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EFFECTIVENESS OF DIABETES SELF MANAGEMENT EDUCATION ON LIFESTYLE IN TYPE 2 DIABETES MELLITUS PATIENTS: A LITERATURE REVIEW

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ABSTRACT
Diabetes Self-Management Education (DSME) is an act of nursing that facilitates knowledge, skills, and abilities. The purpose of DSME is to change the lifestyle of diabetic patients, especially in controlling blood glucose levels. In 2021, the International Diabetes Federation noted that the global prevalence of diabetes reached 10% (537 million people). Objective to ascertain the effectiveness of diabetes self-management education (DSME) on type 2 DM patients' lifestyle. Thematic analysis method, a simplified approach is the method used in this literature review. The articles used were obtained through searching articles form several databases such as Google Scholar, MEDLINE, and PUBMED, using the keywords "DSME AND T2DM AND lifestyle" and "DSME AND DMT2 AND lifestyle". selection of articles using the PRISMA flow diagram. The article was analyzed using JBI Critical Appraisal Checklist tools for RCT and quasi-experiments. Based on the literature review's results of seven articles show that diabetes self-management education (DSME) is effective for lifestyle changes in type 2 DM patients in terms of time, procedure, patient characteristics, and combination of actions. Diabetes Self-Management Education (DSME) helps the type 2 diabetes patients to modify their lifestyle.

Keywords: DSME; lifestyle; T2DM

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INTRODUCTION

Diabetes mellitus (DM) is a condition in which the body experiences an inability to absorb carbohydrates, fats, and proteins that causes high blood sugar levels, which is commonly known as hyperglycemia (Maria, 2021; Pearson, 2019). Diabetes mellitus type 2 (DMT2) is a group of metabolic diseases characterized by hyperglycemia; this condition occurs due to abnormalities in insulin secretion or insulin action or both. Type 2 diabetes mellitus occurs due to peripheral insulin resistance, progressive defects in insulin secretion, and also, gluconeogenesis increased. There is a risk that sufferers of type 2 DM, namely heart disease, and have blood vessels two to four times higher than people who are not diabetics (Decroli, 2019). According to data from the International Diabetes Federation in 2021 the global prevalence of diabetes will reach 10.5% (537 million people) with nearly half of adults with diabetes undiagnosed. Based on Data from the World Diabetes Foundation shows that from 2014 until now, as many as 382 million of people in Indonesia have diabetes Mellitus. Diabetes mellitus is the seven cause of death in the world. Cases of type 2 Diabetes mellitus can reach as much as 85–90% (Bustan, 2015). The World Health Organization in 2018 said that high blood glucose levels caused the deaths of around 2.2 million people in 2012. The

population aged at least 18 years had diabetes mellitus as high as 8.5% in According to RISKESDAS (2018). Diabetes mellitus cases reached 20.4 million people, or around 8.5% People suffering from Diabetes in Indonesia has increased by 6.9% in 2013, an increase of 8.5% in 2018 (Kemenkes, 2018).

Type 2 DM is influenced by environmental factors such as obesity, an unhealthy lifestyle, an inappropriate diet (high in carbohydrates) (Maria, 2021; Izzo et al, 2021). According to American Diabetes Association (2013) Diabetes Mellitus has two complications, namely in the short term and also in the long term. In the short term, the complications that arise are hypoglycemia, diabetic ketoacidosis, and syndrome Nonketotic hyperosmolar hyperglycemia (HHNK). Meanwhile, the complications that arise in the long term are microvascular, macrovascular, neuropathy, diabetic, prone to infection, and feet diabetic (Faselis et al, 2020; Viigimaa et al, 2020). Based on the explanation above, an intervention is needed to provide treatment to patients with diabetes mellitus. Type 2 DM has four main pillars that become its management process, including education, medical nutrition therapy, physical exercise, and pharmacological intervention (Wayan et al., 2015). One of the 4 pillars that has an important role in handling type 2 DM is education. Providing education to patients Type 2 DM aims to increase knowledge andskills so that they have a preventive attitude in managing your lifestyle to prevent complications of type 2 DM. One of the interventions that can be done for cases of diabetes mellitus.

Diabetes Self-Management Education (DSME) is a continuous intervention with the aim of becoming a provider of knowledge, skills, and abilities needed by patients with diabetes mellitus (Davis et al, 2022). In administering the DSME intervention, the patient becomes the focus and center. The care provided must also be appropriate and responsive to individual patient's preferences, needs, and values (Mendez, 2022). There are several types of DSME interventions, including behavioral, educational, and psychosocial, or clinical. Diabetes self-management education (DSME) aims to be a support for diabetes patients in terms of decision-making and self-care behavior, problem solving, and collaboration with other healthcare teams to achieve clinical outcomes, health status, and quality of life good (Powers et al., 2015). Patients with Diabetes mellitus who are given education about self-care behavior will change his lifestyle so that patients can comply with self-care, especially in maintaining their lifestyle (Olesen, 2020). The author has not found a literature review that discusses research results specifically regarding lifestyle in type 2 DM patients (Hermanns, 2020). Based on the reasons above, the author is interested in conducting a literature review regarding the effectiveness of diabetes self-management education (DSME) on lifestyle in patients with Type 2 DM to summarize and draw conclusions regarding interventions given to patients with Type 2 DM. Therefore, the purpose of this study are analyzing the effectiveness of diabetes self-management education (DSME) on lifestyle in patients with type 2 DM and also identify the differences in lifestyle in patients with type 2 DM before and after being given DSME interventions and identify the effectiveness Diabetes self-management education (DSME) on knowledge of type 2 DM patients.

METHOD

The study data sources used in this literature review are Google Scholar, Medline, and PubMed. Boolean logic is a mathematical logic that is used as a search strategy by using logical operators as a means to remove output from true or false, supported by AND, OR, and NOT operators (Dewi, 2018). The AND operator is a boolean which is used to narrow the search by combining the first word and the second word in the Online Public Access Catalog searched simultaneously. To find articles in this study, the authors use the keywords "DSME

AND T2DM AND lifestyle" in English and "DSME DAN DMT2 DAN gaya hidup" in Indonesian. The inclusion criteria used were articles in English and Indonesian, articles published in 2013–2022, articles available for free full text access, articles with a research design of a randomized controlled trial, and quasi-experiments. The exclusion criterion used was the type of article in the literature review articles beyond the DSME intervention.

The total number of articles based on the three databases is 3,526. Articles outside the 2013–2022 year were issued in as many as 687. Then the author issued 221 articles outside English and Indonesian, articles non-full text issued as many as 16 articles, a literature review issued 408 articles, and finally the author issued articles outside the RCT method and quasi-experiment as many as 486 articles. The rest of the articles are as many as 1078. Next, the writer identified duplicate articles and found four articles that had to be removed because the same title in the database was different. The author continued to identify inappropriate titles and found that there were 1684 articles with inappropriate titles because they had no relationship with DSME, lifestyle, or type 2 DM patients. After that, the authors issued articles with inappropriate abstracts and articles that did not answer 13 research questions. The author gets the remaining seven articles from the third search result database. Furthermore, the remaining seven articles were tested for feasibility using the JBI (Joanna Briggs Institute) Critical Appraisal Checklist for Randomized Controlled Trials and the JBI (Joanna Briggs Institute) quasi-experiment, and the final results of articles that are suitable for use in this literature review are as many as seven articles. There were seven articles tested for eligibility to use the JBI (Joanna Briggs Institute) Critical Appraisal Checklist for Randomized Controlled Trials and the JBI (Joanna Briggs Institute) quasi-experimental and the final result of the articles used in the study of literature is as many as seven articles.

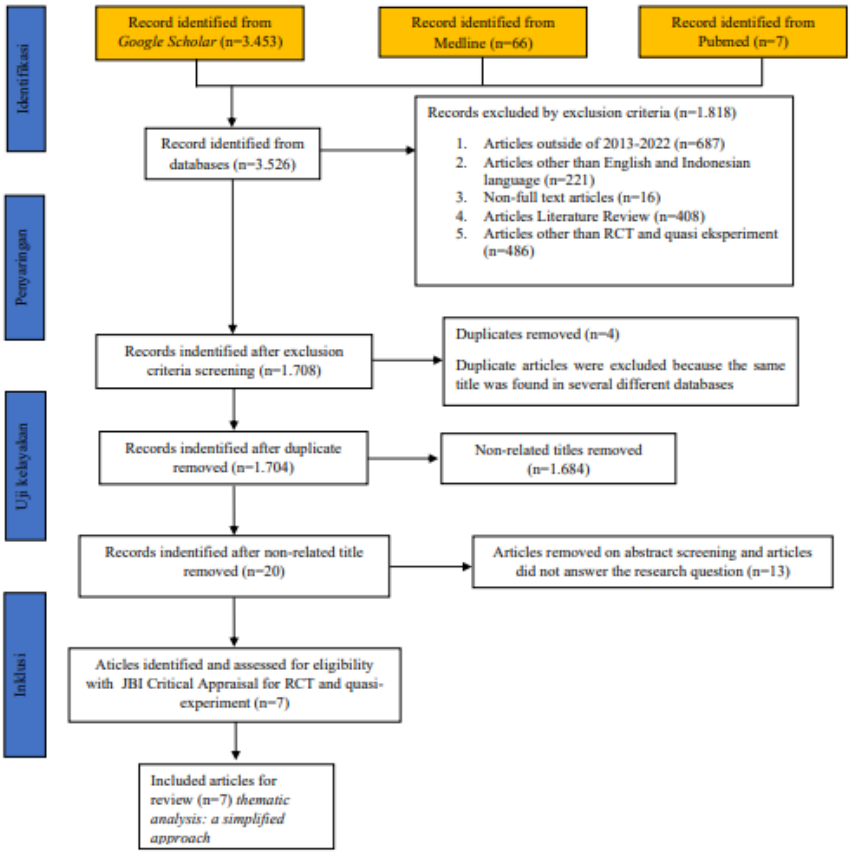

fig 1.1 Diagram Prisma Flow

(Page et al., 2021)

RESULTS

Based on the results of the seven articles, the authors get four sub-themes:

Effects of Using DSME as an Intervention in Type 2 DM Patients

Based on research conducted by Nooseisai et al (2021), Damayantie et al (2021), Sudirman (2018), Kartika et al (2022), Savira & Amelia (2018), Lynch et al (2019), and Sari et al (2022), there were significant changes to lifestyle in type 2 DM patients who had received DSME interventions. After being given the DSME intervention, type 2 DM patients experience several changes, such as decreasing blood glucose levels, coping with stress, improving quality of life, increasing knowledge, increasing self-care behaviors, and a decrease in Hba1c levels. Diabetes Self-Management Education (DSME) can be done in various ways, such as presentations, demonstrations, discussions, and real-life experience with examples, as well as filling out the questionnaire that will receive this intervention. According to research that has been done by Nooseisai et al. (2021), patients with DM type 2 in the intervention group were mostly housewives and did not move a lot but exercised more, while most of the participants in the control group had another job and were more active in physical activity but did less exercise. After intervention with DSME is given to those patients, patients with DM type 2 are experiencing significant changes in lifestyle and self-management. It shows that there is a significant, positive, and effective influence of DSME intervention in improving lifestyle changes in patients with type 2 DM.

Effects of DSME Procedure Settings

Based on research conducted by Nooseisai et al (2021), Damayantie et al (2021), Sudirman (2018), Kartika et al (2022), Savira & Amelia (2018), Lynch et al (2019), and Sari et al (2022), the steps taken in providing DSME interventions to type 2 DM patients are: presentation, discussion, demonstration, real-life examples, and questionnaire filling. Savira & Amelia (2018) and Damayantie et al (2021) support such procedures so that Type 2 DM patients who get DSME intervention will receive education as well as demonstration activities. The methods used in the DSME delivery process are categorized into three groups: one-to-one, group-based, and telemedicine. Based on research conducted by Kim et al. (2017), delivery of DSME is given using the group-based and family-based methods of three to eight sessions once a week. In addition, research that has been conducted by Nooseisai et al. (2021) has published that the DSME intervention was carried out for 8 direct contact sessions, with every monthly session lasting 2 hours during the 4 months of the intervention. This session consists of presentations, discussions, demonstrations, and real-life examples.

Characteristics of Intervention Recipient Participants (DSME)

Based on the research conducted by Nooseisai et al (2021), Damayantie et al (2021), Sudirman (2018), Kartika et al (2022), Savira & Amelia (2018), and Lynch et al (2019), the criteria by which participants can receive the intervention DSME were explained. Research results after being given DSME intervention, participants in the age >40 years old, diabetes mellitus type 2, cooperative patient, willing following research shows there is an increase self-care on participants recipients of the DSME intervention. The characteristics of participants who received the DSME intervention were the average age at which they could receive it, namely the criteria for participants aged >40 years, female sex, and type 2 DM sufferers. This was in line with research by Sudirman (2018), which shows characteristics of the most participants at the age of 55–64 years with the highest number of types of female sex, namely 14 people out of 24 participants. Supported by research (Kartika et al., 2022), which defines the characteristics of participants with patient criteria who have been diagnosed with type 2 diabetes for at least 1 year, are 45–60 years old, and are able to perform activities independently. Other research that supports that is according to Nooseisai et al. (2021), who

determined the characteristics of the participants in the study were T2DM patients aged 50–65 years, women by gender, not insulin dependent, and HbA1c >7% during the last 3 months, with the results of the DSME intervention showing that there was a significant difference between before and after being given DSME intervention on these characteristics and showed positive results in managing the disease.

Effects of Combinations of Actions Accompanying DSME Interventions

Nooseisai et al (2021), Damayantie et al (2021), Sudirman (2018), and Kartika et al (2022) demonstrated the effectiveness of DSME in combination with companion measures in DM patients of type 2. After the intervention is done, DSME combined with other actions such as autonomy support, audiovisuals, and mindfulness (relaxation activities), indicates the presence of an improvement in the patient's lifestyle (type 2 DM). DSME interventions can also be combined with other components or measures such as autonomy support, audiovisuals, mindfulness (relaxation activities), and other media. Research conducted by Nooseisai et al. (2021) found that there is an increase in lifestyle in type 2 DM patients after being given an intervention in the way the patient crochets at home that has proven effective in reducing stress. According to research by Sudirman (2018), DSME, based on a theoretical framework of autonomy support, is to provide support in understanding DM, his needs and priorities, and feelings, and provide options in management independently, providing relevant information. Patients with diabetes mellitus who acquire motivational support autonomy with DSME can increase motivation internally to carry out maintenance independently so that it is effective in changing behavior and lifestyle factors such as diet and physical activity. Therefore, according to researchers, diabetes self-management education (DSME) is one intervention that can be used in the management of type 2 diabetes mellitus because it has been proven effective in increasing lifestyle changes and quality of life in type 2 DM patients.

CONCLUSION

Diabetes Self-Management Education (DSME) is effective for lifestyle changes in patients with Type 2 DM. Through DSME intervention, there is a significant difference in lifestyle before and after being given DSME intervention. This matter focuses on differences in glucose level outcomes, blood pressure, coping with stress, quality of life, self-care behavior, and Hba1c levels. Sufferers of DM type 2 have also increased their knowledge after intervention with DSME, mainly on the detection of episodes of hypoglycemia. DSME in type 2 DM patients can be provided using the methods of presentations, discussions, demonstrations, real-life experience with examples, and a charging questionnaire. Future researchers can conduct research that is more specific and quantitative in assessing the effectiveness of DSME on lifestyle in patients with type 2 DM.

REFERENCES

American Diabetes Association. (2013). Standards of medical care in diabetes—2013. Diabetes care, 36(Supplement_1), S11-S66.

Damayantie, N., Dewi, M., Rusmimpong, R., & Masnah, C. (2021). Diabetes self-management education effect on family knowledge of hypoglycemia episodes detection on type 2 diabetes mellitus. Open Access Macedonian Journal of Medical Sciences, 9, 1398–1402. https://doi.org/10.3889/oamjms.2021.7275.

Davis, J., Fischl, A. H., Beck, J., Browning, L., Carter, A., Condon, J. E., ... & Villalobos, S. (2022). 2022 National standards for diabetes self-management education and support. The science of diabetes self-management and care, 48(1), 44-59.

Decroli, E. (2019). Diabetes Mellitus Type 2. Padang: Pusat Penerbitan Bagian Ilmu Penyakit Dalam Fakultas Kedokteran Universitas Andalas.

Dewi, A. O. P. (2018). Pencarian katalog dalam online public access catalog menggunakan boolean logic. Anuva: Jurnal Kajian Budaya, Perpustakaan, dan Informasi, 2(3), 291-298.

Faselis, C., Katsimardou, A., Imprialos, K., Deligkaris, P., Kallistratos, M., & Dimitriadis, K. (2020). Microvascular complications of type 2 diabetes mellitus. Current vascular pharmacology, 18(2), 117-124.

Hermanns, N., Ehrmann, D., Finke-Groene, K., & Kulzer, B. (2020). Trends in diabetes self-management education: where are we coming from and where are we going? A narrative review. Diabetic Medicine, 37(3), 436-447.

Izzo, A., Massimino, E., Riccardi, G., & Della Pepa, G. (2021). A narrative review on sarcopenia in type 2 diabetes mellitus: prevalence and associated factors. Nutrients, 13(1), 183.

Kartika, K., Ismuntania, I., Karmila, K., & Rakhman, F. (2022). Effectiveness of Variations of Diabetes Self-Management Education (DSME) on Self Care Behavior in Type-2 Diabetes Mellitus Patients in Tengku Chik Ditiro Hospital. Journal of Health Promotion and Behavior, 7(1), 77-85.

Kemenkes RI. (2014). Profil Kesehatan Indonesia 2014. Jakarta: Kemenkes RI.

Kemenkes, R. I. (2018). Laporan Nasional Riskesdas 2018. Jakarta: Kemenkes RI, 154-66.

Kim Yeary, K. H. cheon, Long, C. R., Bursac, Z., & McElfish, P. A. (2017). Design of a randomized, controlled, comparative effectiveness trial testing a Family Model of Diabetes Self-Management Education (DSME) vs. Standard DSME for Marshallese in the United States. Contemporary Clinical Trials Communications, 6, 97–104.

Lynch, E. B., Mack, L., Avery, E., Wang, Y., Dawar, R., Richardson, D. J., Keim, K., Ventrelle, J., Appelhans, B. M., Tahsin, B., & Fogelfeld, L. (2019). Randomized Trial of a Lifestyle Intervention for Urban Low-Income African Americans with Type 2 Diabetes. Journal of General Internal Medicine, 34(7), 1174–1183. https://doi.org/10.1007/s11606-019-04894-y.

Made Candra Citra Sari, N., Noviana Sagitarini, P., Wayan Edi Sanjana, I., & Teknologi dan Kesehatan Bali, I. (2022). Putu Noviana Sagitarini, I Wayan Edi Sanjana Efektifitas Pemberian Intervensi Diabetes Self-Management Education (DSME) Berbasis Audiovisual Terhadap Pengetahuan dan Keterampilan Perawatan Diri. In Diabetes Jurnal Kesehatan (Vol. 11, Issue 2).

Maria, I. (2021). Asuhan Keperawatan Diabetes Melitus dan Asuhan Keperawatan Stroke. Deepublish.

Mendez, I., Lundeen, E. A., Saunders, M., Williams, A., Saaddine, J., & Albright, A. (2022). Diabetes self-management education and association with diabetes self-care and clinical preventive care practices. The science of diabetes self-management and care, 48(1), 23-34.

Nooseisai, M., Viwattanakulvanid, P., Kumar, R., Viriyautsahakul, N., Muhammad Baloch, G., & Somrongthong, R. (2021). Effects of diabetes self-management education program on lowering blood glucose level, stress, and quality of life among females with type 2 diabetes mellitus in Thailand. Primary Health Care Research and Development, 22. https://doi.org/10.1017/S1463423621000505.

Olesen, K., Hempler, N. F., Drejer, S., Valeur Baumgarten, S., & Stenov, V. (2020). Impact of patient-centred diabetes self-management education targeting people with type 2 diabetes: an integrative review. Diabetic Medicine, 37(6), 909-923.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. In The BMJ (Vol. 372). BMJ Publishing Group. https://doi.org/10.1136/bmj.n71.

Pearson, E. R. (2019). Type 2 diabetes: a multifaceted disease. Diabetologia, 62(7), 1107-1112.

Powers, MA., Bardsley, J., Cypress, M., Duker, P., Funnell, MM., Fischl, A., et al. (2017). Diabetes self management education and support in type 2 diabetes: a joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. The Diabetes Educator, 43(1), 40-53.

Savira, M., & Amelia, R. Rusdiana, (2018). The effect of diabetes self-management education on Hba1c level and fasting blood sugar in type 2 diabetes mellitus patients in primary health care in binjai city of north Sumatera, Indonesia. Open Access Macedonian Journal of Medical Sciences, 6(4), 715–718. https://doi.org/10.3889/oamjms.2018.169.

Sudirman, A. A., & Modjo, D. (2021). 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): The Indonesian Journal of Health Promotion, 4(2), 151-156.

Viigimaa, M., Sachinidis, A., Toumpourleka, M., Koutsampasopoulos, K., Alliksoo, S., & Titma, T. (2020). Macrovascular complications of type 2 diabetes mellitus. Current vascular pharmacology, 18(2), 110-116.

Wayan, I., Putra, A., & Berawi, K. N. (2015). Ardana dan Khairun Nisa Berawi Empat Pilar Penatalaksanaan Pasien Diabetes Mellitus Tipe 2 Majority Volume (Vol. 4).