

Original Research Article**THE EFFECT OF DIABETES SELF MANAGEMENT EDUCATION (DSME) ON BLOOD SUGAR CONTROL IN TYPE 2 DIABETES PATIENTS
(In Ngujuran Village)**Leni Nurresta¹⁾, Tiara Putri Ryandini²⁾^{1),2)}Institut Ilmu Kesehatan Nahdlatul Ulama Tuban*Corresponding Author, E-mail: leninurresta94@gmail.com**ABSTRACT**

Introduction. Diabetes mellitus sufferers have problem in controlling the increase in blood sugar levels, because it can trigger complication that will arise. Factors that affect blood sugar control are age, physical activity, carbohydrate consumption, fiber consumption, stress and medication compliance. Diabetes Self Management Education (DSME) is one of the right actions in converting blood sugar control in type 2 diabetes mellitus sufferers. The purpose of this study was to determine the effect of diabetes self management education (DSME) on blood sugar control in type 2 diabetes mellitus patients in Ngujuran village. **Method.** This research design used in this study is quantitative “pre-experimental” using the research method “one group pre-post test design” with a time-cohort approach. The population of this study was 46 patients with type 2 diabetes mellitus in Ngujuran village who were selected using a simple random sampling technique, a sample of 42 patients with type 2 diabetes mellitus in Ngujuran village was obtained. **Result and Analysis.** The results of the research carried out after analysis using the Wilcoxon test with a significance level of $\alpha = <0.05$ obtained a value of $p = 0.000 < 0.05$, which means that H1 is accepted, namely that there is an influence of diabetes self management education (DSME) on blood sugar control in type 2 diabetes mellitus patients in Ngujuran village. **Discussion.** From the description above, it can be concluded that diabetes self management education (DSME) has an effect on blood sugar control in patients with type 2 diabetes mellitus in Ngujuran village.

Keywords : Diabetes Self Management Education (DSME), blood sugar control

INTRODUCTION

Good DM control is one of the factors that makes the cure rate of DM disease better, on the other hand, if there is a lack of DM control behavior, it can result in long-term hyperglycemia which triggers several serious complications, both macrovascular and microvascular, such as heart disease, kidney failure, nerve damage and blindness. (Worang V.H.K, Bawotong J, & Untu, 2020). DM sufferers are less aware of the benefits if blood sugar levels are well controlled. Intensive control for diabetes sufferers through medical nutrition therapy, exercise and drugs is very necessary so that blood sugar is well controlled so that it can prevent or delay the occurrence of complications of the disease. (Mihardja, 2019).

The increase in the number of type II Diabetes Mellitus sufferers is related to several factors, namely unchangeable risk factors, changeable risk factors and other factors. According to the American Diabetes Association (ADA), Diabetes Mellitus is associated with unmodifiable risk factors including a family history of Diabetes Mellitus (first degree relative), age ≥ 45 years, ethnicity, birth of a baby > 4000 grams or a history of gestational Diabetes Mellitus and. History of birth with low birth weight (< 2.5 kg). Modifiable risk factors include obesity based on BMI ≥ 25 kg/m² or waist circumference ≥ 80 cm in women and ≥ 90 cm in men, lack of physical activity, hypertension, dyslipidemia and unhealthy diet.

Based on data from the International Diabetes Federation (IDF) in 2017, there were 425 million people with diabetes mellitus and in 2045 it is estimated to increase by around 48% with a total of 629 million people with diabetes mellitus. In Southeast Asia, the prevalence of diabetes mellitus is estimated to increase by 151 million people in 2045 from 82 million people in 2017 (IDF, 2017). Indonesia is included in the list of 10 countries with the highest number of diabetes sufferers

(million) in 2019 and is ranked 7th at 10.7%. (Infodatin, 2020). The number of DM sufferers in East Java itself is 875,745 (East Java Provincial Health Office, 2020). The prevalence of DM increases every year where the prevalence of type 2 DM cases exceeds other types of DM, which is around 90-95% of the entire population in the world (Mokolomban et al., 2018). According to data obtained from the Tuban Regency Health Office in 2023, there were 15,677 Diabetes Mellitus sufferers who received standard services. Meanwhile, according to data from the Bulu Health Center in 2023, sufferers of Diabetes Mellitus covering the Bulu Health Center's work area consisted of 14 villages totaling 491 and the largest number was in Ngujuran Village, namely 46 sufferers. The increase in the number of diabetes in the future will be a very heavy burden to be handled by doctors alone, even all existing health workers. There are 2/3 people with diabetes in Indonesia who do not know they have diabetes, so that accessing health services is too late (already with complications). Therefore, all parties, both community or government play an active role in prevention efforts (Perkeni, 2015). There are 4 main pillars of type 2 DM management according to the Consensus on Management and Prevention of Type 2 DM in Indonesia in (2015), namely education, medical nutrition therapy, physical exercise, and pharmacological intervention. Providing education is the main pillar that plays an important role in the management of diabetes mellitus.

The education provided includes an understanding of the course of Diabetes Mellitus, the importance of controlling diabetes mellitus, the importance of knowing the complications and risks, and pharmacological and non-pharmacological management of diabetes mellitus (Nuradhyani et al., 2017). One form of education that is commonly used and has been proven effective in improving the effects of improving clinical outcomes and quality of life of type 2 Diabetes Mellitus patients is Diabetes Self-

Management Education (DSME) (McGowan, 2020).

Diabetes Self Management Education (DSME) is an activity that helps people with pre-diabetes or diabetes in implementing and maintaining the behaviors needed to manage the condition continuously inside or outside of formal self-management training with the aim of delaying complications. The types of support provided can be in the form of skills, education, psychosocial (Has, 2014 in Utama, 2019).

Nurses as Educators and counselors for patients who can provide assistance to patients in the form of Supportive-Educative. Providing Supportive-Educative nurses can provide education with the aim that patients are able to carry out independent care so that the ability to maintain their health and well-being is achieved (Kurniawati, 2017).

Diabetes Self Management Education (DSME) can be done independently or in groups, either in clinics or communities. The implementation of DSME was carried out in 4 sessions, namely:

1. Discussing basic knowledge about DM (definition, etiology, clinical manifestations, prevention, treatment, complications)
2. Discussing nutritional/diet management and physical activity/exercise that can be done
3. Discussing foot care and monitoring that needs to be done
4. Discussing stress management and psychosocial support, and patient access to health care facilities

Based on the background description above, the researcher is interested in conducting a study entitled "The Effect of Diabetes Self Management Education (DSME) on Blood Sugar Control in Type II Diabetes Mellitus Patients in Ngujuran Village".

METHOD AND ANALYSIS

The type of research used is Pre-experimental design, which is a design that includes only one group or class that is given a pre- and post-test. This one group pretest and posttest design is carried out on one group without a control or comparison group. and the number of populations of 46 people chosen using the cluster random sampling technique so that 42 respondents are active elderly who are active in the posyandu in the village of Ngujuran and meet the inclusion criteria, namely: The active elderly Following Posyandu in Ngujuran Suwalan Village, an elderly aged 30-60 years, an elderly at risk of Diabetes Melitus tipe 2), Elderly who are willing to be respondents. The independent variable is Diabetes Self Management Education (DSME) and the depden variable is Blood Sugar Control in Type II Diabetes Mellitus Patients in Ngujuran Village by the Wilcoxon test. This study was conducted in January 2025. This study was approval from the Health Ethics Commission for the Nahdlatul Ulama Tuban Health ResearchInstitute Number 305/0084223523/LEPK.Iiknu/XI/2024. The instruments used are SOP before and observation sheets. The data collection process starts from the stages as the following:

1. Research Preparation

Before the research is carried out, the preparation that must be done is the researcher submits a letter of application to the campus via Google Form by filling in E-Learning. Then the letter comes down from the campus agency. After that, submit a letter of application for research permit to the Public Service Mall (MPP) by filling in the link <https://toss.tubankab.go.id/>. The letter of application for research permit is obtained from the Public Service Mall. Then submit a letter of research permit to the Head of UOBF Bulu Health Center. Then lobby several other parties to assist researchers in collecting data and conducting a common perception. Then the research permit letter is received and gets a reply letter from the head of UOBF Bulu

Health Center. And the research is carried out.

2. Implementation of Research (Data Collection Process)

Data collection was carried out with the following steps: The researcher asked permission to participate in the posyandu activities from the village midwife and the village head. After permission was obtained, the research was carried out according to the posyandu schedule in Ngujuran village. In carrying out this research, the researcher was assisted by approximately 4 other parties including the researcher. The posyandu schedule for each post is as follows: On December 2-5, it is scheduled at 2 posts in 2 villages, where the researcher is assisted by one other party in carrying out data collection.

- 1) On January 15-16, Diabetes Self Management Education (DSME) was conducted at the integrated health post in Ngujuran Village.
- 2) On January 19-25, the implementation of DSME in daily life.
- 3) On the 26th, an evaluation was conducted regarding the implementation of DSME in patients with type 2 diabetes mellitus in Ngujuran Village.
- 4) And take the following steps:
 - (1) Ask 1 Asking permission from respondents to introduce themselves and explain the purpose and objectives of the researcher's presence at the Posyandu location, for the number of samples adjusted to the results of the sample calculation that has been carried out.
 - (2) Distributing respondent consent sheets and signing the consent sheet by respondents.
 - (3) Distributing questionnaire sheets to respondents to be filled in for 5-10 minutes.
 - (4) After filling out the questionnaire, respondents will have their blood sugar checked

After the data needed for the study was fulfilled, the researcher thanked the respondents who had agreed to participate in the study and asked for permission to withdraw. The data that had been obtained was then processed, checked and analyzed by the researcher in accordance with the data processing procedure. The data collected in this study were analyzed using the Wilcoxon statistical test, the data scale used for the independent variables and dependent variables was the ordinal and nominal scale. The tool used to analyze the data used the SPSS for Windows software program.

RESULT

Table 1 Characteristics based on age, gender, last education, and occupation at the integrated health post in Ngujuran Village, Bancar District in January 2025.

Characteristic	f	Percentage
Age		
30-40 years	24	57,1%
41-50 years	17	40,5%
51-60 years	1	2,4%
Last Education		
No school	3	7,1%
Elementary school	31	73,8%
Junior high school	8	19,0%
Work		
Self-Employed	3	7,1%
Farmer	27	64,3%
Housewives	12	28,6%
Gender		
Man	2	4,8%
Woman	40	95,2%
Total	42	100%

Based on table 1 above, it can be seen that most of the respondents are aged 30-40 years, namely 24 respondents or 57.1%, it can be seen that most of the respondents' last education was

at the elementary school level, namely 31 respondents or 73.8%, it can be seen that most of the respondents' jobs are farmers, namely 27 respondents or 64.3%, and it can be seen that almost all respondents are female, namely 40 respondents or 95.2%.

Table 2 Frequency Distribution of Blood Sugar Control in Type 2 Diabetes Mellitus Patients in Ngujuran Village Before Being Given Diabetes Self Management Education (DSME) 2025

No.	Blood sugar control	f	Percentage
1.	Bad	20	47,6%
2.	Fair	20	47,6 %
3.	Good	2	4,8%
	Total	42	100%

Based on table 2 above, it can be seen that from 42 respondents (100%), almost half of the respondents have poor and sufficient characteristics, namely 20 respondents or 47.6%.

Table 3 Frequency Distribution of Blood Sugar Control in Type 2 Diabetes Mellitus Patients in Ngujuran Village After Being Given Diabetes Self Management Education (DSME) 2025.

No.	Blood sugar control	f	Percentage
1.	Bad	0	0%
2.	Fair	8	19,0 %
3.	Good	34	81,0%
	Total	42	100%

Based on table 3 above, it can be seen that out of 42 respondents (100%), almost all of the research results obtained had good blood sugar control, namely 34 respondents or 81.0%.

Table 4 Analysis of Diabetes Self Management Education (DSME) on Blood Sugar Control in Type 2 Diabetes Mellitus Patients in Ngujuran Village.

DSME	Pengendalian Gula Darah			Total
	Buruk	Cukup	Baik	
Pretest	20 (47,6%)	20 (47,6 %)	2 (4,8%)	42 (100,0%)
Posttest	0 (0%)	8 (19,0 %)	34 (81,0%)	42 (100,0%)

Wilcoxon Signed Ranks Asymp. Sig. (2 tailed)=0,000

Based on table 4 above, it can be seen that out of 42 (100%) respondents, 34 (81.0%) almost all of them have good blood sugar control after being given Diabetes Self Management Education (DSME).

The results of the Wilcoxon test analysis using SPSS software obtained a significance value of 0.000 which indicates a value of $\rho < \alpha$ ($0.000 < 0.05$) or less than the significance level of 0.05 (< 0.05) so that it can be concluded that there is an Effect of Diabetes Self Management Education (DSME) on Blood Sugar Control in Type 2 Diabetes Mellitus Patients in Ngujuran Village in 2025. work area. This means that the higher the level of perfectionism of a mother, the greater the possibility of complete basic immunization of children.

DISCUSSION

Identification of Blood Sugar Control in Type 2 Diabetes Mellitus Patients in Ngujuran Village Before Being Given Diabetes Self Management Education (DSME).

Based on the results of the study conducted by the researcher, it was found that out of 42 (100%) respondents, almost half (47.6%) had poor and sufficient blood sugar control. This study is in line with research conducted by Tia Puspita (2019) that Diabetes management is an important aspect in maintaining the quality of life of sufferers, and based on the questionnaire above, it can be seen that there are different levels of compliance in undergoing self-care. Some individuals have shown discipline in managing their blood sugar levels, such

as by routinely having check-ups, following the recommended diet, using medication on schedule, and doing regular physical activity. This is a very positive habit because diabetes is a chronic disease that requires close monitoring and a disciplined lifestyle to avoid long-term complications.

However, on the other hand, there are still less than ideal behavioral patterns in diabetes management, such as often missing check-ups, avoiding exercise, consuming high-carbohydrate foods or sweets excessively, and even missing medication or insulin injection schedules. This is an indication that not all diabetes sufferers have sufficient understanding or awareness of the importance of maintaining stable blood sugar levels. This is a serious problem because poor diabetes management can lead to various complications, ranging from visual impairment, nerve damage, kidney disease, to a higher risk of heart disease.

One of the main factors causing non-compliance in diabetes management is the lack of proper education about this disease. Many people still think that diabetes is only related to sugar consumption, when in fact there are many contributing factors, such as overall diet, physical activity levels, stress, and adherence to treatment. The public needs to be given a better understanding that diabetes is not just a disease that can be controlled with medication, but also requires a complete lifestyle change.

In addition, lack of motivation and support from the environment can also be the cause of someone having difficulty maintaining a healthy lifestyle. Some sufferers may feel that changing their diet and exercising regularly is something that is troublesome or difficult to do in the long term. Therefore, the role of family and medical personnel is very important in providing moral support and ongoing education so that diabetes sufferers are more motivated to manage their health better. Mentoring programs, support groups, and regular consultations with medical personnel can help sufferers feel more motivated and easier to carry out the necessary lifestyle changes.

On the other hand, there is still a perception in society that diabetes is not a dangerous disease as long as someone does not experience severe symptoms. This is a mistaken view, because diabetes is often referred to as a "silent killer" that can damage organs slowly without being realized. Many sufferers only realize the serious impact of this disease when severe complications have occurred, such as amputation due to unhealed wounds, kidney

failure, or sudden heart attacks. Therefore, it is important to instill awareness early on that managing diabetes is not just about avoiding pain or discomfort, but also about preventing permanent damage to the body. In addition, bad habits such as often consuming foods high in carbohydrates and sugar excessively, as well as lack of physical activity, are the main factors that worsen diabetes. The modern lifestyle that tends to sit more and consume fast food increases the risk of diabetes complications. Therefore, it is important for people with diabetes to understand that healthy lifestyle changes are not only temporary, but must be applied for life. balanced diet, regular exercise, and adherence to medication should be part of daily habits, not just a temporary effort when blood sugar levels are high.

From this questionnaire, it can also be seen that some sufferers feel the need to have more frequent check-ups, which shows an awareness to pay more attention to their health. This is a positive step that needs to be supported by adequate health facilities and easier access to medical personnel. The government and health institutions also have a role in providing more affordable health services and broader education about diabetes.

Ultimately, success in managing diabetes depends heavily on the individual's own commitment. Without high awareness and discipline, it is difficult for someone to maintain stable blood sugar levels in the long term. Therefore, a change in mindset that diabetes is a disease that can be controlled with consistent effort must continue to be encouraged. With a combination of good education, support from family and medical personnel, and adequate health facilities, diabetes sufferers can have a better quality of life and prevent the risk of more serious complications in the future.

Identification of Blood Sugar Control in Type 2 Diabetes Mellitus Patients in Ngujuran Village after Being Given Diabetes Self Management Education (DSME).

Based on the results of the study conducted by the researcher, it was found that out of 42 (100%) respondents, all (100%) had blood sugar levels above normal. This study is in line with Masitoh's research

(2020) namely that the implementation of Diabetes Self Management Education (DSME) can reduce blood glucose levels in patients with diabetes mellitus, this is supported by several research results that show changes in blood sugar levels (KGD) in people with diabetes mellitus before and after being given the implementation of DSME.

Diabetes is a chronic disease that requires long- term management and high discipline from sufferers. Based on the data presented, it can be seen that there are changes in blood sugar levels before and after certain interventions. The majority of individuals experience a decrease in blood sugar levels after undergoing a diabetes management program, indicating that interventions such as health education, dietary changes, adherence to treatment, and physical activity contribute to controlling this disease. However, not all individuals show a significant decrease, indicating that there are various factors that influence its success.

The Importance of Compliance in Diabetes Management Non-compliance with diabetes management can be caused by various factors, including lack of awareness of the dangers of diabetes complications, discomfort in changing lifestyles, and minimal support from the surrounding environment. Some sufferers may feel that as long as they do not experience severe symptoms, their condition is still safe. In fact, diabetes is often referred to as a "silent killer".

The Role of Education in Increasing Awareness of Diabetes Sufferers In addition, education should not only be given to sufferers, but also to their families and those around them. Families play a major role in helping sufferers live a healthy lifestyle. If families do not understand the importance of diabetes management, they may not provide enough support, for example by continuing to provide unhealthy food or not encouraging sufferers to be active. Therefore, a broader educational approach that includes the family and the environment around the sufferer is very important to ensure successful management

Social and Psychological Factors in Diabetes

Management In addition to medical and educational factors, social and psychological aspects also play a major role in diabetes management. Many people with diabetes feel stressed, anxious, or even depressed due to their condition. This emotional stress can affect eating habits, sleep patterns, and adherence to treatment. Therefore, diabetes management should not only focus on physical aspects, but also on mental health.

Support from the community or support groups can be an effective solution to help people with diabetes feel more motivated to maintain their health. In groups like this, sufferers can share experiences, provide emotional support, and get tips practical in living life with diabetes. This can help them overcome feelings of protection and be more enthusiastic in undergoing lifestyle changes.

The Importance of Physical Activity and Healthy Eating Patterns From the available questionnaire, it can be seen that there are still sufferers who often avoid physical activity or tend to consume foods high in carbohydrates and sugar. In fact, this second factor is the main element in effective diabetes management.

Exercise plays an important role in increasing insulin sensitivity and helping the body manage blood sugar levels better. Physical activity that is done routinely can help lower blood sugar levels, control weight, and reduce the risk of complications such as heart disease and stroke. Therefore, people with diabetes must be given an understanding that exercise is not a burden, but an important part of their care.

In addition to exercise, a healthy diet is also very important in managing diabetes. Many sufferers still have the habit of consuming foods high in sugar and simple carbohydrates that can increase blood sugar levels drastically. Education about the right diet, such as choosing foods with a low glycemic index, regulating portion sizes, and consuming enough fiber, must continue to be encouraged so that sufferers can control their blood sugar levels.

In addition, broader health campaigns need to

be carried out to raise public awareness about the dangers of diabetes and the importance of prevention. Programs such as free blood sugar checks, counseling on healthy lifestyles, and training for medical personnel in treating diabetes sufferers can help reduce the complex figures. In addition, the development of health technology can also be utilized to help sufferers manage their diabetes. Blood sugar monitoring applications, online consultations with doctors, and digital-based guidance programs can provide more practical solutions for sufferers to maintain control of their condition. Based on the available data, it appears that interventions in diabetes management can provide positive results in lowering blood sugar levels, although there are still several challenges that need to be overcome. Compliance factors, education, social support, and access to health services are key elements in determining the success of diabetes management. Diabetes is not a disease that can be cured instantly, but is a condition that requires a long-term commitment in its recovery. With a combination of good education, motivation from the surrounding environment, and access to adequate health facilities, diabetes sufferers can have a better quality of life and reduce the risk of more serious complications in the future. Therefore, it is important for all parties, including medical personnel, government, families, and the wider community, to work together to create a more effective support system.

Analysis of the Influence of Diabetes Self Management Education on Blood Sugar Control in Type 2 Diabetes Mellitus Patients in Ngujuran Village

Based on the results of research that has been Data analysis in this study used the Wilcoxon test. The results of the statistical test in this study showed an influence between Diabetes Self-Management Education on Blood Sugar Control in Type 2 Diabetes Mellitus Patients in Ngujuran Village. The analysis in this study using the Wilcoxon Nonparametric Tests with a significance level of $\alpha = <0.05$ and the calculation was carried out using SPSS software version 23 for windows, the results of the Asymp value were obtained. Sig. (2-tailed) =

0.00 which means that the smaller the ρ -value, the more significant the results of the study, so that $\rho = 0.000 < 0.05$ then H1 is accepted. This shows that there is an influence between Diabetes Self-Management Education on Blood Sugar Control in Type 2 Diabetes Mellitus Patients in Ngujuran Village. This study is in accordance with research from Meriani Herlina (2023), which stated that the blood sugar levels of respondents in the action group after (post-test) were given treatment as many as 10 respondents (100%) with normal blood sugar levels and no high blood sugar levels. The same thing is also stated that acupuncture can also activate glucose-6-phosphate and have an effect on the hypothalamus and work by increasing insulin secretion in the pancreas and accelerating the use of glucose in cells, which can ultimately reduce blood sugar levels.

Many diabetes mellitus sufferers who have been given an overview of Diabetes Self Management Education (DSME) experience a decrease in blood sugar, but some also remain or even increase. Because the education provided is limited, so that respondents cannot remember the education that has been given, other factors in triggering increased blood sugar levels are stress, uncontrolled food and lack of physical activity.

Based on the description of the theory and facts, the researcher argues that changes in students' social interactions can be seen from the results of the comparison between the pre-test and post-test showing significant changes. Apart from the score results obtained, the difference can also be seen from the results of observations that show changes. This statement is also supported by the post-test results that patients with diabetes mellitus have an increase in the number of scores of the post-test questionnaire results.

According to the researcher's assumption, patients with type 2 diabetes mellitus who experience an increase in average blood sugar levels are caused by respondents only knowing the basic concept of diabetes mellitus in general but do not know how self-care should be done for patients with type 2 diabetes mellitus such as nutritional management and types of exercise recommended, so that respondents are at risk of

complications and poor quality of life

The researcher concluded that the intervention carried out was clinically beneficial, which could lower blood glucose levels. This requires the role of nurses in helping DM patients who have high blood glucose levels to lower blood glucose levels. Meanwhile, the researcher considers this intervention as a new approach, especially nurses, to provide holistic care for patients with type 2 DM who have high blood glucose levels. However, the intervention carried out showed that blood glucose levels were still high or less significant because they did not decrease in large amounts, on average respondents only experienced a decrease of 10-50 mg/ml, other factors must also be considered and need to be explored further.

The success of the therapy was due to the provision of Diabetes Self Management Education (DSME) running well and carried out with implementation instructions or SOP and SAP. The success of this therapy was also supported by the role of the patient himself, the village head and local midwife, and a supportive environment, so that it can have a positive impact on improving blood sugar control in patients with type 2 diabetes mellitus.

CONCLUSION

Based on the study "The Effect of Diabetes Self Management Education (DSME) on Blood Sugar Control in Type 2 Diabetes Mellitus Patients in Ngujuran Village" it can be concluded as follows:

1. Most of the blood sugar control in type II Diabetes Mellitus patients in Ngujuran Village before being given Diabetes Self Management Education (DSME) explained blood sugar control in the poor and sufficient categories.
2. Almost all blood sugar control in type II Diabetes Mellitus patients in Ngujuran Village after being given Diabetes Self Management Education (DSME) explained blood sugar control in the good category.
3. There is a significant influence of Diabetes Self Management Education (DSME) on Blood

Sugar Control in Type II Diabetes Mellitus patients in Ngujuran Village.

REFERENCES

- Adityasari P. M. 2023, Manfaat Dan Jadwal Agustina, V., Astuti, N. P., & Naranti, H. F. (2022). Hubungan Self Care Activities Terhadap Kadar Glukosa Darah Puasa Pasien Diabetes Mellitus (DM) Tipe II di RSUD Kelet Provinsi Jawa Tengah. *JPP (Jurnal Kesehatan Poltekkes Palembang)*, 17(2), 207-214.
- Ahmad, J. (2021). Gambaran Tingkat Pengetahuan Pasien Diabetes Mellitus Tipe 2 Tentang Manajemen Diabetes Mellitus. *Media Keperawatan*, 10(2), 19-22.
- Astuti, R. K. (2024). Pengaruh Diabetes Self-Management Education (DSME) Berbasis Keluarga terhadap Peningkatan Pengetahuan dan Sikap dalam Pengendalian Glukosa Darah. *Media Publikasi Promosi Kesehatan Indonesia (MPPKI)*, 7(2), 408-413.
- Darma Karringga, D., & Efendi, F. (2023). Effect of mobile structured educational applications on self-care management in diabetes mellitus patients. *Gac Med Caracas*, 131, 278-86.
- Dewi, E. U. (2020). Gambaran faktor-faktor yang mempengaruhi terkendalinya Kadar gula darah pada pasien diabetes mellitus Di puskesmas pakis surabaya. *Jurnal Keperawatan*, 4(2).
- Fatimah, O. M., & Purwanti, O. S. (2024). The Relationship between Diabetes Self Management and Ankle Brachial Index Value in Patients with Diabetes Mellitus. *Indonesian Journal of Global Health Research*, 6(3), 1445-1452.
- Febrianty, E. (2023). Pengaruh Diabetes Self Management Education (DSME) Melalui Kalender Terhadap Kepatuhan Manajemen Perawatan Diri Pasien Diabetes Mellitus Tipe 2 di Puskesmas Tamalanrea Jaya= Effect of Diabetes Self Management Education (DSME) through Calendar on Self-Care Management Compliance of Type 2 Diabetes Mellitus Patients in Tamalanrea Jaya Public Health (Doctoral dissertation, Universitas Hasanuddin).
- Hailu, FB, Moen, A., & Hjortdahl, P. (2019). Pendidikan manajemen mandiri diabetes (DSME) – Pengaruh pada pengetahuan, perilaku perawatan diri, dan efikasi diri di

- antara pasien diabetes tipe 2 di Ethiopia: Sebuah uji klinis terkontrol. Diabetes, sindrom metabolik dan obesitas: target dan terapi , 2489-2499.
- Lengga, V. M., Mulyati, T. K., & Mariam, S. R. (2023). Pengaruh Diabetes Self Management Education (DSME) terhadap Tingkat Pengetahuan Penyakit Diabetes Mellitus pada Pasien Diabetes Mellitus. *Jurnal Penelitian Perawat Profesional*, 5(1), 103-112.
- Lengga, V. M., Mulyati, T. K., & Mariam, S. R. (2023). Pengaruh Diabetes Self Management Education (DSME) terhadap Tingkat Pengetahuan Penyakit Diabetes Mellitus pada Pasien Diabetes Mellitus. *Jurnal Penelitian Perawat Profesional*, 5(1), 103-112.
- Marbun, A. S., Siregar, R., Harefa, K., & Sinabutar, T. Y. F. (2021). Pengaruh Diabetes Self Management Education (Dsme) Berbasis Aplikasi Whatsapp Terhadap Self Efficacy Pada Pasien Dm Tipe 2 Di Puskesmas Hamparan Perak. *Jurnal Mutiara Ners*, 4(2), 128-139.
- Nooseisai, M., Viwattanakulvanid, P., Kumar, R., Viriyautsahakul, N., Baloch, GM, & Somrongthong, R. (2021). Pengaruh program pendidikan manajemen mandiri diabetes terhadap penurunan kadar glukosa darah, stres, dan kualitas hidup pada wanita penderita diabetes melitus tipe 2 di Thailand. *Penelitian & pengembangan layanan kesehatan primer* , 22 , e46.
- RAHAYU, YSE, ENKARTINI, E., & ANDIKA, R. (2020). Modifikasi Skala Efikasi Diri Pengelolaan Diabetes pada Pasien Diabetes Tipe 2 di Indonesia. *Jurnal Riset Farmasi Internasional* , 12 (1).
- Umaroh, L. (2018). Pengaruh Diabetes Self Management Education (DSME) Melalui Media Kalender Terhadap Kepatuhan Perawatan Kaki Klien Diabetes Mellitus Tipe 2 Di Balai Pengobatan Muhammadiyah Lamongan (Doctoral dissertation, Universitas Airlangga).
- Thiruvelan. (2018). *Diabetes Acupressure*. Retrieved March 16, 2018, from <http://healthy-ojas.com/diabetes/diabetes-acupressure.html>
- Trisnawati. 2013. *Faktor Risiko Kejadian Diabetes mellitus Tipe 2 di Puskesmas Kecamatan cengkareng Jakarta Barat*, Jurnal Ilmiah kesehatan Vol.5, No.1,http://lp3m.thamrin.ac.id/upload/artikel%202.%20vol%205%20no%201_shara.pdf, diakses tanggal 21 Juni 2014.
- Hananto, SY, Putri, ST, & Puspita, APW (2022). Studi Kasus: Penatalaksanaan Diabetes Self Management Education (DSME) Terhadap Kadar Glukosa Darah pada Pasien Diabetes Melitus Tipe 2. *Jurnal Keperawatan* , 20 (4), 128-137.
- Sari, NMCC, Sagitarini, PN, & Sanjana, IWE (2022). Efektivitas Pemberian Intervensi Diabetes Self Management Education (DSME) Berbasis Audiovisual terhadap Pengetahuan dan Keterampilan Perawatan Diri Diabetes. *Jurnal Kesehatan* , 11 (2), 100-106.
- Lengga, VM, Mulyati, TK, & Mariam, SR (2023). Pengaruh Diabetes Self Management Education (DSME) terhadap Tingkat Pengetahuan Penyakit Diabetes Mellitus pada Pasien Diabetes Mellitus. *Jurnal Penelitian Perawat Profesional* , 5 (1), 103-112.
- KASUMAYANTI, E., MAHARANI, M., & APRILLA, N. (2021). Gambaran Kadar Gula Darah Penderita Diabetes Mellitus Tipe II Yang Mendapatkan Diabetes Self Management Education (DSME) Di Desa Sungai Pinang Wilayah Kerja UPT Blud Puskesmas Tambang. *Jurnal Ners* , 5 (2), 51-
- Lutfiah, AS, & Susilawati, S. (2023). Evaluasi metode Diabetes Self Management Education (DSME) pada pendetira Diabetes Melitus Tipe 2. *FLORONA: Jurnal Ilmiah Kesehatan* , 2 (1), 1-10.
- International Diabetes Federation (2019) ‘Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045 : Results from the International Diabetes Federation Diabetes Atlas , 9 th edition’, Diabetes Research and Clinical Practice. Elsevier Ireland Ltd, 157, p. 107843. doi: 10.1016/j.diabres.2019.107843.
- American Diabetes Association (2020) ‘Standards of Medical Care in diabetes 2020’, The journal of clinical and applied research and education, 43(January)
- Kurniawati, T., Huriyah, T. And Primanda, Y. (2019) ‘Pengaruh Diabetes Self Management Education (DSME) terhadap Self Management pada Pasien Diabetes Mellitus’, Jurnal Ilmiah Kesehatan (JIK) Vol, XII(Ii), pp. 588–594. Available at: trinakurniawati@yahoo.co.id
- Nurkamilah, N. And Widayati, N. (2018) ‘(DSME / S) terhadap Diabetes Distress Pada Pasien Diabetes Melitus Tipe 2 di RSD dr . Soebandi Jember [DSME / S] On Diabetes

Distress in Patients with Type 2 Diabetes Mellitus in dr . Soebandi Hospital of Jember)', e-Jurnal Pustaka Kesehatan, 6(1), pp. 133–140.

Qurniawati, D. Et al. (2020) 'Pengaruh Diabetes Self-Management Education (DSME) Terhadap Perawatan Diri Pasien Luka Diabetes Melitus The Effect of Diabetes Self-Management Education (DSME) on Self-Care among Patients With Diabetes Mellitus Wound', Ilmu Keperawatan.