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The Effect of Health Education on the Level of Knowledge and Behavior in Diabetes Mellitus Management

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Abstract

Diabetes mellitus is a metabolic disease characterized by glucose levels in the blood that are more than normal or hyperglycemia, this is due to a decrease in the body's ability to react with insulin, or it could be impaired insulin secretion.Riskesdas 2013 shows that diabetes mellitus sufferers in Indonesia are around 6.9% or around 12 million people with 1.4% of diabetes sufferers in South Kalimantan or around 38,113 people diagnosed with diabetes mellitus, especially type 2 diabetes mellitus which is related to lifestyle.One of the efforts made is health education. This research is an experimental research using pre-experimental method with one group pretest-postest design. The sampling technique used consecutive sampling of 50 people.The results of the effect of health education on the behavior of diabetes mellitus sufferers obtained p-value = 0.011<0.05, this indicates that Ho is rejected, which means that there is an effect of health education on the behavior of diabetes mellitus sufferers in handling diabetes mellitus.The results of the effect of health education on the knowledge level of diabetes mellitus sufferers obtained p-value = 0.421> 0.05, this indicates that Ho is accepted, which means that there is no effect of health education on increasing knowledge of diabetes mellitus sufferers in handling diabetes mellitus. These results were obtained from the pre and post-test scores of the respondents which indicated that there was an influence before and after health education to the public.

Keywords: *Diabetes Mellitus, Health Education, Knowledge, Behavior*

Introduction

Diabetes mellitus is a metabolic disease that has a collection of symptoms due to an increase in blood glucose levels above normal values (hyperglycemia) due to a decrease in the body's ability to react with insulin, impaired insulin secretion, or both[1,2].

There was an increase to 422 million people in 2014[3]. Indonesia is ranked seventh in the world with 10 million people with diabetes mellitus in 2015[4]. The increase in the prevalence of diabetes mellitus globally is mainly due to a lack of knowledge about diabetesmanagement and lifestyle changes such as unhealthy behavior, obesity and lack of exercise[5]. Diabetes mellitus has complications that can occur in patients such as complications in the heart, kidneys, blindness, atherosclerosis and even limbs that can be amputated due to the death of rotting tissue[6].

Knowledge of diabetics is means that can help sufferers undergo diabetes management during their life so that sufferers understand how to behave in dealing with their disease. The behavior of diabetics is very much influenced by knowledge, in this case knowledge is very important to determine behavior that can reduce the risk of complications[5].

The results showed that 83.3% of respondents had inappropriate behavior in managing diabetes mellitus[7]. According to other research, it shows that 23.3% of respondents have less knowledge about diabetes mellitus foot care[8]. Other research shows that 68.3% of respondents do not comply with physical exercise[9].

Management of diabetes mellitus that is understood by people with diabetes mellitus in the community needs to be identified and analyzed as the basis for to develop diabetes mellitus prevention efforts in the community.There has never been a comprehensive health education on the management of diabetes mellitus in the community.

Based on the phenomena and results of previous studies, researchers are interested in conducting research on the effect of health education on the level of knowledge and behavior in diabetes mellitus management.

Method

This research is an experimental research using pre experimental method with one group pretest-postest design. The population in this study were patients with diabetes mellitus in Cempaka Village. The sampling technique used consecutive sampling and a sampling size of 50 samples based on inclusion criteria.

The instrument used was a questionnaire consisting of three parts: demographic questionnaire, diabetes mellitus knowledge questionnaire, and diabetes mellitus management behavior questionnaire.

Results and Discussion

RespondentCharacteristics

Table 1. Characteristics of Respondents

Respondent of Characteristics	Quantity	Percentage
Age		
36-45 tahun	3	6,0
46-55 tahun	27	54,0
56-65 tahun	16	32,0
> 65 tahun	4	8,0
Total	50	100,0
Gender		
Male	14	28,0
Female	36	72,0
Total	50	100,0
Education		
Notcompleted in primary school/ not elementaryschool	36	72,0
Junior highschool Senior high school	11	22,0
College	3	6,0
Total	50	100,0

Respondent of Characteristics	Quantity	Percentage
Profession		
Government Employees	0	0,0
Private	0	0,0
Farmer	2	4,0
Traders	7	14,0
Others	41	82,0
Total	50	100,0
Long suffered Diabetes Mellitus		
0-5 years	38	76,0
6-10 years	8	16,0
11-15 years	3	6,0
16-20 years	0	0,0
> 20 years	1	2,0
Total	50	100,0
Comorbidities		
Have	39	78,0
Do not have	11	22,0
Total	50	100,0

In table 1.The characteristics of respondents obtained the most data based on age at the age of 46-55 years, namely 54%, the most gender is female, 72%. another 82% which includes housewives, retired and not working. The longest duration of diabetes mellitus sufferers was at 0-5 years, namely 76%, respondents who had the most comorbidities with diabetes mellitus were 78%.

This age range is included in the range of middle adulthood (Middle Adulthood)[10]. Age over 40 years is also a risk factor for diabetes mellitus[11]. This is in accordance with other research that old age affects diabetes because physiological body function decreases and there is a decrease in insulin secretion or resistance so that the body's ability to function to control high blood glucose is less than optimal[12,13].

The results of the same study werealso stated that the female respondents who suffered from diabetes mellitus were 84% [14]. This is in accordance with research which states that women have a higher risk of developing diabetes than men. The number of female sufferers compared to male sufferers is caused by risk

factors from the Body Mass Index (BMI) between women and men[15].

In the study, it was stated that there was no significant effect between education level and blood glucose levels in diabetes mellitus patients. The level of education may only affect the perspective of the disease. Patients with a high level of education also have a high awareness of a disease[3].

Work can affect knowledge. Reviewedfrom its type, jobs that often interact with other people are more exposed to information or those without any interaction with other people. Work is also related to the physical activity of people with diabetes mellitus. People who do physical activity will burn body fat. This body fat has the potential to increase blood sugar levels in the body if there is no burning[16].

The longer the respondent suffers from the disease, the better the respondent responds to the disease, such as adhering to the treatment[17]. This is in accordance with other studies, which state that the duration of suffering from diabetes mellitus affects knowledge of the disease[18].

High levels of glucose in the blood, glucose metabolites or high levels of fatty acids in the blood can cause damage to the endothelial cell lining of the arteries[19].Some of the vascularcomplications, including cardiovascular, cerebrovascular and peripheral vascular[20].This can be seen from the respondent's comorbidities, which include high blood pressure, cholesterol, heart disease and stroke. Diabetes mellitus can also reduce the body's immune system. Uncontrolled high blood sugar levels can also result in susceptibility to infection. This can be seen from the respondent's comorbidities related to infection, including the presence of respondents with a history of TBC[21].

Knowledge Levels of Diabetes Mellitus Patients in the Management of Diabetes Mellitus Before and After Health Education Treatment

Table 2. Knowledge Levels of Diabetes Mellitus Patients in Diabetes Mellitus Management Before Health Education Treatment

Knowledge Level	Pre Test		PostTest	
	Quan-tity	Persen-tage	Quan-tity	Persen-tage
Good	38	76,0	41	82,0
Sufficient	9	18,0	7	14,0
Less	3	6,0	2	4,0
Total	50	100,0	50	100,0

In table 2. Knowledge Level of Diabetes Mellitus Patients in Management of Diabetes Mellitus Before Health Education Treatment is given the pre-test results at the level of knowledge before being given health education in the good category, namely 76%.

The results of the post test at the level of knowledge after being given health education were in the good category but increased from the time of the pre-test, namely 82%. The increase occurred by 6% (from 76% to 82%).Thisincrease also shows the effectiveness of health education that has been provided to respondents.

The level of knowledge in the management of diabetes mellitus is related to the duration of suffering from the disease. Most respondents have suffered from diabetes mellitus for five years. This five year period allows respondents to get a lot of information about diabetes mellitus. This is in accordance with other studies, which stated that the duration of suffering from diabetes mellitus affects knowledge of the disease[18].

Knowledge about diabetes mellitus is very important for DM patients, in order to avoid complications. Most of human knowledge is acquired through the eyes and ears[22]. An intervention is needed to increase knowledge about the disease, the management process or treatment therapy[6]. The intervention carried out in this study was by means of health education.

The evaluation in this study was seen from the post test scores that have been carried out. The category of knowledge level in diabetes mellitus sufferers in diabetes

mellitus management before being given health education treatment is in good category. The researcher then provided an intervention in the form of health education to the respondents.As a result, the respondent's level of knowledge increases.This good knowledge is obtained from several factors. Factors that support this

include the length of time the respondent suffer from diabetes mellitus respondents who on average of five years. The increase in respondents' knowledge was then obtained after receiving health education. Respondents returned to get new knowledge about the disease.

Behavior in Diabetes Mellitus Patients in Diabetes Mellitus Management Before and After Health Education Treatment

Table 3. Behavior of Diabetes Mellitus Patients in Diabetes Mellitus Management before and after Health Education Treatment

Behavior	Pre Test		PostTest	
	Quantity	Persen-tage	Quantity	Persen-tage
Good	7	14,0	9	18,0
Sufficient	34	68,0	37	74,0
Less	9	18,0	4	8,0
Total	50	100,0	50	100,0

Table 3. Behavior in Diabetes Mellitus Patients in Diabetes Mellitus Management before and after being given Health Education Treatment, the pre-test result on behavior before being given health education is in the sufficient category, namely 68%. The results of the post-test on behavior after being given health education were in the sufficient category but increased from the initial test, namely 74%. This increase also shows the effectiveness of health education that has been provided to respondents, even though it is in the sufficient category. The increase occurred by 6% (from 68% to 74%).

Behavior is influenced by knowledge. Knowledge is the basis for taking an action[22]. Health behavior is a person's response to stimuli related to illness and disease[23]. The most important thing in health behavior is the problem of behavior formation and change. Behavior

change is the goal of health education or promotion to support other health programs[22].

Knowledge has six levels which were included in the cognitive domain. These levels are knowing, understanding, application, analysis, synthesis and evaluation[22]. This is one of the factors of respondent behavior in the sufficient category. Behavior in the management of diabetes mellitus is in the moderate category. The researcher then provided an intervention in the form of health education to the respondents. The results remain in the adequate category, but the value of the respondent's level of behavior increases. Another study stated that it took 5 weeks to carry out health education before there was a change in the respondent's lifestyle[24].

The Effect of Health Education on Knowledge Levels of Diabetes Mellitus Patients in Handling Diabetes Mellitus

Table 4. The Effect of Health Education on Knowledge Levels of Diabetes Mellitus Patients in Handling Diabetes Mellitus

Knowledge level	Mean	StandardDevia-tion	DifferenceMean	p-value
Pre	11,14	2,523	0,30	0,421
Post	11,44	2,196		

In table 4.Effect of Health Education on Knowledge Levels of Diabetes Mellitus Patients in Handling Diabetes Mellitus, the p-value = 0.421> 0.05, this indicates that Ho is accepted, meaning that there is no effect of health education on increasing knowledge of diabetes mellitus sufferers in handling diabetes mellitus. These results are obtained from the pre and post test scores of the respondents.

The results of this study are different from other studies, which show that health education has a significant effect on increasing knowledge about DM. This is influenced by one factor is the level of education. The dominant education level of respondents in other studies. The dominant education level of the respondents in this study was that they did not complete elementary school, even not elementary school. The distribution of the education level of the respondents in other studies was 37.9%. This 37.9% figure shows that the distribution of education levels is almost evenly divided into the classifications ofelementary school, junior high school, seniorhigh school and college.

The figure of 72% in this studyshows that the distribution of education levels is dominant in those who do not complete primary school/do not attend school[25].

Health education affects the level of knowledge of respondents which can be influenced by several factors. This factor is the level of respondent's knowledge which was classified as less prior to the intervention as much as 56.6%. The value of the respondent's level of knowledge then improved after the intervention was carried out, namely 93.8%. The category of knowledge level in this study is divided into 3, namely, good, enough and less[26]. This is different from the level of knowledge of the respondents carried out by the researcher. The level of knowledge of respondents before the intervention was in the good category, as well as after the intervention.

The Effect of Health Education on the Behavior of Diabetes Mellitus Patients in Handling Diabetes Mellitus

Table 5. The Effect of Health Education on the Behavior of Diabetes Mellitus Patients in Handling Diabetes Mellitus

Behavior	Mean	StandardDevia-tion	DifferenceMean	p-value
Pre	10,22	2,873	1,16	0,011
Post	11,38	2,276		

In table 5. The effect of health education on the behavior of diabetes mellitus sufferers in the treatment of diabetes mellitus, the p-value = 0.011 <0.05this indicates that Ho is rejected.

It can be concluded that there is an effect of health education on the behavior of diabetes mellitus sufferers in handling diabetes mellitus. These results are obtained from the pre and post test scores of the respondents.

These results are obtained from the pre and post test scores of the respondents. There are five principles for managing diabetes mellitus in general. The five principles are education, diet, exercise (physical exercise), drug therapy and monitoring of blood sugar levels and preventing complications. The five principles are included in the form of diabetes mellitus patient behavior. Health education is a learning effort for people who are willing to take actions to maintain and improve their health, prevent disease, maintain existing health standards, maximize the function and role of patients during illness and help patients and families overcome health problems[22].

The results of this study are in line with other studies, which state that there is an effect of providing health education on the level of dietary compliance in diabetes mellitus sufferers[27]. A diabetes mellitus diet is highly recommended to maintain near normal blood glucose levels, achieve optimal serum lipid levels, and manage acute complications and improve overall health[28]. Another study stated that there was an effect between physical activity on blood sugar levels in patients with diabetes mellitus[16]. Physical activity at least 30 minutes every day, both done in an effort to cure diabetes mellitus.

Sports such as swimming, cycling, jogging and brisk walking are the types of sports that are recommended for sufferers of the disease[29].

Conclusions and Recommendations

There are still many people who do not realize the risk factors for disease to maintain blood sugar stability for people with diabetes mellitus. The community's need for health education is related to the factors that influence disease and the emergence of diabetes mellitus so that people have a healthy quality of life.

This research is expected to be able to contribute to the reading audience to be able to develop research with different methods and to provide related health educationdiabetes mellitus.

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