)	13.833	*0.032
	Primary	12(16.2)	43(58.1)	19(25.7)	74(100)		
	SSC	4(8.7)	28(60.9)	14(30.4)	46(100)		
	HSC & above	6(18.8)	12(37.5)	14(43.8)	32(100)		
Family history of DM	No	24(25.0)	49(51.0)	23(24.0)	96(100)	8.107	*0.018
	Yes	8(9.2)	51(58.6)	28(32.2)	87(100)		
Diagnosed with diabetes	No	25(26.6)	49(52.1)	20(21.3)	94(100)	12.410	*0.001
	Yes	7(7.9)	51(57.3)	31(34.8)	89(100)		
Level of knowledge	Poor	25(25.5)	54(55.1)	19(19.4)	98(100)	48.390	*0.000
	Average	7(12.7)	39(70.9)	9(16.4)	55(100)		
	Good	0(0.0)	7(23.3)	23(76.7)	30(100)		
		Level of practices					
		Poor	Average	Good	Total		
		n(%)	n(%)	n(%)	n(%)		
Occupation	A. worker	41(75.9)	13(24.1)	0(0.0)	54(100)	†17.928	*0.010
	Homemaker	33(63.5)	19(36.5)	0(0.0)	52(100)		
	Businessman	10(41.7)	12(50.0)	2(8.3)	24(100)		
	Day labor	16(66.7)	7(29.2)	1(4.2)	24(100)		
	Others	16(55.2)	9(31.0)	4(13.8)	29(100)		
Family income (in taka)	≤20,000	83(69.7)	33(27.7)	3(2.5)	119(100)	†9.588	*0.035
	20,001-40,000	24(47.1)	24(47.1)	3(5.9)	51(100)		
	>40,000	9(69.2)	3(23.1)	1(7.7)	13(100)		
Diagnosed with diabetes	No	85(90.4)	9(9.6)	0(0.0)	94(100)	†64.864	*0.000
	Yes	31(34.8)	51(57.3)	7(7.9)	89(100)		
Levels of knowledge	Poor	80(81.6)	17(17.3)	1(1.0)	98(100)	†36.449	*0.000
	Average	28(50.9)	24(43.6)	3(5.5)	55(100)		
	Good	8(26.7)	19(63.3)	3(10.0)	30(100)		
Level of attitudes	Poor	30(93.8)	2(6.3)	0(0.0)	32(100)	†21.911	*0.000
	Average	63(63.0)	34(34.0)	3(3.0)	100(100)		
	Good	116(63.4)	60(32.8)	7(3.8)	51(100)		

*†Fisher exact test value,   *p<0.05 considered as statistically significant value*

Table-IV: Association within knowledge, attitude and practice scores on DM (n=183)

Knowledge scores				
Source	df	Mean Square	F	p-value
Attitude scores	6	12.341	3.470	*0.003
Practice scores	6	23.032	6.477	*0.000
R Squared = 0.341 (Adjusted R Squared = 0.294)				

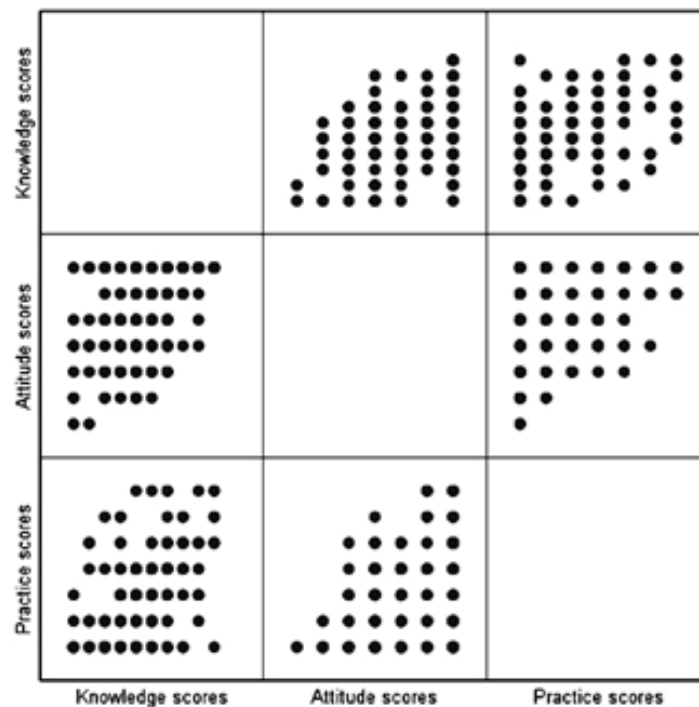*Linear regression test done, *p<0.05 considered as statistically significant value*

Figure-3: Correlations with knowledge, attitude and practice scores (n=183)

Table-V: Association within the levels of knowledge, attitude and practices on DM (n=183)

Level of knowledge	Level of attitudes	N	Level of practices		Source	df	F	p-value
			Mean	SD				
	Poor	25	0.320	0.7483	Knowledge	2	14.014	*0.000
Poor	Average	54	1.482	1.5509				
	Good	19	1.158	1.5371				
	Total	98	1.122	1.4592				
	Poor	7	1.714	1.2536	Attitude	2	3.038	*0.050
Average	Average	39	2.282	1.6535				
	Good	9	2.667	1.8708				
	Total	55	2.272	1.6381				
	Average	7	2.571	1.6184	Knowledge*	3	1.220	0.304
Good	Good	23	3.609	1.8025	Attitude			
	Total	30	3.367	1.7905				
					(Adjusted R-Squared = 0.255)			

Two-way ANOVA test done, *p<0.05 considered as statistically significant value

Discussion

In the present study, the mean age was 49.1±8.6 years; and most of them were from the age group 45-60 years, but a significant number of people (37.7%) were <45 years. A cross-sectional study conducted out in Maharastra, India, shows that the mean age of the study respondents was 50.5 and 52.5 years in urban and rural health centres, respectively and among them, the majority of the subjects belong to the age group 40 to 60 years.[9] Another study in India revealed that the majority of participants (51.6%) were between the ages of 31-50 years.[10] In Ethiopia, respondents had an average age of 44(±7.2) years[11] while in Jordan, 76.1% were below the age of 40.[12]

The current study represents the majority were male (67.8%) and completed up to SSC level of education (65.5%) and significant numbers were illiterate (16.9%). According to BDHS 2022, 14.1% of the population has no education, 13.5% completed primary level and secondary completed or higher was 24.3%.[13] A similar study conducted in India found that among the 384 participants, 43.0% were male and 57.0% were female. Additionally, 70.3% of the participants were illiterate and 55.5% belonged to the low socioeconomic status.[10] In another study assessing the educational status of the test group in South India, it was found that 29.2% of the participants were illiterate, while 50.4% had received education up to the secondary school level.[14]

According to the present study, most of the participants were agricultural workers (29.5%), homemakers (28.4%) and the rest were from different occupations. The most of them lived in joint families (66.1%). The mean family income was 21,562.8±11,400.6 taka. Approximately two-thirds (65.0%) had a monthly family income of ≤20,000 taka. BDHS 2022 shows 18.4% had the lowest wealth quintile and near about 20.0% had the second, middle, fourth and highest wealth quintile.[12] In a study in India shows 43.0% in urban and 40.0% in rural populations were unskilled workers, as in laborers and maids, while most of the female respondents were housewives in both the groups. Maximum diabetics had per capita income below 3000 rupees in both the urban and rural groups.[9]

In accordance with the current study, the mean BMI was 25.0±4.3 kg/m^2; here, one-third of the participants were pre-obese (34.4%) and 13.7% were obese. 47.5% had a family history of DM within their 1st degree relationship. Nearly half of the rural people (48.6%) were clinically diagnosed with DM. A study in Malaysia found that out of 396 respondents, 39.6% of them had a family history of diabetes mellitus.[14] Another study in India revealed that regarding BMI, 39.4% were overweight and 22.6% were obese.[15] The study also reveals that around 31.4% of diabetic patients reported a positive family history of diabetes, implying that more than one-fourth of the participants in the study had a genetic precursor to their diabetes aetiology.[16] It was unanticipated to observe that 68.6% of diabetic patients had no family history of diabetes; this most likely indicates the rapid onset of diabetes among the general population of the study subjects.[17,18]

Regarding knowledge regarding DM, there were 67.2% total participants who declared to know about diabetes, 35.0% knew the risk factors and 50.8% participants had positive family history of risk factors. Among the participants, 62.3% were aware that obesity and 61.7% knew that low physical activity increase the risk of diabetes. Additionally, 59.6% understood that regular exercise can help control diabetes, while 25.1% regularly monitored their diabetes at home. Furthermore, 47.0% were familiar with the symptoms of diabetes and 25.7% were known of its complications. In a study conducted in Gujarat, 68.4% of participants recognized diabetes as a severe condition, but only 14.5% knew about its causes, 10.0% were known of its signs and symptoms and 8.0% understood the consequences of the disease.[9]

According to current study, most rural individuals had poor knowledge (53.6%), average attitudes (54.6%) and poor practices (63.4%) on DM. A nominal number of participants had good knowledge (16.4%), attitudes (27.9%) and practices (3.8%) about DM. The mean knowledge score was 4.3±2.2, attitude was 4.0±1.6 and practices were 1.8±1.8. A

study conducted in Bangladesh involving 18,697 adults found that the average scores for knowledge, attitude and practices among the respondents were 41±16, 85±12 and 57±30, respectively. Regarding knowledge, 17.0% of participants had poor levels, 68.0% had moderate levels and 15.0% had good levels. Similarly, attitude levels were classified as poor in 23.0% of subjects, moderate in 67.0% and good in 10.0%. As for practices, 12.0% of participants were found to have poor levels, 72.0% had moderate levels and 16.0% had good levels.[19] Another study indicates that 49.8% of participants had poor diabetes prevention practices, 26.5% had moderate practices and 23.7% demonstrated good practices.[20]

Conclusion
The study revealed that the level of knowledge and practices regarding diabetes mellitus were poor, but their level of attitude was average. To prevent diabetes and its complications there is an urgent need for coordinated educational campaigns with a prioritized focus on poorer, rural and less educated groups.

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