



Knowledge and Attitude of Medical Students at the Universitas Sumatera Utara toward Lifestyle that Contributes to Type 2 Diabetes

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Abstract

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BACKGROUND: Diabetes mellitus is a chronic metabolic disease with an increased blood glucose level. Lifestyle in the form of wrong diet and low or inadequate physical activity affect to type 2 diabetes.

AIM: The purpose of this study was to determine the level of knowledge and attitude of medical students at the Universitas Sumatera Utara regarding diet and physical activity that contribute to type 2 diabetes.

METHODS: Class 2017 medical students at the Universitas Sumatera Utara who met the inclusion and exclusion criteria were asked to participate as respondents in this cross-sectional study. Respondents were asked to answer online-based questionnaires containing 14 knowledge questions and 14 attitude statements about lifestyle toward type 2 diabetes. Knowledge scores equal to above 11 were categorized as good knowledge, and attitude scores equal to above 42 were categorized as good attitude. The data were presented as frequencies and percentage proportions using SPSS program version 22.

RESULTS: Out of 255 class 2017 medical students, 72 students were respondents in this study. The results showed that the level of knowledge and attitude of medical students regarding diet that plays a role in type 2 diabetes in the good, moderate, and poor categories were 94.4%, 4.2%, and 1.4% and 58.3%, 41.7%, and 0%, respectively. The level of knowledge and attitude regarding physical activity that plays a role in type 2 diabetes in the good, moderate, and poor categories was 97.2%, 1.4%, and 1.4% and 33.3%, 66.7%, and 0%, respectively.

CONCLUSIONS: In this study, it was shown that the knowledge and attitude of medical students at the Universitas Sumatera Utara toward eating pattern that contributes in type 2 diabetes were in line, namely, the percentage of good categories was the highest percentage for each knowledge and attitude, but different results were found on the level of knowledge and attitude for physical activity.

Introduction

Diabetes mellitus is a chronic metabolic disease with an increased blood glucose level (hyperglycemia), which can cause damage the heart, blood vessels, eyes, kidneys, and nerves if left untreated for a long time. Diabetes mellitus can be divided into two, namely, type 1 diabetes and type 2 diabetes. Type 1 diabetes usually occurs in children, which is also called insulin-dependent diabetes, an event which the pancreas produces very little or no insulin. Meanwhile, type 2 diabetes usually occurs in adults, caused by insulin resistance [1], [2].

Type 2 diabetes can occur because it is influenced by various modifiable and non-modifiable risk factors. Modifiable risk factors for type 2 diabetes include knowledge and attitude about the things that contribute to the onset of the disease. Knowledge is the result of knowing that occurs after a person senses (especially by eyes and ears) of a certain object. Attitude is the reaction or response of someone who is still closed to a stimulus or object [2], [3], [4].

In the previous study, it was found that the level of knowledge and attitude regarding the risk factors for diabetes in general among the non-diabetes community members of Bale Zone Administrative Towns, South East Ethiopia was in the good category (52.5% and 55.9%, respectively) [5]. However, the results of the other previous study that was participated by students at Faculty of Medicine, Rabigh, King Abdulaziz University Jeddah, there were 13% with good knowledge score percentage, moderate, and poor knowledge score were 39.8% and 47.1%, respectively, but 83.3% of participants in had positive attitude, and 16.7% had negative attitude [6].

Knowledge and attitude toward wrong eating patterns and low/inadequate physical activity are known as factors that influence a person to suffer type 2 diabetes. For example, the wrong diet, overeating, eating fast foods regularly, and tends to choose eating sweet foods are the risk factor for type 2 diabetes because it can cause obesity. Obesity is one of the main predisposing factors for metabolic disorders, such as insulin resistance in type 2 diabetes [7]. Lack of physical activity is also contributed to type 2 diabetes.

Lack of physical activity causes energy used is also reduced, excessive energy in the body will be stored in the form of fat and will lead to obesity. Apart from these things, stress could also have an indirect effect on the onset of type 2 diabetes. There are different reactions in individuals in dealing with stress, namely, loss of appetite or tend to eat more than usual. Based on the description above, researcher was interested to conduct a research to determine the knowledge and attitude of medical students at the Universitas Sumatera Utara toward diet and physical activity that contribute to type 2 diabetes.

Methods

Ethic

The research was conducted after obtaining approval from the Research Ethics Commission of the Universitas Sumatera Utara No 272/KEP/USU/2020.

Study design

This study was a cross-sectional online questionnaire-based study conducted in June–October 2020. The respondents of this research were class 2017 medical students at the Universitas Sumatera Utara that met the inclusion criteria, such as both male and female medical students at the Universitas Sumatera Utara, did not suffer from type 2, were willing to become the respondents of this research by filling out questionnaires and signing informed consent. Respondents were excluded if they did not complete the questionnaire.

Questionnaire

The questionnaire contains questions about the characteristics of the respondents (name, gender, and age) and questions and statements regarding knowledge and attitude about diet and physical activity that play role in type 2 diabetes which was adapted from previous research questionnaires, namely [8]:

1. Questions evaluating knowledge of class 2017 medical students at the Universitas Sumatera Utara regarding diet and physical activity related to the risk factors of type 2 diabetes consisted of 14 questions. For 14 questions, each knowledge of diet and physical activity regarding type 2 diabetes, the correct answer was given a value of 1, while the wrong answer was given a value of 0. Interpretation of the results: -Good: Total score ≥ 11 -Moderate: Total score 8-10 -Poor: Total score < 8 .
2. The attitude evaluation of class 2017 medical students at the Universitas Sumatera Utara

regarding diet and physical activity related to the risk factors of type 2 diabetes consisted of 14 positive and negative statements. For 14 statements, each positive statement (favorable), the answer strongly agree was given a value of 4, agree was given a value if 3, disagree was given a value of 2, and strongly disagree was given a value of 1. Whereas each negative statement (unfavorable), the answer strongly agree was given a value of 1, agree was given a value of 2, disagree was given a value of 3, and strongly disagree was given a value of 4. Interpretation of the results: -Good: Total score ≥ 42 -Moderate: Total score 3-41 -Poor: Total score < 31 .

Statistical methods

The statistical analysis was made using SPSS program version 22. Knowledge and attitude toward type 2 diabetes were presented based on frequencies and percentages were used as descriptive statistics.

Results

The number of respondents in this study who met the inclusion and exclusion criteria was 72 students whose characteristics is shown in Table 1.

Table 1: Distribution of respondent characteristics

Characteristics	n	%
Gender		
Female	36	50.0
Male	36	50.0
Age (years)		
19	2	2.8
20	29	40.3
21	35	48.6
22	6	8.3

In this study, the results of evaluating the knowledge of medical students at the University of Sumatera Utara toward eating patterns that affect type 2 diabetes are shown in Table 2.

The results of evaluating the attitude of medical students at the University of Sumatera Utara towards eating patterns that affect type 2 diabetes are shown in Table 3.

In this study, the results of evaluating the knowledge of medical students at the Universitas Sumatera Utara toward physical activity that affect type 2 diabetes are shown in Table 4.

In this study, the results of evaluating the attitude of medical students at the Universitas Sumatera Utara toward physical activity that affect type 2 diabetes are shown in Table 5.

Scoring of the evaluation, from the answers of the questions and statements in this study showed that

the level of knowledge and attitude of medical students regarding diet that plays role in type 2 diabetes in the good, moderate, and poor categories was 94.4%, 4.2%, and 1.4% and 58.3%, 41.7%, and 0%, respectively (Table 6).

Table 2: Evaluation of students' knowledge toward eating patterns that affect type 2 diabetes

No.	Statements	Agree		Disagree	
		n	%	n	%
1.	Diabetes mellitus is a disease where there is an increased blood sugar level beyond normal limits	72	100	0	0
2.	The likelihood of developing type 2 diabetes mellitus is only influenced by family history/heredity	23	31.9	49	68.1
3.	Family history, obesity, wrong diet, and lack of physical activity are the trigger factors for the onset of diabetes mellitus	72	100	0	0
4.	Diabetes mellitus can occur if I cannot control my diet	70	97.2	2	2.8
5.	An unhealthy diet at young age is not a cause of diabetes mellitus	16	22.2	56	77.8
6.	A good diet can be used as a preventive action against the onset of diabetes mellitus	72	100	0	0
7.	Setting the good amount of food, type of food, and meal schedule can reduce the risk of developing diabetes mellitus	72	100	0	0
8.	Every day consuming carbonated drinks, syrups, and sweetened drinks in excess, do not increase blood sugar level in the body	5	6.9	67	93.1
9.	Consuming fast food continuously can increase the risk of developing diabetes mellitus	71	98.6	1	1.4
10.	Food intake that is consumed does not have to be adjusted to the energy needed by our bodies	8	11.1	64	88.9
11.	Without having to pay attention to meal times, eating nutritious food is still a healthy diet	9	12.5	63	87.5
12.	Good meal time in a day is 3 times, namely breakfast, lunch, and dinner	68	94.4	4	5.6
13.	Eating excessively high fat food has no effect on the onset of type 2 diabetes	15	20.8	57	79.2
14.	A patient who has suffered from diabetes mellitus does not have to maintain a good diet because he has been given antidiabetic drugs	5	6.9	67	93.1

In this study, the scores for the level of knowledge and attitude of medical students toward physical activity that plays role in type 2 diabetes in the good, moderate, and poor categories were 97.2%, 1.4%, and 1.4% and 33.3%, 66.7%, and 0%, respectively (Table 7).

Table 3: Evaluation of students' attitude toward eating patterns that affect type 2 diabetes

No.	Statements	Strongly Agree		Agree		Disagree		Strongly Disagree	
		n	%	n	%	n	%	n	%
1.	I prefer to get over my anger through eating or snacking rather than do sports	9	12.5	25	34.7	30	41.7	8	11.1
2.	I feel that managing a healthy diet is not important to do, because I am still a teenager	2	2.8	2	2.8	40	55.6	28	38.9
3.	I feel that I do not need to maintain my diet because I have not suffered diabetes	2	2.8	2	2.8	36	50	32	44.4
4.	I prefer eating fibrous foods such as fruits and vegetables to various types of fast foods	11	15.3	42	58.3	17	23.6	2	2.8
5.	I tend to eat when I am hungry without having to set a regular eating schedule	9	12.5	31	43.1	26	36.1	6	8.3
6.	I feel like I still have to maintain a healthy diet even though I am not obese	34	47.2	34	47.2	3	4.2	1	1.4
7.	I prefer consuming water to soft drinks and drinks with artificial sweeteners	29	40.3	30	41.7	13	18.1	0	0
8.	I do not feel worried about eating sweet foods every day	3	4.2	21	29.2	34	47.2	14	19.4
9.	I feel that sleeping right after a big meal can have a negative impact on health	32	44.4	35	48.6	4	5.6	1	1.4
10.	I prefer eating big meals with only rice and side dishes without eating vegetables	2	2.8	10	13.9	47	65.3	13	18.1
11.	I feel like it is needed to make a gap between large meals at least 3 h	25	34.7	34	47.2	11	15.3	2	2.8
12.	I prefer to eat self-cooked rice, side dishes, and vegetables at home rather than eat junk food	29	40.3	34	47.2	9	12.5	0	0
13.	I am more likely to spend my pocket money on foods like fried or ready-to-eat food	3	4.2	18	25	39	54.2	12	16.7
14.	I feel that 3 large meals a day are enough	21	29.2	33	45.8	16	22.2	2	2.8

Table 4: Evaluation of students' knowledge toward physical activity that affect type 2 diabetes

No.	Statements	Agree		Disagree	
		n	%	n	%
1.	Lack of physical activity can be one of the factors that cause diabetes mellitus	72	100	0	0
2.	Patients who have suffered diabetes do not need to do regular physical activity because they have been given antidiabetic drugs	2	2.8	70	97.2
3.	Physical activity only needs to be done by people who suffered diabetes mellitus	1	1.4	71	98.6
4.	Lack of physical activity at young age has no effect on the risk of developing diabetes mellitus	8	11.1	64	88.9
5.	Routine physical activity is one of the ways to prevent type 2 diabetes mellitus	71	98.6	1	1.4
6.	Physical activity does not have to be done for hours, 15–30 min is enough but should be done regularly	72	100	0	0
7.	Exercising regularly means that it must be done every day and only one type of physical activity is done	26	36.1	46	63.9
8.	Heavy exercise for more than 1 h but not done regularly is enough to maintain my health	6	8.3	66	91.7
9.	Doing light daily activities such as recreation, walking in the park, gardening, and cleaning the yard can be considered as physical activity	59	81.9	13	18.1
10.	Spending hours playing games or watching has no effect on health	5	6.9	67	93.1
11.	Doing light exercise for 15–30 min but regularly can prevent us from the risk of diabetes	71	98.6	1	1.4
12.	One of the effects of the imbalance between energy consumed and energy used is obesity	70	97.2	2	2.8
13.	Non-obese people do not need to exercise regularly	3	4.2	69	95.8
14.	Exercise does not have to be done every day, 3–5 times a week is enough	68	94.4	4	5.6

Discussion

Type 2 diabetes is a chronic disease that occurs when the body cannot use the insulin produced by the pancreas adequately. On laboratory examination found an increase in blood glucose level. Diabetes mellitus sufferers have a higher risk of experiencing several serious health problems. Persistently high level

Table 5: Evaluation of students' attitude toward physical activity that affect type 2 diabetes

No.	Statements	Strongly Agree		Agree		Disagree		Strongly Disagree	
		n	%	n	%	n	%	n	%
1.	I feel that I do not need to exercise regularly because I am still a teenager	3	4.2	1	1.4	41	56.9	27	37.5
2.	I prefer to play games/gadgets indoor rather than outside the house	5	6.9	22	30.6	36	50	9	12.5
3.	I prefer to get over my anger through exercising to eating	7	9.7	23	31.9	38	52.8	4	5.6
4.	I feel like it is not needed for me to exercise regularly because I have not suffered diabetes	1	1.4	2	2.8	43	59.7	26	36.1
5.	I like aerobic exercise such as walking, cycling, jogging, and swimming	27	37.5	37	51.4	8	11.1	0	0
6.	I prefer hobbies like watching and reading books to exercising	9	12.5	36	50	21	29.2	6	8.3
7.	I routinely do light exercise (jogging, walking, cycling) 3 times a week for 30 min	14	19.4	29	40.3	26	36.1	3	4.2
8.	I like routine activities such as gardening or cleaning the yard	11	15.3	28	38.9	32	44.4	1	1.4
9.	I prefer a healthy lifestyle such as walking frequently, using stairs (not using the lift)	11	15.3	40	55.6	20	27.8	1	1.4
10.	I choose to keep doing physical activity regularly even though I am on a vacation	14	19.4	42	58.3	16	22.2	0	0
11.	I prefer to take part in extracurricular activities rather than go straight home	11	15.3	31	43.1	29	40.3	1	1.4
12.	I exercise <15 min for each exercise	6	8.3	23	31.9	33	45.8	10	13.9
13.	It is better to do irregular heavy exercise than regular light exercise	1	1.4	4	5.6	40	55.6	27	37.5
14.	I feel that physical activity can only be done by those who like sports	1	1.4	8	11.1	41	56.9	22	30.6

of glucose can cause serious diseases that affect the heart and blood vessels, eyes, kidneys, and nerves. Type 2 diabetes is a major cause of cardiovascular disease, blindness, kidney failure, and lower limb amputations [1], [3].

Table 6: Respondents' knowledge and attitude toward diet that plays role in type 2 diabetes

Behavior	n	%
Knowledge		
Good	68	94.4
Moderate	3	4.2
Poor	1	1.4
Attitude		
Good	42	58.3
Moderate	30	41.7
Poor	0	0

In this study, observations about behavior in the form of knowledge and attitude of medical students at the Universitas Sumatera Utara toward diet and physical activity that plays role in type 2 diabetes were done. Knowledge and attitude are risk factors can be modified to prevent certain diseases, especially type 2 diabetes.

Table 7: Respondents' knowledge and attitude toward physical activity that play role in type 2 diabetes

Behavior	n	%
Knowledge		
Good	70	97.2
Moderate	1	1.4
Poor	1	1.4
Attitude		
Good	24	33.3
Moderate	48	66.7
Poor	0	0

The results of this study indicate the level of knowledge and attitude of medical students at the Universitas Sumatera Utara toward diet that plays role in type 2 diabetes in the good, moderate, and poor categories were 94.4%, 4.2%, and 1.4% and 58.3%, 41.7%, and 0%, respectively. Good categories for knowledge and attitude toward diet were the highest percentage.

This result is the same as the result of previous research which found that the students of Nursing Department of the Health Polytechnic of the Ministry of Health, Palangka Raya, respondents with good levels of knowledge toward diet related to type 2 diabetes were higher (77.4%) than respondents with poor knowledge (22.6%) [9]. However, the other previous study found that different results from the current study, namely, diabetic patients had poor knowledge and had negative attitude were the highest percentage [10].

This study also observed knowledge and attitude of medical students at the Universitas Sumatera Utara toward physical activity that plays role in type 2 diabetes. The results showed that knowledge and attitude in the good, moderate, and poor categories were 97.2%, 1.4%, and 1.4% and 33.3%, 66.7%, and 0%, respectively. There was a difference in the highest percentage of category for knowledge and attitude toward physical activity. Good knowledge of physical activity that affects type 2 diabetes constitutes the highest percentage, but this was not in line with good attitude.

The previous study found the same results, namely, in diabetic patients were found that 49.5% had good knowledge of exercise that affects diabetes whilst 90.0% had negative attitude to exercise [11]. The other previous study showed deficit in patients' knowledge and also lack of positive attitude toward diabetic exercise, but in other previous study, more than half of the participants had good knowledge and attitude toward regular exercise regarding glycemic controls [12], [13].

The other previous study showed that the majority of respondents (92.2%) had poor knowledge of the benefits of exercise, weight loss, and a healthy diet and 84.3% had a positive attitude toward healthy lifestyle modifications [14]. These results were not in line with a previous study that found 53.3% of participants had good knowledge and 46.3% had positive attitude [15].

Knowledge is the result of knowing that occurs after a person senses a certain object. A person's knowledge is influenced by age, education, experience, information/mass media, socio-culture and economy, and environment. Attitude is the reaction or someone's response that is still closed to a stimulus or object. Attitude is not always in line with knowledge. A person's attitude is formed or changed due to internal and external factors [5]. This research respondents were medical students. Good knowledge toward physical activity that affects type 2 diabetes does not always lead to good attitude toward physical activity. Young age is a psychological and physiological factor that internally shape students' attitude toward physical activity. The tight lecture schedule is also an external factor that shape students' less attitude toward physical activity.

Conclusions

In this study, it was shown that the knowledge and attitude of medical students at the Universitas Sumatera Utara toward eating pattern that plays role in type 2 diabetes were in line, namely, the percentage of good categories were the highest percentage for each knowledge and attitude, but different results were found on the level of knowledge and attitude toward physical activity.

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