



## INFLUENCE OF DIABETES SELF MANAGEMENT EDUCATION AND SUPPORT FOR SELF EFFICACY AND SELF CARE BEHAVIOUR IN CLIENT WITH TYPE 2 DIABETES MELLITUS

Fitriah<sup>1</sup>, Mustofa Haris<sup>2</sup>, Cicilia Desy Megawati<sup>2</sup>, Mufarika<sup>2</sup>, Suryaningsih<sup>1</sup>, Rodiyatun<sup>1</sup>

<sup>1</sup>Politeknik Kesehatan Kemenkes Surabaya, 2STIKes Ngudia Husada Madura

Email: mufarika.unpad@gmail.com

ABSTRACT	Keywords
<p><b>Introduction:</b> Independent diabetes care management is needed for health maintenance. Low self-care is caused by low self-efficacy. The purpose of this study was to analyze the effects of diabetes self-management education and support for self-efficacy and independent behavior in clients with type 2 diabetes mellitus. <b>Method:</b> This observational research used a cross-sectional approach. The sample which used the cluster sampling method consisted of 200 people. The independent variable was education and support for independent diabetes management, and the dependent variable was self-efficacy and independence. Research analysis techniques used bivariate statistical logistic regression test. <b>Result:</b> The Binary Logistic Regression test showed that education and independent management support for diabetes significantly influence self-efficacy with a result of <math>\text{sig } 0.001 &lt; \alpha 0.05</math>. Education and support for independent diabetes management significantly influence self-care with <math>\text{sig } 0.000 &lt; \alpha 0.05</math>. Self-efficacy affects self-care significantly with <math>\text{sig } 0.000 &lt; \alpha 0.05</math>. <b>Conclusion:</b> Self-management education and diabetes support are beneficial for people with type 2 diabetes in increasing self-confidence to control and manage the disease they experience.</p>	<p><b>Self-Management, Self-Efficacy And Self-Reliance Behavior</b></p>

## INTRODUCTION

Diabetes mellitus is a chronic disease that requires self-care management. Diabetes mellitus population in Indonesia has increased from 9.1 million in 2014 to 10 million in 2015 (ADA, 2016). Diabetes mellitus if not seriously treated is predicted to cause an explosion of diabetes mellitus people to become 21.3 million people in 2030 (Putra, 2017).

It was known 355 visits were made by patients with diabetes in the authority of Puskesmas Senenan Bangkalan. The visit of diabetics who had recently experienced

symptoms of diabetes mellitus or clients with shorter duration of diabetes mellitus was 221 visits and the visits by patients who had suffered from long diabetes mellitus were 134 visits.

The problems experienced by type 2 diabetes mellitus clients can be minimized if the clients have sufficient knowledge and ability to control his illness by self-care (Kusniawati, 2011). The risk of complications arising from diabetes can be reduced by selfcare, because selfcare behavior requires

adherence to the design of therapy provided (Ekayasa, 2016).

Self-care for patients with diabetes is needed to make various dietary and lifestyle modifications, dietary arrangements, physical exercise, monitoring blood sugar levels, medication and foot care (Ekayasa, 2016). The success of self-care depends on the activeness of individuals to participate in efforts to maintain their health (Indanah, 2010).

The data on self-care shows that of 10 respondents who suffer from type 2 diabetes mellitus, no respondents had good self-care, 3 out of 10 respondents (30%) had sufficient self-care, and 7 out of 10 respondents (70%) had insufficient self-care.

Low self-care is caused by low self-efficacy so that it will have an impact on the pattern of management and self-care activities (self-care) which will affect the patient's ability to manage self-care and illness and decrease the quality of life (Bernal, Woolley, Schenzul dan Dickinson, 2000 in Ariani, 2011).

Self-efficacy will affect the mindset and can change one's attitude patterns so that they can do an action (Fauziah, 2012). Self-efficacy in patients with diabetes mellitus focuses on the patient's confidence to be able to perform behaviors that can support the improvement of his disease and improve management of diabetes mellitus care in general (Gede, 2015).

The data about self-efficacy shows that of 10 respondents who suffer from type 2 diabetes mellitus, no respondents had high self-efficacy, 3 out of 10 respondents (30%) had moderate self-efficacy, and 7 of 10 respondents (70%) have low self-efficacy.

Factors affecting clients who have low self-efficacy include age, sex, level of education, marital status, socioeconomic status, length of suffering, and family support (Ariani, Sitorus, & Gayatri, 2012). This causes a decrease in the ability to manage and care independently and have an impact on increasing complications of disease caused by treatment that is not good (Rondhianto, 2012).

Proper management of education and self-support can improve self-efficacy and implementation of self-care management. The purpose of the study was to analyze the effects of educational management and self-support on self-efficacy and self-care of type 2 diabetes mellitus clients.

## MATERIALS AND METHODS

The observational research design used a cross-sectional approach. The research variables were exogenous variables and endogenous variables. Exogenous variables were the management of education and self-support and endogenous variables were self-efficacy and self-care.

the population consisted of 269 people and the sample which used cluster sampling technique consisted of 190 people. The research instrument used questionnaires. The research analysis technique used a computer-assisted Bivariate statistical test.

## RESEARCH RESULT

The results showed that the management of education and self-support significantly affected the self-efficacy and self-care of type 2 diabetes mellitus clients. The results of the statistical test analysis using the Significance Test and Binary Logistic Regression Test can be seen in the following table:

Table 1: Result of significance test

No	Effect	Coefficient	T-statistic	Sig
1	X1 Education management and Self Support Y1 Self efficacy	0.854	9.830	Sig
2	X1 Education management and Self Support Y2 Self care	0.364	2.348	Sig
3	Y1 Self efficacy Y2 Self care	0.501	3.470	Sig

The significance test is calculated using Linear Regression which is done to test the

effect of exogenous variables on endogenous variables by looking at the value of Standardized Coefficients and t-statistics in the coefficients table. The value used as a reference is the value of T table = 1.96. Exogenous variables affect endogenous variables if the statistical T value is greater than the T table value with an error tolerance  $\alpha$  0.05.

Table 1 above explains that exogenous variables significantly influence endogenous variables with a T-statistic value > T table 1.96.

Effect value based on Standardized Coefficients in table 1 above resulted in indirect influence and indirect effect. The following is an illustration of the pathway of the influence of exogenous variables to endogenous variables, namely the influence of education management and self-support for self-efficacy and self-care is explained as follows:

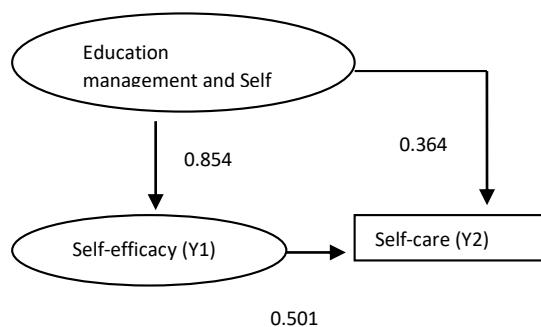


Figure 1 Effect Pathways in Management of Education and Self Support on Self-Efficacy and Self-Care.

The pathway description of the influence of exogenous variables to endogenous variables above can explain the direct and indirect effects of education management and self-support on self-efficacy and self-care. The values of direct and indirect effects are explained in tables 2 and 3 as follows

Table 2 Direct Influence Pathways

Pathway	Effect	
	Direct	Indirect
X1 Education management and Self Support Y2 Self-care	Existent	Existent Through self efficacy
Y1 Self-efficacy Y2 Self-care	Existent	Non existent

The calculation of the value of the direct influence of education management and self-support for self-care is 0.364. Meanwhile, the calculation of the value of indirect effects is explained in table 3 as follows.

Table 3 Indirect Influence

Indirect effect/influence pathway	Indirect effect value
X1 Education management and Self Support Y2 Self-care	X1 Education management and Self Support $\rightarrow$ 0.428
	Y1 Self Efficacy $\rightarrow$ self care $\rightarrow$ $0.854 \times 0.501$

Table 3 explains that the most indirect indirect care is the effect of managing education and self-support through self-efficacy with a value of 0.428. The results of this study indicate that the indirect effect in self-care is stronger than the direct effect.

Table 4 Results of Binary Logistic Regression Test Management of Education and Self Support for Self-Efficacy

	Variables in the equation					
	B	S.E	Wal d	D f	Sig	Exp (B)
Education management and Self Support for Self Efficacy	-3.526	1.015	12.080	1	0.001	0.029
Regresi Binary Logistik					$\alpha=0.05$	

The data in table 4 shows that management of education and self-support

significantly influence self-efficacy with sig results  $0.001 < \alpha 0.05$  so that  $H_a$  is accepted.

Table 5 Results of Binary Logistic Regression Test Management of Education and Self-Support for Self-Care

Variables in the equation						
	B	S.E	Wald	Df	Sig	Exp (B)
Education management and Self Support for Self care	- 1.792	0.483	13.759	1	0.000	0.167
Regressi Binary Logistik						$\alpha=0.05$

Table 5 shows that management of education and self-support significantly influence self-care with sig results  $0.000 < \alpha 0.05$  so that  $H_a$  is accepted.

Table 6 Results of Binary Logistic Regression Test Self-Efficacy for Self-Care

Variables in the equation						
	B	S.E	Wald	Df	Sig	Exp (B)
Self efficacy to Self care	- 2.015	0.532	14.329	1	0.000	0.133
Regressi Binary Logistik						$\alpha=0.05$

The data in table 6 shows self-efficacy significantly influence self-care with a result of sig  $0.000 < \alpha 0.05$  so that  $H_a$  is accepted.

## DISCUSSION

### Management of Education and Self Support for Self-Efficacy

Education management and self-support significantly influence self-efficacy with sig results  $0.001 < \alpha 0.05$  (table 5). This shows that management of education and self-support increases the self-efficacy of type 2 diabetes mellitus clients.

Management of education and self-support in general encourages the formation of one's self-efficacy or self-confidence through the process of forming perceptions that are raised by a person after they obtain management of education and self-support in daily life. Management of education and self-support can be used as a source of formation of one's self-efficacy because it is based on the fact that one's success in perceiving positively the management of education and the self-support it receives will drive changes in one's self-confidence so that achieving this perception will be able to increase efficacy or strong confidence in yourself as an effort to achieve self-management goals.

Management of education and self support facilitates the health information needed, health services, active involvement and experience it receives so that it encourages and increases confidence and self-confidence in the ability to prepare to carry out the task of disease care management.

Management of education and diabetes self-support will affect the formation of four sources of self-efficacy, namely performance accomplishment, vicarious experiments, verbal persuasion, and emotional aurosal, if these four can be positively responded so that self-efficacy increases. Management of diabetes education and self-support is one form of support obtained from self-efficacy sources namely verbal persuasion and emotional aurosal (Indrayana, 2016).

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According to Bandura (1997) a person's self-efficacy is sourced from 4 factors namely performance accomplishment, vicarious experience, verbal persuasion, and emotional arousal. Performance accomplishment is an experience or achievement that has been achieved by the individual in the past, vicarious experience is an experience gained from others, verbal persuasion is a persuasion done by others verbally or by himself that can affect how someone acts or behaves, and emotional arousal which is the generation of positive emotions so that individuals have the confidence to take certain actions.

Bandura's theory states that a person's self-efficacy can be obtained, changed, enhanced or reduced through one or a combination of four factors namely performance accomplishment, vicarious experience, verbal persuasion, and emotional arousal. Self-efficacy is the result of cognitive processes in the form of decisions, awards, and beliefs to the extent that individuals estimate their ability to carry out certain tasks or actions to achieve the desired results (Bandura, 1997).

This is supported by the Diabetes Self-Management Education and Support theory proposed by the American Diabetes Association that diabetes education and support facilitate the knowledge, skills, decision making and abilities needed in self-management (ADA, 2014).

The Source of Self-Efficacy states that self-efficacy can be obtained, studied and developed from four sources of information. Where basically these four things are stimulation or events that can provide inspiration or positive generating (Positive Arousal) to try to complete the task or problem at hand. This refers to the concept of understanding that positive arousal can increase feelings of self-efficacy (Bandura, 1997). Self-efficacy can be improved by providing information about type 2 diabetes mellitus itself, so that patients can make control of self-management (Ariani, 2011).

Management of diabetes education and self-support facilitates the four sources of efficacy above, because according to Funnel (2010) in the process of managing diabetes education and self-support there is a process to provide information support needed by patients in making the right decisions in their care, allowing for active collaboration, and the opportunity to share experiences between patients and health workers, and help patients solve problems.

The process of managing diabetes education and self-support will invite patients to share their past experiences related to the disease and provide the right information and the right steps that can be done by the patient. Patients are also given the opportunity to gain experience from others, in the form of exchanging experiences with nurses so that confidence will be formed to take a particular action.

According to Edberg (2010), the main factor influencing one's self-efficacy is perception. One way to create a good perception is through management of education and self-support that facilitates the need for information, knowledge, health services, skills, and independent involvement so that it will provide a correct perception of the possible level of difficulty in disease management (magnitude), the extent of the problem faced (generality), and gives patients an understanding of the strength (strength) they have in dealing with problems in managing their illness which will ultimately build and strengthen one's self efficacy.

In addition, the basic principle of managing diabetes education and self-support is the existence of autonomous support so that the empowerment process can go well and patients will feel satisfied with their role involvement. This will foster confidence in him that he is able to be involved in taking the necessary actions in managing his illness (Rondhianto, 2012).

Previous research has supported that proper management of diabetes education and self-support can increase the self-efficacy of diabetes mellitus clients to be increasingly increased, by increasing the healthy behavior of diabetes mellitus clients so the quality of life will improve. Proper management of diabetes education and self-support can increase self-efficacy (Indrayana, 2016).

### **Management of Education and Self Support for Self-Care**

Education management and self-support significantly influence self-care with sig results  $0,000 < \alpha 0.05$  (table 6). This shows that the management of education and self-support improve the self-care of clients of type 2 diabetes mellitus.

Management of education and self-support provided to diabetic patients can improve the aspects of cognition and affection of diabetic patients which will simultaneously influence the increase in the healthy behavior of diabetic patients in carrying out disease self-care activities.

Management of education and self-support encourage the process of forming the behavior of patients with diabetes mellitus compliance with the management of disease care, especially in patients who are at home is very important because good self-care management will prevent complications.

Patients who are able to take care of themselves optimally will be able to control their blood sugar, contrary to those who are unable to control their blood sugar levels properly, various problems will arise such as gangrene, decreased vision and neuropathy.

Management of education and self-support can improve one's self-care management through the formation of mindset that can change one's attitude patterns in determining decision making for actions to be taken to support the implementation of self-care management, because management of education and self-support will encourage one's abilities in achieving decision making

through the formation of positive thinking patterns in order to support the success in the implementation of self-care management and cure of disease

Acceptance of effective management of education and self-support can increase one's self-empowerment on their ability to carry out self-care management activities that are needed independently. Management of education and self-support that is received by individuals on an ongoing basis is useful to encourage the process of change and maintenance of behavior in the implementation of a healthy independent disease management and improve the experience of care for patients with diabetes mellitus.

Orem's theory states that self-care is the appearance or practical activity based on individual desires and carried out to maintain life, health, and well-being. The element of selfcare is the ability possessed by humans or the strength to be involved in selfcare. According to Orem (2001), the method that can be used in helping self-care is to provide guidance and direction, provide physical and psychological support and education.

The theory of management of education and self-support proposed by ADA is that management of diabetes education and self-support facilitates the knowledge, skills, direction of decision making and abilities needed for self-care diabete. The main principle of management of education and self-support is that patient involvement in the management of education and support is very important because it reflects the life, experience, and capacity of a person (ADA, 2015).

Management of education and self-support for diabetes supports decision making and self-care activities to improve health status. Management of education and self-support for has a positive effect on behavioral aspects of diabetes and can improve quality of life and lifestyle behaviors such as having a better eating pattern and engaging in regular physical

activity, empowerment, increasing self-confidence and promoting healthy coping (Sutandi, 2012).

Management of education and self-support for diabetes encourages behavioral change, maintenance of healthy diabetes-related behaviors and is a basic reference for assisting diabetes patients in directing decision-making and self-care activities aimed at improving health status. Supported by research which states that educational management and self-support can improve the management of independent care of patients with diabetes mellitus (Sutandi, 2012).

The application of management education and self-support for diabetes is an important element of care for all people with diabetes and those who are at risk for developing diabetes (Sutandi, 2012). Previous research states that proper management of diabetes education and self-support can improve and will change the healthy behavior of diabetes mellitus clients to be increasingly improved, with an increase in the diabetes mellitus healthy client's healthy life habits the quality of life will improve (Funnel, 2010).

Management of education and self-support increases self-awareness about health by using health information, changing attitudes, changing behavior and increasing adherence in therapy programs, and improving the quality of life for people with type 2 diabetes (Ekayasa, 2016).

Research conducted by Funnel (2010) shows that managing diabetes education and self-support can improve patient self-care. Self-care plays an important role in the management of type 2 diabetes mellitus because patient self-care can change the patient's behavior in managing diabetes mellitus independently.

#### **Self-Efficacy Against Personal Care**

Self-efficacy significantly influences self-care with sig results  $0,000 < \alpha 0.05$  (table 7). This shows that self-efficacy improves the self-care of type 2 diabetes mellitus clients.

Previous reserchers states that with high self-efficacy, a person will exert all abilities he has to meet his personal care needs. Self-efficacy will determine how much effort is carried out by an individual persevering in carrying out the management and treatment of his illness. In carrying out self-care management, individuals who have high self-efficacy will tend to try to do the task of self-care activities well to succeed in supporting the healing process of the disease. They will also increase their ability to achieve the desired goals

Self-efficacy will affect the mindset and can change one's attitude patterns so that they can take an action in accordance with a predetermined decision. Self-efficacy in patients with diabetes mellitus increases the patient's confidence to be able to perform certain actions or tasks that can support the improvement of his illness and improve self-care management

Self-efficacy encourages the formation of positive thinking patterns that can make someone brave to make decisions in acting in self-care management tasks. Someone's self-efficacy will affect one's mindset in an effort to conduct self-management and daily self-care activities. Someone who has high self-efficacy will tend to use the ability he has to perform certain actions in meeting the needs of self-care and disease management independently so that the goals for the healing process can be achieved.

Self-efficacy drives the process of self-control to maintain the necessary safety within oneself (Bandura, 1994). Self-efficacy in patients with type 2 diabetes mellitus is needed for the patient's confidence to be able to make improvements that can support the improvement of his illness and improve management of treatments related to diet, physical exercise, medication, control, and treatment of diabetes mellitus in general<sup>25</sup>. According to Rudhianto (2012) self-efficacy is

closely related to the improvement of selfcare in chronic diseases.

Confidence or self-efficacy influences how someone acts for personal health and behavioral mindset of health (Palsdottir, Agusta, 2008 in Fauziah, 2012).

Orem (2001) states that self-care is a performance or practice of individual activities to take the initiative and shape their behavior in maintaining life, health, and well-being. Self-efficacy is the most effective predictor in assessing changes in a person's behavior (Rondhianto, 2012). Self-efficacy is a form of health behavior (Ketut, 2015).

Self-efficacy is the result of cognitive processes in the form of decisions, rewards, and beliefs to the extent that individuals estimate their ability to carry out certain tasks or actions to achieve the desired results. Self-efficacy refers to a person's belief in his ability to monitor, plan, implement, and maintain behavior. Self-efficacy affects how mindsets can drive or hinder a person's behavior. Someone with high self-efficacy will tend to behave as expected and have a commitment to maintain the behavior (Bandura, 1997).

The ability to motivate oneself and behave according to goals is based on cognitive activity. Someone will decide to behave based on thought, use of knowledge in general and the ability to perform a particular action (Ariani, 2015).

### **Management of Education and Self Support for Self-Efficacy and Self-Care**

Education management and self-support significantly have a direct influence on self-care with a result of 0.364 (table 2). Meanwhile, the indirect effect of education management and self-support on self-care explains that the most powerful indirect self-care is the influence of education management and self-support through self-efficacy with a value of 0.428 (table 3). The results of the study indicate that the indirect effect in self-care is stronger than the direct effect. Consequently,

the effect of managing education and self-support indirectly more strongly influences self-care through self-efficacy than the direct effect of education management and self-support on self-care of type 2 diabetes mellitus clients.

Management of education and self-support has a stronger effect directly on self-efficacy with a value of 0.854 compared to the direct effect of management of education and self-support on self-care with a value of 0.364. In addition, self-efficacy also has a strong influence on self-care type 2 diabetes mellitus clients with a value of 0.501 (figure 1)

This shows that the management of education and self-support is more influential in increasing self-efficacy directly than the effect of managing education and self-support in improving self-care of 2<sup>nd</sup> type diabetes mellitus clients. In addition, self-efficacy directly influences in improving self-care of clients of type 2 diabetes mellitus. So it can be concluded that the management of education and self-support has a strong direct effect in increasing the self-efficacy of type 2 diabetes mellitus clients to achieve self-care for type 2 diabetes mellitus clients and self-efficacy directly affects the type 2 diabetes mellitus client self-care.

Someone who gets diabetes education management and self-support will increase the patient's self-efficacy and change adaptive self-care behavior. Management of education and self-support for diabetes is able to shape, encourage and improve one's self efficacy in carrying out management of their illness care independently related to diet, activity and treatment. The existence of confidence and self-ability will make patients feel more meaningful and have confidence in managing their illness to be able adapt to the conditions

The role of patients is well-informed and proactive in their self-care. Patients need information about their illness, treatment goals, health services and motivation to make decisions in the involvement of their care.

Management of education and self-support for diabetes helps identify barriers and facilitates problem solving and coping skills to achieve effective self-efficacy and self-care behavior.

Management of education and self-support for diabetes is needed to improve patient self-efficacy and self-care activities. The most important goal of managing diabetes education and self-support is to improve self-efficacy to carry out DM care (Ariani, Sitorus, & Gayatri, 2012). Stipanovic, (2001) investigated the effect of diabetes education management and self-support on the self-efficacy and self-care of diabetes mellitus patients showing the results that an increase in self efficacy scores and also self-care after respondents obtained diabetes management and self-support management. The results also concluded that there was a positive and significant relationship between self-efficacy and self-care. If a person's self-efficacy increases, his self-care will also increase.

Management of education and self-support for diabetes has a significant relationship with self-efficacy, positive health behaviors and adherence in conducting DM self-care activities and greatly helps 2nd type diabetes mellitus patients to be able to increase confidence in their ability to take self-care actions (Skarbek, 2006).

Management of education and self-support for diabetes in patients with 2<sup>nd</sup> type diabetes can improve their self-efficacy and self-care. DM patients who get diabetes education management and self-support are able to perform self-care independently will have good self-efficacy (Stipanovic, 2001)

Proper management of diabetes education and self-support can increase self-efficacy and will change the healthy behavior of DM clients to be increasingly improved (Ekayasa, 2016). Someone who is always given confidence and encouragement to succeed will show the behavior to achieve success (Bandura, 1997).

## CONCLUSION

The conclusion of this study is the management of education and self-support increases the self-efficacy of type 2 diabetes mellitus clients, the management of education and self-support increases the self-care of type 2 diabetes mellitus clients, self-efficacy improves the self-care of type 2 diabetes mellitus clients, the effect of managing education and self-support indirectly more strongly influences self-care through self-efficacy than the direct effect of education management and self-support for self-care of type 2 diabetes mellitus clients.

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