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Original Articles

THE RELATIONSHIP BETWEEN SELF-EFFICACY AND BLOOD GLUCOSE LEVELS AMONG DIABETES MELLITUS (DM) PATIENTS AT KEDURUS HEALTH CENTER, SURABAYA

Vanti Perdana Nilasari [1], Chilyatiz Zahroh [1*], Nur Ainiyah [1], Erika Martining Wardani [1]

[1] Department of Nursing, Faculty of Nursing and Midwifery, Universitas Nahdlatul Ulama Surabaya

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Correspondence:
Chilyatiz Zahroh
Department of Nursing, Faculty of Nursing and Midwifery, Universitas Nahdlatul Ulama Surabaya
Email: chilyatiz@unusa.ac.id

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Abstract

Background: The decrease in Blood Glucose levels in patients with diabetes mellitus is influenced by self-efficacy.

Objective: The purpose of this study was to determine the relationship between self-efficacy and blood glucose levels in patients with diabetes mellitus (DM) at Kedurus Health care Surabaya.

Methods: The research design is correlational with cross-sectional. The population of this study to 75 people. With a sample of 63 respondents. Sampling technique with non-probability sampling technique purposive sampling type. The independent variable in this study is self-efficacy. The dependent variable is blood glucose levels in patients with diabetes mellitus type 2 at Kedurus Health Center Surabaya. The research instrument is a questionnaire. Data analysis with spearman Rho statistic test.

Result: Based on the spearman rank obtained the level of significance $\rho = 0{,}000 < \alpha = 0{,}05$ which means there is a relationship between self-efficacy and blood glucose levels in patients with diabetes mellitus (DM) at Kedurus health care Surabaya.

Conclusion: Self-efficacy will give a good influence, especially on reducing blood glucose levels in patients with Diabetes Mellitus (DM). it is hoped that the support from nurses and good self-efficacy will have an impact on reducing blood glucose and preventing complications in patients with diabetes mellitus.

INTRODUCTION

Diabetes Mellitus is a chronic disease that is not contagious and will be experienced by sufferers for the rest of their lives (PERKENI, 2015). Good blood glucose control is an important factor and has been shown to reduce the risk of complications in people with Type 1 Diabetes Mellitus (DMT1) and Type 2 Diabetes Mellitus (DMT2). To achieve good blood glucose control, holistic management is needed including education, medical nutrition therapy, physical activity, drug administration and blood glucose monitoring (PERKENI, 2019). The phenomenon of an increase in the number of people with Diabetes Mellitus (DM) has become a major health problem in society, and one of the causes is the increase in blood glucose levels caused by a lack of self-efficacy for people with Diabetes Mellitus.

Self-care or self-efficacy carried out by a person or community is based on knowledge, attitudes, self-efficacy/self-confidence, traditions, etc. of the person or community concerned, which is based on self-care and has the right to carry out self-care independently. independent in the healing process (Sari, 2018).

The number of diabetics in the world is currently 537 million people (World Health Organization, 2021) with records from the International Diabetes Federation (IDF) predicting that at least 537 million people aged 20-79 years in the world will suffer from diabetes in 2021 or the equivalent of a prevalence rate of 9 .3% of the total population of the same age (Infodatin-2021-Diabetes-Melitus.Pdf, n.d.). Indonesia is the 5th country out of 10 countries with the highest number of DM sufferers in the world, which is around 19.47 million people with a population of 179.72 million people (Pahlevi, 2021). While data from the Ministry of Health for 2020, the number of diabetes mellitus (DM) sufferers in East Java Province who received services according to standards was 816,729 people (96.77%), while in Surabaya City the number of DM sufferers was 94,624 sufferers (East Java Provincial Health Office, 2021). Based on the data obtained by researchers from the Kedurus Health Center, the number of people with diabetes mellitus who received standard health services in 2020 was 2979 patients, while in 2021 it increased by 3244 patients. The number of diabetes patients served from January to March 2022 with an average of 263 patients. For the number of visits for new cases of type 2 DM without complications from January to March 2022, an average of 25 patients.

Some of the factors that influence the presence of comorbid diseases or their complications in people with diabetes mellitus are due to the lack of patient compliance in undergoing treatment and diet as well as support for the social environment, family support and health workers (Tandra, 2017). In addition, the prevalence of complications in people with diabetes mellitus tends to increase and get worse due to the inability of sufferers to manage their disease independently (American Diabetes Association, 2018), recommendations and implications for nursing are to increase self-efficacy as one of the excellent independent nursing interventions for management and increased knowledge of patients.

Therefore, the solution to handling diabetes mellitus complications as a nurse can start the nursing process by assessing the patient's level of self-efficacy, then proceed with providing education related to self-management of diabetes mellitus as an intervention that can be integrated into nursing services. Self-efficacy is useful for predicting increased self-management. Individuals who have good efficacy will try to achieve specific goals despite facing obstacles. This shows that support for self-efficacy and self-care in people with diabetes mellitus is very good for management and increasing knowledge in sufferers. Diabetes that is not managed properly can cause various complications, which are generally divided into two, namely microvascular complications and macrovascular complications, and can even result in death. Therefore, patients diagnosed with Diabetes Mellitus must carry out proper self-management so that the risk of complications can be reduced. Based on the background that has been described, the researcher is interested in taking the title "The Relationship Between Self-Efficacy

and Blood Glucose Levels among Diabetes Mellitus (DM) Patients at Kedurus Health Center, Surabaya".

METHODS

Study Design

The type of research used in this study was analytic with a cross-sectional approach, in which researchers tried to find and explain the relationship between self-efficacy (independent) and blood glucose levels in patients with type 2 diabetes mellitus (dependent).

Settings

The research was conducted at Kedurus Health Care Center on 2022.

Research subject

The population of this study to 75 people. The sampling technique or sampling method used in this study is purposive sampling with a sample of 63 respondents.

Instruments

The instrument used in this study was questionnaires for collecting the data.

Data collection

Where researchers only make observations without providing intervention to the object of research. Data collection on the two research variables was only done once and at the same time.

Data Analysis

The analysis data of this study using Spearmen Rho Test with significance level of $\alpha < .05$.

Ethical Consideration

This research has been approved by Faculty of Nursing and Midwifery, Universitas Nahdlatul Ulama Surabaya.

RESULTS

Characteristics of Respondents

Based on table 1 below, it showed that the majority as much as 34 respondents (53.97%) were > 35 years old, almost all of the respondents as much as 51 respondents (80.95%) were female. At the education level, most of respondents as much as 38 respondents (60.32%) had middle educational level, and almost all of them as much as 51 respondents (80.95%) did not work.

Table 1. Frequency Distribution of Respondents based on the Age, Gender, Educational Levels, Occupational of the Diabetes Mellitus Patients at the Kedurus Health Care Center, Surabaya on 2022.

Characteristics	Frequency (f)	Percentage (%)
Age		
>20 years	4	6.35
20-35 years	25	39.68
>35 years	34	53.97
Total	**63**	**100.00**
Gender		
Male	12	19.05
Female	51	80.95
Total	**63**	**100.00**
Education Level		
Basic	3	4.76
Middle	38	60.32
High	22	34.92
Total	**63**	**100.00**
Occupation		
Work	12	19.05
Doesn't work	51	80.95
Total	**63**	**100.00**

Sources: Primary Data, 2022.

The Determination of the Relationship between Self-Efficacy and Blood Glucose Levels among Diabetes Mellitus (DM) Patients at Kedurus Health Care Center, Surabaya on 2022 using Spearmen Rho Test

Table 2. The Relationship between Self-Efficacy and Blood Glucose Levels among Diabetes Mellitus (DM) Patients at Kedurus Health Care Center, Surabaya on 2022.

No.	*Self-Efficacy*	Blood Glucose Level					
		Normal		Not normal		Total	
		f	%	f	%	f	%
1	Very low	0	0.00	1	1.59	1	1.59
2	Low	0	0.00	10	15.87	10	15.87
3	Middle	20	31.75	0	0.00	20	31.75
4	High	32	50.79	0	0.00	32	50.79
Total		52	82.54	11	17.46	63	100.00
ρ-value = .000; r = .720							

Based on table 2 above, it showed that only one respondent (1.59%) had very low level of the Self-Efficacy and blood glucose level was not normal. The respondents had low level of the self-efficacy and not normal blood glucose were 10 respondents (15.87%). The respondents who had middle

level of the self-efficacy and normal blood glucose levels were 20 respondents (31.75%). Most of the respondents had high level of self-efficacy and normal blood glucose levels, as many as 32 respondents (82.54%).

Based on the Spearman rank test for the SPSS 23 program for Windows, it was found that the significance level was ρ-value = .000 < α = .05 (r = .720), which means that Ho was rejected, so there is a relationship between self-efficacy and blood glucose levels in diabetes mellitus (DM) patients at the Kedurus Health Care Center, Surabaya.

DISCUSSION

Self-Efficacy of the Diabetes Mellitus (DM) Patients at Kedurus Health Care Center, Surabaya

Based on the research results of 63 respondents, it was found that most of respondents had high self-efficacy, as much as 32 respondents (50.79%). Self-efficacy encourages the process of self-control to maintain the behavior needed in managing self-care in Sukmayanti's patients (2014). A person's belief in carrying out his own abilities which is expected to generate needs for his own health. As described in the results of this study, high self-efficacy is based on ability to eat a diet, respondents in this case are able to maintain their weight, choose a diet low in salt, low in fat and always consume fruits and vegetables so that they do not experience obesity which is the cause of diabetes mellitus. In addition, the self-efficacy from the research results of respondents was also able to maintain their health by exercising regularly based on the results of the questionnaire at 2,5,9,10. Based on this, self-management in preventing diabetes mellitus is implemented through self-introduction, and self-evaluation, and then self-improvement begins with a nursing perspective, namely patient motivation in the form of understanding self-introduction in the form of understanding obtained from motivation obtained from health workers about good self-efficacy. As for self-evaluation, there is the implementation of self-efficacy, namely by carrying out adherence to a diet, eating patterns, and regular exercise patterns. Lewis and Rook (1999) in Cornwel and Waite (2020) state that social integration, support and control (motivation) are very important in getting someone to change behavior. Family members can help prepare healthy meals or discourage smoking and alcohol use.

In addition, according to another opinion by Kusuma and Hidayati (2013), Self-efficacy is an individual's belief in his ability to organize and perform certain tasks needed to get the expected results. Self-efficacy, in this case, is behavior in helping oneself personally in making choices, efforts to move forward, as well as persistence and perseverance in maintaining tasks that cover their lives both in the form of how one thinks, and feels self-motivated and acts especially in understanding treatment himself to the problem.

Self-efficacy is self-care which is very much needed for people with diabetes mellitus because self-care is something that is very important because it plays a role in controlling the disease and preventing complications. Self-care in question is managing diet (balanced diet), doing physical activity

(exercise), monitoring Blood Glucose, taking medication according to the doctor's advice and doing foot care.

According to Purbalindi (2012) in Sarwuna (2020) someone who has high self-efficacy believes that they will be able to carry out self-care effectively. High self-efficacy reduces fear of failure, increases aspirations, and improves problem-solving, and analytical thinking skills. People who have high self-efficacy will have a higher enthusiasm for carrying out self-care compared to people who have low self-efficacy.

In addition, high self-efficacy from the results of the study was also influenced by the general factors of the respondents, namely the condition of the patient's age, obtained from 63 respondents, the majority (54%) were > 35 years old. So, based on the age of the patient age > 35 years is included in the age category of good thinking patterns towards giving good self-efficacy motivation. The age obtained from the research results also influences good thinking in receiving motivation, especially in the health conditions that afflict diabetes mellitus (DM) patients, especially in the perspective of carrying out acute diabetes mellitus (DM) prevention. Based on the theory put forward based on self-efficacy describing the patient's interaction with the physical and interpersonal environment in various dimensions based on the theory of hope, social cognitive theory and the perspective of nursing. Based on this, the prevention of diabetes mellitus (DM) is implemented through self-introduction, self-evaluation, and then self-improvement from a nursing perspective. The first is patient motivation in the form of understanding self-introduction in the form of motivation obtained from health workers regarding good self-efficacy. As for self-evaluation, there is the implementation of self-efficacy, namely by carrying out adherence to a diet, eating patterns, and regular exercise patterns. This is the opinion of Notoatmodjo, 2015, stating that mature age will affect the stronger a person's motivation, thus the stronger his efforts to achieve goals. Likewise, the more people know the goals to be achieved clearly, especially if the goals are considered important, the stronger the efforts to achieve them will be.

Self-efficacy in diabetes mellitus patients was also influenced by gender, obtained from 63 respondents, almost all of them (81%) were female. The gender of women who suffer from diabetes mellitus in dealing with problems prioritizes their feelings and unstable emotions, which can affect healing whose values change, and also because of the compliance factor. The results of Yetti's research (2007), found that more women are good at implementing self-efficacy. Based on this, it can be said that women are better off and are not at risk of problems with diseases suffering from diabetes mellitus because adherence to the recommended diet for people with diabetes mellitus causes monitoring of eating patterns, monitoring of Blood Glucose, drug therapy is carried out properly, as well as in physical activity, and good foot care. So, it can be concluded that if self-care is done well it will also have a positive effect on the patient's health, and conversely, if self-efficacy is done poorly then it will have negative consequences for the patient on his health.

Blood Glucose Levels of the Diabetes Mellitus (DM) Patients at the Kedurus Health Care Center, Surabaya

Based on the research results obtained from 63 respondents, almost all of them had normal of blood glucose levels, as much as 52 respondents (82.54%). On the indicator of the ability to check of the blood glucose level, respondents obtained almost all normal blood glucose results, which means that the behavior of the patient or respondent is stated to be higher than the behavior of a person's ability to blood glucose check. In line with research by Mahendra and the Indonesian Ministry of Health (2008) cited by Sustyarko (2021), revealed that Blood Glucose regulation can be considered regular if it is done at least once every 3 months with a continuous system including checking fasting blood glucose and Blood Glucose on 2 hours after eating or regularly on HbA1c alone. Thus, from the results of research on blood glucose levels of people with diabetes mellitus, researchers assume that the behavior of respondents in maintaining their health but good self-efficacy also influences how sufferers act for their own health and the mindset of sufferers in self-care of diabetes mellitus. Poor self-efficacy, especially in controlling level of the blood glucose, because maybe sufferers are only told what to do without understanding the reasons why controlling blood glucose levels is necessary. In addition, the general factors that affect the blood glucose level of diabetes mellitus patients are also influenced by the age factor, based on the results obtained in a study of 63 respondents, it was found that the majority (73%) were aged 20-35 years, this age factor, the body has begun to decline. The decline that begins to occur is a decrease in the work of pancreatic hormones in producing insulin and results in an increase in the blood glucose levels. The process of getting older can affect the body's hemostasis, including changes in the function of pancreatic beta cells that produce insulin which will cause disruption of hormone secretion or inadequate use of glucose at the cellular level which affects blood glucose.

Besides that, based on the age factor, the gender factor also showed that of the 63 respondents, the majority (69.8%) were female, the female sex indicated that diabetes mellitus was more common in women than men. According to Damayanti (2010), women have risk factors that cause diabetes mellitus. These risk factors are increased Body Mass Index (BMI), monthly cycle syndrome and pregnancy. Women physically have a greater chance of increasing their BMI (Body Mass Index). This is because some respondents have a fat body, but while suffering from diabetes mellitus the respondents experienced a drastic weight loss. This is in line with research conducted by Isnaini and Ratnasari (2018), that women have a higher risk of becoming obese, so the beta cells in the pancreas are forced to work harder to produce insulin which results in fatigue to balance the intake of calories in the body. In addition, according to research by Candrasari et al (2018), it is stated that there are other factors that have an effect, namely a decrease in the hormone’s estrogen and progesterone in women, especially during menopause which causes insulin response to decrease as well.

The Relationship between Self-Efficacy and Blood Glucose Levels among Diabetes Mellitus (DM) Patients at the Kedurus Health Care Center, Surabaya

Based on the Spearman rank test of the SPSS 23 program for Windows, a significance level of $\rho = 0.000 < \alpha = 0.05$ means that Ho is rejected, so there is a relationship between self-efficacy and blood glucose levels in diabetes mellitus (DM) patients at the Kedurus Health Center in Surabaya. From the relationship between self-efficacy and blood glucose levels in patients with diabetes mellitus (DM), the results of the closeness of the relationship were obtained based on the correlation coefficient (r) of each variable obtained .720 and correlation is significant at the 0.01 level (2-tailed) with the level of reliability .934 which was tested by 20 respondents, meaning there is a relationship between the first variable, namely self-efficacy and the second variable, namely blood glucose levels.

This explanation can be said that complications of diabetes mellitus can arise due to blood glucose that is not controlled properly resulting in microvascular and macrovascular complications. Microvascular complications are complications in which the small blood vessels become stiff or narrow and eventually the organs lack blood supply. This microvascular complication causes retinopathy, nephropathy and neuropathy. Macrovascular complications, namely complications that occur in the larger arteries, causing atherosclerosis. Atherosclerosis caused by macrovascular complications will cause coronary heart disease, hypertension, stroke, and gangrene of the legs (Krisnatuti, Yenrina & Rasjmida, 2014). One effort to prevent complications in people with diabetes mellitus is by maintaining lifelong self-management behavior, including self-efficacy related to health care in everyday life. Management of diabetes mellitus in hospitals is the responsibility of various health disciplines, but after the patient is discharged, the patient and family must take over this responsibility by being able to carry out self-management independently to prevent worse conditions from occurring (Rondhianto, 2012). Self-efficacy can be carried out by people with diabetes mellitus including taking medication regularly, making dietary arrangements, doing physical exercise, monitoring Blood Glucose and doing regular foot care.

In line with the dietary arrangements made in patients with diabetes mellitus, the importance of regulating Blood Glucose in patients with diabetes mellitus. So thus, the Blood Glucose regulation can be considered regular if it is carried out at least once every 3 months with a continuous system including checking fasting blood glucose and blood glucose levels on 2 hours after eating or regularly only checking HbA1c. Thus, from the results of research on blood glucose levels in people with diabetes mellitus, self-efficacy is very influential because self-efficacy based on the results of the research shows that respondents have high self-efficacy, while for measuring normal blood glucose, the researchers assume that the behavior of respondents in maintaining their health has a good effect on self. efficacy on how sufferers act for their own health and the mindset of sufferers in self-care for diabetes mellitus.

LIMITATION

There is no limitation.

CONCLUSION

Half of the patients with diabetes mellitus (DM) at the Kedurus Health Care Center in Surabaya have high self-efficacy. Almost all patients with diabetes mellitus (DM) at the Kedurus Health Care Center in Surabaya have normal levels of the blood glucose. There is a relationship between self-efficacy and blood glucose levels in diabetes mellitus (DM) patients at the Kedurus Health Center in Surabaya.

AUTHOR CONTRIBUTION

Vanti Perdana Nilasari: Literature review, conceptualization, methodology, investigation, resources, formal and statistical analysis, and writing-original draft validation.

Chilyatiz Zahroh: Literature review, conceptualization, methodology, supervision, drafting the manuscript, project and project administration.

Nur Ainiyah: Supervision and drafting the manuscript.

Erika Martining Wardani: Supervision and drafting the manuscript.

ORCHID

Vanti Perdana Nilasari : None.
Chilyatiz Zahroh : https://orcid.org/0000-0002-7466-0963
Nur Ainiyah : https://orcid.org/0000-0003-0390-186X
Erika Martining Wardani : https://orcid.org/0000-0002-0178-0024

CONFLICT OF INTEREST

The researchers stated that there was no conflict of interest in conducting this research.

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