



Affect Health Education With Diabetes Management Self-Education Methods For

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ABSTRACT

Diabetes mellitus or diabetes is a chronic disease that reduces insulin production from pancreas and insulin produced is not effective in reducing blood sugar levels. This situation will increase blood sugar levels thereby increasing most body systems. Disease with a high prevalence cannot be completely resolved, but can prevent or be controlled may not be chronic.

This study aims to measure changes in self-care, diabetes pressure, and blood sugar levels after DSME health education in prolanis diabetes mellitus patients with the Tlogosari Kulon community health center.

The results of this study indicate that Self Management Education (DSME) has a

higher influence on self care, diabetes pressure and blood sugar levels of patients who have not yet died. Patients who have received Self Management Education (DSME) show a change in self-care activities before DSME and after DSME, self-care activities after DSME are higher than before DSME. DSME and sugar levels are more normal and stable than before DSME diabetic patients.

Keywords: Self-Education Management, Diabetes, Smart Claims, blood sugar; self care activities

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Introduction

Diabetes mellitus (DM) is a collection of symptoms that arise in a person caused by an increase in blood glucose levels due to a progressive decrease in insulin secretion motivated by insulin resistance (Soegondo, 2011). The hormone insulin serves to regulate the balance of sugar levels (Yunir, 2007). Hyperglycemia or an increase in blood sugar levels is a common effect on DM that is not contaminated and occurs in a long time (WHO, 2008).

The number of people in the world who have diabetes mellitus tends to increase from year to year. This is related to increasing population, lifestyle, increasing obesity prevalence and less physical activity. A report from WHO regarding studies of DM populations in various countries, the number of people with Diabetes Mellitus in 2000 in Indonesia ranks 4th largest in the number of people with diabetes mellitus with a prevalence of 8.4 million. The order above is India (31.7 million), China (20.8 million), and the United States (17.7 million) (Hadisaputro, 2007). In 2010 the number of DM sufferers in Indonesia was at least 5 million and in the world there were 239.9 million sufferers. It is estimated that in 2030 the prevalence of Diabetes Mellitus in Indonesia will increase to 21.3 million. The morbidity and mortality due to DM in Indonesia tends to fluctuate each year in line with changes in people's lifestyles that lead to fast food and carbohydrate laden (Directorate of Non-Communicable Disease Control, 2008).

In 2010 the number of DM sufferers in Indonesia was at least 5 million and in the world there were 239.9 million sufferers. It is estimated that in 2030 the prevalence of Diabetes Mellitus in Indonesia will increase to 21.3 million. The morbidity and mortality due to DM in Indonesia tends to fluctuate each year in line with changes in people's lifestyles that lead to fast food and carbohydrate laden (Directorate of Non-Communicable Disease Control, 2008). A report from WHO regarding studies of DM populations in various countries, the number of people with Diabetes Mellitus in 2000 in Indonesia ranks 4th largest in the number of people with diabetes mellitus with a prevalence of 8.4 million. The order above is India (31.7 million), China (20.8 million), and the United States (17.7 million) (WHO, 2008).

Type 2 diabetes occupies more than 90% of cases in developed countries. Developing countries, almost all diabetes is classified as sufferers of DM type 2.40% of which is evident from groups of people who are already changing traditional lifestyles into modern ones. Type 2 diabetes is the most in Indonesia. DM can be a cause of various diseases such as hypertension, stroke, coronary heart disease, kidney failure, cataracts, glaucoma, damage to the retina of the eye that can make blind, impotence, impaired liver function, and a long healing wound resulting in infection, so it must be amputated especially in the legs (Health Office, 2009).

Diabetes mellitus as a metabolic disorder due to hormonal disorders characterized by an increase in blood glucose levels (hyperglycemia) which can cause various chronic complications in the eyes, kidneys, nerves, and blood vessels (Mansjoer et.al, 2005). Based on data from the Central Java Provincial Health Office in 2008, the highest prevalence of diabetes mellitus was in Semarang City of 0.84%. While the prevalence of cases of diabetes mellitus independent of insulin, better known as type 2 diabetes, increased from 0.83% in 2006, to 0.96% in 2007, and 1.25% in 2008.9 Results from the Semarang City Health Center report in 2014 the number of cases of Diabetes Mellitus was 16,474 cases, consisting of 1,010 insulin dependent and 15,464



cases of diabetes mellitus non insulin / type 2 diabetes (Directorate of Non-communicable Disease Control, 2008).

Based on the data we obtained from the Tlogosari Kulon Community Health Center, the morbidity due to diabetes continues to increase every year (2009-2016). In 2009, the rate of illness of Diabetes Mellitus was not insulin dependent (Diabetes Mellitus type 2) as many as 387 cases. In 2010, the morbidity due to type 2 Diabetes Mellitus increased to 484 cases, then in 2011 it increased to 643 cases. In 2012, the morbidity due to type 2 diabetes mellitus had decreased to 432 cases, but in 2015 it increased again to 653 cases. Then in 2016 the morbidity due to type 2 Diabetes Mellitus increased to 815 cases. DM sufferers need complex and ongoing care, which includes health education (education), diet (food plan), physical exercise (exercise), and medication (Misnadiarly, 2006). Education is given to patients with type 2 DM with the aim to improve the knowledge and skills of patients so that patients have preventive behavior in their lifestyle to avoid long-term complications of type 2 DM (Smeltzer and Bare, 2001).

To achieve successful DM management, DM management is needed independently and continuously or known as Diabetes Self Management Education (DSME) which includes an understanding of DM disease, the meaning and need for DM control and monitoring, DM complications, pharmacological and non-pharmacological interventions, hypoglycemia, specific problems encountered, how to develop support systems and teach skills, as well as how to use existing health care facilities (Funnell et al, 2011). According to Fisher in Nasriati diabetes and stress are two things that affect each other directly or indirectly. Living with diabetes every day can make a type 2 DM client feel discouraged, stressed or even depressed.

According to Bener's study, 23.4% of patients with type 2 diabetes experience severe stress. Kaur's research (2013) states that 12.5% of patients with type 2 diabetes have symptoms of stress. According to Maghfirah, 14.7% of patients with type 2 diabetes experience moderate stress, and 33.3% experience severe stress, with the above research, it can be seen that there are still many stressful events in patients with type 2 diabetes so that good and optimal management is needed. The general goal of DSME is to support decision making, self-care behavior, problem solving and active collaboration with the health team to improve clinical outcomes, health status, and quality of life.¹⁵

Based on this description, it is necessary to conduct research on the effect of Diabetes Self Management Education (DSME) on self care, diabetes distress and blood sugar levels of type II DM patients in the prolansist group at Tlogosari Kulon Semarang Indonesia Health Center.

Research methods

1. Type of Research

This type of research used in this research is experimental research. The research method used was quasi experimental (quasi-experimental research) with pre-test and post-test with control group design. The design of this study aims to determine the effect of the Diabetes Self-Management Education (DSME) on selfcare, diabetes distress and blood sugar levels of



type II DM patients. Respondents consisted of a control group and an intervention group through the pre-test and post-test stages. Populasi Penelitian

The population in this study were DM type 2 patients who underwent outpatient treatment at the Tlogosari Kulon Community Health Center, which were 58 people according to secondary data and preliminary studies conducted by researchers.

2. Research Samples

Sugiyono stated that the number of samples in a simple experimental study ranged from 10-20 people. The number of samples in this study according to the inclusion and exclusion criteria were 50 respondents who were divided into two groups: 25 respondents in the control group and 25 respondents in the intervention group. The research subject criteria consisted of inclusion criteria and exclusion criteria. Inclusion criteria are criteria or characteristics that are fulfilled by each member of the population that can be taken as a sample.

3. Data Collection Techniques

Data collection techniques in this study were carried out by observing respondents. Respondents will be divided into two groups, namely the control group and the intervention group. Respondents in both groups will be observed first to determine the level of patient knowledge about diabetes experienced by respondents. The next stage, respondents in the intervention group will be given an intervention in the form of DSME as much as 1 session during 1 meeting and observations will be conducted again on the two Research Tools in the form of Easy Touch set, LCD monitor, loudspeakers, observation sheets and SDSCA and DDS questionnaires

4. Data Processing

Data processing in this study uses several processes namely Editing, Coding, Processing / entry, Cleaning.

5. Data analysis

Data analysis in this study uses multiple analyzes which include descriptive (univariate) analysis, analytic (bivariate) analysis, and multivariate analysis.

a. Univariate

Univariate data analysis aims to describe the characteristics of respondents and the characteristics of each variable studied. Categorical variables (sex and education) are presented in the form of proportions, while numeric variables (age) are presented in the form of mean, median, standard deviation, and minimum-maximum values.

b. Bivariate

Bivariate data analysis aims to analyze two groups of data consisting of independent and dependent variables. The data group to be analyzed is the DSME variable as the dependent variable and the selfcare variable. Life quality and blood sugar control are the



independent variables. The data scale in this study is the ordinal for the dependent variable.

c. Multivariate

Multivariate analysis was carried out to determine the effect of the independent variables on the dependent variable together, so that the independent variables obtained were the most related to the dependent variable. Multivariate analysis is done by connecting several independent variables with one dependent variable simultaneously. Because the independent variables are dichotomous (categories), the statistical test used is multivariate logistic regression.

Results

1. Bivariate Analysis

a. Data Normality Test

Data normality test uses the Shapiro-Wilk Test because each group has less than 50 data. Data is said to be normally distributed if the significance value is less than 0.05. and said to be abnormal if the significance value is more than 0.05 Data that are normally distributed, then the comparison test of the average intervention group and the control group uses the independent t test, if not normal using Mann withney. Test to compare pre and post using paired t test if the data is normal, but if the data is not normal using the Willcox sign rank test. If one of the data groups is not normally distributed, the follow-up test uses analysis for data that is not normally distributed, namely: mann withney and willcoxon sign rank test. The normality test results are presented.

2. Bivariate Analysis

b. Data Normality Test

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Table 1: Test for Distress Normality, Self Care Activities, and Blood Sugar Levels

No	Variable Name	Group	Sig.	Conclusion
1.	Distress Pre	Intervention	0,313	Normal
		Control	0,052	Normal
2.	Distress Post	Intervention	0,038	Abnormal
		Control	0,125	Normal
3.	Difference in Distress	Intervention	0,030	Abnormal
		Control	0,026	Abnormal
4.	Self care activities Pre	Intervention	0,442	Normal
		Control	0,176	Normal
5.	Post self care activities	Intervention	0,002	Abnormal
		Control	0,075	Normal
6.	Difference in Self Care Activities	Intervention	0,076	Normal
		Control	0,947	Normal
7.	Sugar Levels Pre	Intervention	0,274	Normal
		Control	0,000	Abnormal
8.	Post Sugar Levels	Intervention	0,304	Normal
		Control	0,169	Normal
9.	Difference in Sugar Levels	Intervention	0,354	Normal
		Control	0,243	Normal

Based on the normality test table, it is known that the sugar content prior to the treatment of Diabetes Self Management Education (DSME) in the intervention group was normally distributed, but the group was not normally distributed. Sugar content data after giving treatment about Diabetes Self Management Education (DSME) in each group was normally distributed. Data on differences in sugar content of each group were normally distributed.

Distress scale normality test results before (pre) treatment of Diabetes Self Management Education (DSME) in the intervention group and the control group were normally distributed. The Distress Scale after (post) treatment of Diabetes Self Management Education (DSME) in the intervention group was not normally distributed, but in the control group was normally distributed. Distress difference in the intervention and control groups were not normally distributed.

The results of normality tests for self care activities pre (before) in the intervention group and the control group were normally distributed. The results of normality tests of post-care self care activities scale in the intervention group were not normally distributed, but in the control group were normally distributed. Data on differences in self care activities, interventions and controls are all normally distributed.



3. Homogeneity Test for Blood Sugar Levels, Distress and Self Care Activities

Homogeneity test uses a levene test, the data is said to be homogeneous if a p value greater than 0.05 ($> 5\%$) is obtained. Homogeneity test results can be seen in the following table:

Table 2: Homogeneity Test for Blood Sugar Levels, Distress and Self Care Activities

No.	Respondents	Sig.	Information
1.	Distress Pre	0,033	Inhomogeneous
2.	Distress Post	0,518	Homogeneous
3.	Distress Difference	0,010	Inhomogeneous
4.	Self care activities Pre	0,176	Homogeneous
5.	Post self care activities	0,013	Inhomogeneous
6.	Difference in Self Care Activities	0,830	Homogeneous
7.	Sugar Levels Pre	0,149	Homogeneous
8.	Post Sugar Levels	0,000	Inhomogeneous
9.	Difference in Sugar Levels	0,000	Inhomogeneous

Homogeneity test results obtained sig. Distress pre of 0.033 is smaller than 0.05, so the data are not homogeneous. Obtained sig. self care activities pre of 0.176 is greater than 0.05 then the data are homogeneous. Obtained sig. Distress post of 0.518 is greater than 0.05, the data is homogeneous. Obtained sig. post self care activities of 0.013 less than 0.05, the data are not homogeneous.

Obtained sig. Distress difference of 0.010 is less than 0.05, the data are not homogeneous. Obtained sig. The difference in self care activities of 0.830 is greater than 0.05, so the data are homogeneous. Sig value pre sugar content of 0.149 is greater than 0.05 then the data are homogeneous. Obtained sig. post sugar content of 0,000 is less than 0.05 then the data are not homogeneous. Sig value the difference in sugar content of 0,000 is less than 0.05 then the data are not homogeneous.

4. Analysis of Diabetes Distress

Table 3 Differences in the Distress Intervention and Control Average

	Group	N	Average Distress	Difference	Value of P
<i>Distress Pre</i>	Intervention	25	49,84	7,8	0,072*
	Control	25	42,04		
<i>Distress Post</i>	Intervention	25	36,40	-9,2	0,006**
	Control	25	45,60		
<i>Selisih Distress</i>	Intervention	25	13,44	17,0	0,000**
	Control	25	-3,56		



Based on the results of the unpaired sample test, the p value of 0.072 is greater than 0.05, so there is no difference between distress control interventions prior to therapy. Obtained a p value of 0.006 smaller than 0.05, there is a difference between distress control interventions after therapy, the average of the control group distress by 45.60 is higher than the average of the intervention group distress of 36.40. Obtained a p value of 0,000 less than 0.05, there is a difference between the distress difference control interventions. The average difference in the distress in the control group was 3.56 lower than the average difference in the distress in the intervention group of 13.44.

5. Analysis of Blood Sugar Levels

Table of Differences in Average Sugar Intervention and Control

	Group	N	Average Distress	Difference	Value of P
<i>Sugar levels pre</i>	Intervention	25	142,72	6,24	0,698**
	Control	25	148,96		
<i>Sugar content post</i>	Intervention	25	144,96	61,60	0,001*
	Control	25	206,56		
<i>Difference in Sugar Levels</i>	Intervention	25	-2,24	55,36	0,002*
	Control	25	-57,60		

Based on Table 8., the p value of 0.698 is greater than 0.05, so there is no difference in sugar levels between control interventions prior to the treatment of Diabetes Self Management Education (DSME). Obtained a p value of 0.001 smaller than 0.05, there is a difference in sugar levels between control interventions after the treatment of Diabetes Self Management Education (DSME). The average sugar content of the control group was 206.56 higher than the average sugar content of the intervention group of 144.96. Obtained a p value of 0.002 smaller than 0.05, so there is a difference in sugar content difference between control interventions. The average difference in sugar levels in the control group was 57.6 higher than the average difference in sugar levels in the intervention group by 2.24. This proves that the group treated with Diabetes Self Management Education had more stable sugar levels.

Discussion

Diabetes Self Management Education (DSME) is an ongoing process carried out to facilitate knowledge, skills. And the ability of DM patients to perform independent care.¹⁵ According to Sidani & Fan, DSME is a process of providing education to patients regarding the application of self-care strategies to optimize metabolic control, prevent complications, and improve the quality of life of DM patients.



The goal of DSME is to optimize the metabolic control and quality of life of patients in an effort to prevent acute and chronic complications, while reducing the use of clinical care costs. According to Funnell, DSME's general goal is to support decision making, self-care, problem solving, and active collaboration with the health team to improve clinical outcomes, health status, and quality of life.

The main principle of DSME according to Funnell is that DM education is effective in improving clinical outcomes and quality of life of patients although in the short term, DSME has evolved from a primary teaching model to become more theoretical based on the patient empowerment model, there is no best educational program but an educational program that combines Behavioral and psychosocial strategies are proven to improve clinical outcomes, ongoing support is a very important aspect of maintaining the progress achieved by patients during the DSME program, and setting behavioral goals is an effective strategy supporting selfcare behavior.

The results showed there was no difference in diabetes distress scores between distress control interventions prior to DSME health education ($p = 0.072$). The average of the control group's distress was 42.04 while the intervention group's distress was 49.84. These results appear that there is a difference in diabetes distress score between intervention and control but the difference is proven insignificant so that the intervention and control group respondents have a stable position, then the analysis can be continued.

The results of the analysis of patient distress after being given health education prove that there is an influence of DSME health education on diabetes distress. DSME health education can significantly reduce diabetes distress. The average Distress group that was given DSME health education was 36.40 lower than the control group or the group that was not given DSME health education (45.60).

Diabetes distress is a unique emotional problem that is directly related to the burden and worries of living with a chronic illness. Providing health education DSME method can change feelings of frustration, worry, and maybe a little fatigue from DM patients to be more confident, optimistic, and responsible. DM patients are more accepting of the situation so DM patients will try to change the situation experienced by diligently doing diabetes treatment independently. DM patients are able to fight the concerns about improper DM treatment, DM patients actively communicate effectively with health care providers about things that must be done so that the DM suffered can be resolved to the maximum.

The average of the control group's distress was 45.60 higher than the average of the intervention group's distress of 36.40. The average change in distress in the control group was 3.56 lower than the average change in the distress in the intervention group by 13.44. The pre-post test results in the intervention group obtained evidence of differences in distress between before and after the treatment of Diabetes Self Management Education (DSME). Distress after giving treatment about Diabetes Self Management Education (DSME) is lower than before giving treatment about Diabetes Self Management Education (DSME).

This research proves that influential health education can reduce the distress of patients with type II DM in the Tlanosari Kulon prolanis Semarang health group. Type II DM patients in the Tlanosari Kulon Public Health Clinic Semarang group who were given DSME health



education, had lower distress than in the control group. The emotional burden is lighter, the feeling that diabetes can use up a lot of mental and physical energy is reduced. DSME knowledge can reduce feelings of anger, fear and stress due to patients thinking about living with DM.

The results of this study are consistent with the results of the study of Ary Januar Pranata (2018) that DSME health education can increase the motivation of DM patients to conduct self-care so that diabetes distress experienced by DM patients decreases. The results of this study also support the study of Kosti and Kanakari (2019) that health education can increase in-depth understanding of the importance of examinations and follow-up. Health education can increase the involvement of DM patients to communicate well between themselves and health professionals so that distress is reduced.

Diabetes Self Management Education (DSME) is a continuous process carried out to facilitate the knowledge, skills and abilities of DM patients to perform self-care.¹⁵ According to Sidani & Fan, DSME is a process of providing education to patients regarding the application of self-care strategies independently to optimize metabolic control, prevent complications, and improve the quality of life of DM patients.

The purpose of DSME is to optimize metabolic control and quality of life of patients in an effort to prevent acute and chronic complications, while reducing the use of clinical care costs.²⁷ According to Funnell the general purpose of DSME is to support decision making, self-care, problem solving, and active collaboration with the health team to improve clinical results, health status, and quality of life.

The main principle of DSME according to Funnell is that DM education is effective in improving clinical outcomes and quality of life of patients although in the short term, DSME has evolved from a primary teaching model to become more theoretical based on the patient empowerment model, there is no best educational program but an educational program that combines Behavioral and psychosocial strategies are proven to improve clinical outcomes, ongoing support is a very important aspect of maintaining the progress achieved by patients during the DSME program, and setting behavioral goals is an effective strategy supporting selfcare behavior.

The results of the study note that before giving DSME education there was no difference in self care activities between intervention and control with a p value of 0.629. Before the DSME education was given to type II DM patients in the Tlogosari Kulon Public Health Center Semarang group, it appeared that there were no differences in self-care activities between the intervention group and the control group. Based on the absence of these differences, the analysis can proceed because comparing comparable samples.

The results showed that there were differences in self care activities between intervention and control after DSME education with a p value of 0.004. The average of the group's self care activities was 64.44 lower than the average of the group's self care activities by 73.12. The average of the self care activities of the control group was lower than the average of the self care activities of the intervention group, indicating that self-care activities in the group not given the DSME method of health education proved to be less compared to the group that were given the DSME method of health education. The influence of DSME on DM patient self-care behavior is



also known from changes in self care activities between the intervention and control groups (p value = 0.018). Changes in self care activities in the intervention group were higher than in the control group.

The results of this study prove that DSME health education is able to change the behavior of DM type II patients in the Tlanosari Kulon Community Health Clinic in Semarang. Type II DM patients in the Tlanosari Kulon Public Health Clinic Semarang group after receiving DSME health education have better self-care activities to avoid DM. Type II DM patients in the Tlanosari Kulon Community Health Center Semarang group within one week become more likely to follow the meal plan (diet) as recommended. Patients with type II DM within one week limit the number of calories eaten as recommended. Type II DM patients are willing to avoid foods containing excessive carbohydrates by regulating food intake and type II DM patients more often include a vegetable menu in every food that is eaten.

Increased knowledge and ability to think individuals are influenced by sources of information obtained. Information can be obtained from various sources such as teachers, parents, health workers, friends, print media and electronic media. The level of knowledge of a person can be influenced by the intensity of information exposure. After the individual understands that it is given then it tends to have a better perception than those who have not obtained information.

Patients with type II DM Tlogosari Kulon Semarang community health center who have high knowledge about DSME, tend to have behaviors that can avoid the risk of DM. This is consistent with the theory that a person's behavior is determined by the ability to think. Individuals who have high knowledge, the better deeds to fulfill their desires or needs, in this case individuals will be more self-sustaining by carrying out self-care activities that can prevent the risk of DM.

The results of the analysis before and after the provision of DSME health education, in the intervention group there were differences in patient self-care (sig. Value = 0,000) whereas in the control group it was proven that there was no difference in patient self-care (sig value = 0.167). Self-care patients with type II DM Tlogosari Kulon Health Center Semarang who are given high knowledge about DSME are better namely: DM type II patients avoid eating foods that are high in fat (such as meat, foods that contain oil or butter). Type II DM patients who have received DSME health education, in recent days, avoid snack foods that contain lots of sugar (such as cakes, biscuits).

The results of this study support the theory that knowledge is the result of knowing, occurs when someone senses (ears, nose, eyes) on a particular object. Most of human sensing is obtained through the ears and eyes, in this case cognitive knowledge is very important in shaping one's actions.⁹ Type II DM patients who have a correct understanding of self-care behavior, will carry out activities that can be avoided from the harmful effects of their actions. Self-care patients with type II DM Tlogosari Kulon Semarang health center who are given high knowledge about DSME, in a few days doing physical exercise at least 20-30 minutes every day and patients also have a high awareness so that in the past week they want to do light exercise including walking on around the house. The results of this study are in accordance with the results of the



Research Directorate of Control PTM RI (2009) that the majority of unhealthy lifestyles, lack of physical activity is the cause of type 2 diabetes.

Knowledge is an important domain in shaping one's behavior or actions. Behavior that is based on knowledge will be better than behavior that is not based on knowledge. Some of the results of previous studies also showed that self-care activities among groups receiving DSME health education increased after intervention. Rahmawati research, Teuku Tahlil, Syahrul (2016), there is an influence of DSME on self-management, DSME health education can increase the motivation of DM patients to conduct self-management of type 2 DM patients in Trienggadeng Health Center, Pidie Jaya Regency. The results of Rondhianto's study (2012) found that the application of diabetes self management education (DSME) in discharge planning had a significant influence in increasing the self care behavior of type 2 DM patients compared with the provision of discharge planning without using DSME.

Diabetes Self Management Education (DSME) is an ongoing process carried out to facilitate the knowledge, skills and abilities of DM patients to perform self-care.¹⁵ The goal of DSME is to optimize metabolic control and quality of life of patients in an effort to prevent acute and chronic complications, while reducing the use clinical care costs.²⁷

The research results obtained evidence that there are differences in sugar levels between intervention and control after the provision of health education Diabetes Self Management Education (DSME). The average sugar content of the control group was 206.56 higher than the average sugar content of the intervention group of 144.96. These results prove that patients with type II DM Tlogosari Kulon Health Center Semarang who were given DSME knowledge had a normal level of sugar compared to patients with type II DM Tlogosari Kulon Health Center Semarang who were not given DSME knowledge. The results of the study also found that there was a high change in the sugar level of the control group compared to the intervention group. The average change in the sugar level of the control group was 57.6 higher than the average change in the sugar level of the intervention group of 2.24. This proves that the group treated with Diabetes Self Management Education had more stable sugar levels. This is also supported by the results of pre and post tests, in the intervention group there was no difference in sugar levels between before and after the treatment of Diabetes Self Management Education (DSME) with sig. amounted to 0.679. However, in the control group there were differences in sugar levels between before and after, with sig values. in the amount of 0.002. The results of this study prove that the group treated with Diabetes Self Management Education (DSME) has stable sugar levels, whereas in the control group or the group not treated with Diabetes Self Management Education (DSME) there is an increase in sugar levels or unstable sugar levels .

So the provision of DSME health education in patients with type II DM Tlogosari Kulon Health Center Semarang affects the patient's sugar levels, the provision of DSME health education can help patients in type II DM Tlogosari Health Center in Semarang to keep their sugar levels more stable, there is no decrease or increase in sugar levels.

DSME given to DM patients, can effectively change the habits of consuming foods that do not pay attention to food composition. Type II DM patients avoid foods that are high in carbohydrates and fat, and DM patients get used to eating foods that are high in fiber such as eating vegetables, by avoiding foods high in carbohydrates and fats, so the patient's sugar levels



are more stable. DSME has a positive effect on the clinical, psychosocial and behavioral aspects of diabetes. DSME / S has been reported to reduce the incidence or development of diabetes complications, to improve the quality of life and lifestyle behaviors such as having a healthier diet and also engaging in regular physical activity, to increase or empowerment in promoting healthy coping (ADA, 2015). The results of this study are consistent with Wiwied Trihardiyanti Purnama's research (2018), that Diabetes Self Management Education and Support (DSME / S) can reduce patients' sugar levels in DM in the Gamping 1 Community Health centers Work Area, Sleman Yogyakarta.

Conclusion

Based on the results of research on the influence of Diabetes Self Management Education (DSME) on self care, diabetes distress and blood sugar levels of type II DM patients in the Tlanosari Kulon Semarang health clinic group, it can be concluded that the type II DM patients in the Tlanosari Kulon Health Center Semarang prolanis group are mostly 40 years old, the majority are female, most have high school education, most do not work, the majority do not smoke, most consume medical drugs, and most suffer from diabetes mellitus for less than five years. The results of this study indicate that there are changes in selfcare activities before DSME and after DSME, self care activities after DSME are higher than before DSME in patients with type 2 diabetes mellitus prolanis in Tlogosari Kulon Public Health Center Semarang. In addition, there is also a change in diabetes distress before DSME and after DSME, diabetes distress after DSME is lower than before DSME patients with type 2 diabetes mellitus prolanis at Tlogosari Kulon Health Center Semarang. And there are changes in blood sugar levels before DSME and after DSME, blood sugar levels after DSME become normal and stable compared to before DSME patients with type 2 diabetes mellitus prolanis Community Health centers Tlogosari Kulon Semarang.



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