

**Review**

**Does Education Influence Self Care Management in Diabetes Mellitus Patients? : Systematic Review**

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**ABSTRACT**

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**Keywords:**


Health Education, Self-care, Diabetes mellitus

**Background:** Diabetes mellitus is a major health problem in society. Indonesia ranks 7th out of 10 countries—metabolic disorders in the body cause diabetes. Several factors also influence the occurrence of diabetes mellitus, including genetic factors, age, and lifestyle (eating patterns and daily activities). This research aims to determine the effect of health education on self-care management in type 2 diabetes mellitus patients.

**Methods:** The method used in this research is a systematic review with systematic reviews (PRISMA) using several journal databases from Google Scholar, Science Direct, and Pubmed. from 2020-2024 with the keywords "Diabetes mellitus," "health education," or "self-care management." Articles that are ready to be reviewed are ten articles obtained using PRISMA.

**Results:** The results of a systematic review study show that providing diabetes self-management education has an influence on self-care management in patients with type 2 diabetes mellitus.


**Conclusion:** It is hoped that the presence of diabetes self-management education will increase knowledge and change the individual's mindset so that they can care themselves and prevent complications and will improve their quality of life

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
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**Introduction**

Diabetes Mellitus (DM) is a chronic disease whose number of sufferers is increasing from year to year. Diabetes Mellitus is a complex metabolic disorder characterized by high blood glucose levels resulting in impaired insulin secretion, function, or both. (Bukhari et al., 2023) . Indonesia is ranked 7th out of 10 countries with the highest diabetes cases in the world. Based on WHO data, it is estimated that type 2 diabetes mellitus in Indonesia

will increase to 21.3 million people in 2030 (Ministry of Health, 2020). Based on 2018 Health research data, it is known that people living with type 2 diabetes increased with a prevalence of 6.9% in 2013 and amounting to 8.5% in 2018. East Java ranks 5th with the highest number of people living with diabetes in Indonesia, with a percentage of 2.02% or 98,566 people (Wahyuningsih et al., 2023) .

In general, diabetes is caused by metabolic disorders in the body. Several



factors also influence the occurrence of diabetes mellitus, including genetic factors, age, lifestyle (eating patterns and daily activities). Diabetes mellitus is a type of chronic disease, which means that this disease cannot be cured but can be controlled so that it does not cause various complications that get worse and threaten the sufferer's life. (Muzhaffarah et al., 2024) . The complications most often faced by people living with diabetes are neuropathy, retinopathy, proteinuria, kidney failure, heart disease and even death (V. W. Astuti, Yusiana, Richard, & Suwardianto, 2021; Noviyanti & Rahman, 2021; Suwardianto, Andynugroho, & YC, 2016). Efforts to prevent complications in DM sufferers can be done with holistic management and lifelong self-care. According to Parkeni, there are 4 important pillars in improving the quality of life of DM sufferers, including education, fitness training, diet and treatment (Kartika *et al.*, 2021) . Effective education is provided to DM patients by means of *health education* by providing education to teach patients knowledge

about self-care which aims to maximize metabolism, prevent disease complications and improve quality of life. With this *health education* , patients will gain sufficient knowledge to control blood sugar, help reduce stress in order to get a better quality of life and optimal health (Rahayu, 2022) . *Health education* helps patients maintain and improve their health, prevent the onset of disease, and make full use of the patient's functions and roles during illness and helps patients and families overcome health problems. Education about diabetes treatment is also very important because it can influence the patient's lifestyle in treating the disease (Jamaludin, 2023)

## Methods

### Study Design

This research article uses a systematic review design with standard Systematic Review and Meta Analysis (PRISMA) used to conduct a systematic review.

### Eligibility Criteria

The criteria used in writing this article use PICO ( *Population, Intervention, Comparison, Outcome* ) to develop eligibility criteria for inclusion and exclusion criteria from randomized research reviews.

here are some criteria:

Criteria	Inclusion	Exclusion
Population	Type 2 diabetes mellitus patients	Apart from type 2 diabetes mellitus patients
Intervention	Health education about <i>self-management</i>	-
Comparison	Do not use comparison factors	-
Outcomes	<i>Self-care management</i>	-
Study design and type of publication	All research designs	Systematic review
Year of publication	2020-2024	< 2020

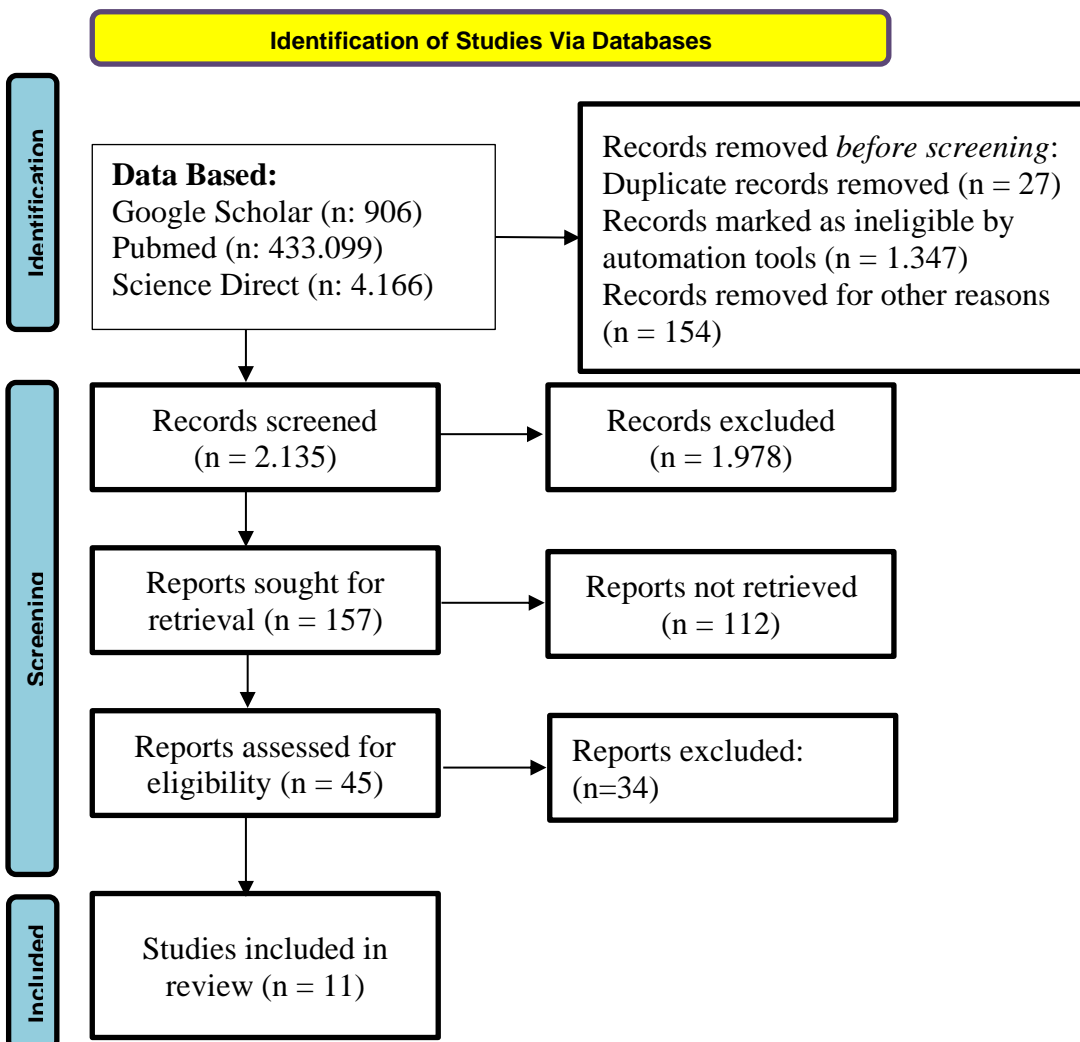
Language	English	other than English
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### Search Strategy

The databases used in writing this systematic review are Google Scholar, Scientific Direct, and Pubmed. Article searches were carried out systematically from 2020-2024 using several keywords, namely " *Diabetes mellitus* ", or " *health education* ", or " *self-management* ", or " *self-care management* ", or " *quality of life* ". Search for articles in English.

### Study Selection and Synthesis

The article feasibility study was carried out by reviewing articles with full text. Articles deemed appropriate will be used in this literature, the process and results of article selection are presented in the PRISMA diagram diagram 1. Based on the journal database search results, results were obtained from *Google Scholar* (906 articles), *Pubmed* (633,099 articles), *Science Direct* (4,166 articles), then selected according to the inclusion and exclusion criteria, 10 articles were obtained.



## Results

Tabel 1. Literatur review

No	Journal	Method	Results
1	Effectiveness of Family Empowerment Therapy Based on Self-Compassion on Self-Care and Glycosylated Hemoglobin in Female Patients with Type 2 Diabetes Mellitus: A Randomized Controlled Clinical Trial (Rahmani & Mansoobifar, 2020)	<p><b>Design:</b> Randomize control</p> <p><b>Sample:</b> 60 (30 control group and 30 intervention group)</p> <p><b>Variables:</b></p> <p>Independent: Family Empowerment Therapy</p> <p>Dependent: self compassion, self care and Glycosylated Hemoglobin</p> <p><b>Instrument:</b> Summary of Diabetes Self-Care Activities (SDSCA) and intervention protocols and procedures</p> <p><b>Analysis:</b> repeated MANOVA and Bronfoni post hoc test</p>	<p>The results of the study stated that the results of the repeated measurements analysis of variance showed significant differences in whether the intervention was given between the experimental and control groups regarding self-care.</p> <p>The results of the Bronphony test showed that at the pretest stage there were no significant differences between the two groups in self-care (p=0.447) and glycosylated hemoglobin (p=0.887). However, at the post-test and follow-up stages, both groups showed different results. significant differed regarding self-care (P=0.001) and glycosylated hemoglobin (P=0.001), implying the effectiveness of the intervention</p>
2	The Influence of Family Caregiver Knowledge and Behavior on Elderly Diabetic Patients' Quality of Life in Northern Thailand (Thongduang et al., 2022) .	<p><b>Design:</b> cross sectional</p> <p><b>Sample:</b> 354 people</p> <p><b>Variables:</b></p> <p>Independent: Family Caregiver Knowledge and Behavior</p> <p>Dependent: Elderly Diabetic Patients' Quality of Life</p> <p><b>Instruments:</b> Activities in Daily Living (ADL), Diabetes Knowledge Scale (SDKS), Diabetes Self-Management Questionnaire (DSMQ), World Health Organization Quality of Life in Older People (WHOQOL-OLD)</p> <p><b>Analysis:</b> ANOVA</p>	<ul style="list-style-type: none"> <li>- The results showed a moderate level of quality of life in elderly diabetes patients. According to simple linear regression analysis, quality of life scores in elderly DM patients are related to knowledge, self-care behaviors, nurse knowledge, supportive behavior from companions.</li> <li>- Nurses' adequate diabetes knowledge and appropriate supportive behavior can impact the quality of life of elderly diabetes patients</li> </ul>
3	Analysis of factors Affecting Self Management in Type 2 Diabetes	<p><b>Design:</b> Descriptive correlation</p> <p><b>Sample:</b> 80 people</p>	<ul style="list-style-type: none"> <li>- The research results show that there is a significant relationship between the</li> </ul>

No	Journal	Method	Results
	mellitus Patients (Hidayanti, Nurhayati, Sari, & Rustini, 2023)	<p><b>Variable:</b>                      independent: : Affecting self management                      dependent : diabetes mellitus type 2</p> <p><b>Instrument:</b> DKT (Diabetes Knowledge Test)                      Summary of Diabetes Self-Care Activities (SDSCA)                      Diabetes Management Self Efficacy (DMSES)                      Diabetes self-management questionnaire (DSMQ)</p> <p><b>Analysis:</b> Spearman rank test</p>	<p>level of knowledge and self-management with a coefficient value (r=0.576)</p> <ul style="list-style-type: none"> <li>- There is a significant relationship between activity ability and self-management with a coefficient value (r=0.612)</li> <li>- There is a significant relationship between self-efficacy and self-management with a coefficient value (r=0.660)</li> </ul>
4	Evaluation of self-care training in adolescents with type 1 Diabetes at the Iranian Diabetes Association (Neda, Zahra, Asadollah, & Zaha, 2020)	<p><b>Design:</b> Randomized clinical trial</p> <p><b>Sample:</b> 90 people divided into 3 groups (30 control group, 30 family centered training group, and 30 peer centered training group)</p> <p><b>Variable:</b>                      Independent: Family Centered training and peer centered training                      Dependent: Self care of adolescents with type 1 Diabetes</p> <p><b>Instrument:</b> a self-care questionnaire for adolescents with type 1 diabetes</p> <p><b>Analysis:</b> ANOVA, paired-t, chi square, Fisher Exact test</p>	<ul style="list-style-type: none"> <li>- The results of the ANOVA test at the Diabetes Association showed that the mean self-care score was not significantly different between the three groups before the intervention (P = 0.971)</li> <li>- after the intervention, self-care showed significant differences between the three groups (P&lt;0.001).</li> <li>- Tukey's comparison test showed no significance between the peer training group and the family training group (P = 0.0844),</li> <li>- Teaching self-care behavior by family and peers can be useful to help control diabetes in patients and reduce complications in diabetes patients</li> </ul>
5	Family Empowerment Method Modern Dressing Based to Increase Diabetes Mellitus Patients with Diabetic Ulcer (Sumara, Wijaya, Priyantini, Anandita, & Ofarisma, 2023)	<p><b>Design:</b> Utilized pre-experimental</p> <p><b>Sample:</b> 53 respondents</p> <p><b>Variables:</b>                      Independent: Family Empowerment                      Dependent: Increase Diabetes Mellitus Patients</p> <p><b>Instruments:</b>                      The World Health Organization Quality of Life (WHQOL)</p> <p><b>Analysis:</b> Wilcoxon</p>	<p>After treatment with the family empowerment method , good quality of life increased to 28 respondents. moderate quality of life became 7 respondents and very good quality of life increased by 18 respondents</p>

No	Journal	Method	Results
6	The Effect of Modified Diabetes Self Management Education and Support on Self-care and Quality of Life among Patients with Diabetic Foot Ulcers in Rural Areas of Indonesia (Damhud, Kortia, & Christiantio Effendie, 2021)	<p><b>Design:</b> Quasy experiment</p> <p><b>Sample:</b> 60 respondents (30 intervention group and 30 control group)</p> <p><b>Variable:</b> Independent: Diabetes self management education and support Dependent: Self care and Quality of life</p> <p><b>Instruments:</b> Diabetes Foot Self-care behavior Scale (DFSCBS)</p> <p><b>Analysis:</b> <i>Difference in Differences (DiD)</i></p>	analysis of the results showed that the adapted DSMES was more effective than standard care in improving self-care and quality of life as well as reducing the degree of DFU ( diabetic foot ulcer ) in a sample of Indonesian people with DFU, both immediately after and 3 months after the intervention
7	The Effect of the Family-Centered Empowerment Model on Family Functioning in Type 1 Diabetic Children: A Quasi-experimental Study (Ghaljaei et al., 2022) .	<p><b>Design:</b> Quasy Experiment</p> <p><b>Sample:</b> 80 people divided into 2 groups (40 intervention group and 40 control group)</p> <p><b>Variable:</b> Independent: Effect of the Family-Centered Empowerment Model Dependent: Family Functioning in Type 1 Diabetic Children</p> <p><b>Instrument:</b> family assessment device (FAD)</p> <p><b>Analysis:</b> ANOVA</p>	Mean family functioning scores were not significantly different between the intervention group and the control group before intervention. However, the two groups showed significant differences in family functioning with scores of one and a half and 3, respectively months after intervention ( $P < 0.001$ )
8	Effects of diabetes self-management education program on lowering blood glucose levels, stress, and quality of life among females with type 2 diabetes mellitus in Thailand (Nooseisai et al., 2021) .	<p><b>Design:</b> Quasy Experiment</p> <p><b>Sample:</b> 77 respondents divided into 2 groups (38 control group and 39 intervention group)</p> <p><b>Variable:</b> Independent: Effects of diabetes self-management education program Dependents: lowering blood glucose levels, stress, and quality of life</p> <p><b>Instruments:</b> World Health Organization Quality of Life-BREF (WHOQOL-BREF) item-objective congruence (IOC) Stress Test-20 (SPST - 20)</p> <p><b>Analysis:</b> Difference and difference (DID),</p>	<ul style="list-style-type: none"> <li>- The results of the study showed that before the intervention was carried out there were no significant differences in the control and intervention groups, but after the intervention there were substantial changes between the control and intervention groups in HbA1c, stress levels and quality of life in T2DM patients (<math>p=0.001</math>)</li> <li>- DSME had positive effects on reducing blood glucose levels, reducing stress, and improving quality of life in female patients with type 2 diabetes during this limited period.</li> </ul>

No	Journal	Method	Results
9	Effect of Empowerment Model -Based Program on Quality of Life in Patients with Type 2 Diabetes: A Randomized Controlled Trial (Ebrahimi et al., 2023) .	<b>Design:</b> Randomize control <b>Sample:</b> 106 respondents divided into 2 groups (53 intervention group and 53 control group) <b>Variables:</b> Independent: Empowerment Model -Based Program Dependent: Quality of Life in Patients with Type 2 Diabetes <b>Instruments:</b> diabetic clients QOL (DCQOL) <b>Analysis:</b> Paired t-test	after intervention, there is significant differences between the two groups in terms of physical (p = 0.003), mental (p = 0.002), social (p=0.013), economic (p=0.042), quality of life disease and treatment dimensions (p=0.033), as well as total quality of life score (p = 0.011)
10	The Effect of DiabetesManagement Shared Care Clinic on Glycated Hemoglobin A1c Compliance and Self-Management Abilities in Patients with Type 2 Diabetes Mellitus (Jiang et al., 2023)	<b>Design:</b> prospective cohort study <b>Sample:</b> 124 respondents <b>Variable:</b> Independent: Effect of DiabetesManagement Shared Care Clinic Dependent: Glycated Hemoglobin A1c Compliance and Self-Management Abilities <b>Instrument:</b> Summary of Diabetes Self-Care Activities-6 (SDSCA-6), Diabetes Empowerment Scale-Diabetes Attitudes, Wishes, and Needs Short Form (DES-DSF), Problem Areas in Diabetes Scale – Five-item Short Form (PAID- 5) <b>Analysis:</b> Shapiro-Wilk (Shapiro-Wilk normality, S-W) test	- After DMSCC diabetes management, the mean HbA1c decreased and the HbA1c compliance rate increased significantly (P < 0.01). - SDSCA-6 showed significant improvements in physical activity, glycemic monitoring, smoking (P < 0.01), and medication taking (P < 0.05). - DES-DSF demonstrated greater willingness to try to treat diabetes effectively (P < 0.05). PAID-5 indicated significant improvement in diabetes-related emotional distress.
11	Health-related quality of life in Diabetes Mellitus Patients in Primary Health Care (Galán et al., 2021)	<b>Design:</b> Cross sectional <b>Sample:</b> 60 respondents <b>Variable:</b> Independent: Health-related quality of life Dependent: Diabetes Mellitus Patients in Primary Health Care <b>Instrument:</b> Health-related quality of life (HRQoL) <b>Analysis:</b> ANOVA	- Of the 60 patients, 55% of women had type 2 diabetes, women aged over 75 years showed a worse quality of life than the intervention group. Health education can improve the quality of life of diabetes mellitus patients

## Discussion

Self Care Management in Diabetes Mellitus is an action taken by individuals to manage DM disease, in the form of treatment and prevention of

complications. The better the self-care management of DM, the better the blood sugar levels will be controlled and ultimately complications can be prevented, thereby improving the quality



of life for DM sufferers (Saragih et al., 2024).

Quality of Life is an individual assessment regarding the health condition they are experiencing. Based on opinion (Behboodi, Fereidooni, Saffari, & Montazeri, 2018). Quality of life can be defined as a conceptual measure to assess the impact of therapy given to patients with chronic diseases. Quality of life requires special attention because it is closely related to a person's health status, severity of disease, level of morbidity and mortality, length of recovery and can worsen disease conditions which can then result in death if a person's quality of life is in poor condition. Quality of life in diabetes patients is always associated with good self-care management skills and ultimately can prevent recurrence and complications (Sitanggang et al., 2023).

Research (Rahmani & Mansoobifar, 2020) showed significant results that the control group and intervention group on self-care and glycosylated hemoglobin achieved results ( $p=0.001 < 0.05$ ), which means that the results of this study revealed that family empowerment therapy was based on self-compassion. can be done effectively in improving self-care and reducing glycosylated hemoglobin in women with type 2 diabetes. Research (Damhud et al., 2021) shows the results that modified DSMES is more effective compared to standard care in improving self-care and quality of life and reducing the degree of DFU (diabetic foot ulcer) in a sample of Indonesian people with good DFU quickly improved within 3 months after the intervention. Research from (Nooseisai et al., 2021) shows that before the intervention was carried out in the control and intervention groups there were no

significant differences, but after the intervention there were substantial changes between the control and intervention groups in HbA1c, stress levels, and quality of life in T2DM patients with ( $p \text{ value} = 0.001 < 0.005$ ) diabetes self-management education has a positive effect on reducing blood glucose levels, reducing stress, and improving quality of life in female patients with type 2 diabetes. Research (Jiang et al., 2023) shows that after being given the intervention diabetes management using DMSCC (Diabetes management shared care clinic), the average HbA1c decreased and the level of HbA1c compliance increased significantly ( $P < 0.01$ ), using SDSCA-6 (Summary of Diabetes Self-Care Activities-6) showed an increase in physical activity, glycemic monitoring, smoking ( $P < 0.01$ ), and taking medication ( $P < 0.05$ ), using DES-DSF (Diabetes Empowerment Scale-DAWN Short Form) showed a greater willingness to try treatment diabetes effectively ( $P < 0.05$ ) and using PAID-5 (Problem Areas in Diabetes Scale) showed significant improvement in emotional distress related to diabetes.

Education is an effective form of education given to patients because it can increase patient knowledge, attitudes and behavior in carrying out self-care. Education provided with diabetes self-management education can increase knowledge, skills and abilities in carrying out self-care for diabetes patients, apart from that patient education can help patients make decisions about goals, beliefs and motivation related to treatment. This DSME uses education, counseling and behavioral intervention methods to increase knowledge about diabetes and improve individual and family skills in dealing with diabetes



(Astuti, 2024). Providing DSME also aims to support decision making, self-care, problem solving, and collaboration with health workers to improve clinical outcomes, health status, and quality of life. People living with Diabetes are expected to be more independent in their treatment by planning their diet, regularly monitoring blood glucose levels, exercising and getting enough rest, being able to manage stress well and taking medication correctly (Sudirman & Moedjo, 2021). Health education can improve a person's ability to enhance cognitive abilities, skills and attitudes in carrying out self-care for people living with diabetes (Yuliana, 2021).

It is hoped that providing health education to diabetes mellitus patients will improve sleep care management and quality of life because they have gained a comprehensive understanding of diabetes mellitus and its management. Apart from that, it is essential to provide support from the family during treatment and care. They need to be empowered to address psychological well-being to improve coping mechanisms and reduce stress or depression during the patient's illness.

## Conclusion

Systematic review is a method used to identify, evaluate and interpret research evidence in order to answer specific research problems. Based on the systematic review study that has been carried out, it can be concluded that diabetes self-management education has an effect on self-care management in diabetes mellitus patients.

## Authors Contributions

Throughout the process of conducting this literature review, each author made

significant contributions: one author conceptualized the study scope, developed search strategies, and performed systematic literature searches across multiple databases; another author critically appraised the selected literature, synthesized vital findings, and identified thematic patterns and research gaps; while a third author meticulously drafted and revised the manuscript, ensuring alignment with research objectives, and incorporating feedback from co-authors.

## Conflicts of Interest

We confirm that all authors involved in this study have declared that there are no conflicts of interest that could have influenced the research outcomes, ensuring that the study was performed with the highest standards of scientific integrity.

## Acknowledgment

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