

# Knowledge, Attitude, and Practice Regarding Diabetic Mellitus among a Sample of Students at Technical Institute of Karbala

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## Abstract

**Background:** Diabetes mellitus (DM) is a life-threatening disease whose complications can cause heart attack or stroke, blindness, and kidney failure. **Objective:** The main objective of this study was to determine knowledge, attitude, and practices regarding DM among a sample of students at the Technical Institute of Karbala. **Materials and Methods:** This cross-sectional study was conducted in Al-Furat A-Awsat Technical University, Technical Institute of Karbala, Iraq. A total of 856 students were included in this study. Data were collected by direct interview with students using a questionnaire form. **Results:** Total sample in this study was 856 students (52.3% male and 47.7% female), 58 DM (Type II) patients were included in this study. The mean age of the study population was  $20.86 \pm 1.58$  years (range of 17–25 years). The majority of students (48.8%) were in the age group of ( $\leq 20$  years). The most of the respondents were single and lived in urban areas as represent 87.4% and 75.9%, respectively. Nearly 60% of cases had good and acceptable knowledge scores, while 50% had good and acceptable scores for attitude and practice regarding DM. **Conclusion:** The overall scores were good and acceptable regarding knowledge, attitude, and practice. A better educational program on diabetes should be conducted to improve awareness, attitude, and practice toward DM using mass media and health education in all Ministries.

**Keywords:** Attitude, diabetes mellitus, knowledge, practices, Technical Institute of Karbala

## INTRODUCTION

Diabetes mellitus (DM) is a clinical syndrome that results due to insulin deficiency, which is a hormone that controls the metabolism of glucose and is characterized by high blood glucose.<sup>[1]</sup> For the last 20 years, in many parts of the world, the incidence of diabetes has risen intensively.<sup>[2]</sup> The worldwide-estimated prevalence of diabetes among adults was 285 million at 2010, and this value is predicted to rise to 439 million at 2030. There are two main types of DM. The first type of diabetes, called insulin-dependent DM, results from a lack of insulin secretion by beta cells of the pancreas.<sup>[3]</sup> DM is a silent killer; many victims become aware they have DM only when they manifest complications.<sup>[4]</sup> The available interventions for preventing DM and managing complications are poor, which result of insufficient awareness among the public.<sup>[5]</sup> The etiology of diabetes is multifactorial and both modifiable (such as presence of obesity, dietary habits, lifestyle, and socioeconomic class) and nonmodifiable (such as genetic obesity-related genomic or genes determining lipid metabolism or polymorphism in the receptor and its coactivator, positive

family history, and age of the individual etc.).<sup>[6,7]</sup> Diabetes management depends on many factors such as drug therapy, physical exercise, diet, and other lifestyle changes.<sup>[8,9]</sup> This study was carried out to determine the level of knowledge, attitude, and practice toward DM.

## MATERIALS AND METHODS

This cross-sectional study was conducted in Al-Furat A-Awsat Technical University, Technical Institute of Karbala, Iraq, from November 1, 2016, to April 29, 2017. After receiving an approval letter from the Ethics Committee at the Technical Institute of Karbala, the data from 856 students were collected by direct interview with those students using a

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questionnaire form. The questionnaire consisted of four parts (some demographics, 15 questions on general knowledge of diabetes, and five questions to each of attitudes and practices regarding diabetes). The medium was calculated for each part of the questionnaire separately. For the knowledge part, the scale of three levels was rated (Likert respondent scale) for each question under the knowledge part. The “two” point was coded for the correct answer, “one” for do not know, and score of “zero” for an incorrect answer.<sup>[10]</sup> Number of questions was 16, Minimum = 0, Maximum = 32, and Medium = 16.

For the attitudes and practices parts, each correct answer was given a score of “one,” while the wrong answer was given a score of “zero,” and the maximum possible score for attitudes and practices was 5, minimum = zero and medium = 2.5 for each one. Those scores below the medium were considered as poor score, while score equal or more than the medium was considered as good and acceptable scores.

Data of the study were analyzed using the PASW Statistics for Windows, Version 18.0. Chicago: SPSS Inc. and Microsoft Excel spreadsheet. Descriptive statistics, including frequency, relative frequency, means, minimum, maximum, median, and standard deviation, were applied to present participant’s demographic information and KAP score. The Chi-square test was used to test the association between variables with the results being considered as statistically significant where  $P < 0.05$ .

## RESULTS

Out of a total sample of 856 students enrolled in this study, 58 diabetic patients were included in the study. Table 1 shows the demographic variables according to the age groups, gender, marital status, and residency. Results show that 52.3% of participants were males and 47.7% were females. It shows

nearly similar distribution in both genders. On the other hand, the highest percentage of age groups was ( $\leq 20$  years) which represents 48%; while the lowest present was 6.9% for the age group ( $\geq 24$  years). The current study showed that most of the participants were living in the urban area (75.9%). The Majority of responders was single and lived in the urban area as 87.4 and 75.9, respectively. About 60.6% of cases had good and accepted knowledge scores, whereas more than 50% of cases had good and acceptable attitude and practice regarding DM. The association was found to be statistically significant between gender and the knowledge score ( $P = 0.001$ ) [Table 1].

Regarding the knowledge of participants about general information of DM, more than two-thirds of the studied sample were answered correctly about “DM is infectious disease.” More than half of the participants were answered correctly for “DM is a genetic disease,” “DM is curable,” and “DM is a serious disease.” While the responding was very poor 12.7% regarding “DM can be prevented.” The majority of the correct answers of studied sample regarding the complications of DM were more than 60%. For signs and symptoms, approximately, three-quarters of studied sample answered correctly about “excessive sugar in the blood can cause diabetes” and other answers were correctly for “excessive drinking of water, weight loss, and excessive urination” which represent 64.2%, 64.2%, and 58.9%, respectively [Table 2].

The results of this study showed that the majority (more than 60%) of the participants had a good and acceptable attitudes toward DM include: “diabetic complications reduced life expectancy,” “regular blood glucose monitoring is helpful for preventing DM complications,” and other answers such as “can diabetes cause damage to the organs” and “good glycemic control was one of the ways to prevent DM” were more than 50%; except “exercising regularly was helpful in preventing complications” had a lower correct answer [Table 3].

**Table 1: Assessment according to the demographics characteristics of the study sample and level of knowledge, attitude, and practice regarding diabetes mellitus**

Demographic characteristics	Knowledge (n=856)			Attitude (n=856)			Practices (n=58)		
	Poor, n (%)	Good and accepted, n (%)	PV	Negative, n (%)	Positive, n (%)	PV	Poor, n (%)	Good and accepted, n (%)	PV
Age groups									
≤20	161 (18.8)	257 (30.0)	0.823	196 (22.9)	222 (25.9)	0.239	15 (25.9)	17 (29.3)	0.956
21-23	154 (18.0)	226 (26.4)		199 (23.2)	181 (21.1)		12 (20.7)	14 (24.1)	
≥24	22 (2.6)	36 (4.2)		26 (3.0)	32 (3.7)		0	0	
Gender									
Male	211 (24.6)	237 (27.7)	0.001	226 (26.4)	222 (25.9)	0.438	13 (22.4)	17 (29.3)	0.611
Female	126 (14.7)	282 (32.9)		195 (22.8)	213 (24.9)		14 (24.1)	14 (24.1)	
Marital status									
Single	291 (34.0)	457 (53.4)	0.463	367 (42.9)	381 (44.5)	0.856	25 (43.1)	27 (46.6)	0.493
Married	46 (5.4)	62 (7.2)		54 (6.3)	54 (6.3)		2 (3.4)	4 (6.9)	
Residence									
Rural	84 (9.8)	122 (14.3)	0.635	98 (11.4)	108 (12.6)	0.596	2 (3.4)	2 (3.4)	0.886
Urban	253 (29.6)	397 (46.4)		323 (37.7)	327 (38.2)		25 (43.1)	29 (50.0)	
Total	337 (39.4)	519 (60.6)		421 (49.2)	435 (50.8)		27 (46.6)	31 (53.4)	

Table 4 shows the distribution of participants according to practices score. The response was good and acceptable (69.0%, 67.2%, and 58.6%) for questions: “did you taken your diabetes medication as prescribed of your doctor,” “Do you exercise regularly,” and “always attending DM clinic for follow-up,” respectively. While correct scores were about one-third for “did you made dietary regimen,” whereas less than quarter of responding were correctly for “Do you checked your blood sugar level regularly.”

As overall assessment regarding the knowledge, attitude, and practice, 60.6% of cases had good and acceptable knowledge scores while more than 50% had positive attitude scores, and about 53% of cases were good and acceptable practices [Table 5].

## DISCUSSION

DM is a global problem with harmful human effects. Globally, DM is the fifth leading cause of death. The prevalence of diabetes is rapidly rising worldwide at an alarming rate.

According to the WHO, at least 171 million people worldwide had diabetes in 2000, which represents 2.8% of the population, and it is estimated that this number will be doubled by the year 2030. About 668,000 of Iraqis had diabetes in 2000, and it is expected to increase by the year of 2030 – 2 million.<sup>[11]</sup> According to the national survey conducted in 2006 in Iraq, it was estimated that 10.4% of the adult population had hyperglycemia.<sup>[12]</sup> Education of college students on healthy behaviors may be helpful for positively impact, not only for their family, but also for their community.

However, difficulty comparing our results with others studies, as most of the studies used different instruments and/or are carried out among different age groups or ethnicities. We obtained the information from our KAP study on diabetic mellitus in nonmedical students who gave us an insight to assess the gaps in their knowledge, which will help us in the future to enrich them with more knowledge by inoculating more study materials in conducting workshops for them. The participant may play a main role in primary prevention

**Table 2: Distribution of study group according to knowledge about diabetes mellitus**

Knowledge question	Knowledge (No = 856)					
	Correct		Unknown		Incorrect	
	No.	%	No.	%	No.	%
Diabetics mellitus is infectious disease	590	68.9	176	20.6	90	10.5
Diabetics mellitus is genetics disease	483	56.4	62	7.2	311	36.3
Diabetes mellitus is curable	462	54.0	76	8.9	318	37.1
Diabetics mellitus is a serious disease	430	50.2	280	32.7	146	17.1
Diabetes mellitus can be prevented	109	12.7	141	16.5	606	70.8
Complications of Diabetics mellitus						
Heart attack or stroke	552	64.5	210	24.5	94	11.0
Eye problem	530	61.9	234	27.3	92	10.7
Kidney problem	522	61.0	222	25.9	112	13.1
Signs and symptoms						
Excessive sugar in the blood	638	74.5	104	12.1	114	13.3
Excessive drinking of water	552	64.5	210	24.5	94	11.0
Weight loss	552	64.5	182	21.3	122	14.3
Excessive urination	504	58.9	262	30.6	90	10.5
Risk factors of diabetes mellitus						
Obesity	542	63.3	216	25.2	98	11.4
Family history of diabetes mellitus	457	53.4	121	14.1	278	32.5
Lack of physical activity/exercise	444	51.9	190	22.2	222	25.9
Cigarette smoking	378	44.2	126	14.7	352	41.1

**Table 3: Distribution of participants according to attitude about diabetes mellitus**

Attitude question	Attitude (n=856)		
	Agree, n (%)	Neutral, n (%)	Disagree, n (%)
Diabetic complications reduced life expectancy	565 (66.0)	149 (17.4)	142 (16.6)
Regular blood glucose monitoring is helpful for preventing DM complications	529 (61.8)	135 (15.8)	192 (22.4)
Good glycemic control was one of the ways to prevent DM	489 (57.1)	134 (15.7)	233 (27.2)
Can diabetes cause damage to the organs	486 (56.8)	141 (16.5)	229 (26.8)
Exercising regularly was helpful in preventing complications	390 (45.6)	119 (13.9)	347 (40.5)

DM: Diabetes mellitus

of diabetic mellitus in the community in future. Hence, their core knowledge, positive attitude, and correct practice toward the prevention and treatment of DM will absolutely decrease the prevalence of complications in the community as most prevention programs of diabetes emphasize patient empowerment, education, and community participation.<sup>[13,14]</sup>

In this study, regarding sociodemographic variables among study participants, results found that there was a similar distribution in both genders, and the higher percentage was in urban areas, and the majority of students were in the age group of  $\leq 20$  years. The majority of the responders were single and lived in urban areas as 87.4 and 75.9, respectively. The current study revealed that the knowledge information about DM among the students had good and accepted knowledge scores 60.6%. Similar findings were reported by other authors.<sup>[15]</sup>

About 31% had “poor knowledge.” Percentages of correct answers to questions on general DM knowledge, DM symptoms, and complications, while more than 50% had well and acceptable for both attitude and practice scores regarding DM. The association was found to be statistically significant only between gender and the knowledge score ( $P = 0.001$ ). This is similar to other reported study in Iraq by Khaznadar *et al.* (90%).<sup>[15]</sup> 31% had “poor knowledge.” Percentages of correct answers to questions were found in results regarding general DM knowledge, DM symptoms, and complications. This result was different from that reported by Herath *et al.*<sup>[16]</sup> in which 23% of participants scored  $< 14\%$  (poor knowledge) and by Bani<sup>[17]</sup> with no significant difference between males and females.

Regarding knowledge of participants about general information of DM, more than two-thirds of participants answered correctly about DM is infectious disease. More than half of the participants answered correctly for DM is a genetic disease,

is curable, and is a serious disease. While the response was very poor (12.7%) regarding DM can be prevented, this result agreed with the finding by Al-Maskari *et al.* in the United Arab Emirates.<sup>[18]</sup>

Majority correct answers of studied sample regarding the complications of DM were more than 60%, while for the signs and symptoms approximately three quarters of studied sample answered correctly about excessive sugar in the blood and other answers were correctly for excessive drinking of water, weight loss, and excessive urination (64.2%, 64.2%, and 58.9%, respectively).

The majority of participants (63.3%) answered correctly about obesity. About half of the participants answered correctly about the family history of DM and lack of physical activity/exercise. The answer was poor for cigarette smoking as risk factors of DM [Table 2].

The majority correct answers of studied sample regarding the complications of DM were more than 60%; while, for signs and symptoms, approximately, three-quarters of studied sample answered correctly about excessive sugar in the blood. The highest 63.3% of studied sample answered correctly about obesity, while more than half of participants' answers were correctly for lack of physical activity/exercise and the family history of DM as risk factors of DM [Table 2]. The majority (60%) of participants had good and acceptable attitude score toward DM. These findings were similar to other study that reported that 85% of the study subjects knew that diabetes could affect other organs<sup>[16]</sup> [Table 3].

The distribution of participants according to practices score, the response was good and acceptable (69.0%) for the question: did you take your diabetes medication as prescribed by your doctor? Sangra *et al.* showed similar findings to this study.<sup>[19]</sup>

Responding to the question: “Do you exercise regularly?” was accepted. This estimate is more than what has been reported by previous studies in KSA.<sup>[17]</sup>

About one-third of the participants had good practices regarding their dietary regime. This finding may be along with the same line of other studies in KSA, which produced a good level of practices to DM specifically for the dietary regimen, weight reduction, and practice of exercise.<sup>[17]</sup> As overall assessment regarding the knowledge, attitude, and practice where 60.6% of cases had good and acceptable knowledge scores. This is corresponding with other studies, in which show the overall knowledge was 90%.<sup>[14,19,20]</sup>

The prevalence of DM is high among the population of the Middle East and Gulf countries; the patients often lack the

**Table 4: Distribution of attack students according to practices score about diabetes mellitus**

Practices question	Practices (n=58)	
	Correct, n (%)	Incorrect, n (%)
Did you take your diabetes medication as prescribed of your doctor	40 (69.0)	18 (31.0)
Do you exercise regularly	39 (67.2)	19 (32.8)
Always attending DM clinic for follow-up	34 (58.6)	24 (41.4)
Did you made dietary regimen	22 (37.9)	36 (62.1)
Do you checked your blood sugar level regularly	13 (22.4)	45 (77.6)

DM: Diabetes mellitus

**Table 5: Distribution of participants according to knowledge, attitude, and practices score about diabetes mellitus**

Assessment	Knowledge score median=67%, n (%)	Attitudes score median=80%, n (%)	Practices score median=91%, n (%)
Good and acceptable	519 (60.6)	435 (50.8)	31 (53.4)
Poor	337 (39.4)	421 (49.2)	27 (46.6)
Total	856 (100)	856 (100)	58 (100)

knowledge and skills to self-manage their condition.<sup>[17]</sup> Half of the participants had positive attitude scores toward DM; this finding is similar to other study that conducted in India.<sup>[14,18]</sup> The majority of the participants (72%) had a negative attitude toward having diabetes, and about 53% of cases have good and acceptable practices toward diabetes; this result is differ from other reported by Balagopal in India while 59.0% of cases had poor attitude scores and about two-thirds of the cases (67.5%) had poor practices.<sup>[14]</sup>

The overall scores were good and acceptable regarding knowledge, attitude, and practice. A better educational program on diabetes should be conducted to improve awareness, attitude, and practice toward DM using mass media and health education in all ministries. Obtaining information about the prevalence, risk factors of DM is the first step in formulating a preventive program for the disease. In addition, there is increasing need to investigate KAP among diabetic patients to help in the future development of programs and techniques for effective health education.

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There are no conflicts of interest.

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