
DIABETES SELF MANAGEMENT EDUCATION ASSISTANCE ON THE QUALITY OF LIFE IN TYPE 2 DIABETES MELLITUS PATIENTS

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ABSTRACT

Patients with DM in the district. Rejang Lebong reached 382 cases, and 9 people died from this disease in 2020. Diabetes Self Management Education (DSME) is a program designed to provide understanding and skills in caring for DM sufferers daily at home. This subject of this study was to analyze the effect of DSME administration on the quality of life in type 2 DM patients in the PKM Perumnas area, Rejang Lebong district. This research is a quasi-experimental study with a pretest and posttest approach with a control group design. The sampling technique used consecutive sampling involving 30 respondents, divided into 15 respondents in the treatment group and 15 in the control group. Bivariate analysis in the form of a parametric test, namely the dependent t-test and independent t-test with $\alpha = 0.05$. Researchers use computer programs for data processing and statistical analysis. The mean quality of life for DM patients was 36.20 with a standard deviation of 10.79 and $p = 0.000 < 0.05$. This shows that after the intervention, there is an increase in the quality of life of DM patients by 36.20. There is an effect of Diabetes Self-Management Education (DSME) on the Quality of Life of Diabetes Mellitus (DM) Patients in Kab. Rejang Lebong in 2022. Education is essential for patients to change their behaviour and self-management independently to improve the quality of life of DM patients.

Keywords: education, diabetes, diabetes mellitus, indonesia.

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INTRODUCTION

Diabetes Mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia resulting from impaired insulin secretion, insulin performance, or both (Giraudet et al., 2022). Hyperglycemia occurs due to insulin deficiency (type I DM) or decreased cell responsiveness (type II DM) to insulin (von Deneen & Garstka, 2022). Effect multisystem, Which is caused by enhancement glucose that begins with polyuria, polydipsia, And polyphagia; then progressive complications like disturbance cardiovascular, musculoskeletal, And integument (Rompolski, 2022).

People living with Diabetes in Bengkulu province are still very high, reaching 4,184 cases spread across 9 districts or 1 city. Diabetes is now entering the level or rank of two types of non-communicable diseases that can cause death, so it is necessary to have a healthy and regular lifestyle to prevent the disease. Kabid disease control and environmental health (P2PL) Bengkulu provincial health office that cases of people with diabetes in Bengkulu province based on the data it receives every year, highest in region city Bengkulu Which reaches 3,087 cases. Sufferer diabetes is Still very

dominant in the regional city of Bengkulu; even his death reached 32 people in the past 2019. As for the district area, people living with diabetes are evenly distributed, and the highest cases occur in the Rejang Lebong district, reaching 382 cases. Those who died from this disease reached 5 people in 2019 (Bengkulu Province Health Profile, 2020).

Diabetes Mellitus can cause complications in various body systems, namely hypoglycemia, hyperglycemia, macrovascular disease of the great vessels, coronary heart disease, microvascular disease affecting small vessels retinopathy and nephropathy, neuropathies of nerves sensory or affect the extremities (L. Anggraeni et al., 2018). Diabetes complications include ketoacidosis, retinopathy, stroke, attack, heart And neuropathy (Dunggio, 2021). Neuropathy peripheral and disease peripheral vascular cause decline perfusion, peripheral Which will start happening hypoxia network. Such conditions reduce the oxygen in the tissues, affecting the activity of vascular and cellular networks. Impact more carry on caused happening damage network and diabetic foot ulcers or gangrene develop in patients with diabetes mellitus. The number of complications that can occur in the end will be able to reduce the quality of life of patients with DM (Djrolo et al., 2015).

One of the causes of the decreased quality of life of DM patients is that the patient cannot carry out self-care (Ekayasa, 2017). Self-care is a purposeful action to control diabetes which includes a series of treatment and prevention actions for complications. DM sufferers are expected to have good knowledge and skills to can do management independently in a comprehensive manner.

Strategies that can be done to prevent complications or the four pillars of management DM cover education, therapy, nutrition, medical, exercise, physical, And pharmacological intervention (AFN Anggraeni et al., 2018). Diabetic Self Management Education (DSME) is a program designed to provide understanding and skills in caring for DM sufferers at home in day-to-day care, stability of blood sugar, and prevention of complications, which includes educational activities, medical nutrition therapy, physical exercise, and pharmacological interventions to improve the quality of life of sufferers DM. The objective of this study was to analyze the effect of giving DSME on quality of life in patients with type 2 diabetes mellitus in the PKM Perumnas area, Rejang district Lebong.

METHODS

This type of research is quasi-experimental with a pretest and posttest approach with a control group design. The sampling technique used consecutive sampling involving 30 respondents, divided into 15 respondents in the treatment group and 15 in the control group. The treatment group was given DSME in the form of discharge planning in 4 sessions; namely, sessions 1-3 were held at PKM with a duration of 50 minutes, and session 4 was carried out at the patient's home with a duration of 100 minutes. The control group received discharge planning as usual for 4 sessions carried out at the PKM simultaneously with a duration of 150 minutes. The research time is from May to October 2021.

The instrument used in this study was the DQOL (Diabetes Quality of Life) questionnaire adopted from Yusra's research and the DSME SOP by modifying it based on the results of previous studies. Data analysis used univariate and bivariate analysis, bivariate analysis in the form of parametric tests, namely the dependent t-test and independent t-test with $\alpha = 0.05$. Researchers use computer programs for data processing and statistical analysis. The research design is shown in the following figure.

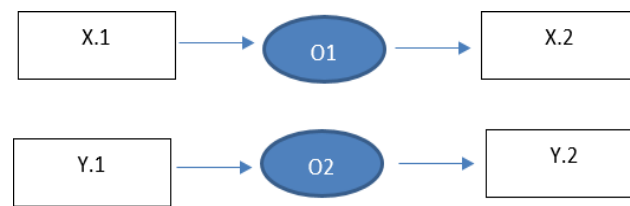


Figure 1. Research design

Information

X.1 : Pretest in the treatment group

X.2 : Posttest in the treatment group

Y.1 : Pretest in the control group

Y.2 : Posttest in the control group

O.1 : Intervention in the form of DMSE modules and assistance

O.2 : Intervention in the form of leaflets without assistance

RESULTS AND DISCUSSION

Characteristics of Respondents

Table 1. Characteristics of Respondents

Characteristics	Treatment		Control	
	Total (N=30)	%	Total (N=30)	%
Age				
<50 yrs	7	23.3	8	26.6
50-60 yrs	10	33.3	12	40
>60 yrs	13	43.3	9	30
Total	30	100	30	100
Gender				
Man	10	33.3	12	40.0
Woman	20	66.6	18	60.0
Total	30	100	30	100
Level of education				
SD	12	40.0	4	13.3
junior high school	4	13.3	3	10
high school	9	30	14	46.6
Bachelor	5	16.6	8	26.6
Total	30	100	30	100
Work				
civil servant	4	13.3	4	13.3
Private	13	43.3	9	30
Does not work	13	43.3	16	53.3
Total	30	100	30	100

Characteristics of Respondents The results showed that of the 30 respondents, most respondents in the treatment group were 13 people (43.3%) aged > 60 years and in the control, group were 12 respondents (40%) aged 50 to 60 years. Based on gender, in the treatment group, the majority were female, with 20 respondents (66.6%) and female respondents in the treatment group 18 respondents (60.0%). The education level of the respondents in the treatment group was mainly elementary school, namely 12 respondents (40.0%), with 10 respondents (66.7%) in the treatment

group and 6 respondents (40%) in the control group. The work of respondents in the treatment group was dominated by entrepreneurs, namely 14 respondents (46.7%), with 6 respondents (40%) in the treatment group and 8 respondents (53.3%) in the control group.

Characteristics of respondents the results of the study showed that of the 30 respondents, the majority of respondents in the treatment group were 13 people (43.3%) aged > 60 years and in the control, group were 12 respondents (40%) aged 50 to 60 years. As age increases, the risk of experiencing glucose intolerance increases (Ekayasa, 2017). This ageing process causes a reduced ability of pancreatic β cells to produce insulin (Rompolski, 2022). Age affects a person's ability to carry out self-care for DM (Qurniawati et al., 2020). DM patients who cannot carry out care independently can reduce their quality of life.

Based on gender, in the treatment group, the majority were female, with 20 respondents (66.6%) and female respondents in the treatment group 18 respondents (60.0%). Women quickly experience an increase in body mass index, a decrease in the hormone *estrogen* and low physical activity, which increases the risk of developing DM (Qurniawati et al., 2020). Women are prone to experiencing stress which can interfere with their mental condition. Hence, their quality of life is lower than that of men.

The education level of the respondents in the treatment group was mainly elementary school, namely 12 respondents (40.0%) with 10 respondents (66.7%) in the treatment group and 6 respondents (40%) in the control group. The level of education also determines a person's ability to understand the knowledge obtained; that is, the higher a person's education level, the easier it is for a person to accept the information obtained (Ahdiah & Arofiati, 2020). Knowledge of a person in preventing both short-term and long-term complications can improve the quality of life.

The work of respondents in the treatment group was dominated by entrepreneurs, namely 14 respondents (46.7%), with 6 respondents (40%) in the treatment group and 8 respondents (53.3%) in the control group. The type of work the respondent indirectly describes his physical activity. Physical activity can control blood sugar. In people with light physical activity, it causes food substances that enter the body not to be burned but stored in the body as fat and sugar, which can cause type 2 DM (Ahdiah & Arofiati, 2020). Respondents who do a light physical activity can increase insulin sensitivity and can reduce DM complications that can affect their quality of life

Average Quality of Life (QOL) of DM Patients in the Intervention Group (N=30)

Table 2. Average Quality of Life (QOL) of DM Patients in the Intervention Group (N=30)

Variable	Means	std. Dev	Min	Max
Quality of life of DM patients in the intervention group (pretest)	27.3	3.19	20	33
Quality of life of DM patients in the intervention group (posttest)	49.2	4.84	39	57

Table 2 shows that in the intervention group, before the action, respondents' average quality of life was 27.3, with a standard deviation of 3.19, a minimum value of 20 and a maximum of 33. After the action, respondents' average quality of life was 49.2, with a standard deviation of 4.84, with a minimum value of 39 and a maximum of 57.

Improving the quality of life in the treatment group is influenced by the provision of structured education and is given in stages to patients. One education that can be given to patients with type 2

diabetes mellitus is Diabetes Self Management Education and Support (DSME/S). DSME/S is a program designed to provide health for patients, knowledge, family support, financial status, medical history, and other factors that affect patient activities in carrying out self-care (Rahayu, 2014).

DSME/S is given in the form of discharge planning. Discharge planning is anticipating and planning needed by patients and their families after returning home to carry out comprehensive health care. It is carried out in every patient care plan (Fitriani et al., 2019). DSME/S supports patient decision-making and self-care so that patients experience increased knowledge, attitudes, and behaviour. This increase will encourage patients to manage and manage DM independently.

Patient self-care will affect the quality of life of DM patients. Self-care is an action that aims to control diabetes, including treatment and prevention of complications (Nolasco-rod  guez et al., 2022). Complications due to the patient's inability to carry out self-care impact decreasing the quality of life. Factors from family support also influence the improved quality of life because the DSME/S involves the family.

Average Quality of Life (QOL) of DM patients in the control group (N=30)

Table 3. Average Quality of Life (QOL) of DM Patients in the Control Group (N=30)

Variable	Means	std. Dev	Min	Max
Quality of life of DM patients in the control group (pretest)	36.6	3.95	26	44
Quality of life of DM patients in the control group (posttest)	24.2	1.84	24	38

In table 3, it is found that in the control group, before the action, the average quality of life of the respondents was 36.6 with a standard deviation of 3.95 with a minimum value of 26 and a maximum of 44. After the action, the average quality of life of the respondents was 24.2, with a standard deviation of 1.84; the minimum value is 24, and the maximum is 38.

Respondents in the control group were not given DSME/S education, and respondents carried out activities according to treatment procedures at Curup PK by being given leaflets routinely given to respondents who went to PKM Curup for treatment. Respondents in this study experienced an increase in quality of life due to receiving information about diet and examination methods from health workers, although not in detail, only in the form of information on taboos and recommendations for eating (Ahdiah & Arofiati, 2020).

This freedom of information can also be obtained from other type 2 DM sufferers in the same treatment room to exchange information. The difference in the quality of life between hospitalized and non-hospitalized patients is influenced by medical and psychological factors. In hospitalized patients, the quality of life will be affected by medical factors, including stress due to the burden of self-care and the threat of complications that can reduce the quality of life of type 2 DM patients (Hulya Parildar, Ozlem Cigerli, 2015).

Disease-related stress caused by continuous self-care burdens can lead to low self-care for patients, impacting their quality of life (Waleed M Sweileh, Hanadi M Abu-Hadeed, Samah W Al-Jabi, 2014). For patients who are not hospitalized, their quality of life will be influenced by psychological factors. Psychological factors such as daily stressors, anger, hostility, and social support are closely related to the patient's blood sugar levels. Daily stress, originating from daily events and stress related to diabetes, affects the quality of life of type 2 DM patients (Ekayasa, 2017).

Differences in Average Quality of Life (QOL) of DM Patients Before and After Intervention in Kab. Rejang Lebong Year 2022 (n=30)

Table 4. Differences in Average Quality of Life (QOL) of DM Patients Before and After Treatment in Kab. Rejang Lebong Year 2022 (n=30)

Variable	Means		Men difference
	Pretest	Posttest	
Quality of life of DM patients in the intervention group	27.46	44.93	17,47
Quality of life of DM patients in the control group	36.46	43.86	7,41

Table 4 shows that DM patients' average quality of life in the intervention group before DSME assistance was 27.46, with a posttest value of 44.93 and a mean difference of 17.47. Meanwhile, in the control group, the mean pretest quality of life was 36.46, with a posttest value of 43.86 and a mean difference of 7.41.

Effect of Diabetes Self Management Education (DSME) on Quality of Life (QOL) of Diabetes Mellitus (DM) Patients in Kab. Rejang Lebong.

Table 5. Effect of Diabetes Self Management Education (DSME) on Quality of Life (QOL) of DM Patients in Kab. Rejang Lebong (n=30)

Variable	Means	Std. Dev	t	sign
DM patient's quality of life	36.20	10.79	1.39	0.00

Based on Table 5. the mean value of quality of life for DM patients is 36.20 with a standard deviation of 10.79, and the Sig value is 0.000 < 0.05. This shows that after the intervention, there is an increase in the quality of life of DM patients by 36.20; it can be concluded that there is an effect of Diabetes Self-Management Education (DSME) on the Quality of Life of Diabetes Mellitus (DM) Patients in Kab. Rejang Lebong Year 2022.

These results indicate that the value of quality of life in the treatment group is higher than in the control group. Education is essential for patients to change their behaviour and manage DM independently. The role of nurses as educators for patients helping patients to increase their knowledge by providing self-care knowledge that can be carried out by patients and their families (Utama et al., 2021).

Respondents in this study experienced an increase in quality of life after being given DSME/S. DSME/S is given in the form of discharge planning to patients to increase knowledge about DM and increase patient skills in self-care independently. Patients and their families at home can carry out this independent management of diabetes. The advantage given by DSME/S is that it involves the family in it. This form of ongoing support or ongoing support for DSME/S requires the community to support the self-management behaviour of diabetes clients in daily life (Andriyanto et al., 2021).

DSME/S implementation is given in stages, with 4 sessions at PKM and 2 sessions at the patient's home. There was an increase in the quality of life in the control group because patients received health education. At the same time, they were hospitalized at the hospital. This is due to obtaining information about diet and methods of examination from health workers in the form of information on taboos and recommendations for eating (Nkomani et al., 2021).

CONCLUSION

Based on the results of this study, it was found that there was an effect of Diabetes Self-Management Education (DSME) on the Quality of Life of Diabetes Mellitus (DM) Patients in Kab. Rejang Lebong Year 2022. The quality of life in the treatment group is higher than in the control group. Education is essential for patients to change their behaviour and self-management independently to improve the quality of life of DM patients.

REFERENCES

- Ahdiah, N., & Arofiati, F. (2020). Methods of Delivery Diabetes Self-Management Education (DSME). *Health Dynamics Journal of Midwifery and Nursing*, 10 (1), 303–317. <https://doi.org/10.33859/dksm.v10i1.416>
- Andriyanto, A., Janes, C., & Akbar, N. (2021). Implementation of Diabetes Self-Management Education (Dsme) on Families' Independence in Caring for Diabetes Mellitus Patients. *Indonesian Journal of Nursing Health Science ISSN*, 6 (1), 23–30.
- Anggraeni, AFN, Rondhianto, R., & Juliningrum, PP (2018). Effect of Diabetes Self-Management Education and Support (DSME/S) on Quality of Life in Type 2 Diabetes Mellitus Patients. *Health Library*, 6 (3), 453. <https://doi.org/10.19184/pk.v6i3.11688>
- Anggraeni, L., Syamsudin, S., & Siswanto, S. (2018). Application of Diabetic Foot Exercise Procedures to Minimize Peripheral Neuropathy Complications in Mrs I with Diabetes Mellitus. *Karya Bhakti Journal of Nursing*, 4 (2), 30–38.
- Djrolo, F., Adoukonou, T., Houehanou, C., Houinato, JD, & Houinato, D. (2015). Diabetes in Borgou Department in Benin: Prevalence and Associated Factors. *Journal of Diabetes Mellitus*, 05 (02), 90–96. <https://doi.org/10.4236/jdm.2015.52011>
- Dunggio, ASR (2021). Hypertension Gymnastics As An Alternative For Prevention And Control Of Stroke Potential In Class Iia Ambon Criminal Institutions. *ABDIKEMAS: Journal of Community Service*, 3 (December 2), pp. 178–186.
- Ekayasa, S. (2017). *The Effect of Diabetes Self Management Education and Support (Dsme/S) on Self Care Behavior of Type 2 Diabetes Mellitus Clients in the Work Area of the Patrang Health Center, Jember Regency*.
- Fitriani, Y., Pristianty, L., Hermansyah, A., East Java Provincial Health, D., & Ahmad Yani, J. (2019). Health Belief Model (HBM) Approach to Analyze Compliance of Type 2 Diabetes Mellitus Patients in Using Insulin Adopting Health Belief Model Theory to Analyze the Compliance of Type 2 Diabetes Mellitus Patients When Using Insulin Injection. In *Pharmaceutical Journal of Indonesia* (Vol. 16, Issue 02).
- Giraudet, F., Mulliez, A., de Resende, LM, Beaud, L., Benichou, T., Brusseau, V., Tauveron, I., & Avan, P. (2022). Impaired auditory neural performance is another dimension of hearing loss in type-2 diabetes mellitus. *Diabetes & Metabolism*, 48 (6), 101360. <https://doi.org/https://doi.org/10.1016/j.diabet.2022.101360>
- Hulya Parildar, Ozlem Cigerli, N. G. D. (2015). *Depression, Coping Strategies, Glycemic Control and Patient Compliance in Type 2 Diabetic Patients in an endocrine Outpatient Clinic*. 1. <https://doi.org/PMID: 25878608> PMID: PMC4386151 DOI: 10.12669/pjms.311.6011
- Nkomani, S., Ruskaniko, S., & Blaauw, R. (2021). The impact of existing diabetes self-management education interventions on knowledge, attitudes and practices in public health care institutions in Harare, Zimbabwe. *South African Journal of Clinical Nutrition*, 34(1). <https://doi.org/10.1080/16070658.2019.1641272>
- Nolasco-rodríguez, G., Ordaz-castro, LE, Albarrán-rodríguez, E., García-delgado, L., Bañuelos-pineda, J., & Rosales-cortés, M. (2022). *Diabetes, Allopathic and Alternative Methods (Kombucha) for*

- Its Treatment* . 187–203. <https://doi.org/10.4236/jdm.2022.124015>
- Bengkulu Province Health Profile. (2020). Bengkulu Province Health Profile 2020. *Nuevos Sistemas de Comunicación e Information* , 2013–2015.
- Qurniawati, D., Fatikasari, A., Tafonao, J., & Anggeria, E. (2020). The Effect of Diabetes Self-Management Education (DSME) on Self Care of Diabetic Mellitus Wound Patients. *Journal of Nursing Science*, 8 (1), 10–21.
- Rahayu. (2014). *The Effect of Diabetes Self-Management Education (DSME) on Self-Management Improvement in Type II Diabetes Mellitus Patients*. 9.
- Rompolski, SFK (2022). *Human Physiology 16th Edition* (19th ed.). McGraw-Hill Higher Education (International).
- Main, RD, Indasah, I., & Noor Layla, SF (2021). The Effect of Diabetes Self-Management Education (DSME) on Improving Self-Management and Quality of Life in Mellitus Type 2 Diabetes. *Journal for Quality in Public Health*, 4 (2). <https://doi.org/10.30994/jqph.v4i2.176>
- von Deneen, K. M., & Garstka, M. A. (2022). Neuroimaging perspective in targeted treatment for type 2 diabetes Mellitus and sleep disorders. *Intelligent Medicine*, 2(4), 209–220. <https://doi.org/https://doi.org/10.1016/j.imed.2022.05.003>
- Waleed M Sweileh, Hanadi M Abu-Hadeed, Samah W Al-Jabi, S. H. Z. (2014). Prevalence of depression among people with type 2 diabetes mellitus: a cross-sectional study in Palestine. *BMC Public Health*, 1, 13,14. <https://doi.org/PMID: 24524353> PMID: PMC3929146 DOI: 10.1186/1471-2458-14-163



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