

**Original Research Article: Quantitative Research**

**ANALYSIS OF FACTORS AFFECTING SELF MANAGEMENT IN TYPE 2 DIABETES MELLITUS PATIENTS**

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**Abstract**

**Background:** Diabetes mellitus type 2 is a common problem that occurs in people who have metabolic disorders characterized by increased blood sugar due to decreased secretion by pancreatic beta cells or impaired insulin function.

**Objectives:** This study aims to determine what factors are associated with self-management in Type 2 DM patients at the Buduran Health Center.

**Design:** This study was a quantitative research. The design in this study was a cross-sectional analytic with a sample of 80 people who were carried out at the endocrine polyclinic Puskesmas Buduran Sidoarjo. Research instrument used the Diabetes Self-Management Questionnaire (DSMQ) developed by Schmitt et al (2013) to determine the self-management of type 2 DM patients and to measure the level of knowledge using the Diabetes Knowledge Test (DKT) instrument developed by Burrough et al (2008), measure to physical activity using the Summary of Diabetes Self Care Activities (SDSCA), measure to family support using Family Support Questionnaire, and measure to self efficacy using Diabetes management Self Efficacy Scale (DMSES). The sample size with simple random sampling method, and data analysis using spearman rank test.

**Results:** The results showed that there was a significant relationship between the level of knowledge and self-management with a coefficient value ( $r=0.576$ ), a significant relationship between activity ability and self-management with a coefficient value ( $r=0.612$ ), a significant relationship between family support and self-management with a value of coefficient ( $r=0.592$ ) and there is a significant relationship between self-efficacy and self-management with a coefficient value ( $r=0.660$ ).

**Conclusion:** Patients DM Type 2 can be overcome by providing education in every prolanis activity program which is expected to increase knowledge, activity abilities, family support and self-efficacy, so that patients are able to improve self-management well. This intervention is highly recommended for people with Type 2 DM by increasing the frequency of health education and involving the family of diabetes mellitus patients so that patients are able to carry out self-management well.

**Keywords:** *Knowledge, Activity Ability, Family Support, Self Management, Diabetes Mellitus*

## INTRODUCTION

Diabetes mellitus is a metabolic disease characterized by hyperglycemia or a chronic and variable increase in blood sugar levels. This can be caused by abnormalities in insulin secretion, insulin action or both. In addition, the etiology of DM is very complex, both an unhealthy lifestyle, environment, genetics, and others (Soelistijo SA, et. al., 2019) Signs and symptoms that are commonly felt in patients with high blood sugar are increased urinary frequency. (polyuria), increased thirst (polydipsia) and increased hunger (polyphagia). If this is left unchecked, it can cause complications both acutely and chronically, which arise several months or years after suffering from DM. The most frequent complications of DM are hyperglycemia and diabetic coma (Saviqoh, et. al., 2021). The phenomenon obtained from the results of observations and interviews with 15 DM patients who visited the Buduran Health Center, on average the respondents had poor self-management, which was evidenced by the knowledge of patients about DM who did not understand the signs and symptoms of DM and the course of the disease from DM. Poor activity is evidenced by patients rarely doing sports, not knowing about diabetic foot exercises, the average patient visiting/routine control at the Buduran Health Center comes alone without being accompanied by family or partners and poor self-efficacy is proven by patients rarely regularly checking to the health center.

International Diabetes Federation (IDF) in 2019, there were 463 million people in the world aged 20-79 years experiencing Diabetes Mellitus per year 2019. This figure is expected to increase to 578.4 million people in 2030 and 700.2 million people in 2045 Indonesia is ranked 7th out of 10 countries with the highest number of diabetes patients in the world, which is around 10.7 million patients per year 2019 and is expected to increase to 13.7 million patients in 2030 and 16.9 million patients in 2045. (IDF, 2019). The results of the Basic Health Research (RISKESDAS) in 2018 Diabetes Mellitus in the population aged 15 years in East Java increased by 0.5% from 2.1% in 2013 to 2.6% in 2018. East Java ranks 5th with the highest number of Diabetes Mellitus in Indonesia (Riskesdas, 2018). the prevalence of DM in Sidoarjo with a DM diagnosis is 3.6% of the total population of East Java (Health Research and Development Agency, 2013) (Wahyuni, Rohmah and Setyawati, 2021), Type 2 DM patients who visited the Buduran Health Center in the period of January Until December 2020, there were 860 patients, the

number of type 2 DM patients. From August to September 2021, there were 100 people.

Diabetes Mellitus is known as a silent killer because the sufferer is often not aware of it and when it is known that complications have occurred (Kemenkes RI, 2014). Diabetes Mellitus patients who are not compliant or without medication and lifestyle adjustments, can increase the risk of complications of other serious diseases. Uncontrolled blood sugar levels can lead to dangerous chronic conditions. The consequences of hyperglycemia can cause acute complications such as Diabetic Ketoacidosis (DKA), while long-term hyperglycemia contributes to chronic complications in the heart, kidneys, eyes, and nerves, such as coronary heart disease, nephropathy, retinopathy and neuropathy. These complications will have an impact on the very poor quality of life of DM patients. Self management in patients with diabetes mellitus, which is an effort that diabetic patients can do to be able to manage themselves, cultivate a lifestyle according to the demands of the disease, so that self-management is very important, with self-management it is expected to have an impact on blood sugar control. included in diabetes self-management, namely regulation of diet (diet), physical activity/sports, blood sugar monitoring, drug consumption compliance, and self/foot care. Implementation of optimal self-management in patients with diabetes mellitus can assist in increasing the achievement of goals in the management of type 2 diabetes mellitus. It has a bad impact if self-management in DM patients is not applied, the patient will experience complications that can lead to death (Platis et al., 2020).

Diabetes Mellitus (DM) is a chronic disease that requires long-term therapy and care and even accompanies the patient's lifetime. This situation can certainly cause saturation in the patient. Therefore, in addition to paying attention to physical problems, the patient's psychological factors are important to consider. In an effort to prevent complications, nurses as one of the health workers have a role in managing Diabetes Mellitus patients by implementing 5 pillars of DM management, namely education, meal planning, physical exercise, pharmacological intervention and blood sugar checks. (Suwanti, et al., 2021).

## METHODS

### *Study Design*

This research is a quantitative study with a descriptive correlation method through a cross

sectional approach.

*Setting*

This research was conducted at the endocrine polyclinic Puskesmas Buduran Sidoarjo.

*Research Subject*

This research was conducted from 28 December to 04 January 2022. The population in this study were all patients suffering from type 2 diabetes mellitus. The sample size in this study was 80 patients. The sampling technique in this study used simple random sampling method. The sample is then selected based on the characteristics and criteria of the sample based on.

Inclusion Criteria: 40-65 years old; able to read, write and speak Indonesian and long suffering from Diabetes Mellitus 5-10 years. Exclusion Criteria: patient suffering from other diseases such as complications of type 2 diabetes mellitus such as HHF, CKD, CHF and Gangrene Diabetes Mellitus

*Instrument*

The instrument used is DKT (Diabetes Knowledge Test) to measure the level of knowledge about diabetes mellitus and has been tested for validity and reliability with a cronbach alpha value of 0.989, there are 20 valid questions. The next instrument is SDSCA (Summary Of Diabetes Self Care Activity) which has been tested for validity and reliability of 0.973 with 17 valid questions. To measure family support using a family support instrument in diabetic patients with a VR test result of 0.956 with 12 valid questions. To measure the patient's self-efficacy using the DMSES (Diabetes Management Self Efficacy Scale) instrument, the VR test has been carried out with a result of 0.921 with 20 valid questions. Meanwhile, to measure self-management using the DSMQ (Diabetes Self Management Questionnaire) instrument which has been tested by VR with the results of 0.977 with 16 valid questions

*Data Analysis*

After the data is collected the researcher sorts out the research data and does the coding. Data analysis using SPSS version 25. The analysis used the Spearman rank test with a significance level  $\alpha < .05$ .

*Ethical Consideration*

This research has been reviewed and declared to have passed the ethical review of the STIKES

Hang Tuah Surabaya Ethics Committee with number PE/96/XII/2021/KEPK/SHT in an effort to protect the human rights and welfare of nursing research subjects. At the time of conducting the research, the researcher guaranteed all the confidentiality of the respondents and did not violate the rights of the respondents and did not cause harm to the respondents who participated in this research.

**RESULTS**

*Characteristics of Respondents*

The results of data analysis on the characteristics of respondents (table 1) show that the majority are female as many as 54 respondents (67.5%). The age characteristics of the respondents are mostly aged 53-65 years, as many as 42 respondents (52.5%). The characteristics of the education level are mostly SMA/SMK as many as 38 respondents (47.5%). The characteristics of income level are mostly income less than 3,500,000 thousand as many as 38 respondents (47.5 %). Characteristics of long suffering mostly suffered for 5-15 years a number of 72 respondents (90%). The characteristics of the control companion were mostly when the control came alone as many as 49 respondents (61.2 %), and the majority of type 2 DM patients did not carry out routine control as many as 50 respondents (62.5%).

**Table 1.** Distribution of Frequency of Respondents in the Endocrine Polyclinic Puskesmas Buduran Sidoarjo from December 28, 2021 to Januari 04, 2023

Characteristics of Respondents	Frequency (f)	Percentage (%)
Gender		
Male	26	32.55%
Female	54	67.5%
Age (Years)		
40-52	38	47.5%
53-65	42	52.5%
Last Education		
Elementary school	15	18,7 %
Junior high school	24	30 %
Senior high school	38	47,5 %
College	3	3,75 %
Salary		
None	33	41,3 %
< 3.500.000	38	47,5 %
3.500.000	5	6,2 %
> 3.500.000	4	5 %

Longtime Sick		
5-15 Years	72	90 %
15-30 Years	8	10 %
Control		
Companion	49	61,2 %
Alone	15	18,8 %
Husband/Wife	11	13, 8 %
Child	5	6,2 %
Family		
Control Schedule		
Seldom	50	62,5 %
1 Month	27	33, 7%
2 Month	3	3,8 %

Sources: Primary Data of Questionnaire, 2021

*Analysis Analysis of factors that influence self-management in patients with type 2 diabetes mellitus.*

The results of the data in table 2 show that there are factors that influence self-management of type 2 diabetes mellitus, including the level of knowledge with self-management (r=0.576), activity ability with self-management (r=0.612). ), family support with self-management (r=0.592) and self-efficacy with self-management with a coefficient value (r=0.660). (p-value = 0.01). These results mean that there is a relationship between factors that influence self-management in type 2 DM patients.

**Table 2.** Relationship between Level of knowledge and Self-Management among Patients Type 2 Diabetes Mellitus in the Endocrine Polyclinic Puskesmas Buduran Sidoarjo from December 28, 2021 to January 04, 2022

Level of Knowledge	Self Management							
	Good		Sufficient		Not Good		Total	
	f	%	f	%	f	%	f	%
Good	2	7.4	11	40.7	14	51.9	27	100
Sufficient	0	0.0	5	25	15	75	20	100
Not Good	0	0.0	3	9.1	30	90.9	33	100
Total		2.5	45	23.7	59	73.8	80	100

p-value =0 .01; r =0 .56

The results of the study in table 2. it shows that the relationship between the level of knowledge and self-management in type 2 DM patients shows that of the 80 respondents who had a low level of knowledge as many as 33 respondents, 30 respondents (90.9%) had a low level of knowledge with less self-management, 3 respondents (9.1 %) have a low level of knowledge with sufficient self-management, 0 respondents (0%) have a low level

of knowledge with good self-management. Respondents who have a sufficient level of knowledge are 20 respondents, 15 (75%) have a sufficient level of knowledge with less self-management, 5 respondents (25%) have a sufficient level of knowledge with sufficient self-management and 0 respondents (0%) have a sufficient level of knowledge with good self-management. Respondents who have a good level of knowledge are 27 respondents, 14 respondents (51.9%) have a good level of knowledge with less self-management, 11 respondents (40.7%) have a good level of knowledge with sufficient self-management, and 2 respondents (7.4%) have a good level of knowledge good with good self-management.

Based on the results of the Spearman Rho statistical test, the value of value = 0.001 is smaller than the value of, namely (p = 0.01) which indicates that H0 is rejected and H1 is accepted. In addition, based on the results of the Spearman Rho test, the value of r = 0.576 with a value of = 0.001 with a value of r = 0.51-0.75 a strong relationship, it shows a strong relationship and statistically there is a significant relationship between the relationship between the level of knowledge and self-management in type 2 DM patients.

**Table 3.** Relationship between Physical Activity Ability and Self-Management among Patients Type 2 Diabetes Mellitus in the Endocrine Polyclinic Puskesmas Buduran Sidoarjo from December 28, 2021 to January 04, 2022

Activity Ability	Self Management			Total
	Good	Sufficient	Not Good	
Good	16.7%	50%	33.3%	100%
Sufficient	3.1%	33.3%	63.6%	100%
Not Good	0%	12.2%	87.8%	100%
Total	2.5%	23.7%	73.8%	100%

*Spearman Rho Test* (p=0,01) (r=0.612)

The results of the study in table 3. show that the relationship between activity ability and self-management in type 2 DM patients showed that from 80 respondents who had less activity ability, 41 respondents, 36 respondents (87.8%) had less activity ability with not good self-management, 5 respondents (12.2%) have not good activity ability with sufficient self-management, 0 respondents (0%) have not good activity ability with good self-management. Respondents who have sufficient activity ability are 33 respondents, 21 (63.6%) have

sufficient activity ability with not good self-management, 11 respondents (33.3%) have sufficient activity ability with sufficient self-management and 1 respondent (3.1%) has sufficient activity ability. with good self-management. Respondents who have good activity skills are 6 respondents, 2 respondents (33.3%) have good activity skills with less self-management, 3 respondents (50%) have good activity skills with sufficient self-management, and 1 respondent (16.7%) has activity skills. good with good self-management.

Based on the results of the Spearman Rho statistical test, the value of value = 0.001 is smaller than the value of, namely ( $\rho = 0.01$ ) which indicates that H0 is rejected and H1 is accepted. In addition, based on the results of the Spearman Rho test, the value of  $r = 0.612$  with a value of = 0.001 with a value of  $r = 0.51-0.75$  is a strong relationship, it shows a strong relationship and statistically there is a significant relationship between the relationship between activity ability and self-management at type 2 DM patients.

**Table 4.** Relationship between Family Support System and Self-Management among Patients Type 2 DiabetesMellitus in the Endocrine Polyclinic Puskesmas Buduran Sidoarjo from December 28, 2021 to January 04, 2022

Family Support System	Self Management			Total
	Good	Sufficient	Not Good	
Good	14.2%	28.5%	57.3%	100%
Sufficient	0%	45%	55%	100%
Not Good	0%	13.1%	86.9%	100%
Total	2.5%	23.7%	73.8%	100%

*Spearman Rho Test* ( $\rho=0,01$ ) ( $r=0,592$ )

The results of the study in table 4. show that the relationship between family support and self-management in type 2 DM patients showed that of the 80 respondents who had less family support, 46 respondents, 40 respondents (86.9%) had less family support with less self-management, 6 respondents ( 13.1%) have less family support with sufficient self-management, 0 respondents (0%) have less family support with good self-management. Respondents who have sufficient family support are 20 respondents, 11 (55%) have sufficient family support with less self-management, 9 respondents (45%) have sufficient family support with sufficient self-management and 0 respondents (0%) have sufficient family support

with good self-management. Respondents who have good family support are 14 respondents, 8 respondents (57.3%) have good family support with less self-management, 4 respondents (28.5%) have good family support with sufficient self-management, and 2 respondents (14.2%) have family support good with good self management.

Based on the results of the Spearman Rho statistical test, the value of value = 0.001 is smaller than the value of, namely ( $\rho = 0.01$ ) which indicates that H0 is rejected and H1 is accepted. In addition, based on the results of the Spearman Rho test, the value of  $r = 0.592$  with a value of = 0.001 with a value of  $r = 0.51-0.75$  is a strong relationship, it shows a strong relationship and statistically there is a significant relationship between the relationship between family support and self-management in type 2 DM patients.

**Table 5.** Relationship between Self Efficay and Self-Management among Patients Type 2 DiabetesMellitus in the Endocrine Polyclinic Puskesmas Buduran Sidoarjo from December 28, 2021 to January 04, 2022

Self Efficay	Self Management			Total
	Good	Sufficient	Not Good	
Good	25%	50%	25%	100%
Sufficient	3.4%	41.4%	55.2%	100%
Not Good	0%	10.6%	89.4%	100%
Total	2.5%	23.7%	73.8%	100%

*Spearman Rho Test* ( $\rho=0,01$ ) ( $r=0,660$ )

The results in table 5. show that the relationship between Self Efficay and self management in type 2 DM patients shows that from 80 respondents who have less self efficacy as many as 47 respondents, 42 respondents (89.4%) have less self efficacy with less self management, 5 respondents (10.6%) have less self-efficacy with sufficient self-management, 0 respondents (0%) have less self-efficacy with good self-management. Respondents who have sufficient self-efficacy are 29 respondents, 16 respondents (55.2%) have sufficient self-efficacy with less self-management, 12 respondents (41.4%) have sufficient self-efficacy with sufficient self-management and 1 respondent (3.4%) has self-efficacy enough with good self-management. Respondents who have good self-efficacy are 4 respondents, 1 respondent (25%) has good self-efficacy with less self-management, 2 respondents (50%) has good self-efficacy with sufficient self-management, and 1

respondent (25%) has self-efficacy good with good self-management.

Based on the results of the Spearman Rho statistical test, the value of  $\rho = 0.001$  is smaller than the value of  $\alpha = 0.01$  which indicates that  $H_0$  is rejected and  $H_1$  is accepted. In addition, based on the results of the Spearman Rho test, the value of  $r = 0.660$  with a value of  $\rho = 0.001$  with a value of  $r = 0.51-0.75$  is a strong relationship, it shows a strong relationship and statistically there is a significant relationship between the relationship between Self Efficacy and self management in type 2 DM patients.

## DISCUSSION

The results showed that the relationship between the level of knowledge and self-management in type 2 DM patients showed that of the 80 respondents who had a low level of knowledge, 33 respondents (90.9%) had a low level of knowledge with less self-management, 3 respondents (9.1%) have a low level of knowledge with sufficient self-management, 0 respondents (0%) have a low level of knowledge with good self-management. The knowledge level assessment was obtained using the Diabetes Knowledge Test (DKT) questionnaire, so that from the results of the above study it can be concluded that the dominant Type 2 DM patient has a low level of knowledge because there has never been education about the disease.

This level of lack of knowledge occurs due to the lack of information regarding knowledge about Type 2 DM. Someone who has low knowledge tends to find it difficult to accept and understand the information received, so that person will be indifferent to new information and feel they do not need the new information (Riyambodo, 2017). Subject data from the results of this study indicate that most people with DM have a low level of knowledge and have less self-management in carrying out knowledge about Type 2 DM. lack of knowledge about diabetes. This is not in line with the results of research (Yin, 2005) with the research title *The Relationship Between Duration of Diabetes and Diabetes Self Management Behaviors* where through his research it was found that knowledge is not significantly related to self-management behavior where if the level of knowledge is good it does not affect self-management well. and vice versa if the level of knowledge is less it does not affect self-management less.

Good knowledge is indicated by respondents being able to know the factors that can cause DM, good knowledge is very much needed in changing

lifestyles, while respondents with a low level of knowledge are indicated by that they do not know about DM. Most experienced symptoms of DM but they did not know that it was a sign of DM. They also do not know what things can increase sugar levels (Azis, et al, 2020). One of the main risk factors for diabetes is age. Diabetes examination must be started no later than the age of 45 years, this is because the older a person gets, the more his body functions decline (American Diabetes Association, 2019). Ages above 30 years are at risk of suffering from Type 2 DM due to anatomic, physiological and biochemical decline (Damayanti, 2015).

A person's education is related to that person's knowledge about health, about the influence of demographics on diabetes client compliance in self-care management. It can be concluded that education is one of the variables that has a significant relationship with diabetes client compliance in managing stress, anxiety and distress. A person's level of education is related to his ability to understand information into knowledge (Galveia, et al, 2012). This agrees with (Notoatmodjo, 2010) the factor that can influence a person's opinion is the level of education. Better and higher education will make a person more critical in thinking, making decisions and including increasing knowledge and behavior related to personal health in order to avoid disease (Wahyudi, 2006). Individuals who have a higher education level better understand how their body condition is as a patient with the disease and will have a high awareness of maintaining their health status (Irwan, 2010). This is reinforced by research conducted (Khairani, 2012) about the lack of public knowledge about diabetes mellitus which affects the level of awareness in maintaining health, so that early detection of diabetes mellitus cannot be known which results in continued complications. Conversely, if the public's knowledge is good about diabetes mellitus, it can affect the level of awareness that is good as well. So that early detection of the symptoms caused will be known. This is in line with the results of research (Yin, 2005) that education is not related to self-management behavior. Likewise, the research conducted by (Wattanukul, 2012), both studies yielded  $p$  value  $> 0.05$ , indicating that there is no difference in DM self-management behavior between respondents who have basic, secondary, or higher educational backgrounds. Researchers assume that DM patients in the implementation of the delivery of the information needs to be done in stages. Too little or too much information should be avoided in a short period of time. In conveying information, the factor that needs to be considered is the condition of the DM patient, both physical condition in this case the severity of the disease and

psychological condition, therefore in providing health education it must be observed continuously by health workers.

The results showed that the relationship between activity ability and self-management in type 2 DM patients showed that of the 80 respondents who had less activity ability, 41 respondents, 36 respondents (87.8%) had less activity ability with less self-management, 5 respondents (12.2 %) have less activity ability with sufficient self-management, 0 respondents (0%) have less activity ability with good self-management. The assessment of the ability of these activities was obtained using the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire, so that from the results of the above study it can be concluded that if the dominant Type 2 DM patient has less activity ability because the patient is lazy to do sports, the respondent has sufficient activity ability because Many people with Type 2 DM work so they don't do much activity, respondents with good activity abilities are farmers on average so that their physical activity is maintained.

People who are physically active are quite high, their bodies can convert glucose into glycogen stored in muscles quickly, than those who do not do physical activity regularly can increase muscle glycogen (Notoatmodjo, 2010). The results of this study are supported by research conducted by (John, 2019) Physical activity is defined as a movement made by the muscles of the body that results in energy expenditure. There are four main domains of physical activity, namely: at work, transportation (walking, cycling to work), doing household chores and physical activity during leisure time (sports, or doing recreational activities). The increase in DM can also occur due to an increase in the number of people who are overweight and lack of physical activity (Notoatmojo, 2010). Based on this research, the researchers assumed that the ability of physical activity can control blood sugar levels. When doing physical activity, glucose will be converted into energy, and by doing physical activity insulin production will increase so that blood sugar levels will decrease. In someone who rarely does physical activity, the food consumed will be stored in the body into fat and sugar. If there is not enough insulin, there will be high levels of glucose in the blood.

Age > 40 years is the age at risk of developing type 2 diabetes due to glucose intolerance and the aging process that causes a lack of pancreatic beta cells to produce insulin. Type 2 diabetes is caused by a decrease in the body's ability to insulin sensitivity (insulin resistance) and insulin secretion

is impaired with increasing age resulting in insulin resistance as the key to enter glucose into cells that does not function properly, resulting in insulin resistance. Physical strength and body defense mechanisms tend to decrease with age and the body is no longer able to face unhealthy lifestyle choices, which ultimately results in the manifestation of diseases such as diabetes (Trisnawati, 2013). This is in line with research (Fitriani, 2020) with the title The Relationship of Self-Acceptance with Self-Management in Type II Diabetes Mellitus Patients in the Palaran Community Health Center Work Area, Samarinda City that as a person ages, anatomical, physiological and biochemical changes will occur so that his body functions decrease. Therefore, those aged >45 years are susceptible to diabetes mellitus. Researchers assume that as a person ages, their ability to do activities decreases due to a decrease in changes in body physiology.

Research results Female sex tends to be more at risk of developing diabetes mellitus associated with a large body mass index and lack of exercise. Research results People who have less physical activity behavior will further increase the probability of developing DM. Physical activity that is carried out can burn energy in the body that comes from the food consumed, so that if the calorie intake is excessive and not balanced with physical activity, the body will experience obesity and this condition can increase the risk of DM (Nyoman, 2019). Women are more at risk of suffering from diabetes mellitus than men because of hormonal factors, the amount of body fat and triglyceride levels which tend to be higher in women than men and women's physical activity which tends to be lower. Low levels of physical activity in women can trigger obesity, insulin resistance and decreased glucose tolerance (Odume, et al., 2015). Researchers assume that female DM patients are more susceptible to Type 2 DM, this is because Even with the lack of physical activity, the majority of housewives suffer from being lazy to do sports, unlike working men, physical activity should be done regularly 3-5 times a week for about 30-45 minutes and check blood glucose before exercise. Daily physical activity is different from physical exercise, but it is highly recommended to be active every day.

Activity ability according to Riskesdas (2013) classifies physical activity into heavy physical activity, moderate physical activity, and light physical activity. Strenuous physical activity is physical activity that is carried out continuously for at least 10 minutes until the pulse increases, breathing is faster than usual, and is carried out for at least three times a week. Examples of activities that include strenuous physical activity are

sprinting, mountain climbing, hoeing, drawing water, and so on. Meanwhile, moderate physical activity is when doing moderate physical activity such as sweeping, mopping, washing, etc. for a minimum of five days or more. In addition to those included in the above categories, it includes light physical activity. Riskesdas also stated that those included in the category of active physical activity are individuals who carry out heavy physical activity, moderate activity, or even both. Meanwhile, those included in the category of less active physical activity are those who do not do heavy physical activity and moderate physical activity such as watching television and reading books.

Based on the results of the analysis of the ability of the activity, the researcher assumes that the ability of the dominant activity is the ability of the activity that is lacking. However, the lack of activity ability that is lacking cannot be underestimated, because the resulting impact can also lead to strenuous activity due to lack of movement or physical exercise regarding Type 2 DM. hunger, increased thirst and increased urinary frequency. With the many impacts caused by the lack of activity capability, it is necessary to support various parties, especially educational staff and medical personnel to provide education about the impacts caused by lack of activity capability and can produce good activity capabilities.

The results of the family support assessment were obtained using a family support questionnaire using a social response questionnaire, so that the results of the study above can be concluded if the dominant Type 2 DM patient has less family support due to self-medication without being accompanied by a husband/wife, children, other families, so that they can Disturbing the psyche of sufferers is different from patients who are escorted by their husband/wife, other family children, who can give the spirit of attention to the sufferer, so that the sufferer can be happier and feel cared for by the family.

Family support is defined as assistance provided by other family members so that they can provide physical and psychological comfort to people who are expected in stressful situations (Friedman, et al., 2010). The family support dimension consists of 4 dimensions, namely emotional support or attention to someone, the appreciation dimension, the instrumental dimension, and the information dimension. This is in line with the results of research conducted by (AZ, 2018) at the Puskesmas in the city of Jambi, which explained that there was a significant relationship between family support and self-

management behavior with a p value of 0.019; where the most family support provided is informational support, followed by instrumental support, emotional support, reward support and network support. This is in line with the results of research (Kusniawati, 2011) that there is no relationship between family support and type 2 diabetes self-management ability, according to the researcher's analysis, because family support is not the only factor that affects the self-management ability of type 2 DM patients. External factors such as the relationship between patients and health workers is also one of the factors that can affect the fulfillment of self-care activities for type 2 DM patients (Kusniawati, 2011). Researchers assume that family support can improve the quality of life for type 2 DM patients because family support is provided in the form of information that can provide a sense of comfort and can increase patient knowledge in undergoing treatment and self-care which will affect the quality of life of DM patients for the better.

Family social support makes the family able to function with various intelligences and senses, so that it will increase their awareness and adaptation in life. The effects of family social support have been shown to reduce mortality, recover more easily from illness, cognitive function, physical and emotional health (Harnilawati, 2013). Family support is given to all family members, both healthy and sick. Family support is very necessary because it will have a positive impact on psychological health, physical well-being and quality of life. Family involvement in diabetes management will help diabetics to reduce stress on disease, help control blood sugar and help increase self-confidence (Sari, 2016). Social support from family is very influential in self-care of diabetes mellitus patients (Rembang, et. al., 2017).

Family support regarding this information has good family support because the family provides informational support, assessment support, instrumental support and emotional support for patients with diabetes mellitus so that patients can accept their condition, increase self-confidence, reduce stress and want to seek treatment regularly for quality of life. routinely control blood sugar levels to prevent complications (Prihanto, et al., 2020). The benefits of family support for health have been specifically proven to reduce mortality, recover more easily from illness, improve cognitive, physical, and emotional or psychological health (Prihanto, et. al., 2010). In addition, the positive influence of family social support is in adjusting to stressful life events. Based on this research, the researcher assumes that good family support and



support from the closest family is very necessary for diabetes mellitus patients to be able to accept their condition, increase self-confidence, reduce stress and want to seek treatment regularly for quality of life by regularly controlling blood sugar levels to improve blood sugar levels. prevent complications.

All forms of support obtained such as instrumental support, assessment, information, emotional, and financial provide great benefits for families, especially for DM patients (Friedman et al., 2013). The treatment process in DM patients has a family impact. The impact of families with care for DM patients is an increase in the burden in terms of time, energy, work, and financial problems (Wong et al., 2009). Researchers assume that DM patients should get support, both from internal and external families, namely support from husbands, parents, siblings, friends and colleagues, and health workers. The forms of support obtained include emotional, informational, instrumental, and financial support.

Based on the results of the analysis of family support, the researcher assumes that the dominant family support is the lack of family support for DM patients. However, the lack of family support cannot be ignored, because the resulting impact can also lead to heavy family support due to a lack of support to care for patients. The impact obtained from inadequate family support can result in less than optimal care for DM patients. With many impacts caused by lack of family support, it is necessary to support various parties, especially education personnel to provide education about the impacts caused by lack of family support and can produce good family support.

The results of the Self efficacy assessment using the Diabetes Management Self Efficacy Scale (DMSES) questionnaire, so that the results of the study above can be concluded if the dominant Type 2 DM patient has self-efficacy, lack of self-care, never controls resulting in poor self-efficacy, respondents with sufficient self-efficacy because sufferers rarely control and neglect to do self-care, respondents who have good self-efficacy because sufferers often routinely control health services, length of suffering can also influence to determine good care.

Self efficacy is an important thing that must be owned by DM patients, especially in carrying out self-management related to their disease. Recommendations and implications for nursing are to increase self-efficacy as an independent nursing intervention. Nurses can start the nursing process by assessing the patient's level of self-efficacy, then continue by providing education regarding DM self-management as an intervention that can be

integrated into nursing services. Self efficacy is useful for predicting an increase in self management. Individuals who have high self-efficacy will tend to choose to be directly involved in carrying out a task, even though the task is a difficult task. Individuals who have low self-efficacy will stay away from difficult tasks because they perceive it as a burden so that it makes them avoid tasks that they perceive as difficult. Self efficacy has a very important role in influencing the effort made, how strong a person's effort is in believing that success will be achieved (Anwar et al., 2009). Individuals who have good efficacy will try to achieve specific goals despite facing obstacles. Several studies have shown that diabetes mellitus self-management education programs based on self-efficacy theory can improve self-management and can delay the onset of complications from the patient's condition (Walker et al., 2014). Researchers assume that DM patients have a high level of self-efficacy and have a positive relationship with participation in diabetes self-management behavior, although it does not occur simultaneously in all self-management domains. The discussion relates to self-efficacy in self-management of DM patients, consisting of diet, physical activity, glycemic control, medication, and foot care. Self efficacy is an important thing that must be owned by DM patients, especially in carrying out self-management related to their disease. Recommendations and implications for nursing are to increase self-efficacy as an independent nursing intervention.

Self-efficacy of DM patients is influenced by various factors, one of which is gender. Several studies have found that individuals with high levels of self-efficacy have a positive relationship with participation in diabetes self-management behavior, although it does not occur simultaneously in all self-management domains (Sharoni, et al., 2012). Therefore, it is necessary to discuss self-efficacy in self-management of DM patients, considering that increasing self-efficacy is one of the independent nursing actions (Bulecheck, et al., 2013). Researchers assume that Type 2 DM patients, the factors that affect self-efficacy are gender which can be a risk for someone to experience DM because hormonal conditions that occur in women can cause a greater increase in body mass index than men, so women experience an increase in fatty acids and This will cause the body to become resistant to insulin.

Individuals who have high self-efficacy will be able to manage symptoms, treatment, physical changes, and lifestyle so that they can adapt to their conditions (Asrikan, 2016). Self-efficacy makes a

person have the potential to behave in a healthy manner, people who are not sure that they can perform a behavior that supports health will tend to be reluctant to try (Rahmi, 2018). Researchers assume that DM patients should get good self-efficacy to achieve the desired goals in terms of controlling blood sugar, diabetes who have good self-efficacy in their ability to regulate a healthy lifestyle will be able to perform good self-care behavior for the treatment of Diabetes Mellitus.

Based on the results of the self-efficacy analysis, the researcher assumes that self-efficacy is dominant, namely self-efficacy that is lacking in DM patients. However, lack of self-care cannot be left alone, because the resulting impact can also lead to less care for DM patients. The impact obtained from self-efficacy resulted in less than optimal care for DM patients. With so many impacts caused by lack of self-efficacy, support is needed various parties, especially education personnel and health workers to provide education about the impacts of low self-efficacy and can produce good self-care.

## CONCLUSION

There is a significant positive relationship between the level of self-management and quality of life in type 2 DM patients. From the results of the Spearman test correlation coefficient, there is a positive sign. This means that the higher the patient's level of knowledge, physical activity, family support system, and self-efficacy it will also improve their self management.

## SUGGESTION

The implication of this study are nurses can increase patient knowledge by providing education that focuses on improving self-management and facilitating the provision of family support as well as supervision and monitoring related to self-management by type 2 DM patients.

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**Nur Hidayanti:** Contributes to the completion of article.

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