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EFFECT OF DIABETES SELF-MANAGEMENT EDUCATION ON QUALITY OF LIFE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS: A QUASI-EXPERIMENTAL STUDY

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Abstract

Type 2 diabetes mellitus is a chronic disease that requires continuous self-management to prevent complications and maintain quality of life. Diabetes Self-Management Education (DSME) has been widely promoted as a structured educational intervention to improve patients' self-care behaviors. Objective to analyze the effect of a DSME program on quality of life among patients with type 2 diabetes mellitus. Methods a quasi-experimental pretest–posttest control group study was conducted among patients with type 2 diabetes attending the outpatient clinic at RSUD Majalengka, Indonesia. A total of 106 participants were recruited using purposive sampling and divided into intervention (n=53) and control (n=53) groups. The intervention group received a structured DSME program consisting of four sessions covering diabetes knowledge, physical activity, nutrition management, and pharmacological therapy. Quality of life was measured using the Diabetes Quality of Life (DQOL) questionnaire before and after the intervention. Data were analyzed using statistical tests to compare within-group and between-group changes. Results participants who received DSME showed greater improvement in Quality of life scores compared with the control group. The intervention supported better self-management behaviors, improved understanding of disease management, and increased patient engagement in their care. Conclusion DSME significantly improves quality of life among patients with type 2 diabetes mellitus and can be considered an effective educational strategy in outpatient care settings.

Keywords: *Diabetes Mellitus, DSME, Quality Of Life, Self-Management, Patient Education*

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INTRODUCTION

Type 2 diabetes mellitus (T2DM) is one of the most prevalent chronic diseases worldwide and continues to increase in incidence due to population aging, urbanization, sedentary lifestyles, and dietary changes. The disease is associated with long-term complications such as cardiovascular disorders, neuropathy, nephropathy, and retinopathy, which significantly affect morbidity, mortality, and healthcare costs. Beyond clinical complications, diabetes also has a substantial impact on patients' psychological condition, social functioning, and overall quality of life, making comprehensive management essential (World Health Organization, 2023).

Quality of life has become an important outcome indicator in the management of chronic diseases, particularly in patients with diabetes mellitus. It reflects an individual's perception of their physical health, emotional well-being, social relationships, and functional capacity in daily life. Poor glycemic control, disease duration, and the presence of complications are known to contribute to reduced quality of life among individuals living with diabetes. Therefore, improving quality of life is not only a complementary outcome but also a primary goal in long-term diabetes care (Rubin & Peyrot, 1999).

Effective diabetes management requires active patient participation in self-care practices, including monitoring blood glucose levels, adhering to medication, maintaining a healthy diet, engaging in regular physical activity, and preventing complications. However, many patients experience difficulties in maintaining consistent self-management behaviors due to limited knowledge, lack of motivation, and insufficient support. This highlights the need for structured educational interventions that empower patients to actively participate in their treatment and decision-making processes (Powers et al., 2020).

Diabetes Self-Management Education (DSME) is a structured, evidence-based educational approach designed to equip individuals with the knowledge, skills, and confidence necessary to manage diabetes effectively. DSME supports informed decision-making, promotes self-care behaviors, enhances problem-solving abilities, and strengthens collaboration between patients and healthcare providers. The overall goal of DSME is to improve clinical outcomes, health status, and quality of life by fostering sustainable self-management practices (Anida et al., 2022).

Tesis Najwatussikha

Previous studies have shown that DSME can improve glycemic control, increase treatment adherence, reduce diabetes-related complications, and enhance psychological well-being. By increasing patients' understanding of their condition and promoting lifestyle modification, DSME plays a crucial role in supporting long-term disease management. Educational interventions that focus on self-efficacy and behavioral change are particularly important in helping patients maintain consistent self-care practices (Chrvala et al., 2016).

In Indonesia, the burden of type 2 diabetes continues to rise, and many patients rely on outpatient services for routine monitoring and treatment. Despite ongoing clinical management, patients often face challenges in maintaining optimal self-management behaviors, which may affect their quality of life. Structured educational programs such as DSME are expected to strengthen patient independence and improve disease outcomes. However, evidence regarding the effectiveness of DSME in improving quality of life among local patient populations remains limited, particularly in outpatient care settings.

Therefore, this study aimed to analyze the effect of Diabetes Self-Management Education on the quality of life of patients with type 2 diabetes mellitus in an outpatient clinic setting. The findings are expected to provide evidence to support the integration of structured educational interventions into routine diabetes care to improve patient well-being and long-term disease management outcomes.

METHODS

Study Design

This study employed a quasi-experimental design using a pretest–posttest control group approach to evaluate the effect of Diabetes Self-Management Education (DSME) on the quality of life of patients with type 2 diabetes mellitus. The design allowed for comparison of changes in outcomes between an intervention group receiving DSME and a control group receiving standard care, thereby strengthening causal inference regarding the effectiveness of the educational intervention.

Study Setting and Period

The study was conducted at the outpatient clinic of RSUD Majalengka, Indonesia. Data collection, intervention implementation, and evaluation were carried out over a three-month period from April to June 2025. The selection of this setting was based on the availability of a large population of patients with type 2 diabetes who regularly attend follow-up care at the clinic.

Population and Sample

The target population consisted of all patients diagnosed with type 2 diabetes mellitus receiving treatment at the outpatient clinic, totaling approximately 630 individuals. The sample size was calculated using a two-sample comparison formula with a significance level of 5% ($Z\alpha = 1.96$) and statistical power of 80% ($Z\beta = 0.84$). Based on the calculation, the required sample size was 106 participants, divided equally into two groups: 53 in the intervention group and 53 in the control group.

Participants were selected using purposive sampling, a non-probability sampling technique in which respondents were chosen based on eligibility criteria and accessibility during the study period.

Inclusion and Exclusion Criteria

Participants were included if they:

1. Had a confirmed diagnosis of type 2 diabetes mellitus.
2. Were receiving outpatient treatment at RSUD Majalengka.
3. Were willing to participate and provided informed consent.

Participants were excluded if they:

1. Had severe complications that limited participation.
2. Were unable to complete the questionnaire independently.

Intervention

The intervention consisted of a structured Diabetes Self-Management Education (DSME) program delivered to the experimental group. The program was conducted in four educational sessions covering:

1. Basic understanding of diabetes and blood glucose monitoring
2. Physical activity and foot care management
3. Nutritional management
4. Pharmacological therapy adherence

These sessions aimed to improve patient knowledge, enhance self-management skills, and promote behavioral change in managing diabetes.

The control group received standard outpatient care without structured DSME intervention.

Outcome Measurement

The primary outcome was quality of life, measured using the Diabetes Quality of Life (DQOL) questionnaire consisting of 26 items assessing physical, psychological, and social dimensions. Scores were categorized as:

- Good: 76–100
- Moderate: 50–75
- Poor: <50

Measurements were conducted twice:

- Pretest: Before intervention
- Posttest: After completion of DSME sessions

Data Collection Procedure

Data collection was assisted by trained research assistants who explained the study procedures and guided participants in completing demographic questionnaires and the DQOL instrument. All questionnaires were reviewed for completeness immediately after submission to ensure data quality and minimize missing responses.

Data Processing and Analysis

Data processing included editing, verification, and tabulation of responses. Quality-of-life scores were calculated using Microsoft Excel and subsequently analyzed using SPSS software.

The effectiveness of the intervention was evaluated by comparing:

- Within-group changes (pretest vs posttest)
- Between-group differences in score changes (delta values)

The intervention effect was determined by comparing the improvement in the intervention group with natural changes observed in the control group

RESULTS AND DISCUSSION

Table 1. Effect of DSME on Quality of Life in the Intervention Group (Pre–Post Analysis)

Variable	Mean Difference	SD	t-value	df	p-value
Quality of Life (Pre–Post)	-25.58	1.27	-145.79	52	0.000

The intervention group showed a substantial increase in quality-of-life scores after receiving Diabetes Self-Management Education (DSME). The mean difference of 25.58 points indicates a strong clinical improvement. The paired t-test demonstrated a highly significant effect ($p < 0.001$), confirming that DSME produced a meaningful enhancement in

patient-reported outcomes. The homogeneity test also indicated consistent variance within the group, supporting the reliability of the findings.

Table 2. Effect of DSME on Quality of Life in the Control Group (Pre–Post Analysis)

Variable	Mean Difference	SD	t-value	df	p-value
Quality of Life (Pre–Post)	-6.66	2.47	-19.61	52	0.000

The control group also showed a statistically significant improvement ($p < 0.001$), but the magnitude of change was considerably smaller than in the intervention group. The average improvement of 6.66 points suggests that routine care may contribute to minor natural improvement over time; however, this increase is substantially lower than the improvement observed following structured DSME exposure

Table 3. Comparison of Quality-of-Life Scores Between Intervention and Control Groups

Group	Mean Pretest	Mean Posttest	Delta (Δ)	t-value	p-value
Intervention	51.77	77.36	25.58	145.79	0.000
Control	51.64	58.30	6.66	19.61	0.000

At baseline, both groups had nearly identical mean quality-of-life scores, indicating good comparability. After the intervention, the intervention group showed a marked increase from 51.77 to 77.36, while the control group showed a modest rise from 51.64 to 58.30. The delta value demonstrates that the improvement in the intervention group was nearly four times greater than in the control group, providing strong evidence of the effectiveness of DSME in enhancing quality of life.

Table 4. Independent t-Test on Delta Score Between Groups

Group	Mean Delta	SD	t-value	p-value	Interpretation
Intervention	25.58	4.35	29.42	0.000	Significant
Control	6.66	2.92			

The independent t-test comparing the delta values between groups revealed a statistically significant difference ($p < 0.001$), confirming that the increase in quality of life in the intervention group was not due to chance. The effect size of improvement was substantially greater in the DSME group, demonstrating that structured self-management education is a strong determinant of improved patient well-being.

Discussion

The present study demonstrates that Diabetes Self-Management Education (DSME) significantly improves the quality of life among patients with type 2 diabetes mellitus. Participants who received the structured educational intervention showed a substantial increase in posttest scores compared with the control group. These findings indicate that structured self-management education plays an essential role in improving patients' physical, psychological, and social well-being. Improvements in quality of life following DSME are consistent with previous studies that reported enhanced patient outcomes through education-based behavioral interventions (Chrvala et al., 2016).

The marked improvement observed in the intervention group suggests that increased knowledge and awareness about diabetes management contribute to better self-care practices. DSME equips patients with essential skills such as glucose monitoring, dietary regulation, physical activity planning, and medication adherence. These skills support better metabolic control and reduce anxiety related to disease management. Educational interventions are known to improve patients' self-efficacy, which in turn strengthens their ability to manage chronic illness effectively (Powers et al., 2020).

The increase in quality-of-life scores in the control group, although smaller, may be attributed to routine clinical care, regular monitoring, and natural adaptation to living with diabetes. However, the magnitude of improvement in the intervention group was substantially higher, indicating that standard care alone is insufficient to produce optimal outcomes. Structured education provides additional

cognitive and behavioral reinforcement that supports sustained lifestyle modification and long-term disease management (Funnell et al., 2012).

The significant delta difference between the intervention and control groups highlights the effectiveness of DSME as a patient-centered intervention. The large effect size suggests that education-based approaches can lead to meaningful clinical and psychosocial benefits. This finding aligns with prior research showing that DSME significantly improves treatment adherence, self-management behaviors, and quality of life among individuals with chronic diseases, particularly diabetes mellitus (Azami et al., 2018).

From a behavioral perspective, DSME contributes to improved self-efficacy, motivation, and confidence in managing the disease. Patients who understand their condition tend to be more engaged in self-care practices and more consistent in following treatment recommendations. This active participation leads to improved health perception and psychological well-being, both of which are important determinants of quality of life (Bandura, 1997).

In addition, DSME promotes patient empowerment by shifting the role of patients from passive recipients of care to active participants in disease management. Empowerment-based education encourages patients to make informed decisions, solve problems related to their condition, and maintain healthier lifestyles. Studies have shown that empowerment-oriented diabetes education is associated with improved long-term health outcomes and enhanced quality of life (Anderson et al., 1995).

Another important factor that may explain the effectiveness of DSME is the structured and comprehensive nature of the intervention. The educational sessions addressed multiple aspects of diabetes management, including diet, physical activity, medication adherence, and glucose monitoring. A multidimensional approach is known to be more effective than single-component interventions because it targets various behavioral determinants simultaneously (Norris et al., 2002).

The findings of this study also reinforce the important role of nurses and healthcare professionals in delivering education-based interventions. Nurses are often the primary providers of patient education and play a key role in supporting behavioral change, improving patient understanding, and providing emotional support. Nurse-led DSME programs have been shown to improve patient engagement and self-care outcomes significantly (Peyrot et al., 2010).

From a public health perspective, DSME can serve as an effective and low-cost strategy to improve diabetes outcomes and reduce the burden of complications. By improving self-management behaviors and quality of life, educational interventions may help reduce hospitalization, disability, and healthcare costs associated with poorly controlled diabetes. The integration of DSME into routine outpatient care could therefore have a substantial impact on long-term disease management (World Health Organization, 2023).

Despite the positive findings, this study has several limitations that should be considered. The quasi-experimental design may limit causal inference compared to randomized controlled trials, and the use of purposive sampling may reduce generalizability. Additionally, the relatively short duration of observation may not fully capture long-term effects of DSME on quality of life and clinical outcomes. Future studies with larger samples and longer follow-up periods are recommended to confirm and expand these findings (Polit & Beck, 2017).

Overall, the results provide strong evidence that DSME is an effective intervention for improving quality of life among patients with type 2 diabetes mellitus. The consistent improvement across multiple dimensions suggests that structured education should be considered an essential component of diabetes management strategies in clinical practice.

CONCLUSSION

This study concludes that Diabetes Self-Management Education (DSME) is effective in improving the quality of life of patients with type 2 diabetes mellitus, as evidenced by a substantially greater increase in post-intervention quality-of-life scores in the intervention group compared with the control group, indicating that structured education enhances patients' knowledge, self-efficacy, and engagement in self-care behaviors; therefore, integrating DSME into routine outpatient diabetes services is recommended to support sustained self-management and patient-centered outcomes, while future studies with randomized designs and longer follow-up are needed to confirm long-term effects and broader generalizability

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