

The impact of health education about Diabetes mellitus on patient knowledge to control their Blood Sugar

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ABSTRACT

Background; Diabetes mellitus (DM) is the most common degenerative disease. The disease is characterized by elevated blood sugar levels (hyperglycemia) and high levels of glucose in the urine. Diabetes Mellitus is a chronic disease that requires long-term care and requires the thorough management of all medical teams at a health care center in the hope that the patient will be able to self-management to prevent acute and chronic complications. Method; This study was conducted using an experimental design method, and with a study design of a single variable before the experimental design of a pretest-posttest group. Result; The significance of the relationship between the variables under study was significant ($p= 0.011$). Discussion; a client with diabetes mellitus must be given health education to prevent their habit and behavior in controlling blood sugar. All health practitioners must work together to give client understanding and health education to control blood sugar.

Keywords: Health education, diabetes mellitus, knowledge, control, blood sugar

Introduction

Diabetes mellitus (DM) is the most common degenerative disease.^[1] It is characterized by elevated blood sugar levels (hyperglycemia) and high levels of sugar in the urine^[2]. Diabetes Mellitus (DM) is a metabolism of carbohydrates, proteins, and fats that is characterized by hyperglycemia or elevated blood glucose levels due to abnormalities in insulin secretion or decreased insulin function (American Diabetes Association)^[3]

International Diabetes Federation (IDF) statistics show that the prevalence of DM worldwide from 371 million in to 592 million in 2035. Indonesia itself ranked fourth in the country with the largest diabetes mellitus population in the world after India, China, and the United States of 8 million people (IDF, 2010). Diabetes Mellitus if not treated seriously, is expected to cause

the explosion of Diabetes Mellitus to 21.3 million in 2030^[4]. Indonesia's Health Profile in 2012 shows that DM is ranked 6th out of 10 main diseases in outpatients in Indonesian hospitals^[4].

Diabetes Mellitus is a chronic disease that requires long-term care and requires the thorough management of all medical teams at a health care center in the hope that the patient will be able to self-management to prevent acute and chronic complications (Ika, 2014). Diabetes mellitus management according to Perkeni (2011) has been identified as four main pillars namely: health education, meal planning/diet, physical exercise, and pharmacological interventions^[5].

Health education is the first four pillars of diabetes mellitus management. According to the American Diabetes Association (2003) report 50% - 75% of patients with type 2 DM have undergone lower extremity amputation^[6]. Over 50% of amputations can be prevented by providing health education and foot care training and daily exercise. All medical personnel, especially the nursing profession who plays a major role in providing health care of people with diabetes mellitus. The low knowledge of people with diabetes mellitus providing opportunities for nurses to provide an educational role for people with diabetes mellitus.

The role of nurses not only provides medical services but can also provide education through health education to individuals,

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families, and communities. Health education provided by nurses can improve the knowledge of patients with diabetes mellitus and family, which is expected to form good behavior for people with diabetes mellitus to achieve their ultimate goal of health education blood sugar levels of people with diabetes mellitus. Rantaupratat regional hospital itself is a local hospital with 14 polyclinics, where polyclinic internal medicine is one of the polyclinics where diabetes mellitus ranks the first (41%). Data from patients with diabetes mellitus that went to the polyclinic of disease in Rantaupratat hospital on average every month from January to September 2016 as many as 410 patients. A preliminary study by the authors conducted in September in 40 diabetic patients showed that most of the patients who were referred for treatment were still unaware of the importance of glycaemic control, how to control blood sugar, due to uncontrolled blood sugar and how much the tolerance limit Blood sugar levels were proven by the average patient who was included in the preliminary survey of researchers having uncontrolled blood sugar levels. Judging by the patient's history of control month, it was found that blood sugar levels as the patient tended to be high month ($> 200\text{mg} / \text{dl}$). Patients say they are unable to control appetite and tend to frequently consume foods/beverages containing high sugar content such as sweet tea with the reason patients are easily hungry. Patients also do not know that rice has a high sugar content and are reluctant to substitute for the main replacement carbohydrate intake such as sweet potatoes, potatoes with concerns digestive disorder experienced by patients if they donot consume rice.

Patients and families are also rarely exercised based on fear of injury that difficult to treat. For pharmacology, most patients are diligent in taking medicine according to doctors' recommendations, but of the 40 respondents involved in the preliminary survey, only 12 respondents have their blood glucose checkbox at home / routine blood glucose checks. Respondents' reasons vary, from an inability to purchase the KGD check tool to failure to know how to use it, and most responses just enough to carry out KGD checks while in hospital-only control. Most patients and families say they have never received a health education on how to control blood sugar and treat patients with diabetes mellitus and do not have sufficient knowledge of how to treat people with diabetes mellitus. Patients say they have diligent control and eat medicine continues, but the sugar content remains high, all the foods are still being challenged and we still don't know how to control the sugar content that has increased our patience.

Seeing the increasing phenomenon of diabetes mellitus and patients' low knowledge of how to control blood glucose where health education plays a very important role to improve the knowledge of patients and their families about how to control blood glucose in people with diabetes mellitus. In Rantaupratat general hospital-district researching the effect of health education on awareness of blood sugar control of diabetes mellitus patients in polyclinic diseases Rantaupratat general hospital.

Research hypothesis

There is the Influence of Health Education on Patient Knowledge on controlling blood sugar level of diabetes mellitus patient in polyclinic of disease in Rantaupratat general hospital.

Research Methods

This study was conducted using an experimental design method, and with the research design of a single variable before the experimental design of a pretest-posttest. The researchers compared the results of blood glucose testing before and after determining health education to determine the effect of health education on blood sugar in polyclinic disease at Rantaupratat general hospital. This study was conducted at the Rantaupratat general hospital, internal medicine Polyclinic from January 2 to February 4, 2017, with a population of 416 respondents with a sample of 41 respondents. Data were analyzed using paired Sample T-Test design. To see the result of significance of statistical calculation used (0, 05), so if the result of the statistical research indicates that H_0 accepted if: $-t_c < t_H < t_c$ which means there is no significant difference, otherwise H_0 is rejected.

Research Result

The level of Knowledge of controlling blood sugar level before and after health education. Respondents pre-knowledge level of diabetes related health education was 19 respondents (46.3%) at the highest level while knowledge level was less than 14 people (34.1%) and only 8 for good knowledge level respondents (19.5%) For the frequency distribution of the respondent's knowledge level after health education, significant changes were observed in the number of respondents at the knowledge level of 24 persons (58.5%), while the knowledge level decreased to only 1 person (2.4%) and for the level of knowledge enough for 16 respondents (39%).

Frequency distribution based on demographic data of respondents before to health education on knowledge level in internal medicine Polyclinic of Rantaupratat general hospital based on gender with medium knowledge level before health education for women as many as 11 people (26.8%) and knowledge level of fewer than 7 persons (17%) in women. For the age category, the age range of 30-40 years has the highest level of knowledge that is 4 persons (9.7%). The knowledge level is less based on the highest level of education on respondents who have a high school education level of 7 people (17%). And the knowledge level data is less based on the type of work performed by the patient, who works as civil servants as many as 5 people (12.2%). For the best level of knowledge based on respondent duration, the highest rate of diabetes mellitus was in the group of 1- <5 years (12.5%), but for the highest level of knowledge, 7 respondents (17%) were also in this group followed by the respondents in the 5- <10 years group as many as 6 people (14.6%).

Frequency distribution of respondents demographic data after health education on knowledge level at Polyclinic of internal disease of Rantauprapat general hospital based on gender with the level of post health education knowledge change of many respondents in knowledge level less become 1 person (2.4%) in both women and 0 % of male respondents. For the age category, the age range of 41-50 years has the highest level of knowledge, which is as much as 10 people (24.4%). The lowest knowledge level based on the category of education level is only in respondents with junior secondary education level and only 1 person (2.4%). The level of knowledge is less based on the type of work that comes from the research before the health education is the patient who works as a civil servant, that is as

much as 5 people (12,2%) but after health education, the number of respondents that knowledge was reduced to 1 person (2.4%) respondents only. For the good knowledge level based on the duration of the respondent suffering from diabetes mellitus mostly in a group of 1- <5 years as many as 5 people (12.2%) decreased to 1 person (2.4%) respondents after health education.

Sugar Levels description of respondents before and after health education

Table 1. Frequency distribution of blood sugar level inspection of Respondents Before and after health education in polyclinic diseases in Rantauprapat general hospital

No	Time of Blood Sugar Measurement	Blood Sugar Level Before Health Education						Blood Sugar Level After Health Education					
		≤90mg/dL		>90 - ≤200 mg/dL		>200 mg/dL		≤90 mg/dL		>90 - ≤200 mg/dL		>200 mg/dL	
		n	%	n	%	N	%	n	%	n	%	N	%
1	Time	0	0.0	6	14.6	33	80.6	0	0.0	15	36.6	17	41.5
2	Fasting Time	0	0.0	0	0.0	1	2.4	0	0.0	2	4.9	3	7.3
3	2 hours after load 75 grams of glucose	0	0.0	0	0.0	1	2.4	0	0.0	0	0.0	4	9.8
	Total	0	0.0	6	14.6	35	85.4	0	0.0	17	41.5	24	58.5

From Table 1, it was found that before health education, none of the respondents had blood glucose levels of ≤90 mg / dL before and after health education. Most respondents had blood glucose levels > 200 mg / dL as many as 33 people (80.6%) and only 6 respondents (14.6%) who had sugar content ≤200 mg / dL. Only 1 respondent (2.4%) had to fast blood glucose and 1 respondent also measured blood glucose level 2 hours after 75 grams of glucose load and the 2nd blood glucose > 200mg / dL. After health education, a significant decrease was observed in the number of respondents who had blood sugar levels > 200 mg / dL to 17 respondents (41.5%) and the number of respondents who had blood sugar levels > 90-≤200 mg / dL

increased to 15 respondents (36.6%). Respondents with fasting blood glucose measurement were 5 respondents where 2 respondents (4.9%) had blood sugar > 90-≤200 mg / dL and 3 respondents (7.3%) had fasting blood sugar > 200mg / dL. For measurement of blood glucose 2 hours after loading 75 grams of post health education glucose counted 4 respondents (9.8%) and all respondents were in blood sugar group > 200mg / dL.

Influence of health education on patient knowledge about blood sugar level control

Table 2. The effect of health education on patient knowledge about blood sugar level control in polyclinic disease at Rantauprapat Regional General Hospital

Influence of Health Education on Knowledge of KGDCControl	T-test value								p-value
	t	df	Std. Dev	Std. Error	Mean	Mean Diff.	95% Confidence Interval of the Difference		
							Lower	Upper	
Pre Health.Education	.951	40	.77	.121	2.15	.951	.707	1.195	0.011
Post Health Education	.244	40	.58	.091	1.44	.244	.060	.428	

Based on Table 2, the effect of health education can be shown to increase the level of patient knowledge about the control of blood glucose levels in polyclinic diseases at Rantauprapat general hospital. This can be seen from the paired T-Test result, where before health education obtained t-test results of 7.879 and decreased to 26682 after health education. There is a decrease in the T-Test value of 0.707 which means there is a decrease in blood sugar levels of 0.707 before and after the

health education with significant relationship significance with a p-value of 0.011.

Discussion

The Effect of health education on the level of knowledge of patients on controlling blood sugar level. Assessment of blood

glucose levels of respondents before health education and after being given health education mostly decreased as much as 33 respondents (80.5%), which is directly proportional to respondents' knowledge level change. Of the respondents with a good knowledge level before receiving health education only 8 people (19.5%), and the difference of respondents who have enough knowledge are 19 respondents (46.4%). Knowledgeable enough and 14 respondents were less knowledgeable about controlling blood sugar levels. Following health education an increasing number of respondents were reported to have a good knowledge 24 respondents (58.5%) of whom 21 respondents (51.2%) experienced a decrease in blood sugar levels.

The result of paired Sample T-Test obtained before giving health education is 0.951 and after being given health education reduced to 0.244 which is interpreted the influence of health education to knowledge. There is a difference in the rate of decreased blood sugar levels before and after health education amounted to 0.707. Significance of the relationship between the variables under study was significant ($p=0.011$). The results of this study indicate the effect of health education on improving the level of patient knowledge about the control of blood sugar levels in polyclinic diseases at Rantauprpat general hospital.

The results of this study are consistent with the theory proposed by Perkeni (2011) where health education is the first 5 pillars of diabetes mellitus management, while the next 4 pillars are: medical nutrition therapy, physical exercise, pharmacological intervention and monitoring blood sugar independently. The importance of health education conducted by nurses strongly supports the improvement of the patient's level of knowledge of diabetes Mellitus. Increasing knowledge promotes patient awareness of blood sugar control with the ultimate goal of improving the health status of patients with diabetes mellitus and preventing acute and chronic complications.

Research conducted by Wahid (2016) on the influence of health education blood sugar levels of diabetes mellitus showed a positive t-test of 0.281, which indicates a lower blood sugar level after health education than before health education [7]. The decline that occurs due to increased knowledge of the patient after providing health education.

Health education is provided not only to improve patient' knowledge, but also the process of empowering and maintaining the community to maintain and improve their health (Ottawa Charte, 1986 in Maulana 2009) [8]. Changes in attitudes and behaviors are also expected to occur after health education is given to increase the cognitive, affective and psychomotor abilities of people with diabetes mellitus and family. Knowledge based Behavior and consciousness will remain a very long time (Roger in Notoatmodjo, 2010) [9]. According to Norris et al (2002), the purpose of health education is to optimize blood sugar control and patient quality of life to prevent acute and chronic complications while at the same time reducing the use of clinical care costs [10]. Education provided through health education can facilitate the testing, skills, and abilities of patients with diabetes mellitus to self-care [11]. Providing information to patients in health education is a

stimulus that can increase knowledge, thereby awareness of expected behavior improving the ability, and awareness to control blood sugar independently [10].

The results of health education showed that there is one respondent who still has a level of knowledge about the control of blood sugar levels. Respondents blood sugar levels before health education > 200 mg / dL and after health education, respondents sugar content remained at level > 200 mg / dL. Respondents are female; the last high school junior is 38 years old and has been with diabetes for 2 years. According to interviews, respondents combine medical treatment with alternative medicine in the treatment of diabetes suffered, and respondents alternative medicine is more useful than medical treatment which makes respondents use healthy living recommendations to control their blood sugar. This is in line with the theory of Notoatmodjo (2005) [12] in which many support factors concerning the establishment of good knowledge such as education level, socioeconomic level, community values, traditions, and beliefs, are supported by facilities and infrastructure or health facilities for the community or individuals, and influenced by the attitudes and behaviors of individuals perceived as important by the community or individuals such as religious leaders, community leaders, and health workers. The cultural environment can influence the behavior of people who have the culture.

The relationship social/cultural view to the handling of a variety of diseases, the opinion of Notoatmodjo (2005) which states cultural diversity can change human behavior in all cases including healthy behavior in the treatment of diabetes mellitus [12].

Conclusions

1. Knowledge level of pre-diabetes respondents is related to health education at the knowledge level of 19 people (46.3%)
2. Knowledge level of respondents after health education obtained the number of respondents a good knowledge level was 24 people (58.5%) and knowledge level of less than 1 person (2.4%).
3. Effect of health education on increasing the level of patients' knowledge about blood sugar levels control in polyclinic diseases in Rantauprpat general hospital after health education, there is a significant influence to decrease blood sugar levels $\alpha = 0.011$.

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