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FAMILY SUPPORT AND DIABETES SELF-MANAGEMENT PROGRAM FOR TYPE 2 DIABETES MELLITUS : SYSTEMATIC REVIEW

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ABSTRACT

Background: Diabetes mellitus is a global health problem and is the 7th leading cause of death worldwide. Self-management has become a central concept for diabetics who are in families. The purpose of this to review and describe the impact of family support and self-management programs by involving families with health behavior outcomes in patients, namely self-management behavior, psychological results, and clinical outcomes consisting of body mass index, blood pressure, cholesterol levels, and sugar blood control. Methods: Searches were made on three databases, Science Direct, Google Scholar, and Pub Med from 2010-2020. In total, 22 studies met the inclusion criteria. Results: Twenty-two articles examined the impact of self-management programs on diabetes with family involvement. Based on this literature review, engagement using a collaborative approach can influence the patient's self-management behavior so that it changes the patient's health behavior and changes the clinical outcome in an optimal state. They experience obstacles due to the lack of information they have. The follow-up strategy is considered effective in measuring the success of the intervention. Conclusion, from this review, that diabetes self-management programs with family support can improve health outcomes in patients with controlled blood sugar levels.

INTRODUCTION

Diabetes mellitus is a global health problem and is the 7th leading cause of death worldwide. The prevalence of type 2 diabetes mellitus (T2DM) has increased continuously. In the World Health Organizatin (WHO) in 2014, the number of diabetes sufferers was 422 million people (Hemmingsen et al., 2012), and will experience an increase in Asian countries by 60% in 2030 (Abdullah et al., 2014). Epidemiological trends show that the prevalence of type 2 diabetes is expected to increase due to increased

urbanization, lack of physical activity, unhealthy lifestyle, unhealthy nutritional intake, increased body weight, and an increasing number of the elderly population (Sarah WIld, Gojka Roglic, Anders Green, Richard Sicree, 2004).

Diabetes management requires patience and diligence and requires a consistent attitude for sufferers (Article, 2010) such as changing an unhealthy lifestyle to be healthy (Wong-rieger & Rieger, 2013). One of the causes of failure in diabetes management is the lack of using social support. Several studies suggest that family involvement in diabetes self-management can help control patients' blood sugar, and increase knowledge, self-efficacy, and quality of life for diabetics (Brown et al., 2015;Cai & Hu, 2016;clasifiction, 2014;CDM, 2019 ;Di & Pi, 2003).

Management of diabetes mellitus is necessary to prevent complications and can improve the quality of life for sufferers (Shrivastava et al., 2013). Self-management has become a central concept for diabetics who are in families. Effective self-management can optimize health outcomes, reduce treatment costs, and improve patient quality of life. Several studies have shown that early diagnosis and effective self-management can improve the quality of life for people with diabetes (Jarvis et al., 2010).

The management strategy that is considered the most effective is the Education program for patients and families (Hill-Briggs & Gemmell, 2007; Lorig & Ritter, 2005; Mcgowan, 2011; Ory et al., 2013; Penn et al., 2015). (The American Diabetes Association (ADA) states diabetes self-management education (DSME) is the basis of care for people with diabetes. Patients are given several tasks, namely they have to check themselves regularly, adhere to medication, engage in self-care such as being able to control blood sugar levels, being able to change healthy diets, and perform physical activities (Classification, 2014).

Barriers that are often found in self-management programs do not go well, including an unsupportive environment, patients experiencing boredom, low self-efficacy, and a lack of support from family members (Mcgowan, 2011). Several studies have stated that family support has a role in the success of diabetes care (Miller, 2013; Wong-rieger & Rieger, 2013). Instrumental and emotional support can be obtained from the family. With instrumental support, the patient can complete specific tasks such as attending a health service or helping to inject insulin. Emotional support can be given to patients in the form of comfort and support when patients experience frustration caused by their disease (Baig et al., 2015; Wagner et al., 2001). Family support has a positive effect on patient self-management behavior (Miller, 2013; Wong-rieger & Rieger, 2013).

Based on the above phenomena, the researchers are interested in conducting a systematic review that aims to determine family support and diabetes self-management programs in type 2 diabetes mellitus sufferers by involving individuals as a basic concept to improve self-management programs with family support and results related to diabetes mellitus type 2.

This study aims to review and describe the impact of family support and self-management programs by involving families with health behavior outcomes in patients, namely self-management behavior, psychological results ,and clinical outcomes consisting of body mass index, blood pressure, cholesterol levels, and blood sugar control.

METHOD

This review describes the impact of family involvement in diabetes self-management programs in patients with type 2 diabetes mellitus. We conducted a search using all stages of PRISMA (Preferred Reporting Item for Systematic Review and Meta-Analysis). A search using databases namely Science Direct, Google Scholar, and PubMed resulted in 375 articles after the duplicates were removed. Search using MeSH with the keywords Family support, social support, family-based, self-management, diabetes self-management, diabetes mellitus type 2. The title is omitted if the patient is type 1 diabetes, gestational diabetes, or not in English. The complete articles are 150 articles and 22 articles relevant to the systematic review.

Researchers used the PICO (Participant-Intervention Comparation-Outcomes) format

based on the Joanna Briggs Institute (JBI) (2014), in making inclusion and exclusion criteria in reviewing articles. Utilizing multiple treatment strategies (eg regular care, didactic methods, participatory learning, internet-based methods, social media-based methods) as part of this review. Inaccurate subject description (eg articles on diabetes management that do not involve the family). Types of designs such as single, descriptive designs, not published in academic journals (e.g. unpublished dissertations) and studies that focus on diabetes prevention or population are gestational diabetes and type 1 diabetes.

The primary outcome expected was blood sugar control as demonstrated by the patient's HbA1c level. Secondary outcome measures were health behavior consisting of diet, physical activity, blood sugar monitoring, foot care and examination, medication adherence, quality of life, social welfare, and self-efficacy. Physiological results (HbA1c, blood sugar levels, blood pressure, body mass index, and cholesterol levels).

The search strategy that has been used is the relevant articles, namely: "type 2 diabetes (T2DM)", "self-management", diabetes self-management program "," self-care "," family support "," social support ", and" family-based ". Titles and articles are reviewed in a systematic manner relevant to involving individuals and families.

The searches used the PubMed, Google Scholar, and Science Direct databases for articles published in 2010-2020. Incomplete and duplicate articles are removed.

RESULTS

The results of this review are explained in a narrative. Outcome descriptions describe: 1) diabetes self-management program; 2) how to integrate family support for patients, 3) assess the program on health impact and clinical outcomes (Table 1).

PRISMA 2009 Flow Diagram
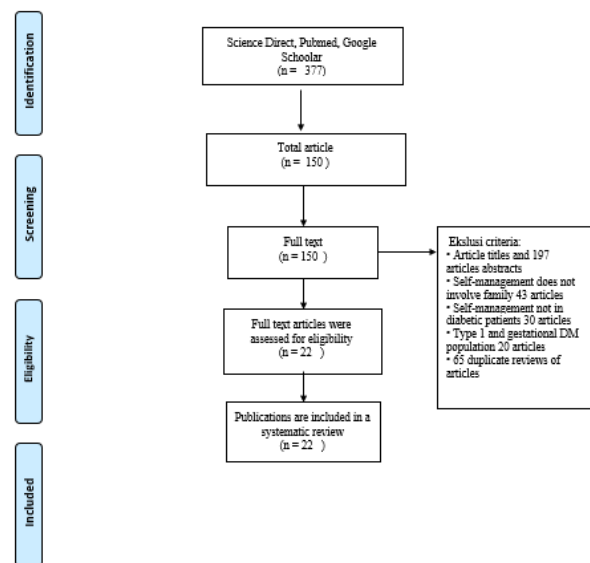
Twenty-two articles examined the impact of self-management programs on diabetics with family involvement. eleven studies used a radomized control trial (RCT), (Aikens et al., 2014; Brown et al., 2015; Fall et al., 2013; Kang et al., 2010; Keogh et al., 2007; Moreno & Mateo, 2018; Murray et al., 2012; Piette et al., 2014; Tabasi et al., 2014; Tang, 2015; Trial et al., n.d.; Wild et al., 2016), four studies using experimental quasy designsm (Cai & Hu, 2016; Goetz et al., 2015; Jones, 2015; Sebire et al., 2018), one research using a cross sectional design (Gunggu et al., 2016), one study using a qualitative design (Pesantes et al., 2018).

Diabetes Mellitus self-management program

We found that all articles involved family members in patient self-management programs. In general, these types of programs are personal counseling, goal setting, problem-solving, and explanations of how family members can support diabetes patients, and how follow-up is carried out.

Learning strategies

The learning strategy of the diabetes self-management program model is participatory learning involving patients in the learning process, followed by group discussion sessions, setting goals to be achieved, bargaining, and solving

problems. To improve communication skills, one study offers programs using DVDs (Kang et al., 2010) and one study uses video recordings (Jones, 2015). In other studies using Bluetooth technology (Wild et al., 2016), Sixteen studies combined didactic and participatory learning with goal-setting strategies, action planning, problem-solving, and follow-up strategies. To increase knowledge about diabetes self-management, communication skills are required, one study offered a DVD-based program (Aikens et al., 2014), another study included Bluetooth technology to transmit health information via provided modems (Wild et al., 2016), one study used telemonitoring diabetes using mHealth + Care Partner to improve diabetes self-management and blood sugar monitoring (Piette et al., 2014).

One study used handouts to provide information on diabetes management (Brown et al., 2015), one study provided information using the WeChat application (Mao et al., 2019), another study used food images (Manuscript & Hawaiians, 2014) and demonstrations. make a diet menu for diabetics (Tailored Diabetes Self-Management Latinos En Control, 2011).

Health Education Materials

The material used in this review varies, one study uses Bluetooth to convey information about diabetes (Wild et al., 2016), and five studies use food models, food bingo, and food images to describe a healthy diet and food portion size for sufferers (Tailored Diabetes Self-Management Latinos En Control, 2011); (Manuscript & Hawaiians, 2014), Diabetes handouts/booklets and handbooks, pictures and power points (diet, physical activity or exercise, medication-medicine, foot care) is used as a learning medium (Gunggu et al., 2016; Kang et al., 2010; Mao et al., 2019; Manuscript & Hawaiians, 2014) in addition to three studies using videos and DVDs to demonstrate the success of self-care behaviors between diabetic patients (Aikens et al., 2014; (Hzu et al., 2014; Jones, 2015) and three studies using simple tools to monitor blood sugar (Brown et al., 2015; Gunggu et al., 2016; Tailored Diabetes Self-Management Latinos En Control, 2011).

Follow-up (follow-up)

The follow-up of activities that have been carried out is a very important thing to do in maintaining self-management behavior. This review verified that there were 21 articles that followed up on actions that have been taken (Aikens et al., 2014; Cai & Hu, 2016; Brown et al., 2015; Mao et al., 2019; Gunggu et al., 2016; Hu et al., 2014; Islam & Tandon, 2012; Piette et al., 2014; Kang et al., 2010; Keogh et al., 2007; Mao et al., 2019; Robling et al., n.d.; Tailored Diabetes Self-Management Latinos En Control, 2011; Manuscript & Hawaiians, 2014; Tang, 2015; Mendenhall et al., 2010; Wild et al., 2016; Jones, 2015).

Family support relationship with self-management programs
Self-management programs have been used in a variety of settings, especially in primary care and community settings. With the use of these programs, effective communication and supporting skills are needed, so that self-management programs can be applied in everyday life (Islam & Tandon, 2012). All of these research articles involve family members in improving diabetes self-management behavior. Nine research articles ask family members to provide support in relieving stress, rejection and maximizing environmental conditions (Aikens et al., 2014); (Brown et al., 2015); (Piette et al., 2014); (Kang et al., 2010); (Goetz et al., 2015); (Pesantes et al., 2018); (Robling et al., n.d.);(Wild et al., 2016); (Tang, 2015). Eleven articles involved patients and families and required family members to attend education classes and meeting (Garcı et al., 2011); (Gunggu et al., 2016); (Islam & Tandon, 2012); (Article, 2021); (Keogh et al., 2007); (Mao et al., 2019); (Tailored Diabetes Self-Management Latinos En Control, 2011); (Manuscript & Hawaiians, 2014); (Mendenhall et al., 2010); (Trial et al., n.d.); (Jones, 2015). One article that requires attending and being involved in this activity is both (Hu et al., 2014).

According to research by Keogh et al, (2007) the role of family members is needed in helping and supporting patients in self-management practices, by helping patients to plan, setting goals to be achieved and helping patients solve problems if obstacles are encountered. Feedback is needed in exploring

perceptions and exchanging information between patients, families, and researchers, thus helping patient care in self-efficacy (Keogh et al., 2007). Several studies mention interactive telephone communication (Aikens et al., 2014); (Cai & Hu, 2016); (Brown et al., 2015); (Hu et al., 2014); (Gary et al., 2003); (Kang et al., 2010); (Keogh et al., 2007); (Manuscript & Hawaiians, 2014); (Tang, 2015) face to face (Brown et al., 2015); (Gunggu et al., 2016); (Miller, 2013); (Islam & Tandon, 2012); (Robling et al., n.d.); (Tailored Diabetes Self-Management Latinos En Control, 2011); (Trial et al., n.d.); (Mendenhall et al., 2010); (Wild et al., 2016); (Jones, 2015) and via telephone and face to face (Kang et al., 2010); (Keogh et al., 2007); (Manuscript & Hawaiians, 2014) to facilitate communication between patients and researchers when patients experience obstacles or difficulties in carrying out the self-management process, seeking medical assistance with involving family members.

The impact of diabetes self-management programs is proven to be effective in reducing the risk of complications in people with type 2 diabetes [5]. Reducing HbA1C levels (Brown et al., 2015); (Garcı et al., 2011); (Gunggu et al., 2016); (Tabasi et al., 2014); (Piette et al., 2014); (Keogh et al., 2007); (Goetz et al., 2015); (Mao et al., 2019); (Tailored Diabetes Self-Management Latinos En Control, 2011); (Manuscript & Hawaiians, 2014); (Mendenhall et al., 2010); (Toobert et al., 2011); (Trial et al., n.d.); (Wild et al., 2016); (Jones, 2015), increase knowledge, self-efficacy and quality of life of sufferers, (Brown et al., 2015); (Gunggu et al., 2016); (Cai & Hu, 2016); (Gary et al., 2003); (Mao et al., 2019); (Tailored Diabetes Self-Management Latinos En Control, 2011), lowers cholesterol (Brown et al., 2015); (Mao et al., 2019); (Tang, 2015); (Trial et al., n.d.), lowering blood pressure, body mass index (Piette et al., 2014); (Mao et al., 2019); (Tang, 2015); (Mendenhall et al., 2010), medication adherence and reducing symptoms of depression and stress (Aikens et al., 2014); (Keogh et al., 2007); (Jones, 2015);. A study comparing the presence of family involvement in diabetes management found that family involvement can reduce blood sugar levels (Keogh et al., 2007). Emotional support provided by family members has a positive role in influencing diabetes management behavior (Baig et al., 2015).

Another study stated that elderly people whose partners are involved in self-management programs have increased knowledge, good blood sugar control, and low stress levels. Emotional and instrumental support has a big influence on the elderly who are undergoing the program (Forum & Health, 2011). Diabetes self-management programs with family support help patients who are undergoing the program, comply with diabetes management, carry out discussions related to behavior change, facilitate patients if they experience obstacles,

Impact of family support on health outcomes

Diabetes self-management programs have a significant impact on health outcomes. The results were classified into five categories of self-management behavior, namely (diet, physical activity, blood sugar monitoring, medication adherence and foot care), physiological results (self-efficacy and clinical support), physiological results (HbA1C / blood sugar levels, blood pressure), body mass index, and cholesterol levels).

The results of self-management behavior

Twenty-two articles examined self-management in diabetics. Following a diabetes self-management program, diet, physical activity/exercise, monitoring blood sugar levels, medication adherence, and foot care can improve clinical outcomes and prevent complications (Classification Of Diabetes Mellitus 2019 Classification of Diabetes Mellitus, 2019). Three articles reported on the impact of healthy food intake (Cai & Hu, 2016); (Kang et al., 2010); (Tailored Diabetes Self-Management Latinos En Control, 2011) after receiving the program. Two studies improve exercise behavior (Keogh et al., 2007); (Jones, 2015). Eight studies explain the significance level of family support for reducing blood sugar at home (Trial et al., n.d.); (Tailored Diabetes Self-Management Latinos En Control, 2011); (Robling et al., n.d.); (Manuscript & Hawaiians, 2014); (Jones, 2015); (Wild et al., 2016); (Brown et al., 2015); (Gunggu et al., 2016); (Hu et al., 2012), six studies have had an influence on

treatment adherence (Aikens et al., 2014); (Fall et al., 2013); (Garcı et al., 2011); (Tabasi et al., 2014); (Mao et al., 2019); (Robling et al., n.d.) and and two studies on the impact of family support on foot care (Mao et al., 2019); (Jones, 2015).

Psychological Outcomes

As an approach to exploring psychological problems in self-management management, it is necessary to pay attention to the obstacles that will be faced so that it will interfere emotionally associated with diabetes management it will have an impact on poor blood sugar control and complications (Miller, 2013). Family support research can reduce symptoms of depression and stress (Aikens et al., 2014); (Trial et al., n.d.), positive emotional control (Pesantes et al., 2018), self-efficacy (Tailored Diabetes Self-Management Latinos En Control, 2011); (Hu et al., 2014); (Brown et al., 2015); (Gunggu et al., 2016), improving the quality of life (Gary et al., 2003). The depression caused by diabetes can have a significant impact on self-management behavior and clinical outcomes.

Clinical Outcomes

Twenty-two articles were reviewed by researchers, of which fifteen articles showed that HbA1C levels had decreased significantly (sarah et al., 2004); (kang et al., 2010); (fal et al., 2013); (tabasi et al., 2014); (shrivastava et al., 2013); (pen et al., 2015); (jones, 2015); (piete, sen & aiken, 2018); (Tandon, 2012); (bittner et al., 2011); (wagner et al., 2001); (trial, 2003); (forum, 2011); (loss & patient,2005); blood pressure (sarah et al., 2004); (hill & gemel, 2007); (robling et al., 2011), body mass index (sarah et al., 2004); (hill & gemel, 2007) ; (loss & patient,2005) and cholesterol reduction (robling et al., 2011).

DISCUSSION

Researchers conducted a review of twenty-two articles related to the impact of family support on diabetes self-management programs in people with type 2 diabetes mellitus between 2010-2020. The results showed that there was a significant relationship between family support and diabetes self-management programs with several health outcomes.

Several studies used a randomized control trial design and this program was used at both the individual and group level. A collaborative approach teaches that family involvement in learning, goal setting, action planning, and problem solving has a positive impact on health outcomes and improved health. Based on this literature review, engagement using a collaborative approach can influence patient self-management behavior thereby changing patient health behavior and changing clinical outcomes in optimal conditions. Several studies in this literature explain that family members are part of the intervention program. However, they experience obstacles due to the lack of information they have. The duration of the intervention was not measured, in the short term the intervention was measured using several strategies, namely weekly telephone follow-up, face-to-face, and discussion in planning goals and action plans in improving health outcomes.

The follow-up method is an important component of diabetes self-management. In general, the follow-up method is divided into four strategies, namely telephone-based, social media (WeChat), short message service (letter), and home visits. These different follow-up methods are used in assessing the patient's experience in running the program, identifying barriers and problem-solving approaches, revising goals, and implementing actions in implementing self-management. A combination of follow-up conducted either in person or by telephone is the most effective method of monitoring goal achievement.

Strengths and weaknesses

In this review, many studies use a randomized control trial (RCT) design, some studies use a quasi-experimental, cross-sectional, qualitative study. Some limitations are still found. Heterogeneous methods, strategies, populations, settings, and results were compared with the effect size of each study. With the search process that is quite time-consuming, perhaps some studies related to family support in diabetes management were not identified and excluded because they did not involve families or report

specific results. W, therefore,e do not describe the effects of any of the study results.

CONCLUSION

Diabetes self-management programs with family support are integral in maintaining self-management behaviors and improving health outcomes in type 2 diabetes patients. In conclusion, from this review it was found that a diabetes self-management program with family support could improve health outcomes in patients with controlled blood sugar levels. Recommendation for further researchers are to conduct research that explores forms of family support and conduct qualitative research on how family support is felt by people with DMT2 and their families.

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