



Awareness of diabetes mellitus and its complications among students in a Malaysian university

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Abstract

Background: In Malaysia, the prevalence of diabetes in 2006 was 11.6% and 22.6% in 2013, a two-fold increase.

Aim: This study aims to find out the level of awareness and knowledge on type 2 diabetes (T2D) mellitus and its complications among university students.

Materials and Methods: The study was conducted using a questionnaire which is developed based on the information drawn from the literature regarding awareness and complications of T2D.

Results: Most of the respondents knew that consuming sugar-containing foods can lead to diabetes and DM is controllable but not curable. Most of them know that DM causes increased frequency of urination and increased thirst. They also know that DM can affect any part of the body and the wound takes long time to heal. Unfortunately, only 50% of respondent aware that diabetes can damage kidney, blood flow to heart is decreased, and DM can cause loss of sensation in hands and feet and blindness. 61.5% of respondent knew that eating wheat and leafy vegetables are advisable for diabetic patient. 34.5% responded eating potato, banana, and rice is advisable and 4% responded consuming soft drinks and fruit juices is advisable.

Conclusion: Students in AIMST have good awareness on DM. Awareness about DM among university students will help to play a crucial role in fight against DM and to prevent complications of DM.

Introduction

Diabetes mellitus (DM) is a serious condition which is threatening the world, which can be seen by the raising number of people diagnosed with diabetes every year. For proper control of diabetes, the younger generation must be made aware of the symptoms of diabetes and the prevention of its complications. The present study was undertaken among the university students to find out how much they know about DM. Wherever the knowledge is deficient measures can be taken and appropriate information, education and communication campaign can be done based on these findings which will help to plan public health program. In Malaysia, there is an alarming increase in the prevalence of DM. Awareness of these complications such as neuropathy, retinopathy, albuminuria, and microalbuminuria is still not adequate among Malaysian, especially younger generation.

Purpose of the study

It is to provide evidence-based statistics of the awareness and knowledge of diabetic mellitus among students who are in the non-medical related field in AIMST University.

Inclusion and exclusion criteria of the participants

The inclusion criteria were the students from the Foundation to Undergraduates of Dentistry, Biotech, Foundation Studies, Business Studies, Physiotherapy, Engineering, and Nursing, in total of 200 students. The exclusion criteria were the medical, pharmacy, and international students.

Materials and Methods

This study was conducted in Asian Institute of Medical, Science and Technology (AIMST) University, consisting of a sample

size of 200 AIMST students from the Faculty of Dentistry, Faculty of Pharmacy, Faculty of Biotechnology, and Faculty of Allied Health Professions. It is random sample selection, regardless of age, gender, ethnicity, and medical insight. This study is conducted from January 2018 to March 2018.

The questionnaire is bilingual; in English as well as Malay. The questionnaires consist of three parts with 20 questions: 5 questions on demographic, 12 questions on knowledge of DM, and 3 questions on source of information and any family member having type 2 diabetes mellitus (T2DM). Questionnaires comprising question with base choice answers and multiple choice answers, where the participants are asked to identify the suitable ones. The questionnaires are distributed among participants who fulfill the study criteria. Furthermore, the participants are voluntary and written informed consent will be obtained before proceeding with the survey.

Variables

The independent variables are the sex, ethnicity, education level, and family history of DM.

The dependent variable is the awareness of T2DM and its complications. Using SPSS trial version 21, all the data were analyzed. The reliability of the questionnaire was determined after conducting the pilot study to get a value of Cronbach's alpha which is equal and more than 0.700. The first run of analysis showed that the Cronbach's alpha is 0.888; therefore, there was no need to delete or add any questions in the questionnaire. The approval of this study had been obtained from FOMRHAEC in March 2018 (RefNo: FOM/113 SSM/2018/10).

Results

Majority of the participant were 18 years old then followed by 19 and 20 years old. Age group of 25 years had participated least in this survey with a percentage of 8%. Age group of 21, 23, and 24 years had participated 11% each in this survey.

Knowledge on DM among participants

Most of the students are aware that the eating of sugar and other sweet food causes diabetes (70.5%) and only 14% did not know it [Table 1]. 62.5% of students know that diabetes cannot be cured but can be controlled with treatment and lifestyle modification, 18 think that it can be cured and 19.5% cannot be cured [Table 2]. Most of the students who took part in the study were aware that

Table 1: Can eating too much of sugar and other sweet foods cause diabetes?

Responder	Can cause diabetes	Cannot cause diabetes	Do not know
Frequency (%)	141 (70.5)	31 (15.5)	29 (14)

Table 2: Can type 2 diabetes mellitus be controlled or cured?

Responder	Can be cured	Cannot be cured	Can be controlled
Frequency (%)	36 (18)	39 (19.5)	125 (62.5)

frequent urination and increased thirst are due to increased blood sugar level. There still 5.5% of respondent thought low blood sugar and 14% of respondent thought normal blood sugar causing frequent urination and thirst in diabetes [Table 3]. Majority of respondent aware that diabetes can affect any parts of the body and some of them are unsure whether diabetes can affect our body parts [Table 4]. Unfortunately, only 50% know that diabetes can produce kidney failure which is common cause of morbidity. Majority of the respondent aware that blood flow to heart in T2D will be decreased. <35% unaware that blood flow to heart is decreased in T2D. It is good know that all students know that soft drinks and fruit juices must be avoided by diabetic patients [Table 5]. Through 75% of respondents know personally patients with diabetes only 60% are able to give correct answer. The students having relations with diabetes have good knowledge about diabetes.

Discussion

Nowadays, younger people are suffering from T2D. DM can be controlled if diagnosed early and managed. 93 students took part in the cross-sectional descriptive study. Hemoglobin (Hb) A1c blood sugar was measured in 93 students in a medical school in Malaysia using venous sampling. In that study recorded a 7.5% prediabetic prevalence rate among young adults aged 19–25 with a lack of knowledge about the prediabetic HbA1c values.^[1] It will be beneficial to young people if they know about the risk factors for the development of DM and their preventive methods. Majority of participants were <21 years of age as the study was conducted among students of a university. The source of information regarding DM is almost equally divided among word of mouth 35%, internet 25%, 21.5% from newspaper and television, and 18.5% gain their information through other sources. 74.5% of them know personally people suffering from diabetes and 57.5 of them had family members suffering from diabetes. More than 80% know that the high blood sugar is the cause for diabetes. They also know the symptoms of diabetes such as increased urination and increased thirst. >64% of

Table 3: What is the relation between blood sugar level and frequent urination as well as thirst in diabetes?

Responder	High	Low	Normal
Blood sugar (%)	161 (80.5)	11 (5.5)	28 (14)

Table 4: Is diabetes is a disease which can affect any parts of the body?

Responder	True	False	Do not know
Percentage of frequency	73.5	12.5	14

Table 5: What type of food advisable to be eaten by diabetic patient?

Responder	Cabbage, wheat, leafy vegetables	Potato, bananas, rice	Soft drinks, fruit juices
Percentage of frequency	61.5	34.5	4

students are aware of the healthy food, but 31% does not know the food to be avoided by diabetic patients. Most of them are aware that insulin produced by pancreas is deficient in diabetic patients. 62.5% of students know that diabetes cannot be cured but can be controlled with treatment and lifestyle modification. Unfortunately, 18% of them said it can be cured and another 19.5% said it cannot be controlled. Around 67% of them are aware of the complications of diabetes such as kidney disease, heart disease or loss of sensation, and poor wound healing. 57.5% of the study's participants had relatives suffering from DM, their level of knowledge regarding DM cannot be considered sufficient, especially since the study involved an educated population. In one study among 350 respondents, 81.7% did not know about the frequent urination and thirst is signs of DM. 82.3% had a misconception that diabetes is caused by failure of the kidneys to keep sugar out of the urine.^[2] In a study conducted in the United Arab Emirates (UAE) regarding DM among university students in non-medical professional courses in the UAE, 70% knew that blood sugar levels are increased in DM. Family history of DM is a major risk factor. They are not aware that thirstiness, increased frequency of micturition, and loss of weight as symptoms of DM. They got moderate knowledge about the complications of diabetes such as gangrene, loss of sensation in limbs, oral and dental diseases, infections, and increased risk for cardiovascular disease. There are no differences between participants with or without a family history of DM in the health behavior. DM-related knowledge was not adequate among students.^[3] Al Baha University Students participated in a study; of them, 49.4% were medical students and 50.6% non-medical students. Most of the respondents were <24 years of age (70.1%). The overall knowledge about diabetes among the participant was found to be about 69.2% and their awareness regarding diabetes risk factors was found to be 61.2%. Almost all (100%) of the medical students were agreed on diabetic complications; while only 50% of nonmedical students were aware of these complications. Students' knowledge about diabetes was fair; the knowledge is more among medical students as compared to the non-medical students.^[4] Only 50% of family physicians in Pakistan had DM-related knowledge and attitude. Half of family physicians answered correctly to blood values of glucose, treatment of DM among children and pregnant women, and technique of insulin injection. More than 50% of fasting plasma (FPs) know about impaired glucose tolerance, insulin in pregnancy, educating people about complications of diabetes, and its screening and management. Programs must be conducted to FPs to update the knowledge of FPs' on early detection and management of diabetes. A total of 767 family physicians took part in this study with mean clinical practice duration of 13.41 years. >90% FPs treated diabetics and 107 (14%) of the doctors were diabetic themselves.^[5] A study conducted in Nigeria revealed high level (75.9%) of awareness of the DM among undergraduates in a Nigerian university, but only 40.4% know the definition of diabetes. They could not discuss the symptomatology of the condition, as well as the associated risk factors. About a one-third (30.1%) was not aware of the preventive measures.^[6] In

a study conducted among non-diabetic Saudi population, the knowledge about DM is 71.1%, symptoms 80.8%, risk factors 63.4%, and complications 47.7%. The source of information is from relatives, friends 73.8%, and media 47.1%. Only 19.1% got information on DM from health-care professionals. Most of them believed that diabetes is a curable disease. Most of them do not know about complications of DM. Hence, more programs must be conducted to educate the general population about diabetes and its complications. The majority of young age population are thinking that diabetes can be cured.^[7] In another study conducted in India among students on diabetes, frequent micturition 73.15%, tiredness 50.15%, and increased appetite 46.91% were mentioned as symptom of diabetes. They could not identify the common complications such as ulcer on foot (70.83%), loss of sensation (69.91%), skin infections (62.80%), and stroke (61.42%).^[8] In a study among Chennai city, urban population found that 75.5% of population know about diabetes. However, only 26.8% of non-diabetics are aware of complications of diabetes among and 74.2% among diabetics.^[9] Kulkarni *et al.* reported that students knew about diabetes through mass media (42%). Students felt that polyuria was the most common symptoms and 42% of the students knew that it will affect the kidney. Majority of the students revealed that medications can control diabetes.^[10] AIMST students' knowledge about is comparable to the study conducted among technical students in Iraq for signs and symptoms approximately 75%, "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. The knowledge information about DM among the students had good and accepted knowledge scores 60% regarding the complications of DM. About one-third of the participants had good practices regarding their dietary regime.^[11] In a study conducted with 166 patients in Malaysia aware the fasting blood sugar value was 5.50 ± 1.13 . They know about the diet control is important in DM. Education is important factor in controlling blood sugar among DM patients. Better control of sugar was seen in young Malay patients, working women, and those patients who have diabetes among family members. They also had good knowledge about DM. Good knowledge about DM helped in better blood sugar control.^[12] A total of 4333 students took part in a study conducted in Kuwait about DM and scored 71% in knowledge about diabetes, risk factors of diabetes 63%, the symptoms and complications 55.8%, treatment and management 62.7%, and 72.3% monitoring diabetes.^[13] The knowledge about DM among the students of AIMST University is no way different from other university students and also among the same age group people. Their knowledge same as non-diabetic people in general population but less when compared to diabetic patients.

Conclusion

About 2.8% of the population worldwide had diabetes in 2000 and it is estimated that in the year 2030, this number will be

doubled.^[14] The study was conducted with the aim of finding about the awareness of DM among non-medical students and to identify where the knowledge is deficient and design educational programs to overcome these deficiencies. Most of the college students have basic knowledge about diabetes mellitus. But they do not know about methods of presentation of DM and its complications. It is important to conduct health awareness programs among students to increase awareness about diabetes.

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Clinical Significance

The present study was undertaken among the university students to know the level of knowledge about DM and to take appropriate steps to impart information about DM, to educate about diet and exercise. Health education can be done based on the findings of the study, which will help to plan public health program.

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