

Implementation of Diabetes Self Management Education (DSME) Towards Reducing Blood Glucose Levels in Patients With Type II Diabetes Mellitus in the Wijaya 4 Room of X

Laikha Meyda Sari¹, Shindi Hapsari²

^{1,2}Nursing Professional Study Program, Faculty of Nursing and Health Sciences, Keryahusada University, Semarang, Semarang, Indonesia

Email: meydalaikha@gmail.com

Diabetes mellitus type II is a chronic metabolic disease characterized by elevated blood glucose levels and requires effective self-management to prevent complications. This study aimed to describe the effect of Diabetes Self-Management Education (DSME) on reducing blood glucose levels in patients with type II diabetes mellitus in the Wijaya Kusuma 4 Ward of RSUD Dr. Adhyatma, MPH, Central Java Province. A descriptive case study design was used involving two patients with type II diabetes mellitus. Data were collected through interviews, observations, blood glucose measurements, and the Diabetes Knowledge Questionnaire (DKQ-24). DSME was implemented in four structured sessions over three days. The results showed a decrease in blood glucose levels in both patients and an improvement in knowledge after the intervention. These findings indicate that DSME is effective as a non-pharmacological nursing intervention to reduce blood glucose levels in patients with type II diabetes mellitus

Keywords: Diabetes Mellitus Type II, Diabetes Self-Management Education, Blood Glucose Level, Nursing Intervention, Patient Education

This is an open access article under the [CC BY-NC](#) license



Corresponding Author:

Laikha Meyda Sari

Nursing Professional Study Program, Faculty of Nursing and Health Sciences, Keryahusada University, Semarang, Semarang, Indonesia

meydalaikha@gmail.com

1. Introduction

Indonesia ranks fifth worldwide in terms of the highest number of diabetes mellitus cases, with a total of 19.47 million people affected [1]. Diabetes Mellitus (DM) is a metabolic disease involving endocrine system disorders that manifest as elevated blood glucose levels, influenced by dysfunction of pancreatic beta cells, abnormalities in insulin secretion, or both [2]. Based on its causes, DM is classified into four types: type 1 diabetes mellitus, type 2 diabetes mellitus, gestational diabetes in pregnant women, and other specific types of diabetes mellitus [3]. Diabetes Mellitus is caused by several factors, including genetic predisposition, poor dietary habits, age, stress, and unhealthy lifestyles [1]. An unhealthy lifestyle is a major factor contributing to the increasing prevalence of DM. The rise in DM prevalence may occur due to the lack of public awareness regarding the importance of maintaining and managing a healthy lifestyle [1]. Patients with DM commonly experience signs and symptoms such as polyuria, polydipsia, polyphagia, weight loss, and malaise or weakness [4].

Diabetes mellitus is a disease that cannot be completely cured; however, patients are able to manage and control their condition in order to improve their quality of life [5]. Inadequate management of DM may lead to various dangerous complications [6]. To reduce complications, a patient self-management program is required, which includes dietary management, physical activity, and exercise. Self-management refers to the individual's ability, particularly patients with DM, to manage health problems related to symptoms, physical changes, and psychosocial consequences associated with adopting a healthier lifestyle [7] [8].

Health education also plays an important role in improving independence among patients with DM and their families [9]. Through health education, patients and families can understand the positive aspects provided during educational sessions and apply them in daily life [10]. Diabetes Self-Management Education (DSME) is an activity designed to facilitate knowledge, coping understanding, and behaviors required for sustainable self-management in patients with DM [10]. Sustainable DSME requires community resources to support self-management behaviors, particularly through the involvement of family members or close relatives who are considered effective in assisting self-care management and promoting behavioral changes needed for independent diabetes management [11][12].

A preliminary study conducted by the author in the inpatient ward of Wijaya Kusuma 4 at RSUD X, found that the majority of patients suffered from type II diabetes mellitus. The prevalence of DM in Central Java in 2022 was approximately 15.6%. At RSUD Tugurejo, a total of 979 DM patients were recorded, consisting of 212 patients with type I DM and 767 patients with type II DM. Current nursing interventions primarily involve insulin therapy as a pharmacological approach to facilitate glucose uptake into body cells and control blood glucose levels. Therefore, the author intends to implement Diabetes Self-Management Education (DSME) as an intervention to reduce blood glucose levels in patients with type II diabetes mellitus in the Wijaya Kusuma 4 Ward of RSUD X.

2. Literature Review and Problem Statement

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder characterized by hyperglycemia resulting from insulin resistance and/or impaired insulin secretion, which may lead to microvascular and macrovascular complications if glycemic control is not adequately managed. The management of T2DM does not rely solely on pharmacological therapy but also requires sustainable behavioral changes through structured self-management education. Diabetes Self-Management Education (DSME) is considered an essential component of T2DM management, as it aims to enhance patients' knowledge, skills, and coping abilities in managing their condition independently, including dietary regulation, physical activity, blood glucose monitoring, and complication prevention [9], [13].

Numerous studies have demonstrated that DSME has a positive impact on glycemic control and self-care behaviors among patients with T2DM. DSME interventions have been shown to improve treatment adherence, promote regular blood glucose monitoring, and contribute to clinically meaningful reductions in blood glucose levels [12]. However, previous research findings indicate variability in effectiveness, which may be influenced by differences in intervention design, duration, session intensity, and the availability of ongoing support. In addition, most studies focus on long-term outcomes such as HbA1c, whereas in primary healthcare practice, random or fasting blood glucose measurements are more commonly used for daily monitoring. These limitations highlight a research gap regarding the effectiveness of DSME on blood glucose levels, particularly within healthcare settings with limited resources.

Based on the identified research gap, the research problem of this study is formulated as follows: *Does the implementation of Diabetes Self-Management Education (DSME) have an effect on blood glucose levels in patients with type 2 diabetes mellitus?* This problem formulation provides an academic foundation for examining the role of DSME as a non-pharmacological intervention in glycemic control. Therefore, this study is expected to provide empirical evidence regarding the effectiveness of DSME in improving blood glucose control among patients with T2DM and to strengthen the implementation of self-management education as an integral component of nursing care.

3. Method

This study employed a descriptive case study design with a pre-experimental approach by observing subjects before and after the implementation of Diabetes Self-Management Education (DSME). The study subjects consisted of at least two patients with type 2 diabetes mellitus who met the inclusion criteria, namely patients with blood glucose levels above 200 mg/dL, limited knowledge regarding type 2 diabetes mellitus, compos mentis level of consciousness, and willingness to participate as respondents, while the exclusion criteria included patients without a history of type 2 diabetes mellitus, patients who refused DSME intervention, and patients in emergency conditions. The focus of this case study was the implementation of DSME and changes in blood glucose levels among patients with type 2 diabetes mellitus. Research instruments included the Diabetes Knowledge Questionnaire (DKQ-24), standard operating procedures (SOPs) for DSME implementation conducted in four sessions, SOPs for blood glucose measurement, and a glucometer. Data collection was carried out through interviews, observation, physical examination, and measurement of blood glucose levels before (pre-test) and after (post-test) the intervention, with educational sessions conducted over three days for 45–60 minutes per session. The case study was conducted in the Wijaya Kusuma Ward of RSUD X, in April 2025. Data analysis was performed descriptively through stages of data collection, reduction, presentation, and conclusion drawing by comparing field findings with relevant theories. Ethical principles applied in this study included informed consent, anonymity, confidentiality, and non-maleficence.

4. Results and Discussion

Results

This chapter presents the results of the study on the application of *Diabetes Self-Management Education* (DSME) in reducing blood glucose levels among patients with type II diabetes mellitus. The study was conducted in the Wijaya Kusuma 4 Ward of RSUD Dr. Adhyatma, MPH Semarang using a case study approach. The DSME intervention was implemented in a structured manner over three days and evaluated through measurements of blood glucose levels and patients' knowledge. The results are presented in two cases of patients with type II diabetes mellitus who experienced the primary nursing problem of unstable blood glucose levels due to hyperglycemia. Each patient underwent an initial assessment, pretest measurement, DSME intervention sessions, and posttest evaluation to determine changes in blood glucose levels and disease understanding.

The first patient was Mr. S, a 53-year-old man who was hospitalized in the Wijaya Kusuma 4 Ward of RSUD Dr. Adhyatma, MPH with a medical diagnosis of type II diabetes mellitus. The main nursing problem identified was unstable blood glucose levels related to hyperglycemia. During the initial assessment, the patient complained of weakness and frequent hunger and appeared uncomfortable and anxious. The patient stated that he had no previous history of diabetes and was unaware of his condition because he had never checked his blood glucose levels. The pretest results on the first day showed a low level of knowledge with a DKQ-24 score of 58.24% and a random blood glucose level of 317 mg/dL.

The DSME intervention for Mr. S was provided over three days in four sessions, each lasting 45–60 minutes. The DSME materials included basic concepts of diabetes mellitus, disease management, stress control and foot care, and prevention of acute and chronic complications. After the first day of DSME sessions, the patient began to understand his condition and showed a decrease in blood glucose levels to 302 mg/dL. On the second and third days, the patient appeared calmer, began adhering to the recommended diet, took medications and insulin regularly, and demonstrated better compliance with therapy. The final evaluation showed a reduction in blood glucose levels to 153 mg/dL and an increase in knowledge to 87.36%.

The second patient was Mr. D, a 45-year-old man diagnosed with type II diabetes mellitus who also experienced unstable blood glucose levels due to hyperglycemia. During the initial assessment, the patient complained of weakness, blurred vision, and frequent urination. He had a six-month history of diabetes mellitus but admitted to irregular medication adherence and difficulty avoiding sweet foods and beverages. The patient expressed concern that long-term medication use could damage other internal organs. The pretest results on the first day indicated a low level of knowledge with a DKQ-24 score of 49.92% and a random blood glucose level of 271 mg/dL.

The DSME intervention for Mr. D was conducted over three days using the same four-session educational approach as in the first case. After the first day of DSME, the patient began to understand the importance of diabetes management and showed a reduction in blood glucose levels to 212 mg/dL. On the second and third days, the patient became more cooperative, started regulating his diet, reduced sweet food consumption, adhered to medication and insulin therapy, and performed light physical activity. The final evaluation demonstrated an improvement in knowledge with a DKQ-24 score of 83.2% and a decrease in blood glucose levels to 145 mg/dL.

Based on the results of both case studies, the application of Diabetes Self- Management Education (DSME) proved effective in improving patients' knowledge and reducing blood glucose levels among individuals with type II diabetes mellitus. The gradual reduction in blood glucose levels over the three-day intervention period indicates that structured education enhances patient adherence to self-management practices. Furthermore, the increased knowledge scores in both patients demonstrate that DSME plays a crucial role in shaping positive health behaviors. Therefore, DSME can be considered an effective nursing intervention for the management of type II diabetes mellitus.

Discussion

In the discussion section, the researcher explains the meaning of the research findings regarding the application of Diabetes Self-Management Education (DSME) on the reduction of blood glucose levels among patients with type II diabetes mellitus in the Wijaya Kusuma 4 Ward of RSUD Tugurejo Semarang. This discussion includes a comparison between the results of the present study, previous research findings, and relevant theoretical concepts.

The results of the case study involving two respondents with type II diabetes mellitus in the Wijaya Kusuma 4 Ward showed that after the implementation of Diabetes Self- Management Education (DSME), blood glucose levels decreased to 153 mg/dL in Mr. S and 145 mg/dL in Mr. D. These findings indicate that the application of DSME resulted in a reduction in blood glucose levels when comparing measurements taken before and after the intervention. This result is consistent with the study conducted by [13], which reported a significant difference in blood glucose levels in patients with type II diabetes mellitus before and after a four-session DSME intervention. Lifestyle modification toward healthier behaviors and continuous preventive efforts are essential through an understanding of holistic diabetes management. Educational interventions are the main strategy in achieving successful diabetes management, aiming to reduce blood glucose levels and prevent complications. Gradual and structured education and guidance in self-care management can change lifestyle and behavior in patients with diabetes, thereby improving their self-management abilities. The DSME intervention enhances patients' capacity for self-care through structured learning that emphasizes knowledge, behavior, and attitudes, ultimately improving healthy behaviors in individuals with diabetes.

This case study is in line with the research conducted by Zai et al. (2019) entitled "The Effect of Diabetes Self-Management Education Program on the Reduction of Blood Glucose Levels in Patients with Type II

Diabetes Mellitus at Royal Hospital Medan.” The study involved 30 respondents, consisting of 15 in the intervention group and 15 in the control group. The average pretest blood glucose level in the intervention group was 265.45 mg/dL, while in the control group it was 299.80 mg/dL. The results showed a significant effect of DSME on blood glucose reduction, with p-values of 0.001 ($p < 0.05$) in the intervention group and 0.007 ($p < 0.05$) in the control group.

Diabetes Self-Management Education (DSME) is an educational intervention provided to patients or individuals with type II diabetes mellitus. DSME is an activity designed to facilitate knowledge, understanding, coping skills, and behaviors required for sustainable self-management of diabetes [14]. Sustainable DSME requires community resources to support self-management behaviors, including the involvement of family members or close relatives, who are considered effective in supporting self-care management and facilitating necessary behavioral changes in patients with diabetes [15].

In conclusion, the application of Diabetes Self-Management Education (DSME) is effective in reducing blood glucose levels in patients with diabetes mellitus and can be considered an effective non-pharmacological nursing intervention for diabetes management.

5. Conclusion

Based on the results of the research, data processing, and discussion regarding the application of Diabetes Self-Management Education (DSME) on the reduction of blood glucose levels among patients with type II diabetes mellitus in the RSUD X, it can be concluded that prior to the DSME intervention, both patients had elevated blood glucose levels, namely 317 mg/dL in Mr. S and 271 mg/dL in Mr. D. After the implementation of DSME, a significant reduction in blood glucose levels was observed, with levels decreasing to 153 mg/dL in Mr. S and 145 mg/dL in Mr. D. These findings indicate a clear difference in blood glucose levels before and after the application of DSME in patients with type II diabetes mellitus.

The implementation of Diabetes Self-Management Education (DSME) was proven to be effective as a non-pharmacological nursing intervention in reducing blood glucose levels among patients with type II diabetes mellitus. DSME is an important educational approach because it enhances patients' knowledge, understanding, and skills in managing their disease independently. Through structured education, patients are better able to regulate their diet, adhere to medication regimens, engage in physical activity, and prevent complications, thereby contributing to improved health status in individuals with type II diabetes mellitus.

Based on the findings of this study, it is expected that the researcher can improve competence in managing and preventing elevated blood glucose levels in patients and their families through the application of DSME. In addition, the results of this study are expected to serve as a reference and preliminary data for nursing education institutions to support further research, provide useful information for hospitals in improving blood glucose control efforts, and act as a source of information for the community to recognize early signs and symptoms of type II diabetes mellitus and its management through Diabetes Self- Management Education (DSME).

6. References

- [1] M. Syikir, “Pengaruh Program Diabetes Self-Management Education (DSME) Berbasis Health Coaching (HC) Dalam Meningkatkan Self-Care Management Pasien Diabetes Mellitus Type 2 Di Kabupaten Polewali Mandar,” *Universitas Hasanuddin*, 2021.

- [2] Sudirman, "Efektifitas Diabetes Self Management Education (DSME) terhadap Kadar Glukosa Darah pada Pasien Diabetes Mellitus Tipe 2 di Wilayah Puskesmas Limboto Barat," *Media Publikasi Promosi Kesehatan Indonesia (MPPKI)*, 2021.
- [3] Putri, "Hubungan Diabetes Self Care Management Dengan Kadar Glukosa Darah Pada Pasien Diabetes Mellitus Tipe 2 Di UPT Kemas Abiansenal II Tahun 2019," *Poltekkes Denpasar*, 2019.
- [4] Putra, "Tingkat Stres Dan Mekanisme Koping Pada Klien Diabetes Mellitus Di Wilayah Kerja Puskesmas Pacar Keling Surabaya," *Jurnal Keperawatan*, 2017.
- [5] PPNI, "Standar Intervensi Keperawatan Indonesia," *Standar Intervensi Keperawatan Indonesia*, 2018.
- [6] Nugroho, "Diabetes SelfManagement Education (DSME) Pendekatan Emotional Demonstration. Media Sains Indonesia," *Keperawatan. Salemba Medika*, 2021.
- [7] Na'imah, "Kadar B-Karoten, Serat, Protein, Dan Sifat Organoleptik Snack Bar Labu Kuning Dan Kacang Merah Sebagai Makanan Selingan Bagi Pasien Diabetes Mellitus Tipe 2," *Indonesian Journal of Public Health and Nutrition*, 2021.
- [8] WHO, "Guideline on Sodium Intake for Adults and Children," *World Health Organization*, 2021.
- [9] I. Luthfa, "Implementasi Selfcare Activity Penderita Diabetes Mellitus di Wilayah Puskesmas Bangetayu Semarang," *Buletin Penelitian Kesehatan*, 2019.
- [10] Milita, "Kejadian Diabetes Mellitus Tipe II Pada Lanjut Usia di Indonesia (Analisis Riskesdas 2018)," *Jurnal Kedokteran Dan Kesehatan*, 2021.
- [11] Marbun, "Pengaruh Diabetes Self Management Education (DSME) Berbasis Aplikasi WhatsApp Terhadap Self Efficacy Pada Pasien DM Tipe 2 Di Puskesmas Hamparan Perak," *Jurnal Mutiara Ners*.
- [12] Hong, "PatientProvider Communication With Teach-Back, Patient-Centered Diabetes Care, And Diabetes Care Education. Patient Education and Counseling," 2020.
- [13] Kasumayanti, "Hubungan Motivasi Diri Dan Dukungan Tenaga Kesehatan Dengan Kepatuhan Diet Penderita Dm Tipe 2 Di Wilayah Kerja Uptd Puskesmas Bangkinang Kota Tahun 2019," *Jurnal Ners*, 2019.
- [14] Kartika, "Diabetic Self-Management Education-Effect on Self-Management Care of Type-2 Diabetic Patients," *Media Karya Kesehatan*, 2021.
- [15] Fitria, "Asuhan Keperawatan Pada Pasien Diabetes Mellitus Tipe 2 Di Ruang Penyakit Dalam RSUD dr. Rasidin Padang," *Jurnal Keperawatan*, 2020.