



Diabetes Self-Management Program and Quality of Life Among People with Type 2 Diabetes Mellitus: A Systematic Review

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ARTICLE INFO

Article history:

Received 19th September 2023

Revised 13th December 2023

Accepted 27th December 2023

Available online

<https://talenta.usu.ac.id/IJNS>

E-ISSN: 2685-7162

How to cite:

Tarigan, M., Siripul, P., Sangchart, B. (2023). Diabetes self-management program and quality of life among people with type 2 diabetes mellitus: a systematic review, *Caring: Indonesian Journal of Nursing Science*, 5(2), 125-132.

ABSTRACT

One of the health problems currently faced globally and in Indonesia is type 2 diabetes because it presents a harmful impact on the sufferer, and the number continues to increase every year. Diabetes self-management programs are considered one activity that maintains the quality of life of type 2 diabetes patients. This systematic review aimed to determine the effectiveness of type 2 diabetes self-management programs on the quality of life of patients with type 2 diabetes. The databases used to search were CINAHL, Proquest, and PubMed, between 2006 and 2016, and all articles were evaluated for relevance and quality of research. There were 14 articles analyzed on the characteristics, content of interventions, quality of life instruments, and quality of life outcomes. Eleven of the 14 studies significantly showed an effect of diabetes management programs on the quality of life of patients with type 2 diabetes. Nurses and other health professionals can apply diabetes self-management programs at all levels of health care.

Keywords: Diabetes self-management program, Quality of life, Type 2 diabetes



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<https://doi.org/10.32734/ijns.v5i2.12285>

1. Introduction

Diabetes mellitus is a disorder of the endocrine system where the body cannot use blood glucose according to the body's needs, so levels increase in the blood, called hyperglycemia. If this hyperglycemia condition cannot be adequately controlled, then various complications will arise and cause other adverse effects to the sufferer. The type of diabetes is most often categorized into two, namely type 1 diabetes and type 2 diabetes. According to the 2021 International Diabetes Federation (IDF) report, globally, the number of diabetics in adults is 537 million and children 1.2 million and is expected to continue to rise. Diabetes is the ninth leading cause of death and results in complications such as stroke, heart attack, kidney failure, blindness, and lower limb amputation (Alharbi et al., 2023).

Self-management is fundamental for diabetic patients to take care of themselves so that the burden caused by diabetes can be reduced. Diabetes self-management consists of two, called diabetes self-management education and support (DSMES). People with diabetes need the knowledge, skills, and ability to implement diabetes management. DSMES enables patients to control their blood glucose levels, reduce recurrence rates, and prevent other adverse effects due to diabetes. Therefore, diabetes self-management has been recommended internationally as one of the core standards of care for managing diabetic patients. Diabetes self-management is an activity with a patient-centered approach to comprehensively address the patient's self-care needs, including clinical, educational, psychological, and behavioral management (Aung et al., 2023).

Diabetes self-management is a behavioral activity of type 2 diabetes patients consisting of medication adherence, monitoring blood sugar levels, controlling diet, physical activity, and visiting a doctor (Yang,

Masingboon, & Samartkit, 2022). According to the American Association of Diabetes Educators, diabetes self-management behavior consists of seven components, namely: taking medication, monitoring blood sugar levels, being active, eating healthy, healthy coping, problem-solving, and reducing risk (Kurnia, Amatayakul & Karuncharennpanit, 2017). Diabetes self-management is an action or daily activity that patients must do with diabetes to keep their blood sugar levels controlled and maintain their health and well-being. Self-care management can lower the burden of health costs and improve the quality of life of diabetic patients (Kumar & Mohammadnezhad, 2022).

Diabetes is a global health problem that significantly affects the quality of life of sufferers and can increase the risk of premature death (Alharbi et al., 2023). Studies in various countries such as China, Russia, Pakistan, and Turkey found that the quality of life of people with diabetes is lower than that of people with type 2 diabetes. Variables significantly associated with the quality of life of diabetic patients include age, sex, economic status, level of control of blood glucose levels, length of time suffering from diabetes, treatment methods, and non-adherence to treatment. Managing diabetes is a job that never ends without vacation or rest (Shetty et al., 2021). Quality of life is the ultimate goal of all health interventions measured by physical and social functioning dimensions and perceptions of physical and mental well-being. The results of the study showed that diabetic patients have a lower quality of life compared to healthy people but have a higher quality of life compared to people with severe chronic diseases (Rubin & Peyrot, 1999).

The effectiveness of diabetes self-management still requires further research. This is because there are research results that show an improvement in the quality of life of diabetic patients; however, other studies have not shown the same results. Based on the results of a systematic review by Norris et al. (2001), further studies are still needed to determine the effectiveness of diabetes self-management on the quality of life of type 2 diabetes patients. According to Zhang, Norris, Chowdhury, Gregg, and Zhang (2007), a range of interventions can enhance the quality of life of diabetic patients, but their impact varies. Cochran & Conn (2010) have found that individuals with diabetes can experience an improvement. In contrast, a study conducted at a municipal hospital outpatient clinic in Taipei found that self-management interventions did not significantly differ (Pal et al., 2014). Therefore, this study describes the effectiveness of self-management programs on the quality of life of patients with type 2 diabetes mellitus.

2. Methods

The electronic databases CINAHL, Proquest, and PubMed were searched between 2006 and 2016. We checked the references of all the retrieved articles to find relevant studies. The search keywords on CINAHL and Proquest were "type 2 diabetes," "self-management program," "self-management programme," "self-management intervention," "self-management strategy," "self-management support," "self-management education," and "quality of life," whereas, keywords on PubMed were "type 2 diabetes mellitus", "self-management program," and "quality of life." The electronic search and process are illustrated in Figure 1.

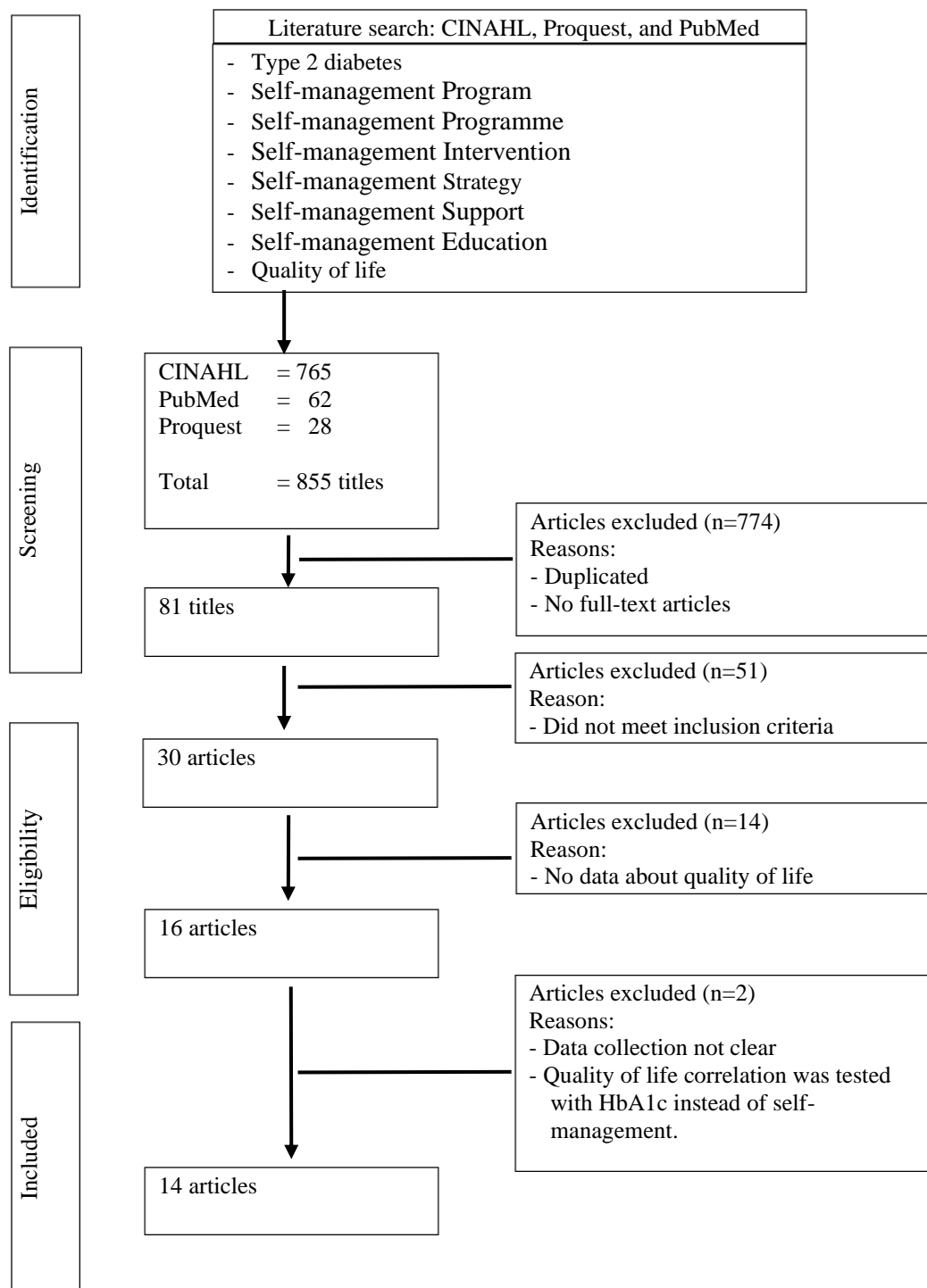


Figure 1 The selection process of the articles

3. Results

Out of the 855 articles generated in Figure 1, only 14 were selected for this review. Table 1 summarizes the study characteristics, intervention content, quality of life measurements, and reported outcomes. The table is organized based on the similarities and differences of theoretical models used to create self-management programs. Research was conducted in different countries and covered various levels of healthcare services. Five studies from the US were performed in different settings, such as urban and rural communities, medical centers, local public health services, and community centers. There were two studies from the UK (primary care and hospital), two studies in public health centers and community hospitals in Thailand, one study in a community-based setting in Denmark, one study in an outpatient hospital in Japan, one study in a regional care group in the Netherlands, and one study in an outpatient in Brazil.

Of the 14 studies, 9 used a randomized controlled trial (RCT) design, while 5 used a time series design. The range of sample sizes was 25 to 702 in the time series design. In the RCT studies, the smallest sample was

23 patients in the control group. The larger samples were in the intervention groups with 437 to 824 patients. Various intervention programs were developed based on several models such as social cognitive theory, empowerment principles, disease process, biopsychosocial approach, and chronic care model. Some studies combined more than one model, as indicated in Table 1, and the follow-up period ranged from one week to three years. Eleven studies found an improvement in quality of life, while three studies did not reveal any improvement.

Table 1 The summary of the included studies

The authors, year	- The intervention programs - Time spent follow up - Sample characteristics	Scale	Results
(Moriyama et al., 2009).	- Education program based on the theoretical and logical intervention of cognitive behavior theories. - Baseline, at 3, 6, and 12 months. - n = 65. CG= 23; IG= 42.	WHO version translated into Japanese.	It was improved significantly.
(Steed, Barnard, Hurel, Jenkins, & Newman, 2014).	- Diabetes self-management program based on the social theory and the self-regulatory theory. - Baseline, at one week, three months, and six months. CG= 59; IG= 65.	Audit of Diabetes-Dependent Quality of Life Measures.	It was improved significantly at all points in time.
(Glasgow et al., 2012).	- Diabetes self-management program assisted by computer based on the social cognitive theory and the social-ecological model. - Baseline, at four months, and 12 months. - n = 463.	Diabetes Distress Scale.	Quality of life improved over 12 months, with larger effect sizes at four months.
(Wattana, Srisuphan, Pothiban, & Upchurch, 2007).	- Diabetes self-management program based on the self-efficacy theory and the self-management theory. - Baseline and six months. - n = 147. CG= 72; IG= 75.	Thai version of SF-36 QoL.	It was improved significantly.
(Skinner et al., 2006).	- Education programs are based on the social learning theory, education process, and the common-sense model of illness. - Baseline and three months. - n = 236.	WHO version of QoL.	A significant improvement was observed from the baseline measurement to the three-month mark.
(Cani, Lopes, Queiroz, & Nery, 2015).	- A pharmacotherapeutic program based on the necessities and diabetes education protocol. - Baseline and six months. - n = 70. CG=36; IG=34.	The Brazilian version of diabetes quality of life.	It was improved significantly.

Table 1 Continued

The authors, year	- The intervention programs - Time spent follow up - Sample characteristics	Scale	Results
(Jaipakdee, Jiamjarasrangsi, Lohsoonthorn, & Lertmaharit, 2015).	- Education programs are based on the disease process and how to manage situations and lifestyles. - Baseline, at 3 and 6 months. - n = 403. CG= 200; IG= 203	Diabetes Quality of Life.	Significant improvement in quality of life was observed for six months.
(García, Brown, Horner, Zuñiga, & Arheart, 2014).	- Diabetes education based on symptom-based and food demonstrations. - Baseline, at 2 and 6 months. - n = 72. CG=33; IG=39.	The Diabetes-39.	It was improved significantly.
(Molsted, Tribler, Poulsen, & Snorgaard, 2012).	- Education program based on the empowerment strategy and philosophy. - Time for intervention is available elsewhere. - n = 702.	The Danish Health and Morbidity Survey 2000 Questionnaire.	It was improved significantly.
(Tang, Funnell, Noorulla, Oh, & Brown, 2012).	- Lifelong management program based on the principles of empowerment. - Baseline, at 6 and 24 months. - n = 60.	Diabetes Distress Scale.	It was not significant in six months but significantly improved after 24 months.
(Tang, Funnell, & Oh, 2012).	- Lifelong management program based on the principles of empowerment. - Twenty-four months and 36 months. - n = 25.	Diabetes Distress Scale.	During the 1-year follow-up period, no changes were found. However, after the 2-year intervention, a significant improvement was observed.
(Van Dijk-De Vries et al., 2015).	- Diabetes self-management support based on the biopsychosocial approach. - Baseline, at 4 and 12 months. - n = 264. CG= 147; IG= 117.	SF-12 QoL.	The program was not effective.
(Glasgow et al., 2006).	- The CD-ROM is based on the chronic care model. - Baseline and 2 weeks. - n = 335. CG=161; IG=174.	Revised Diabetes Distress Scale.	There were no significant differences.
(Khunti et al., 2012).	- Education programs are based on the social learning theory, education process, and the common-sense model of illness. - Three years follow-up. - n = 824. CG= 387; IG= 437.	WHO version of QoL.	There were no significant differences.

*CG: control group; IG: intervention group.

4. Discussion

This review aimed to evaluate the effect of diabetes self-management programs on the quality of life of type 2 diabetes mellitus. Implementing self-management, diet, and exercise is challenging because we have to change the lifestyle that has been lived for a long time. Diabetes self-management requires a long time to make adjustments to a new lifestyle. The research results on adults found that it takes considerable effort and a long time to do self-management successfully. Various behavioral interventions in diabetes self-management programs have evolved from behavioral theories of cognitive, psychology, and behavioral sciences. Behavioral theory focuses on changing old behaviors to support new health behaviors, and cognitive theory focuses on changing thinking patterns or emotions to apply to specific health behaviors. Many interventions in diabetes self-management are a combination of education and some behavioral and cognitive strategies. This is done because changing behavior is complex, and no single strategy works best (Whittemore, 2006). For nutrition management, the approach that includes environmental, economic, social, and cultural factors and is supported by education and interaction on an ongoing basis is the most successful. There is no universally recommended diet (Salvia & Quatromoni, 2023).

Various factors can influence the development of health behaviors, including social, cultural, and economic. Therefore, social cognitive theory is most accepted and often used. This theory is compiled from observational learning, self-efficacy, ability to manage behavior, reinforcement, and self-control. This theory dimension describes the dynamic relationship between individual behavior, environmental, and personal factors and how each dimension influences the other (Islam et al., 2023). Skinner et al., (2006) stated that the social cognitive theory emphasizes how individuals perceive their ability to carry out actions and fulfill their plans. The main idea in this theory is self-efficacy, which refers to one's confidence in their abilities. Research has consistently shown that self-efficacy is a crucial predictor of an individual's self-care behavior, and it is commonly included in various health psychology models. This aligns with the WHO recommendation that people with diabetes must learn self-management skills to manage their condition effectively (Deakin, McShane, Cade, & Williams, 2005).

The empowerment principles were also used as a theoretical model for the basis of intervention in this review. In the empowerment approach, people with diabetes are directed to identify and improve their strengths and make informed choices. This process is facilitated by the interaction between the patient and caregiver in intrapersonal and interpersonal relationships (Ebrahimi, Sadeghi, Amanpour, & Vahedi, 2016). Empowering is a process that allows patients to gain knowledge and skills tailored to the needs of the disease, make decisions about their self-care, and have control over their condition. Empowerment is an approach to improving one's health. Empowerment focuses on increasing patient autonomy, and achieving self-efficacy or a sense of control in life to ensure that patients are actively engaged in self-care. The empowerment approach aims to understand and recognize the problems experienced by patients and make informed choices about disease self-management (Beiranvand, Ashrafizadeh, & Sheini-Jaberi, 2023). In the empowerment process model, patients strive to have the ability to understand their resources, including knowledge of self-management, skills, and self-efficacy. In the spirit of empowerment, this intervention aims to provide holistic support to patients to adjust to an ever-changing and complex life (Cheng et al., 2021).

5. Conclusion

In conclusion, multi-component self-management interventions effectively improve the quality of life for adult people with type 2 diabetes mellitus. Nurses and other healthcare providers may use self-management programs to increase the quality of life for people with diabetes type 2 mellitus in different levels of health services.

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