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Research Article

The Effect of Diabetes Self Management Education (DSME) with Audiovisual Media on Self-Care and Decreasing Blood Sugar Levels in Diabetes Mellitus Patients Type II

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ABSTRACT

Background: Diabetes mellitus (DM) is a metabolic disease characterized by hyperglycemia that occurs due to abnormal insulin secretion. Diabetes Self Management Education (DSME) is an important role in preventing or delaying complications in people with pre-diabetes and diabetes. Aim of study is to analize effect of Diabetes Self Management Education (DSME) with audiovisual media on self-care and decreasing blood sugar levels in diabetes mellitus patients type II
Methods: Using a quasy experiment research design with control group design. Samples is 34 respondents (17 respondents in the control group and 17 respondents in the experimental group) that chosen randomly with odd and even way according to data patients DM. Self care measured by Summary of Diabetes Self-Care Activity (SDSCA) questionnaire, and blood sugar level measure with a glucometer. Intervention group given DSME for 14 days, and control group get treatment according to community standards. Bivariate analysis used the non-parametric Wilcoxon test and to see the difference between pre-test and post-test on the self-care variable and to see the differences between groups using the Mann-Whitney test. Analysis of bivariate test on blood sugar levels drop variables using parametric test Paired T-Test and to see the difference between groups using Independent T-Test test.
Results: The results of the Wilcoxon test of self-care control group p=0.246 (p=<0.05), so there is no effect, the experimental group p = 0.005 (p=<0.05), so that concluded no effect. Mann-Whitney test results with personal care and experimental control group p=0.000 (p=<0.05), so that there is a significant difference. Results of Paired T-Test blood sugar control group p = 0.812 (p =<0.05), so there is no effect, the experimental group, p = 0.000 (p=<0.05), so that concluded no effect. The results of the Independent T-Test blood sugar levels in the control and experimental groups p=0.020 (p=<0.05), so there is a significant difference in effect.

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Conclusion: There is the influence of Diabetes Self-Management Education (DSME) The Audiovisual Media on self-care and decrease blood sugar levels in people with Type II DiabetsMellitus.

Keywords: Audiovisual; Blood Sugar Levels; Diabetes Mellitus (DM) Type II; Diabetes Self Management Education (DSME); Self-Care

Introduction

Nowadays, many things change social lifestyle. One of them is consuming unhealthy foods that affect blood sugar levels such as fast food, soft drinks, sweet foods and etc. These are factors which can trigger the enhancement of degenerative disease, named Diabetes Mellitus (DM). Diabetes mellitus (DM) is a metabolic disorder characterized by increasing blood sugar levels (hyperglycemia) from impaired insulin secretion, insulin action, or both [1].

The incidence of diabetes is predicted increasing each year. International Diabetes Federation (2017) [2], DM sufferers stated 425 million people and by 2045 it is expected to increase around 48% with 629 million people suffering diabetes mellitus. Uncontrolled DM can cause cerebrovascular disease which increases the risk of death [3]. DM patients with complications of degenerative diseases, such as hypertension and heart disease are one of the highest causes of death [4].

The incidence of DM in Indonesia is lower than world incidence. The prevalence of DM in Indonesia based on the (Riset Kesehatan Dasar (RIKESDAS) [5], (2018) increased to 10.9%. This number is higher than in 2013 (8.5%). In the last 20 years, in East Java there was an increase of 329.8% for people with diabetes mellitus. In Madiun, this disease increases every year. On average, there are 34 people with diabetes type II which treated at the Madiun Health Center each month.

People who suffering diabetes take care of themselves optimally to maintain blood glucose levels than they are not able to control blood glucose levels with good experience such as complications, diabetic sores, loss of vision and neuropathy. The provision of education is the main pillar that has an important role in the management of diabetes mellitus include the understanding of the course of diabetes mellitus, the importance of controlling diabetes mellitus, importance of knowing the complications and risks, management of pharmacological and non-pharmacological DM [6].

A form of education that has proven its effectiveness in providing a positive effect on clinical outcomes and quality of life of patients with diabetes mellitus type 2 is the Diabetes Self-Management Education (DSME). According to the American Diabetes Association [7] Diabetes Self Management Education (DSME) is a process to facilitate sufferers' knowledge of self-management in self-care. The purpose of DSME is self-care behaviors, problem solving, with active collaborative health care team to improve health status. In implementing education, there are many methods that can be used. One of them is audiovisual media. Audiovisual method is a medium used by educators in delivering health messages through the hearing aid, such as television, video, or DVD Notoadmojo S. [8].Self-care is good and right in DM patients is needed in the early prevention through promotive, preventive, curative and rehabilitative services. Khotimah [9], conveyed long-term complications that can be caused by diabetes self-care requires handling behavior is specifically one of which is self-care behavior.

Tahlil et al. [10] stated the results show that DSME can increase knowledge of DM sufferers starting from diet, physical exercise, compliance with pharmacological treatment and monitoring blood sugar levels. Showed that there was an effect of DSME on reducing blood sugar levels. This is indicated by the attitude of the patient who is able to independently manage the correct diet, reduce the consumption of sweet foods and drinks, consume drugs regularly according to indications, regulate rest patterns and physical activity, and regularly independently monitor blood sugar levels. This study aims to analyze the effect of DSME through audiovisual media on increasing self care, and reducing blood sugar levels in patients with diabetes type II.

Methods

The design of this study was a quasy experimental pretest-posttest design with non-equivalent group design. This research was conducted at the Madiun Public Health Center, East Java on February 09 - March 20, 2021. The sample in this research were all patients with diabetes type II who treated at the Madiun Health Center. There were 34 respondents who suffering type II diabetes mellitus. The control group contained 17 respondents and the experimental group 17 respondents. The sample technique is random sampling. Odd respondents get a control group and even respondents get an experimental group. The research instrument used a Summary of Diabetes Self-Care Activity (SDSCA) questionnaire.

Respondents described the purpose, benefits and research procedures in detail that consent of the purpose and the willingness of the respondents in the study the influence of Diabetes Self Management Education (DSME) via the audiovisual media to decrease blood sugar levels and self-care on the client diabetes type II by researchers and further research do a pretest checking blood sugar levels 2 hours after eating and a self-care questionnaire. The control group was given audiovisual media without daily observation.

Researchers conducted the first session that discusses medical history, goal setting and achieving target blood glucose and self-care. The first phase describes the concept of diabetes mellitus (definition, causes, signs and symptoms, classification and risk factors, complications of acute and chronic through audiovisual media during 18 minutes and monitoring is done every day for 14 days through print out questionnaires, photos, video call WhatsApp or via cell phone. During the DSME program, respondents are monitored online by the researcher via Personal WhatsApp every day and also the respondent sends photos to prove that they have followed the procedures that have been given with family assistance. After doing DSME for 14 days, observations blood sugar levels of respondents. for the control group, monitored via Personal WhatsApp for blood sugar levels were observed after 14 days.

Data analysis includes univariate analysis and bivariate analysis. In this research, the univariate test consisted of age, sex, and values of blood sugar levels before and after being given the DSME program. The bivariate analysis in this study aims to analyze the effect of DSME through audiovisual media on reducing blood sugar levels in patients with diabetes type II. The normality test uses the Shaphiro-Wilk test with result is P=0,350 to self care variable, and P=0,120 to blood glucose level, means that the data is normally distributed. Bivariate analysis used the non-parametric Wilcoxon test and to see the difference between pre-test and post-test on the self-care variable and to see the differences between groups using the Mann-Whitney test. Analysis of bivariate test on blood sugar levels drop variables using parametric test Paired T-Test and to see the difference between groups using Independent T-Test test.

Result and Discussion

The description of respondents is shown in table 1. Table 1 shows that in the control group 13 respondents (76.5%) and 11 respondents (64.7%) in the experimental group were mostly female. The age group most ages 50-69 years (58.8%) and most of the experimental group was 40-59 years (70.6%). Respondents education in the control group the majority of elementary education (29.4%) and junior (29.4%) and the experimental group the majority of high school education (41.2%). Ocuppation of respondents in the control group mostl farmers (47.2%) and the experimental group mostly also as farmers (35.3%). A history of diabetes mellitus in the control group and the experimental largely a history of DM <5 years (64.7%).

Table 2 illustrates that the result of self-care control group pretest lower category of 14 respondents were three categories of respondents and post-test lower category of 15 respondents Seang second category of respondents, while the experimental group pretest self-care is very low category 4 respondents, the lower 9 respondents, and Medium 4 respondents, in the high category self-care posttest results 15 respondents and very high 2 respondents.

Table 3 illustrates that the results of the control group pre-test blood sugar levels are 254.94 and post-test blood sugar levels 254.94. The experimental group pre-test mean blood sugar levels of 276.76 and standard deviation of 46.261 and post-test mean blood sugar levels of 224.12.

Tabel 1 Description of Respondents

No	Characteristic	Control Group		Experimental Group	
		Amount	Persentage (%)	Amount	Persentage (%)
	Gender				
1	Female	13	76,5	11	64,7
2	Male	4	23,5	6	35,3
	Age				
1	30-39 Years	1	5,9	1	5,9
2	40-49 Years	4	23,5	6	35,3
3	50-59 Years	5	29,4	6	35,3
4	60-69 Years	5	29,4	4	23,5
5	70-79 Years	2	11,8	0	0
	Education				
1	Primary School	5	29,4	3	17,6
2	JHS	5	29,4	2	11,8
3	SHS	3	17,6	7	41,2
4	D III	1	5,9	2	11,8
5	S1	3	17,6	3	17,6
	Work				
1	Laborer	4	23,5	5	29,4
2	Farmer	7	41,2	6	35,3
3	Entreprenure	3	17,6	2	11,8
4	IRT	2	11,8	2	11,8
5	PNS	1	5,9	2	11,8
	History DM				
1	< 5 years	11	64,7	11	64,7
2	>5 years	6	35,3	6	35,3

Tabel 2 Result of Self-care

No	Category	Amount Control Group		Amount Experimental Group		P Value
		Pre-test	*Post-test*	*Pre-test*	*Post-test*	
1	Very Low	-	-	4	-	0,000
2	Low	14	15	9	-	
3	Average	3	2	4	-	
4	High	-	-	-	15	
5	Very High	-	-	-	2	
	Amount	17	17	17	17	

Tabel 3. Results of the Blood Sugar Levels

Category	Control Group		Experiment Group		P Value
	Pre-test	*Post-test*	*Pre-test*	*Post-test*	
Mean	254,94	254,94	276,76	275,00	0,000
Median	256,00	256,00	224,12	224,00	

This study aims to determine the effect of DSME with audiovisual media on self-care and decrease blood sugar levels in patients with Type II diabetes. Wilcoxon test results that sig. (2-tailed) of 0.005 in the experimental group, sedangan sig. (2-tailed) of 0.246 in the control group. The results of the Mann Whitney test analysis showed p = 0.000 (p <0.05), which means that there is a difference in the value of self-care in the control group and the experimental group. From these data we can conclude in experimental group after being awarded DSME action with audiovisual can influence self-care in patients with type II diabetes. This is due to the information provided to patients through audiovisual media. Audiovisual can not be separated from the appeal on the method of demonstration. Andayani et al. [11] suggests that there are significant health education with the method of demonstration of knowledge of diabetes mellitus. The demonstration method has the same method as the audio-visual method in which the visual and auditory senses demonstration method is the same as the audio-visual media used.

The results are consistent with research [12] shows the results of the statistical value in the experimental group DSME is p = 0.000 (p <0.05) that shows the result of applying the principle of DSME educational approach can increase the ability of self-management is good so can improve behavior self-management compliance in patients with type II diabetes which can have an impact on improving the quality of life. DSME is an example of education that can be applied in diabetic patients aiming to improve patient self-care behavior so as to improve knowledge can empower patients and patients in order to avoid the complications that quality of life can also be increased. Providing health education to DM sufferers is very important to help change behavior in DM sufferers to be better.

Independent care is considered the foundation of care for people with DM. Therefore, a rigorous assessment of self-care for people with diabetes is very important to identify and understand the problem areas in the management of diabetes itself, in order to facilitate a better glucose control, and to reduce the occurrence of complications akubat of the value of blood sugar levels are not controlled. Vocilia [13] conveyed that self-care is an individual activity to perform self-care and shape behavior in an effort to maintain health, maintain life, prosperity, and overcome complications due to uncontrolled blood sugar levels. Self-care activities play an important role in everyday life for people with diabetes because it is an effective way to monitor blood sugar levels. Patients with diabetes is expected to perform self-care activities or self-care with a consistent and obey every day so as to achieve blood sugar levels stable and to minimize the occurrence of complications. Self-care can be done well if the patient has the ability to run the self-care.

The result of the Paired T-Test shows that the sig. (2-tailed) value is 0,000 in the experimental group, while the sig. (2-tailed) value is 0.812 in the control group. From these data it can be concluded that DSME with audiovisual media can affect blood sugar levels decrease in patients with type II diabetes. Audiovisual media is one of the media that can be used in providing health education. Audiovisual capable of changing levels of patient compliance, due to the efforts of health education to improve patient adherence so that it can change everyday behavior. This media is more interesting and more effective because it involves two senses, namely sight and hearing which can maximize the reception of information.

Nuradhayani et al. [14] test result data obtained statistical value of p = 0.002 (p <0.05) suggesting that the intervention DSME able to withstand the rate of increase in blood sugar levels in people with type II diabetes, it can be proved that when comparing the difference in the increase in blood sugar levels, there was a significant change compared to the control group. In patients control blood sugar levels to remain stable and tiad experiencing complications need for awareness for each diabetic patient to improve the quality of life. Tia [15] stated there is a change in the value of blood sugar levels before and after being given the DSME intervention. The value of the average blood sugar levels when seen that DSME intervention group with greater influence in the

change in blood sugar levels decrease when comparing to the blood sugar level as in the control group and there were significant differences in both groups.

DSME can change behavior in which after respondents know about the disease, then apply the information they get, such as always controlling their blood sugar levels regularly, adjusting the recommended diet, doing physical activity, and doing foot care to prevent complications in the future. From DSME, respondents can change their behavior in carrying out daily self-care so that they can experience improvements in controlling blood sugar levels, and reduce the risk of complications. Diabetes mellitus can be serious and lead to chronic and dangerous conditions if left untreated. As a result of hyperglycemia, there can be acute metabolic complications such as diabetic keteacidosis and hyperglycemia over a long period of time contributing to chronic complications in the cardiovascular disease, kidney, eye disease, and neuropathic complications. DM is also associated with an increase in the incidence of macrovascular diseases such as stroke Nuradhayani et al., (2017). Nuradhayani et al., (2017), one of the aspects that plays an important role in the management of type II DM is education. Education in DM patients is early as type II diabetes control. One form of education that is commonly used and proven effective in improving clinical outcomes and quality of life of patients with diabetes mellitus type II is Diabetes Self-Management Education (DSME).

Conclusion

There is an influence of Diabetes Self-Management Education (DSME) The Audiovisual Media on self-care and decrease blood sugar levels in people with diabets mellitus type II. Patients with diabetes mellitus need to be accompanied so that they are enthusiastic about dieting, exercising, regularly taking medication and taking good care of themselves. DSME can be used as a way to improve self-care and lower the patient's blood glucose level, so that the patient's quality of life improves.

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