# Diabetes Mellitus Knowledge and Awareness among Diabetic University Students at Makkah in Saudi Arabia 2021

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## Abstract:

**Background:** Diabetes mellitus (DM) is a major metabolic disorder currently affecting over 350 million people worldwide. Type 2 diabetes mellitus is fast becoming a global epidemic and the number of individuals with diabetes in the world is expected to reach 330 million by 2030. The rate of T2DM is rapidly increasing in developing countries, particularly among younger age groups A cross-sectional study indicated that Saudi university students had more health-related knowledge than the older population; the majority of the university students believed that obesity was dangerous and that regular exercise was beneficial for their health. According to the International Diabetes Federation.

**Aim of the study:** The study aimed to identify the level of knowledge and awareness of DM among university students at the Makkah in Saudi Arabia 2021.

**Methods:** cross sectional descriptive study conducted among university students at Makkah, during 2021, the Sample size 300 university students of diabetic university students.

**Results:** regarding age the same percentage 22.0 %, were 18 and 25 years; with mean and standered deviation  $20.58 \pm 2.248$ . As for 54.3% were male. In relation to monthly income 52.3. regarding academic year 39.0% were in first year university. 44.0% use mass media as a source of their DM information. 40.0% had fair level, the same percentage 30.0% had poor and good knowledge level. 38.7% had good awareness level, followed by 35.0% had fair level and 26.3% had poor level. there were no significant correlation socio-demographic characteristics and knowledge level among diabetic university students. Conclusion: the level of awareness and knowledge of a considerable number of university students regarding DM was inadequate. Also, no significant relation was found between the knowledge students and sociodemographic data.

Keywords: Diabetes mellitus, knowledge, awareness, university students, Saudi Arabia

## Introduction

Type 2 diabetes mellitus is fast becoming a global epidemic and the number of individuals with diabetes in the world is expected to reach 330 million by 2030. The rate of

T2DM is rapidly increasing in developing countries, particularly among younger age groups including university students. A cross-sectional study indicated that Saudi university students exhibited more health-related knowledge than the older population; the majority of the university students believed that obesity was dangerous and that regular exercise was beneficial for their health. According to the International Diabetes Federation. Saudi Arabia is a developing country with a young population (53%  $\leq$ 24 years old). Saudi university students are at a high risk of developing diabetes as many suffer from obesity, a sedentary lifestyle and hereditary diabetes. In 2004, almost a quarter (23.7%) of the Saudi population was diagnosed with T2DM; this was 10 times the number of diabetic individuals in 1980.6 The occurrence of T2DM has been linked to the high rate of overweight adults (35.5%) in the Saudi population and the number of overweight and obese Saudi adolescents is high among both genders (Williams, et al.; 2020 and Meo,. et al.; 2019).

The youth are the future of a country and are considered dynamic human capital that plays a vital role in nation-building. If students adopt sedentary lifestyles and are inclined to fast food and irregular eating habits, then there is a lot of probability of suffering from being overweight, obese, and, consequently, type 2 diabetes mellitus (T2DM) at a young age. Low knowledge about diabetes coupled with high disease prevalence is common in lower source countries. It is essential to evaluate and update the knowledge, education and awareness of the diabetes especially among secondary school students, because in future they are going to avoid the diabetic complications and health problem of diabetes (Saraswathi, et al 2019 and Gillani, et al., 2018). The incidence of Type 2 diabetes mellitus has tremendously increased globally in the last 20–30 years. It is basically due to changes in people's carbonated and energy drinks, lifestyle by introducing fast foods, and reduced energy expenditure by manual hard work or regular exercise. It is essential to evaluate and update the knowledge, education and awareness of the diabetes among university students (Hoda, et al., 2019 and Garland, et al., 2011)

The level of knowledge and awareness regarding the DM among the university students helps to manage it properly both on the prevention and management front. It is very important to target the school students who are or would be involved in the care of diseased persons because if we succeed in creating good awareness and positive attitudes towards the difficulties and miseries of the school students in our future health care, then we can expect positive trends both in planning and management side (**Saeedi, et al.; 2019 and Alotaibi, et al.; 2017).** There may be a gap between knowledge of diabetes and awareness of diabetes among university students and in Saudi Arabia.

DM is a life-long disorder which can be treated by a complex regimen of insulin injections, diet and exercise, and which greatly affects the life of patients and their families. The researcher expects low the Knowledge about type 2 diabetes was generally high in our study, also some precautions must be taken for patients with type 2 Diabetes mellitus, this study will add significantly to the limited the knowledge and awareness among diabetic secondary school students toward management of Type 2 diabetes mellitus. Prevention and health promotion is one of the cornerstones in our practice, thus investing in knowledge and awareness toward management of Type 2 DM (**Robert, et al.; 2020, Alakhrass, et al., Abdirahman, et al., and Pinar, et al 2017).** 

Saudi Arabia is considered to be one of the highest countries in the Middle East for the incidence of diabetes mellitus. Data are lacking regarding knowledge and awareness about

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Diabetes mellitus among secondary school students in Saudi Arabia. So, The study aimed to assess the level of knowledge and awareness of diabetes mellitus among university students at the Makkah in Saudi Arabia . This knowledge would allow improvements of the current programs to address areas of knowledge deficiency and misconceptions, thus achieving maximum efficiencies with the finite resources devoted to secondary school students. The awareness of secondary school students about the disease can be of a great help to reduce the risk of complication developing diabetes in future

## Materials and methods

Study design: descriptive type of cross-sectional study was conducted

**Subjects**: convenience sample of 300 university students; Systematic random sampling technique is used. Simple random sampling technique has been applied to select the subjects. Also, convenience sampling technique will be utilized to select the participants in the study. By using systematic sampling random as dividing the total students by the required sample. Inclusion criteria including: university students at Makkah, any nationalities, age group from 18-25. Subject exclusion criteria including participate in before in study like our study.

Setting: The study has been carried out in Makkah governorate universities- Saudi Arab.

Data collection time: six months during 2021.

**Tool:** The self-administered questionnaire is designed based on previous literatures to identify the level of knowledge and awareness of DM among university students in Makkah. The questionnaire has been developed in English. All questions were closed-ended, the questionnaire is estimated to take 10 min to complete:

Part 1: Socio demographic information including: age, gender, Sources of information, education level, economic level.

Part 2: questions related to knowledge.

Part 3: questions related to awareness.

Scoring system of the tool: The level of knowledge and awareness has been categorized into poor, fair and good. per each topic/question, and also as per each response/answer.

After developing the study tool, the two senior faculty members checked the questionnaire's validity and comprehension, and it was revised according to their suggestions

**Ethical considerations:** Permission from the Makkah joint program of Saudi pediatric residency program will be obtained. consent was taken from every student before completing the survey, participants were required to indicate their using a forced response question followed by the survey questionnaires.

**pilot study**: A pilot study has been conducted on 15 secondary students to check the questionnaire's understanding and responses further, and its Cronbach's alpha was 0.86. The sample and results of the pilot study were not included in the final analysis.

Data entry and analysis were carried out using the Statistical Package for the Social Sciences (SPSS), version 20. Descriptive statistics (e.g., number, percentage) and analytic statistics using Descriptive statistics (e.g., number, percentage) and analytic statistics using Chi-Square tests ( $\chi$ 2) to test for the association and the difference between two categorical variables were applied. A p-value  $\leq 0.05$  will be considered statistically significant.

# **Results:**

Table 1: regarding age the same percentage 22.0 %, were 18 and 25 years; with mean and standered deviation  $20.58 \pm 2.248$ . As for 54.3% were male. In relation to monthly income 52.3. regarding academic year 39.0% were in first year university. 44.0% use mass media as a source of their DM information.

Socio-demographic data	No.	%	
Age (years)	66	22.0	
18	66	22.0	
19	33	11.0	
20	27	9.0	
21	40	13.3	
22	35	11.7	
23	5	1.7	
24	28	9.3	
25	66	22.0	
Mean ± SD	$20.58 \pm 2.248$		
Median	20.00		
Gender			
Male	163	54.3	
Female	137	45.7	
Monthly income (from the student's point of view)			
Enough	157	52.3	
Not enough	143	47.7	
Academic year			
First	117	39.0	
Second	98	32.7	
Third	42	14.0	
Fourth	43	14.3	
Sources of information about DM			

 Table (1): Frequency Distribution of socio demographic characteristics among diabetic university students (N=300)

	81	27.0
Educational work shop	87	29.0
Mass media	132	44.0
otners	4	5.7

Table (2): regarding level of knowledge 40.0% had fair level, the same percentage 30.0% had poor and good knowledge level.

Table (2):	Frequency Distribution of the Studied Students According to Overall
	Knowledge level among diabetic university students (N=300)

Knowledge level among diabetic			score	
university students	No.	%	Mean ± SD	
Poor	90	30.0	$2.00 \pm 0.776$	
Fair	120	40.0	$2.00 \pm 0.770$	
Good	90	30.0		

Table (3): the table shows that 38.7% had good awareness level, followed by 35.0% had fair level and 26.3% had poor level.

 Table (3): Frequency Distribution of Awareness level among diabetic university students (N=300)

Awareness level among diabetic university students	No.	%
Poor	79	26.3
Fair	105	35.0
Good	116	38.7

Table (4): there were no significant correlation socio-demographic characteristics and knowledge level among diabetic university students.

 Table (4): Shows the relation between socio-demographic characteristics and knowledge

 level among diabetic university students (N=300)

	Overall knowledge							
Socio-demographic characteristics	<b>Poor</b> (n = 33)		Fair (n = 23)		Good (n = 14)		χ²	Р
	No.	%	No.	%	No.	%		
Age in years								
18	22	24.4	25	20.8	19	21.1		
19	18	20.0	26	21.7	22	24.4	5 2 1 1	0.080
20	11	12.2	12	10.0	10	11.1	5.541	0.980
21	9	10.0	12	10.0	6	6.7		

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22	9	10.0	16	13.3	15	16.7		
23	12	13.3	16	13.3	7	7.8		
24	1	1.1	2	1.7	2	2.2		
25	8	8.9	11	9.2	9	10.0		
Gender								
Male	51	56.7	60	50.0	52	57.8		
Female	39	43.3	60	50.0	38	42.2	1.536	0.464
50≤60								
Monthly income								
Enough	49	54.4	58	48.3	50	55.6		
Not enough	41	45.6	62	51.7	40	44.4	1.305	0.521
Academic year								
first	37	41.1	42	35.0	38	42.2		
second	29	32.2	43	35.8	26	28.9	2 134	0.007
third	13	14.4	16	13.3	13	14.4	2.134	0.907
fourth	11	12.2	19	15.8	13	14.4		
Sources of information								
about DM								
Educational work shop	21	23.3	33	27.5	27	30.0	• • •	0.000
mass media	30	33.3	30	25.0	27	30.0	2.706	0.608
other	39	43.3	57	47.5	36	40.0		

#### Discussion

There may be a gap between knowledge of diabetes and awareness of diabetes all participants in our study were the students of university, the study aimed to assess the level of knowledge and awareness of diabetic university students. As has been shown in other countries, better health education is a powerful tool to control chronic health problems such as DM. For examples, 2 studies carried out in the United Kingdom by **Christie et al. 2009 and Deeb,2008**, reported better education among diabetic patients improves their ability to control the disease, resulting in better patient outcomes and reduced complications.

Firstly level of student knowledge and awareness must be known before health education program. In the present study, large majority of participants were in the age 18 and 25 years, male students were more participants than female students and the, moreover, regarding academic year the majority of participant are in the first year. In same line with the current study results study done by **Tannous, et al. (2012).** there was dominancy in male and young age participants. The results of the current study showed that the largest percentage of the studied students were had fair level of knowledge. Also in this study results showed that the largest percentage of the studied students were had good level of awareness.

Moreover, there was no statistically significant correlation between sociodemographic characteristics and knowledge level. In line with our study results a study done by **Amissah**, et

al., (2017). They that showed more prevalence of males and most of study participants showed a moderate level of knowledge that is similar to our results reported. Previous study to FPC, (2013), to assess knowledge of diabetes mellitus among Bahraini school teachers, reported an average knowledge and awareness of the study participants. More over overall the results showed that more than half (59.8) of their participants had an average level of knowledge of diabetes although there were areas of shortage. knowledge of the participant toward diabetes mellitus study results show the majority of participant had average information were (59.8%) while weak knowledge were (24.0%). In congruent with our study findings Alanazi, et al., 2018. They assessed Knowledge and awareness of diabetes mellitus and its risk factors in Saudi Arabia. Their results showed that their participants had an inadequate level of knowledge and awareness of diabetes mellitus and its risk factors in Saudi Arabia. Their results showed that their participants had an inadequate level of knowledge and awareness of diabetes mellitus and its risk factors in Saudi Arabia. Their results showed that their participants had inadequate level of knowledge and awareness of diabetes mellitus among the respondents in Saudi Arabia . Al-Aboudi et al., 2016; reported that 15% of the study participants had inadequate knowledge of DM, while 72% had moderate knowledge, the respondents in Dammam were found to obtain low scores regarding knowledge and attitudes toward diabetes mellitus. In another survey by Al Malki et al. [31], the percentage of correct answers to

Another study it results not in the same line with our results done by Maskey et al., 2011; among patients with diabetes mellitus reported that study found there was a significant difference between knowledge scores of postgraduate (19.67) and undergraduate (14.74) respondent (p < 0.001) [39]. moreover, a study by Al-Mutairi et al.2015, showed significant associations for all demographic variables (including diabetes mellitus status) with awareness scores including a significant association for gender and economic level significantly knowledge and awareness scores among Age, may be related to a higher level awareness Another study was carried out exclusively among their participants students.

## Conclusion

Our study concluded that the level of awareness and knowledge of a considerable number of university students regarding DM was inadequate. Also, no significant relation was found between the knowledge students and sociodemographic data.

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