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THE EFFECTIVENESS OF DIABETES SELF-MANAGEMENT EDUCATION (DSME) ON THE SELF-CARE OF PATIENTS WITH DIABETIC FOOT ULCERS

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ABSTRACT
Diabetic foot ulcers are one of the chronic complications of diabetes mellitus (DM) that can lead to serious infections and even amputation. Poor self-care ability is a major risk factor in the development of chronic wounds among DM patients. The Diabetes Self-Management Education (DSME) intervention has been considered effective in improving patients' self-management abilities; however, contextual evidence in Indonesia remains limited. This study aimed to evaluate the effectiveness of DSME intervention in improving self-care abilities among patients with diabetic foot ulcers at RSUD Banjarmasin. The study employed a quasi-experimental design using a one group pre-test and post-test approach. A total of 30 patients were selected using total sampling. The DSME intervention was delivered over seven consecutive days through a structured, face-to-face educational approach. Self-care ability was measured using the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire before and after the intervention. Data were analyzed using a paired sample t-test. Prior to the intervention, the majority of respondents (70%) were categorized as having poor self-care. After the intervention, 80% of respondents were categorized as having good self-care. The paired sample t-test showed a significant difference in self-care scores before and after the DSME intervention ($p < 0.001$). The DSME intervention was effective in enhancing self-care abilities among patients with diabetic foot ulcers.

Keywords: diabetes mellitus; DSME; diabetic foot ulcers; education; self care

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INTRODUCTION

Diabetes mellitus (DM) is one of the most prevalent chronic diseases worldwide, characterized by elevated blood glucose levels resulting from impaired insulin secretion, insulin resistance, or both. This condition significantly contributes to global morbidity and mortality and leads to various serious complications, including diabetic foot ulcers, neuropathy, and cardiovascular disease (Hasankhani et al., 2023). The World Health Organization (2023) reported an increase in diabetes cases from 108 million in 1980 to more than 422 million in 2024, with the highest growth observed in developing countries such as Indonesia (Organization, 2023). According to the 2023 Riskesdas report, the prevalence of DM in Indonesia increased to 2.0% among individuals aged ≥15 years, with a higher prevalence among women. In South Kalimantan, the Health Department recorded 25,057 DM cases in 2024, indicating that diabetes remains a significant public health issue, particularly due to its complications such as diabetic foot ulcers (Zubir et al., 2024).

Diabetic foot ulcers are chronic wounds commonly found in the lower extremities due to peripheral neuropathy and vascular disorders. If not treated properly, they can lead to severe infections, amputations, and even death (Primadhi et al., 2023). patients struggle with self-care due to limited knowledge and skills in managing their condition, including wound care (Abidin, 2024). A high level of dependence on healthcare providers and family members slows down healing, increases complication risks, and adds to economic burdens (Yachmaneni Jr et al., 2023).

Conventional health education is often too general and fails to address the specific needs of DM patients, particularly in managing wounds and disease control. Therefore, a more structured and focused educational approach is necessary. One effective educational intervention is Diabetes Self-Management Education (DSME), defined as a process that facilitates the knowledge, skills, and abilities required for individuals to manage diabetes independently (Gerber et al., 2023).

DSME has been proven to improve patients' understanding of their condition, promote healthy behaviors, and reduce the risk of long-term complications. The program includes key components such as blood glucose monitoring, foot care, dietary management, physical activity, and adherence to therapy (Indriyani et al., 2023). With a patient-centered and collaborative approach, DSME strengthens self-care capacity and improves overall quality of life. Several previous studies have shown the benefits of DSME in improving blood glucose control and reducing stress among DM patients. However, research specifically evaluating the effectiveness of DSME on self-care ability in patients with diabetic foot ulcers remains limited, especially in Indonesia (Ernawati et al., 2021). This gap highlights the need for contextual and empirical studies.

This study was conducted to address that gap by examining the effect of DSME on self-care ability in patients with diabetic foot ulcers at RSUD Banjarmasin. The intervention was carried out intensively over one week using a structured procedure that included educational sessions, independent practice, and evaluation using the standardized instrument, the Summary of Diabetes Self-Care Activities (SDSCA). This tool measures patient engagement in self-care activities such as dietary management, exercise, foot care, and blood glucose monitoring (Lee et al., 2020). This study holds significant urgency given the high incidence of diabetic foot ulcers, which can be prevented through appropriate education. Implementing DSME as an evidence-based educational approach is expected to serve as an effective strategy in nursing practice to reduce wound-related complications, accelerate healing, and enhance patient quality of life. Therefore, the main objective of this study is to analyze the effect of DSME on the self-care ability of patients with diabetic foot ulcers. The results of this study are expected to provide practical recommendations for healthcare providers in delivering DSME-based educational interventions and serve as a foundation for the development of more comprehensive and sustainable diabetes care policies.

METHOD

This study employed a quasi-experimental design with a one group pre-test and post-test approach to evaluate the effectiveness of Diabetes Self-Management Education (DSME) in improving self-care ability among patients with diabetic foot ulcers. The study was conducted at the Diabetic Foot Clinic of RSUD Banjarmasin. A total of 30 patients were recruited using total sampling from those who met the inclusion criteria: diagnosed with diabetes mellitus, aged ≥40 years, presenting with diabetic foot ulcers, and willing to participate by signing an informed consent form. Data collection was carried out in three phases: pre-test, intervention, and post-test. In the pre-test phase, all respondents completed the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire to assess their baseline self-care ability. The DSME intervention was then delivered over seven consecutive days using a structured educational method in a face-to-face setting at the clinic’s education room. Each session lasted approximately 30–45 minutes.

The educational material covered five main topics: (1) introduction to diabetes and its complications, (2) foot and wound care techniques, (3) blood glucose monitoring, (4) dietary and physical activity management, and (5) medication adherence and family support. The delivery methods included interactive lectures, educational leaflets, live demonstrations, and

group discussions to enhance participant understanding. Evaluations were conducted at the end of each session to ensure active engagement. Following the completion of the intervention, respondents retook the SDSCA questionnaire during the post-test phase. Data were analyzed using a paired sample t-test to compare pre-test and post-test results. This study was approved by the Ethics Committee of Banua Institute Num: 031/BAIN/EC/II/2025.

RESULT

Table 1.
Respondent Characteristics (n=30)

No	Characteristic	Category	Total	
			Frequency (n)	Percentage (%)
1	Gender	Male	18	60.0%
		Female	12	40.0%
2	Age (years)	40-49	6	20.0%
		50-59	14	46.7%
		60-69	7	23.3%
		≥70	3	10.0%
3	Education Level	Junior High School	5	16.7%
		Senior High School	17	56.7%
		Higher Education	8	26.6%
4	Duration of Having DM	≤3 years	8	26.7%
		>3 years	22	73.3%

Table 1 presents the characteristics of the respondents (n = 30). Most participants were aged 50–59 years (46.7%), indicating that diabetes-related complications such as diabetic foot ulcers are more prevalent among older adults. The majority were male (60%) and had completed senior high school (56.7%), factors that may influence their understanding and self-care practices. In addition, most respondents (73.3%) had been living with diabetes for more than three years, increasing the risk of chronic complications such as diabetic foot ulcers.

Table 2.
Self-Care Level Before DSME Intervention (n = 30)

Self-Care Level	f	%
Good	9	30
Poor	21	70

Table 2 shows the self-care levels of patients prior to the DSME intervention (n = 30). It was found that the majority of respondents (70%) had poor self-care abilities before the intervention. This reflects a lack of knowledge and skills in diabetes self-management and highlights the need for structured educational interventions to improve patient self-care capacities.

Table 3.
Self-Care Level After DSME Intervention (n = 30)

Self-Care Level	f	%
Good	24	80
Poor	6	20

Table 3 presents the self-care levels after the DSME intervention. A significant improvement was observed, with 80% of respondents classified as having good self-care abilities. This indicates that DSME is effective in enhancing patient understanding and self-care practices for those with diabetic foot ulcers.

Table 4.
Effectiveness of DSME on Self-Care in Patients with Diabetic Foot Ulcers (n = 30)

Variable	Mean	Std. Deviation	n	t	Sig. (2-tailed)
Self-Care Pretest	1.70	0.466	30		
Self-Care Post-test	1.23	0.430	30	6.123	<0.001

Table 4 shows the effectiveness of DSME on self-care. The paired sample t-test revealed a significant difference in self-care scores before and after the intervention, with a p-value < 0.001. This suggests that DSME had a statistically significant positive effect on improving self-care among patients with diabetic foot ulcers.

DISCUSSION

This study aimed to evaluate the effectiveness of Diabetes Self-Management Education (DSME) in improving self-care abilities among patients with diabetic foot ulcers. The findings showed a statistically significant improvement in self-care following the intervention, indicating that structured educational approaches can meaningfully enhance patient awareness, skills, and adherence in managing chronic conditions like diabetes. In terms of respondent characteristics (Table 1), most participants were aged 50–59, male, with a high school education, and had been living with diabetes for more than three years. Increasing age is associated with metabolic and vascular decline, worsening wound healing (Motuma et al., 2025; Ousey et al., 2022). Longer duration of diabetes also increases the risk of nerve damage and microangiopathy, contributing to ulcer development (Saluja et al., 2020).

Before the intervention, most participants had poor self-care, suggesting low awareness and knowledge of self-management. According to (Islam et al., 2023), low health literacy among DM patients correlates with limited ability to engage in foot care, dietary regulation, and glucose monitoring. A lack of ongoing education and access to information further hinders self-care, especially in resource-limited primary care settings. After receiving a seven-day DSME intervention, a significant improvement in self-care was recorded. Most participants were reclassified as having good self-care, demonstrating that a systematic, interactive educational approach can effectively enhance patient behavior. (Gathu et al., 2018) also found that DSME-based education improved medication adherence, foot care, and physical activity among DM patients.

The DSME program in this study covered five essential components: dietary management, physical activity, blood glucose monitoring, medication adherence, and foot care. This aligns with the educational model recommended by the International Diabetes Federation and the American Diabetes Association (Educators, 2020), which emphasizes practical, patient-centered education. Practice-based training, such as foot care demonstrations and glucose recording, offers hands-on experience that enhances understanding and applicability (Ali et al., 2024). The paired sample t-test yielded a highly significant result ($p < 0.001$), reinforcing the conclusion that the improvement was not due to chance. Similar findings were reported by (Caro-Bautista et al., 2020), who noted a significant increase in SDSCA scores after a two-week DSME intervention in Indonesia. Even over a relatively short period, structured DSME can yield measurable outcomes.

The most notable impovements were seen in foot care and glucose monitoring—areas that were previously the weakest. This aligns with (Martínez-Sánchez et al., 2021), who found that diabetic patients often neglect foot care due to a lack of understanding about the importance of daily foot inspection in preventing wounds and amputations. Hands-on education and practical training raise awareness of early warning signs and equip patients with simple preventive measures. Family support was another key success factor in this study. Several participants received assistance in the form of medication reminders, physical help, and the

provision of healthy meals. This is consistent with (Abdulkareem, n.d.), who reported that social support from family contributes to sustained self-care behavior among diabetic patients. This study confirms that DSME-based education is not only effective in increasing knowledge but also in enhancing practical skills and patient self-efficacy. Participatory, experience-based learning supported by visual aids or demonstrations is more accessible and acceptable, especially for patients with a moderate educational background (Della Pepa et al., 2021). Therefore, this intervention is particularly relevant for primary healthcare settings in Indonesia, which serve diverse communities with varying educational and socioeconomic backgrounds.

The limitations of this study include the absence of long-term evaluation to assess the sustainability of behavior change and the reliance on self-reported questionnaires, which may introduce response bias. Future studies should consider longitudinal designs and objective clinical measures such as HbA1c or wound healing progress to gain a more comprehensive view. Community-based DSME programs implemented regularly are also recommended to ensure long-term educational impact. Overall, this study strengthens the evidence that DSME is an effective and applicable educational intervention for improving self-care in diabetic patients, particularly those with wound-related complications. Implementing DSME as part of routine nursing care in both hospitals and primary health centers is a strategic step toward reducing complications and improving patient quality of life. This aligns with the principle of patient empowerment, which emphasizes giving patients control over their health through enhanced knowledge and skills.

CONCLUSION

This study demonstrates that Diabetes Self-Management Education (DSME) is an effective educational intervention for improving self-care abilities in patients with diabetes mellitus and diabetic foot ulcers. A statistically significant improvement was observed in self-care scores following the DSME intervention, particularly in the areas of dietary management, blood glucose monitoring, medication adherence, physical activity, and foot care. These findings suggest that structured education delivered directly and using participatory, practice-based methods can enhance patients' understanding and skills in managing chronic conditions independently.

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