



Systematic Review

## Self-Care Education Program among Type II DM Patients

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### A B S T R A C T

**Introduction:** The prevalence of Type 2 Diabetes Mellitus was substantially increased around the world, resulting complications and death.

**Objective:** The self-care education program aimed patients to prevent complications and to increase their quality of life is needed.

**Method:** The method used with the help of an electronic data base from journals that have been published through PubMed, Wiley, and Google Scholar as many as 7 articles from 646 articles reviewed.

**Results:** Description of Diabetes Mellitus self-care education program implementation on body biochemical improvement, life quality improvement from physiological, psychological, knowledge, and attitude side.

**Conclusion:** self-care education program that consisted of providing health education to patients and families with a variety of learning methods, training and discussion where patients and families are involved in activities, both in exploring the patient's feelings to goal setting and intervention. Implementation of this self-care education program can be applied to health services with the adjustment of media based on the local conditions.

### INTRODUCTION

Diabetes mellitus (DM) is one of the endocrine disorders and is a major health problem in the community. The most common type of DM is T2DM, around 90 -95%. Type 2 diabetes mellitus (T2DM) affects more than 8% of the adult population globally (Al-Rubae and Al-Abri 2016; Committee and Classification 2010).

The incidence of DM is felt in all parts of the world, both rich and poor groups, ethnicity, age and cross gender. In 2016 the Global Diabetes Report was first formally presented, the World Health Organization (WHO) noted that "the prevalence of diabetes continues to increase, most noticeably in middle-income countries in the world" and DM "is no longer a disease of rich countries" (Setiawan H, et al, 2018). It is estimated that globally 108 million adults suffer from DM in 1980, in 2014 it became 422 million and it is projected that in 2035 it will increase to 592 million. Chin, Davis, and Casalino (2007) in Dagogo-jack (2017) stated that this increase was due to

an increase in the incidence of T2DM due to population growth, aging, and decreased mortality (Chin, Davis, and Casalino 2007; Pandey et al. 2010). The higher incidence of DM is directly proportional to the risk of DM complications, such as cardiovascular disease, stroke, nephropathy, blindness, kidney failure, impotence in men, amputation and infection. This affects health and can cause death (Baraz, Zarea, and Shahbazian 2017).

This event will reduce Life Expectancy, decrease in quality of life, and increase morbidity (Chaidir et al. 2017; Dagogo-jack 2017; Parsa et al. 2017). DM patients compared to those without chronic disease, have a lower quality of life and are more difficult to manage than other common chronic conditions (Akinci, Yildirim, and Go 2008; Kakhki and Abed 2013; Saatci et al. 2010). The long period of DM makes the patient and family very responsible in providing care (Hosseini and Hosseini 2017). So the need for self-awareness of patients to care for themselves (Shrivastava, Shrivastava, and Ramasamy 2013).

Self-care education programs for T2DM patients are needed because they can change lifestyles (diet, exercise and self-monitoring). Patients must be able to manage their own conditions to achieve the main treatment goal of glycemic control (Shrivastava, Shrivastava, and Ramasamy 2013; Thi et al. 2017). Various studies related to self-care education programs in DM patients are deemed necessary for analysis, because in the management of DM patients the most important program among "The Circle of Good Diabetes Control" is self-care education, where this program is a factor affecting factors healthy diet, DM medications, exercise, blood glucose control, skin and foot care and health control to the doctor (Milchovich and Long, 2011).

The importance of self-care education programs in controlling T2DM greatly influences the emergence of DM complications so that it can improve self-management, self-efficacy and quality of life of patients.

## METHOD

Proses dalam pencarian artikel jurnal terpublikasi dalam *sistematik review* ini mengacu pada PRISMA (*Preferred Reporting Items for Systematic Reviews and Meta-Analyses*) untuk semua tahap *review*. Pencarian menggunakan 3 database elektronik yaitu Pubmed, Wiley dan Google Scholar. Menggunakan kata kunci dalam bahasa inggris yaitu "Self-care" and "Education Program" and "Diabetes" merupakan kata kunci pencarian utama yang menghasilkan 646 artikel. Jurnal kemudian di spesifikasikan berdasarkan kriteria inklusi yaitu 1) Artikel di publikasikan *full text* dan dalam bahasa inggris, 2) Artikel di publikasikan dalam rentang waktu 2013-2017, 3) Jenis penelitian kuantitatif, 4) Artikel Lengkap, 5) Penelitian yang populasinya di atas 18 tahun. Setelah disesuaikan berdasarkan kriteria *inklusi* maka tersisa adalah 265artikel. Selanjutnya menyeleksi artikel yang sama dari ketiga database pencarian menjadi 174 artikel. Kemudian menyeleksi artikel memiliki konten DM tipe 1/*Gestational* didapatkan 62 artikel, kemudian diseleksi lagi berdasarkan tujuan penulisan menjadi 7 artikel dan akan di *review*, dapat di lihat pada Gambar 1.

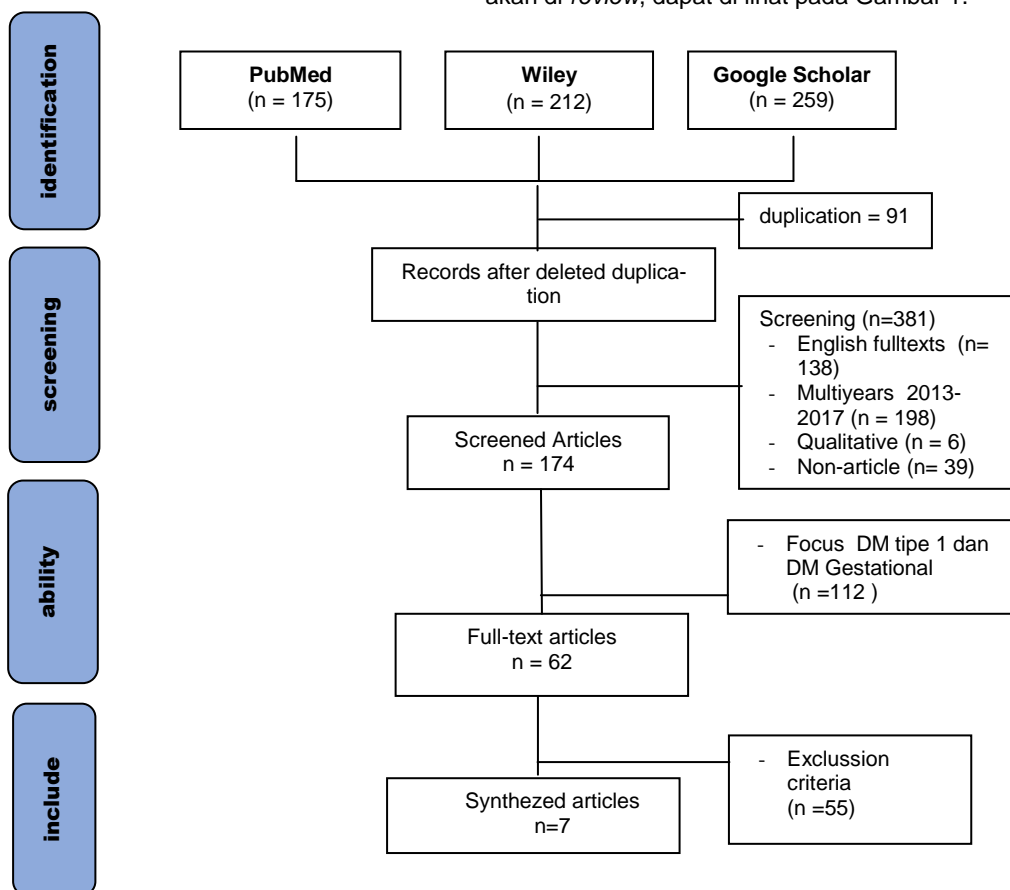


Figure 1. Prisma Flowchart

**Table 1. Journal Articles Review**

No	Author	Design	Country	Objective	Component	Respondent	Follow Up	Topic	Result
1	Cortez et al. (2017)	Cluster Randomized Trial	Brazil	Evaluate the effectiveness of empowerment programs that provide support in the psychosocial, behavioral, and clinical aspects of DM to help Brazilian people gain metabolic control in health care.	<ul style="list-style-type: none"> <li>• Giving topics in group meetings: Physical activity, re-education about nutritional needs, how to maintain quality of life, DM complications and care, self-care.</li> <li>• Identify and discuss feelings and perceptions/ attitudes</li> <li>• Setting shared goals</li> <li>• Make nursing interventions to achieve goals</li> <li>• Evaluate the experiences and interventions that are set</li> </ul>	284 (30-80 years old) (intervention 162, control 122 peoples)	Call every month and visit home if the respondent is absent from the group for 12 months	Provision of Material and Discussion in groups	<p><b>Primary</b> There was a statistically significant decrease in HBA1c, Total Cholesterol, LDL, Diastolic Blood Pressure and an increase in HDL.</p> <p><b>Secondary</b> Intervention group There was a statistically significant increase in knowledge, attitudes, self-care and empowerment</p>
2	Barash eh et al. (2017)	Quasi-experimental Study	Iran	Investigate the effect of educational programs based on preliminary models on increasing self-care behavior in T2DM patients	<p>Provision of material for 1 hour 2 times a week for 3 months</p> <p><b>First</b> session; increased understanding of diabetes and DM disease myths.</p> <p><b>Second</b> session; training by presenting nutritionists to teach patients in a healthy diet, monitor blood glucose.</p> <p>The <b>third</b> session, presenting one patient's family and giving a booklet</p> <p>The <b>fourth</b> session, summarizes the discussion of the previous session.</p>	110 female patients aged > 30 years where 55 intervened patients and 55 control patients	Through telephone and care records that are filled out by patients at home for 3 months	Provision of films, booklets and presentations	After the intervention there was a significant difference between pre and post who experienced an increase in the average of knowledge, attitudes, self-efficacy, supporting factors, reinforcing factors and self-care behavior. There is a significant but not significant difference between blood glucose and BMI
3	Niknam i et al. (2014)	Experimental Study	Iran	Determine the impact of the self-care education program on reducing HbA1c, T2DM patients	<ul style="list-style-type: none"> <li>○ Provide education, training and group discussions about DM, its complications, and DM control</li> <li>• Providing pamphlets and learning CDs when returning home.</li> </ul>	138 female patients, 69 given intervention and 69 as controls	Telephone and face to face for 3 months	Providing CDs, pamphlets and discussion and film screenings	There is a significant difference and statistically significant improvement between self-care knowledge, attitudes and behavior and the reduction of HbA1c after the intervention
4	Sheikh Abumaksud et al. (2015)	Randomized Control Trial	Iran	Knowing the effect of self-care programs with the support of multimedia software on quality of life among T2DM patients	Support of multimedia software by providing education and discussion (introduction of DM, exercise, controlled blood glucose, digestive system and foot care) where they are asked to use software programs at least once a week	60 patients, 30 were given intervention and 30 as controls	Telephone and face to face for 2 months	Provision of multimedia software "Self-care in diabetes mellitus"	There was a statistically improved quality of life with the support of multimedia software in the intervention group while the control group did not.

5	(Zolfagari et al. 2017)	<i>Quasi-experimental Study</i>	Iran	Compare the effectiveness of DM care education programs through podcasts and pamphlets.	In the <b>podcast</b> group: 5 audio training files are transferred via Blue-tooth to the patient's cell-phone. In the <b>pamphlet</b> group: Providing pamphlets with content that is very similar to audio in the podcast group.	90 patients, 45 were given Podcast Training and 45 were given pamphlets.	Telephone and face to face for 3 months	Audio training files are transferred via Blue-tooth to cellphones and pamphlets	There was a statistically and significant increase in the exercise program in the two groups and a statistical increase in the pamphlet compared to the podcast (drug therapy program), in the diabetic diet program there were significant differences in the pamphlet group.
6	Davari et al. (2014)	<i>Randomized Control Trial</i>	Iran	Evaluating the efficiency of educational program interventions of self-care among T2DM patients	Active learning in the education process (Diabetes nutrition, physical activity, blood glucose control, foot care and medication adherence). Training involves the family	64 patients aged 30-65 years, 32 were given training and 32 controls.	face to face for 3 months	Provision of material and discussion	<ul style="list-style-type: none"> <li>• There was a significant difference between before and after the intervention in DM nutrition, physical activity, GDS control and total self-care</li> <li>• There was no significant difference between before and after the intervention in foot care and adherence to treatment</li> </ul>
7	Thi et al. (2017)	<i>Randomized Control Trial</i>	Vietnam	Test the effects of supporting educational nursing programs in glycemic control in Vietnamese patients with uncontrolled T2DM	<ul style="list-style-type: none"> <li>• The first part is to provide DM education and self-care skills as well as group discussions. By increasing patient confidence.</li> <li>• The second part is the supporting part, providing an appropriate environment for self-care at home and motivating patients</li> </ul>	84 patients aged 30-65 years, 41 were given training and 43 controls	Telephone and home visits for 3 months	Hanbook, program manual, Video (VCD)	<ul style="list-style-type: none"> <li>• Scores The average HbA1c level in the experimental group was lower than the control group</li> <li>• Glucose control in the experimental group was significantly higher than in the control group.</li> </ul>

## RESULT

The research articles reviewed were from Brazil, Iran and Vietnam, where Iran has 5 articles. All articles reviewed use a quantitative approach, the method used is Randomized Control Trial (RCT) (n = 3), Randomized Trial Cluster (n = 1), Quasi-experimental Study (N = 2), Experimental Study (N = 1), more women than men. The results of a systematic review can be seen in table 1.

### Kind of Self-care Education Program

The results of research that have been reviewed, there is an article with a basic education program and then monitored its development by empowering patients in a nursing care process (Cortez et al. 2017). Whereas Barasheh et al. (2017) based on a learning model by involving nutrition professionals and families (Davari et al. 2014). Niknami et al. (2014) involved doctors in providing material. Sheikh Abumasoudi et al. (2015) using multimedia software. Zolfaghari et al. (2017) using Podcast and Pamphlet media. Whereas Thi et al. (2017) uses supportive education.

### Strategy and Components

Learning strategies / components that have been used are increased knowledge. The seven articles provide material about DM, ranging from understanding DM, DM complications, DM control (Physical activity, not smoking, taking regular medication, proper diet, foot care, blood glucose control) by a doctor. There are additional self-care material (Cortez et al. 2017; Thi et al. 2017), DM with gastrointestinal disorders (Sheikh Abumasoudi et al. 2015), myths of DM disease (Barasheh et al. 2017) and drugs that can reduce blood glucose and nursing plans (Zolfaghari et al. 2017). After the increase in knowledge is continued with training and discussion by nutritionists, starting from a healthy diet, how to process food, monitor blood glucose independently, do activities / exercise and involve the family (Barasheh et al. 2017; Davari et al. 2014). This discussion explores patient feelings, positive experiences, material taught, expectations and goals of patients in care (Barasheh et al. 2017; Cortez et al. 2017; Niknami et al. 2014; Sheikh Abumasoudi et al. 2015; Thi et al. 2017; Zolfaghari et al. 2017) to establish self-care plans at home and motivate patients after at home (Thi et al. 2017).

### Follow Up

The process of follow-up with telephone media, where patients can contact and be contacted at any time when patients experience problems in the process of self-care behavior at home (Barasheh et al. 2017; Cortez et al. 2017; Niknami et al. 2014; Sheikh Abumasoudi et al. 2015; Thi et al. 2017; Zolfaghari et al. 2017), if the patient did not attend the meeting, a home visit was carried out (Cortez et al. 2017; Thi et al. 2017). Follow up through patient self-care records other than by telephone at each

meeting (Barasheh et al. 2017; Niknami et al. 2014; Sheikh Abumasoudi et al. 2015; Zolfaghari et al. 2017). Whereas Davari et al. (2014) face to face when post intervention.

### Media

Media/ learning methods by providing material and discussion in groups (Barasheh et al. 2017; Cortez et al. 2017; Davari et al. 2014; Niknami et al. 2014; Sheikh Abumasoudi et al. 2015). Provision of booklets and films about DM (Barasheh et al. 2017; Niknami et al. 2014). Whereas Zolfaghari et al. (2017) with podcasts and pamphlets and with multimedia software "self-care in diabetes mellitus" in audio visual form (Sheikh Abumasoudi et al. 2015; Thi et al. 2017).

### Result of Self-care Education program

The biochemical and anthropometric results statistically after the intervention are a decrease in HbA1c levels (Cortez et al. 2017; Niknami et al. 2014; Thi et al. 2017), reduction in total cholesterol (TC), Low Density Lipoprotein (LDL), Diastolic Blood Pressure (DBP) and an increase in High Density Lipoprotein (HDL) (Cortez et al. 2017) as well as a decrease in Fasting Blood Glucose (GDP) and Body Mass Index (BMI) (Barasheh et al. 2017).

After the intervention showed increased self-care behavior (physical activity / exercise, drug therapy / glycemic control and DM diet) better. Thi et al. (2017) only looked at self-care behavior in terms of glycemic control where the results were better, knowledge and attitudes about self-care also improved better (Barasheh et al. 2017; Cortez et al. 2017; Niknami et al. 2014) and self-efficacy, supporting factors and self-care reinforcing factors also improved better (Barasheh et al. 2017), the quality of life of patients increased positively (Sheikh Abumasoudi et al. 2015).

## DISCUSSION

The purpose of self-care education programs for T2DM patients is to identify and describe self-care education programs that enable T2DM patients to control and prevent complications of DM. From the results of a review of more research in Iran (Barasheh et al. 2017; Davari et al. 2014; Niknami et al. 2014; Sheikh Abumasoudi et al. 2015; Zolfaghari et al. 2017) compared to Vietnam (Thi et al. 2017) and Brazil (Cortez et al. 2017). The research design uses 3 RCTs, 1 Cluster randomized trial, 2 quasi experimental studies and 1 experimental study, 4 studies that have high quality namely RCT research and Cluster randomized trial (Cortez et al. 2017; Davari et al. 2014; Sheikh Abumasoudi et al. 2015; Thi et al. 2017).

The seven journals use basic education programs involving families and other health professions (nutritionists and doctors), the use of audio visual software, the use of pamphlets, supportive educative booklets. The use of various types of educational media can show a good self-care response from T2DM patients. The diabetes education program (DEP) is part of "therapeutic education". The ultimate goal is to help patients develop behavioral skills based on parameters and quality of life associated with improving health status (Pamungkas, Chamroonsawasdi, and Vatanasomboon 2017; Ruiz-gonzález et al. 2016).

Research conducted by Barasheh et al. (2017) and Davari et al. (2014) involving the family in the education process strongly supports the patient's self-care process, but does not see family involvement after the education process. Several studies explain family support has a positive correlation on the ability of coping self-care among T2DM patients. Living life with family is associated with higher self-care diet abilities among T2DM patients (Baumann, Opio, and Otim 2010; Pamungkas, Chamroonsawasdi, and Vatanasomboon 2017). Educational programs involving expert preceptor in the learning process coupled with a variety of methods that support can increase knowledge and attitudes that have an impact on positive behavior towards the expected goals.

Supporting educational nursing programs are programs that are developed based on Orem's theory with the assumption that the person has a self-care agent. Self-care agent is an individual's ability to recognize self-needs, evaluate appropriate resources, determine and take self-care actions in controlling glycemic levels. (Renpenning and Taylor 2011). A variety of program strategies / components have been offered that can support each other so as to produce an integrated self-care program (Baumann, Opio, and Otim 2010; Gamboa Moreno et al. 2013; Renpenning and Taylor 2011).

Nurses use techniques to teach, guide, and provide DM self-care knowledge and skills. Nurses foster an appropriate learning environment and encourage patients to overcome difficulties in self-care behavior. Therefore, with an educative nursing system the nurse helps participants to achieve adequate self-care after 3 months. This is according to research by Barasheh et al. (2017), Davari et al. (2014), Niknami et al. (2014), Thi et al. (2017) dan Zolfaghari et al. (2017).

Follow up is done on average using the telephone and visiting respondents when not following the training process. Follow-up can see the development and progress of self-care education programs, where the follow-up used is very economical and practical with the use of the telephone. This is in line with research by

Pamungkas, Chamroonsawasdi, and Vatanasomboon (2017) which explains that the use of electronic media by telephone can improve control of patients without having to meet with these patients.

The results of the self-care education program show a better change after the intervention in terms of biochemistry and anthropometry as well as from the patient's self-care behavior as well as an increase in knowledge, attitudes, self-efficacy, supporting factors as well as reinforcing factors and the quality of life of the patient also increases. Recent meta-analyses of controlled studies (Hopkins, Lawrence, Mansell, et al., 2012) have shown decreases ranging from 52% to 0.81% in hemoglobin (HbA1c) levels when training in disease management is included.

In addition, interventions including the flexibility of diet / insulin regimens such as adjusting the dosage program for normal diets in diabetic patients have achieved very positive results in metabolic control. In recent interventions (Hopkins, D., Lawrence, I., Mansell, P. 2012), researchers reported a 0.44% reduction in HbA1c from baseline to one year of follow-up and a significant reduction in episodes of severe hypoglycemia ( ranging from 1.7 to 0.6 per individual) as well as a 43% increase in the ability to control blood glucose. Similar results have been observed by other research authors, who have also shown considerable improvement in other fields such as self-efficacy and knowledge (Rankin et al. 2011), psychological distress (Hopkins, D., et al., 2012) and satisfaction and quality of life (Rankin et al. 2011). The results of the analysis of this journal state that the self-care education program for T2DM patients is very influential in self-care behavior to prevent complications of DM.

Self-care education programs for T2DM patients are needed in public health services to prevent community morbidity and mortality, especially DM patients, the implementation of self-care education programs can be applied to health services in the community or health clinic settings both in hospitals and private clinics, the implementation media can be adapted to local conditions and conditions. The results of the review show that all learning media influence the outcome of the intervention, which can reduce the risk of diabetes, improve the quality of life and develop themselves positively.

## CONCLUSION

The T2DM patient self-care education program consists of providing DM education to patients and families, then training and discussions are held where patients and families are involved, both in exploring patient feelings to setting goals and interventions, it is expected that in the self-care education program using several methods

learning and involving practitioners who are experts in DM management, and held follow-up by utilizing existing technology.

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