

The Effect of Self Management Education and Support in Improving The Self-Efficacy of Patients with Type 2 Diabetes Mellitus

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Abstract

Diabetes mellitus type 2 is a chronic disease that requires self-management. Self-efficacy of patients with type 2 diabetes focuses on improving management education and support services. This study aimed to determine the effect of diabetes self-management education and support on self-efficacy in patients with type 2 diabetes mellitus in Dr. Soebandi hospital Jember. This type of research was a quasi-experiment using a two-group pre-post-test design. The research sample consisted of 30 respondents from 15 controls and 15 consecutive sampling groups. Technique sampling used. Inclusion criteria included 1) diagnosed with type 2 diabetes mellitus; the level of consciousness is *compos mentis*; 2) aged 30–65 years. The statistical test used t-tests dependent and independent t-test. Stages there were 6 sessions. Implementation of 1–4 sessions in the hospital and at home 5–6 sessions patients. The results showed that a score of self-efficacy increased by 17.53 in the treatment group and 4.93 in the control group ($p=0.001$). The results showed that there was a significant difference between self-efficacy, the treatment group and the control group after administration amounted to 10.495 ($p=0.001$). The conclusion suggests that there is a significant influence on the self-efficacy of patients with type 2 diabetes in Dr. Soebandi hospital Jember. It is expected that this study found is a recommended intervention for health workers to improve the self-efficacy of patients with type 2 diabetes so as to improve healthy lifestyles, reduce complications, and improve quality of life.

Keywords: Diabetes mellitus, self-efficacy.

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Introduction

Diabetes mellitus (DM) type 2 is a chronic disease that requires self-management. Self-efficacy of patients with type 2 diabetes focuses on improving management services. Diabetes self-management education and support (DSME/S) are structure educational programs and independent activities to improve self-care. DM is the most common chronic diseases and the fourth leading cause of death in developing countries. Most types of DM disease is type 2 diabetes is approximately 85–95% (Sicree et al., 2009).

The global prevalence of 387 million people with diabetes mellitus cases is expected to increase to 600 million cases in 2035 (International Diabetes Federation, 2015). According to the World Health Organization (WHO) that Indonesia ranks fourth cases of type 2 diabetes with a prevalence of 8.6% of the total population. WHO predicts a rise in DM in Indonesia from 8.4 million in 2000 to about 21.3 million in 2030. The prevalence of diabetes disease in East Java, the second position a number of 8,370 cases (East Java Health Office, 2013). Jember District Health Office data (2016) showed the number of diabetic patients visit health centers as many as 6247 people.

Ariani research results (2011) found that patients with type 2 diabetes have poor self-efficacy (47.3%) in the treatment of diabetes. Kusuma & Hidayati research results (2013) found that patients with diabetes have poor self-efficacy by (30.9%). Research Astuti (2014) stated that there is a significant relationship between the self-management and self-efficacy in patients with type 2 diabetes mellitus ($r=0.412$, $p<0.05$).

Self-efficacy focuses on the belief in self-efficacy of patients' behavior, with type 2 diabetes mellitus which could bolster the disease and improve care management such as diet, exercise, medication, glucose control, and diabetes care in general (Wu et al, 2006). Self-efficacy in diabetic patients describe the ability of individuals to make the right decisions, including planning, monitoring, and implementation of care during his lifetime (Temple, 2003). Individuals with high self-efficacy will set high goals and have a strong commitment to the goal. Instead of individuals

with low self-efficacy has a weak commitment to the goal, resulting in non-compliance with self-care (Bandura, 1994). DM patients should have specialized knowledge and skills in the form of self-management of diabetes to prevent any particular disease patients with type 2 diabetes complications (Smeltzer & Bare, 2001). The successful management of type 2 diabetes depends on information about type 2 diabetes, motivation, and self-efficacy of patients to perform self-care to control psychological symptoms and complications (Wu et al, 2006). The success rate of the DM management of patients affected by high self-efficacy, because people have high self-efficacy, then the individual will be working hard to deal with and resolve the problem (Edberg, 2010).

One of the education given to patients with type 2 diabetes were hospitalized, namely diabetes self-management education and support (DSME/S). Diabetes self-management education and support (DSME/S) is an educational program to facilitate the knowledge, skills, and ability necessary for self-care of patients with diabetes mellitus (ADA, 2014). DSME/S has the advantages of the program including clear structure, standardized of curriculum, and empower patients with type 2 diabetes independently as well as an element of support, which is the support that assists in implementing, maintaining, and monitoring the behavior of people with diabetes (ADA, 2015). The study aimed to determine the effect of diabetes self-management education and support (DSME/S).

Research Method

This study was a quasi-experiment using pre-test and post-test with control group design. The self-efficacy of patients with type 2 diabetes mellitus measured before and after DSME/S in the treatment group.

Total samples of the treatment and control group were 30 respondents. The sample was chosen using the consecutive sampling technique. Inclusion criteria include 1) patients with type 2 diabetes were hospitalized; 2) compos mentis; 3) age 30–65 years; 4) a minimum of elementary education; 5) able to

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read; 6) citizen of Jember; 7) live with the family at home. The research settings were he inpatient unit Selenium and Anthurium Dr. Soebandi hospital Jember.

The instrument of this study was diabetes self-management education and support (DSME/S). The (DMSES) contains 20 items, and then the data score using the Likert scale of 1–5. Value 1: Not sure, 2: unsure, 3: pretty sure, 4: sure, 5: very confident. Score range is 20–100. This questionnaire provides questions about the capability of checking blood sugar (3 items), diet and maintaining weight (11 items), physical activities (2 items), foot care (1 item), and following the treatment programs (3 items).

Data collection and processing stages included: 1) licensing research and informed consent; 2) doing pre-test of self-efficacy in the treatment and control groups using questionnaires DMSES after 1 day of admission to hospital; 3) providing DSME/S in the treatment group for 6 sessions for patient and family, while the control group doing the activity as hospital procedures, and obtaining a regular education program by health workers in the inpatient unit; 4) doing the DSME/S at the patient's home after patient discharged from hospital; 5) discussing the timing of the DSME/S with the patient and family in the treatment group. The implementation of DSME/S divided into six sessions. 1–4 sessions were done in the hospital. The duration of implementation

approximately 60 minutes each session. The first session was done after one day of admission to hospital, session 2 and session 3 were done when the patient hospitalized, the fourth was one day before the patient discharged from the hospital. Sessions 5 (1st day) and 6 (3rd day) were done at home with a duration of 150 minutes each session. Respondents filled in the self-efficacy questionnaire immediately after the last session. There were 3 numerators in this study, they have been trained for the DSME/S procedures. The 6 sessions activities were discussing the basic concepts of DM (definition, causes, classification, clinical manifestations, pathophysiology, treatment, and complications); discussing nutrition / diet and physical activity / exercise for patient with DM; discussing on foot care and monitoring; discussing about stress management, social support, and access to health facilities; discussing the evaluation, monitoring and counseling DSME/S; discussing the evaluation, monitoring and counseling DSME/S.

The ethical consideration in this research included: 1) informed consent; 2) anonymous; 3) safety and comfort; 4) confidentiality; 5) justice (Potter & Perry, 2006).

Research Results

Characteristics of Respondents

Table 1 Characteristics of Respondents

No	Variable	Mean	sd	Return Max
1	Age (years)			
	Treatment Group	58.73	5.982	47–65
	Control Group	56.00	7.061	37–65
2	Duration of Illness (years)			
	Treatment Group	2.93	1.710	1–7
	Control Group	4.67	2.582	1–10

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Table 2 Distribution of Respondents by Sex, Education, and Occupations

No	Variable	Treatment		Control	
		f	%	f	%
1	Gender				
	Male	8	53.3	5	33.3
	Female	7	46.7	10	66.7
2	Education Level				
	Elementary	10	66.7	6	40
	JSS	2	13.3	1	6.7
	High School	2	13.3	8	53.3
	Graduate	1	6.7	0	0
3	Occuoations				
	Unemployed	5	33.3	6	40
	Civil Servant	1	6.7	0	0
	Self-employed	6	40	8	53.3
	Farmer	2	13.3	0	0
	Retired	1	6.7	1	6.7
	Other	0	0	0	0

Table 3 Self-Efficacy Before and After the DSME/S intervention in Treatment Group

Groups	Self-efficacy	Mean	95% CI	The difference (Δ)
Treatment	Before	45.87	41.07 to 50.53	17.53
	After	63.40	58.14 to 67.86	
Control	Pre test	43.87	40.20 to 47.40	4.93
	Test post	48.80	45.53 to 52.00	

Table 4 The Results of The Dependent T-Test on The Treatment Group and The Control Group

Groups	Self-efficacy	n	mean	t	p-value
Treatment	Pre test	15	17.53	-16.143	0.001
	Post test				
Control	Pre test	15	4.93	-9.646	0.001
	Post test				

Table 5 Results of The Independent T-Test in The Treatment and Control Group

Self-efficacy	mean	to	95% CI	t	p-value
treatment group	17.53	4.207	10.141–15.059	10.495	0.001
control group	4.93	1.981			

Table 1 showed the average age of respondents was 58.73 for the treatment and control group of 56.00 years. The average duration of illness was 2.93 years for the treatment group and the control group was 4.67 years.

Table 2 that the respondents' gender

treatment groups are predominantly male as 8 people (53.3%). The education level of respondents in the treatment group was mostly elementary as many as 10 people (66.7%). The majority of the respondent were self-employed, 6 (40.0%).

Self-efficacy in Treatment and Control

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Group

Table 3 shows that the results of self-efficacy in treatment groups DSME/S score were 17.53. The self-efficacy of the control group DSME/S score was 4.93.

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Table 4 shows that the treatment group had a p-value of 0.001 means that there are differences in self-efficacy before and after the intervention of DSME/S. the control group had a p-value of 0.001 means that there are differences in self-efficacy as a pre-test and post-test.

Differences in Self-Efficacy in Treatment and Control Group

Table 5 shows that there was a significant difference between the self-efficacy treatment group and control group DSME/S on self-efficacy of patients with type 2 diabetes with a p-value of 0.001.

Discussion

The Self-Efficacy Before and After DSME/S in Treatment Group

The self-efficacy of the treatment group before intervention DSME/S was a low category with a value of 41.07 to 50.53. After the intervention was changed into a medium and high category with a value of 58.14 to 67.86. Self-efficacy is an individual's beliefs about abilities in performing certain tasks to get the results as expected (Bandura, 1997). Self-efficacy can be obtained, modified, enhanced or reduced through one or a combination of four sources (Alwisol, 2005). Patients with type 2 diabetes who have low self-efficacy perception unfavorable due to illness, so the patient will feel low self-esteem and lack of effort to deal with the disease by looking for information related to handling and management of diabetes. There was also a lack of information obtained by the diabetic patient from health professionals.

DSME/S is the process of health education structured is the key to the treatment of patients with diabetes mellitus. The process of giving education the DSME/S helps patients to share experiences related to the disease in the past (performance accomplishment), gain new

experiences of others and the environment, get encouragement and persuasion both of the health team in the form of information needed patient in making decisions, and family support needed to influence or suggestion that the patient is able to resolve the issue (verbal persuasion) and to improve the patient's emotions in making changes to keep better (emotional arousal) (Rondhianto, 2011). It can foster confidence that patients can take the necessary action in the management of diabetes.

The results of the self-efficacy score were 17.53. The mean values increased before and after the administration of DSME/S from 45.87 into 63.40. The level of self-efficacy of patients with type 2 diabetes has increased after the DSME/S intervention, patients become more understanding about diabetes, causes, complications, dietary management, and activity or physical exercise, and stress management. The results are consistent with research conducted by Rondhianto (2011) that an increase in the average level of self-efficacy responder treatment group at 25.20 after the intervention of Diabetes Self-Management Education (DSME) in patients with type 2 diabetes in Dr. H Koesnadi hospital Bondowoso. These results are also consistent with Atak's (2013) study found that an increase in self-efficacy diabetic patients after health education.

In addition through health education, there are other factors that can increase self-efficacy in patients with type 2 diabetes which is family support. The family support has a positive impact on psychological health, and physical as well as the effect on self-efficacy of patients with type 2 diabetes, as the family involved in many aspects of diabetes care activities (Ramadhani, 2016). According to the facts and theories, self-efficacy in patients with type 2 diabetes may increase when patients and family have a good knowledge of how to manage the disease.

Self-Efficacy of the Control Group

The pre-test result of self-efficacy in the control group was the low category with a value of 40.20 to 47.40. While the post-test results were also in the low category with a value of 45.53 to 52.00. Respondents' self-efficacy increased without the intervention of

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DSME/S, respondents in the control group they got an education about diabetes as health workers' schedule in the inpatient unit. The level of self-efficacy slightly increased in the control group.

Type 2 diabetes patients shared some problems related to their disease. The majority of patients self-efficacy value range was $> 40,005 - \leq 53,35$, it due to several factors such as knowledge related disease, diet, and how to do wound care, and how to control blood sugar. In addition, there is a lack of awareness of health and support from the family. One factor that would affect self-efficacy by Bandura in Santrock (2007), was the occupation. Situations or certain kinds of problems forced patients to work harder than others.

Disease Type 2 diabetes is a chronic disease that may cause complications, this statement may become scary information for patients with type 2 diabetes who do not know about diabetes and the appropriate management. As research conducted by Ratnawati, et al (2016) states that there was a significant relationship between self-efficacy on quality of life in patients with type 2 diabetes at RS PKU Muhammadiyah Yogyakarta with a positive correlation ($p=0.001$ and $r=0.751$). Patients with type 2 diabetes who possess knowledge about diabetes and disease management can improve their confidence in performing self-care related to diabetes. Ratnawati et al (2016) explain that patients with type 2 diabetes who have high levels of self-efficacy, they had knowledge about diet, exercise, monitoring blood sugar independently, drug consumption, and foot care optimally which will improve the quality of life of patients with type 2 diabetes mellitus.

Another factor that would affect patients' self-efficacy is a reward that given for individuals who achieved abilities to manage diabetes, roles in community, respect of others, and a sense of confidence in dealing with problems, so patients can find out what are the things about their illness and knowing what actions should be taken in the management of diabetes (Santrock, 2007).

The control group was not given DSME/S by researchers, they obtained education programs as health workers' regular programs. Based on the results of the study,

the majority of respondents said that access to information to improve their knowledge is limited. Wiastuti (2016) states that knowledge and confidence is an important part in determining the success of someone doing self-management and healthy behavior.

Differences in Self-Efficacy in Treatment and Control Groups

The results of the data analysis showed that the variables of self-efficacy between the treatment group and the control group obtained the t value = 10.495 and p -value = $0.001 < \alpha (0.05)$. Based on these results it can be seen that there are significant differences in the value of self-efficacy both groups, with the value of self-efficacy in the treatment group was higher by 10.495 compared to the control group. Based on the tables 3 and 4, the value of respondents' self-efficacy in the treatment group before the intervention mostly within the range of $> 40,005 - \leq 53,35$, and after the intervention largely increased, range $> 53.35 - \leq 66,65$. Whereas the control group did not receive the intervention although based on tables 5 and 6 also show an increase in self-efficacy, which is currently pre-test largely is in the range $> 40,005 - \leq 53,35$ whereas the post-test result was within the range of $> 40,005 - \leq 53.35$. Based on Table 7 t -test dependent increased self-efficacy in both groups, but the increase in self-efficacy in the treatment group was higher than in the control group. This is reinforced by the results of independent t -test as listed in table 8 showed significant differences in self-efficacy between treatment and control groups.

Albert Bandura said self-efficacy is the key idea of cognitive social theory (social cognitive theory). Self-efficacy is a person's level of confidence in its capacity to manage and perform certain tasks required to get the desired results. Bandura (1994) states that a person's self-efficacy comes from four factors: performance accomplishment, vicarious experience, persuasion social, and emotional arousal. Performance accomplishment is an experience of success achieved by himself in the past, vicarious experience is an experience that happened to someone else, social persuasion, verbal persuasion are used to ensure that individuals have the ability to achieve what they want, and emotional

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arousal is a state of physiological emotions can affect an individual's ability to do its job.

Self-efficacy will be formed through several processes, including; cognitive processes, motivational, affective and selection (Bandura, 1994). Cognitive processes are the mindset of someone in the face of the problems, the motivation comes from the ability of a person so affected him, the effect is the emotional state of a person in the processing problems, and the selection process is the unity of all three of the above processes. According to Bandura (1994), a person who has a high level of self-efficacy can set high goals and has a strong commitment to the goal. A factor affecting self-efficacy according to the Health Belief Model in Edberg (2010) is the perception. Research conducted by Lau-Walker (2004) showed a significant relationship between the perception of the disease with self-efficacy. One way to create a good perception is health education (Edberg, 2010), the patient knows the knowledge about the management of the disease so increase their efficacy. Rondhianto (2011) states that there is a positive relationship between perception and self-efficacy of patients with type 2 diabetes.

Increasing self-efficacy occurred in the control group due to the control group also received health education from health professionals. an increase in self-efficacy of patients with type 2 diabetes In line with research conducted by Atak (2010), found that an increase in self-efficacy value of 20.0 becomes 21.9 in the treatment group after a health education intervention in patients diabetes mellitus type 2. the results showed an increase in self-efficacy that occurred in the treatment group was higher than the control group .

The treatment group received health education through the Diabetes Self-Management Education and Support (DSME/S) program when patients hospitalized and continued at home. DSME/S is a process that facilitates the knowledge, skills, and abilities for self-care in patients with DM and to implement and maintain behaviors needed to manage the condition (ADA, 2014). The implementation of DSME/S performed a total of six sessions, 1-4 sessions were done in the hospital, and the 5th-6th sessions performed

at the patient's home.

Before the first session, the researchers did a pre-test related to respondents' and family's knowledge and the management of DM at home. The majority of respondents said a lack of knowledge related to the disease and DM management. Respondents said merely knowing diabetes from the community and did not know the causes. In addition, respondents were also less aware of the symptoms and signs of abnormal blood sugar.

The second session learned about managing nutrition/diet and physical activity/exercise. The majority of respondents said that they did not know how to control the diabetes diet. The diabetic diet is to help patients improve their eating habits and exercise to get better metabolic control. Determination diet was made by counting the number of calories and the level of physical activity. Most respondents have mild activity, however, hard activities sometimes make the respondents do not have the time to do light exercise regularly every week. According to PERKENI (2015) Physical activity/exercise that can be performed by patients with type 2 diabetes on a regular basis as much as 3-4 times a week for about 30 minutes including CRIFE (continuous, rhythmical, interval, progressive, endurance training).

The third session taught about foot care and monitoring. Foot care activities include examining the foot every day related to discoloration, swelling, pain or numbness; checking out footwear, such as shoes or socks does not cause blisters on the feet; washing feet every day using soap and warm water, dry the feet carefully, especially between the toes sidelines; and cutting the nails. The majority of respondents never examine the foot, they were less attentive to protect his legs. Routine monitoring taught related to controlling blood sugar independently.

The fourth session was about stress management, social support, and patient access to health facilities. The majority of respondents said that they lack knowledge about stress management and health service procedures. Stress management is effective to improve the quality of life. The types of stress management include deep breathing techniques (relaxation), Progressive Muscle

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Relaxation (ROP), guided imagery, and massage the back (back rub). Researchers provided information about access to health care and health facilities, so patients are able to check the progress of the disease.

Sessions fifth and sixth on evaluation, monitoring and counseling related materials that have been taught from the first session to the fourth session, and reviewing the material to improve patients' better understanding of materials and be able to perform independently. The post-test was conducted one day after the last session to determine the level of self-efficacy after the administration of DSME/S.

Based on the research results, there are differences in self-efficacy in the treatment group and the control group with $t = 10.495$ and $p = 0.001 < \alpha (0.05)$. The results are consistent with previous research conducted by Indrayana (2016) which stated that there are significant differences in self-efficacy value of pre-test and post-test after the intervention of DSME/S in type 2 diabetes patients in the PHC Patrang Jember. Research by Pramesti (2014) also showed the effect of DSME in patients with type 2 diabetes.

Conclusion

The treatment group had a significant difference in self-efficacy before and after the Diabetes Self-Management Education and Support (DSME/S). While the control group there were also significant differences in self-efficacy value in the pre-test and post-test results. The score of self-efficacy in treatment was higher than the control group. The results of this study add knowledge and insight for researchers on the effect of Diabetes Self-Management Education and Support (DSME/S) in improving self-efficacy in patients with diabetes mellitus type 2. Further research needs to be done to enhance this discussion including determining the effectiveness of the DSME/S to increase self-efficacy in patients with type 2 diabetes with larger samples and longer periods and using different sampling technique, influencing factors on patients' self-efficacy, and identifying the effectiveness of the DSME/S carried out individually by the group.

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