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Development of Family-Based Dietary Self-Management Support Program on Dietary Behaviors in Patients with Type 2 Diabetes Mellitus in Indonesia: A Literature Review

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Background: WHO statistics show that Indonesia has the fourth highest number of diabetes sufferers. The International Diabetes Federation's 5th estimated that in 2011 there were 71.4 million people in South East Asia region were suffering with DM
Purpose: To develop a family-based dietary self-management support program to improve dietary behaviors in patients with T2DM.
Method: A literature review was conducted by reviewing articles related evidence-based practices. Only articles in the English and Indonesian languages were reviewed. The search found eleven published experimental studies related to the topic.
Result: Even though dietary self-management has benefits for patients with diabetes, many studies have found that these patients often have difficulty in establishing or maintaining an effective program to self-manage their dietary behaviors. Lack of family support is one factor that often seems to be related to such failures. Family participation in a diabetes education program also had positive psychosocial impacts. Otherwise, another study found that family might not always have a positive impact on self-management. Therefore, this review recommends that development of a family-based support program could be a positive factor in helping to improve dietary self-management behaviors in patients with T2DM. Self-management theory by Funnell and Anderson's work (2004) can guide the development of a program with the goal of empowering individuals and families in improving the patient's dietary behaviors. The program consists of: (1) reflecting on current and/or past self-management experiences by listening to the patient about their dietary behaviors, (2) discussing the emotions and feelings of the patients, (3) engaging the patient in improving their situation by active listening and helping the patient reflect on their problems and identifying effective strategies, (4) providing information about dietary management and problem-solving strategies, and (5) goal-setting and action planning by assisting the patient to write the goals and action plan on a specially prepared form. All of these sessions would involve the patient's family. Follow-up visits may be needed to evaluate the dietary behaviors of patients.
Conclusion: The collaboration of patients, family and health care professionals can have a positive impact on the dietary self-management behaviors of patients with T2DM. Further study is needed, as there is a growing awareness of the important role in diabetes management of integrating family support into routine diabetes management.
Key words: Type 2 diabetes mellitus, dietary behaviors, self-management, and family support.

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Background

Diabetes mellitus (DM) is a global health problem. Recent estimate showed that there were 171 million people in the world with diabetes in the year 2000 and this is projected to increase to 366 million by 2030 (Wild, Roglic, Green, Sicree, & King, 2004). The current World Health Organization (WHO) indicates 346 million people worldwide have diabetes (http://www.who.int/mediacentre). WHO statistics show that Indonesia has the fourth highest number of diabetes sufferers. The International Diabetes Federation's 5th estimated that in 2011 there were 71.4 million people in South East Asia region were suffering with DM. Currently, based on the statistics of the Health Research Association of Health Basic Research in Indonesia in 2007, three regions in Indonesia have a diabetes prevalence rate above 1.5 %: Aceh, East Java and North Sulawesi (Widjojo, 2011).

From the prevalence of global disease, T2DM is more common type of diabetes (Sutanegara, Darmono, & Budhiarta, 2000). It is one of the most common chronic diseases in nearly all countries, and continues to increase in numbers and significance. Increasing prevalence of diabetes can lead to high incidence of complications if diabetic patients do not control their disease. Diabetes and associated complications is a major health care burden worldwide (Ignatavicius & Workman, 2010) and present major challenge to patients, and health care systems.

In order to control the complications and improve the outcomes, the appropriate and adequate management for this disease must be taken. Furthermore, diabetic patients have to control their disease routinely and manage their life style including management of diet to prevent diabetic complications. Dietary management is fundamental part of the management in diabetic patient (Arsand, Tufano, Ralston, & Hjortdahl, 2008). Even the dietary management is a core component of overall self management of diabetes and has benefits for patients, most of patients with diabetes had difficulty to self-manage their dietary behaviors (Lin, Anderson, Hagerty, & Lee, 2008; Nelson, Reiber, & Boyko, 2002). It may be difficult to achieve because it often requires changes in long term food consumption, food preparation habits and change lifelong eating habits. Several contributing factors included their knowledge, belief and lack of support (Bazata, Robinson, Fox, & Grandy, 2010; O'Dea, 2003).

Family support has been evidenced to get benefit to self-management directly (Toljamo & Hentimen; Wang & Fenske at cited in Xu, Toobert, Savage, Pan, & Whitmer, 2008) (for example prepare the food, encourage the patient to eat healthy food, and scheduled exercise together). Family support is also important factor in patient recovering from illness,

health maintenance and changing behaviors (Cohen; DiMatteo & Hays; Helgeson & Cohen; Uchino, Cacioppo, & Kiecolt-Glaser; Wallston, Alagna, DeVellis, & DeVellis as cited in DiMatteo, 2004). Family members may provide practical help, for example, they might assist with blood glucose testing or by identifying the signs of an oncoming hypoglycaemic. The family may also act as a psychological resource, encouraging people with diabetes to view themselves as healthy and normal (Paddison, 2010). Previous studies have been conducted by involving the family members (Awallom, 2011; Jack, 2003) found that optimal self-management is the product of a partnership between the patient, the family, and health care providers. The collaborative relationships with clients and their families are critical to the success of self-management support (Registered Nurses' Association of Ontario, 2010).

Since dietary management is one of the most important factors of diabetes management, and considering on self-management and social influence, dietary management in adult patients with diabetes may be affected by the dietary behaviors of those around them, specifically the family members. Most of the patients live with their family. Family members then influence patients' behaviors. This study aims to review the support of family member in self-management support program significantly affects on dietary behaviors in patients with type 2diabetes mellitus.

Objectives

The objective of this study was to develop a family-based dietary self-management support program in improving dietary behaviors in patients T2DM.

Method

Research articles were retrieved from a number of relevant electronic databases, including CINAHL, PubMed, Science Direct, and the Cochrane Library. The researcher also used the general internet search including Google-web and Google-scholar. The keywords/phrases used to search for these articles were type 2 diabetes mellitus, self-management, dietary behaviors, and family support.

The data, information, and documents that matched the keywords were retrieved. Firstly, the author examined the search 'hits' and made a preliminary evaluation about whether or not the articles were relevant to the study and then downloaded the relevant ones. Then the author carefully read the downloaded articles and extracted the relevant information. The inclusion criteria of the retrieved articles focused on dietary behavior, standards of self-management, and family support. The included articles were written in the English or

Indonesian languages, written by nurses, nurse students, or physician, the research was conducted in any setting (hospital, family, or community), and meta-analyses, systematic reviews, randomized controlled trials, quasi-experimental studies, or correlational studies were accepted.

Results

Self-management, in the health field context, is defined as the engagement of individuals in activities and practices that sustain and promote health and well-being by making, and participating in decisions concerning their particular treatment program; building and sustaining partnerships with others who are involved in their health to design and maintain their particular program; and having the capacity of knowledge, resources, and confidence to manage the impact of their health problem on daily functioning, emotions and interpersonal relationships (Queensland Health, 2008). The individual's ability to self-manage can be influenced by a range of factors, including, for example, social supports, readiness for change, the way in which related services are delivered, and the expertise of the individual, family and service providers across all sectors involved in self-management.

The process of self-management refers to the use of abilities and skills to manage chronic conditions or risk factors. Self-management has been used to refer to 5 different processes: (a) activities such as reflecting on self-management experiences, (b) discussing emotions and feelings, (c) engaging in problem-solving, (d) education and counseling, and (e) goal-setting and action planning (Tang, Funnell, Brown, & Kurlander, 2010). These processes are usually facilitated by the intervention of a health care advisor who has been trained in this type of self-management program, and whenever possible family support is a central part of the program.

Family support on self management

The success rate of dietary self-management programs is much higher when positive family support is part of the program (Watanabe et al., 2010). When family members are involved in self-management intervention, they provide support to the patient which usually improves the outcome. Patients with higher levels of family support report better self-management behavior (Rosland, 2009). The aims of self management are empowering and preparing patients, emphasizing their own central role in managing their health and health care. For example, effective self-management strategies include assessment, goal-setting, problem solving, follow-up, and organizing internal and community resources for self-

management (Funnell & Anderson, 2004). Fisher et al (2010) found that family structure and organization were associated with good diet and exercise among Hispanic patients with diabetes. Furthermore, the Fisher study also found quality of life (QOL) was higher in patients having family member involvement and/or group meetings participation than in patients with traditional, individual care.

In Indonesia, the family tries to eat together at meal times, especially the midday meal (Culture grams, 2005). Customs and rituals are familial and there are various social patterns of behavior in which members have designated roles or responsibilities. The characteristics of a healthy family include good communication and supportive behaviors, such as a sense of trust, humor and play, a shared sense of responsibility, and a willingness to seek help from outside the family if problems cannot be solved within the family group (Bodenheimer, Lorig, Holman, & Grumbach, 2002). However, there has been little research has been done on how families deal with a family member suffering from a chronic illness such as diabetes. Family members can support self-management of the patient through general awareness and by helping set the goals and creating an action plan (California Health Care Foundation, 2010).

Family-based interventions are designed to provide guidance, training, information, and support to not only the patients, but also family members who may be experiencing their own problems in dealing with an ill family member. One of the goals of a family-based intervention program is to enhance self-management of a patient with T2DM by engaging family members with the program. The family of a patient with T2DM requires information to help both themselves and the patient understand the self-management goals, in order to prevent complications of the disease, and to understand what kind of support and information are available when problems arise. Effective family strengthening prevention programs should be a central part of any comprehensive dietary self-management program.

A study by Teufel-Shone, Drummond and Rawiel (2005) showed that family participation in a diabetes education program had positive psychosocial impacts. They conducted an initial home visit to explain the length and format of the program to the family, identify interested family members and record details such as name, age and relationship to the family member with diabetes, and obtain informed consent for their participation in evaluation activities. At follow up visits during the intervention, they encouraged the families to discuss together their progress and goals, and suggest ways that they could enhance their success through family support and unity. Rearranging the family environment and encouraging healthy behaviors such as by preparing healthy meals was found to be an

effective intervention for diabetes self-management (West, Sanders, Cleghorn & Davies, 2010). Another intervention expanded the support activities by teaching all family members to recognize, avoid, and take care of low and high blood sugar (Teufel-Shone et al., 2005).

The goal of a family-based program is to introduce the patient and the family member of dietary self-management behaviors and to assist them in creating a supportive environment for healthy behaviors. Familiarizing family members by involving into education and counseling session with the key dietary behaviors may lead to changes in the family environment (Eisenmann, Gentile, Welk, Callahan, Strickland, Walsh, et al., 2008). Previous study provided self-management education and support. The intervention focused on diabetes. A study by Laroche, Davis, Forman, Palmisano, Reisinger, Tannas et al., (2009) found that successful self-management, including a healthy diet, was successful in decreasing blood glucose.

Self-management support program in patients with type 2 diabetes mellitus

For the current study, the literature review found a number of relevant studies concerning the development of self-management programs to help the DM patient, and their family, manage their illness properly. The main goals of these programs were to improve the patient's general health and dietary behaviors, and thus reduce complications related to the illness and maintain a good heath status (Atak, Gurkan & Kose, 2008; Clark, & Hampson, 2001; DeWalt, Davis, Wallace, Seligman, Bryant-Shilliday, Arnold et al., 2009; Huisman, de Gucht, Maes, Schroevers, Chatrou, & Haak, 2009; Kang, Chang, Chen, Liu, Liu, Chang, & Chang, 2010; Keogh, White, Smith, McGilloway, O'Dowd, & Gibney, 2007; Leibbrandt, Jong, Hogenelst, Snoek & Weijs, 2010).

***Target population*s.** The target populations of most of these studies included outpatients with T2DM. The ages of the patients ranged from 18-80 years old, they had levels of HbA1c ranging from 4% to 16.8%, and BMIs ranging from 25 kg/m2 to 73.4 kg/m2. The studies included both family or non-family caregivers, and all excluded patients who had complications that caused them to be unable to perform self-management activities.

Settings. Most of the studies were conducted in outpatient settings such as a hospital outpatient department, a diabetes center, or other health care service centers. A few of the studies included patients in a primary care unit, community center or the patient's home.

***Teaching strategies*.** Several teaching strategies for self-management in diabetes were discussed in the papers, including involving health educators to encourage

patients and family members in learning sessions, participating in an exercise classes in the community, support groups, and offering cooking demonstrations (Jack, 2003). The most common intervention used goal setting and action planning as a teaching method (Glasgow, Toobert, Hampson, & Noell, 2003; Primanda, Kritpracha, & Thaniwattananon, 2011). However, Clark et al. (2001) suggested that the lack of dietary knowledge should be considered as the reason to include an information session before the discussion, goal setting and problem solving sessions. The effect of these intervention methods was mostly seen as behavioral changes rather than clinical outcomes.

Educational contents and materials. The contents and materials of educational sessions varied across the studies. Most of the studies not only focused on dietary behaviors in patients with T2DM, their educational contents also combined with other topics related to diabetes such as physical activities, self-monitoring of blood glucose, medication therapy, and complications of diabetes. With respect to dietary behaviors, the educational discussions included basic information on healthy food and diets, goal setting, action planning, and problem solving related to dietary behaviors, healthy dietary patterns and meal planning, and strategies to achieve healthy eating habits. Various educational materials were used in the studies, such as written guidelines, newsletters, or handbooks. One recent study also incorporated the use of modern smart-phones and a mobile phone photo (Arsand, Tufano, Ralston, & Hjortdahl, 2008). Most of the interventions provided handouts or a handbook giving information about diets, medications, physical activities and exercise, preventing complication, eye and foot self-care, and other information related to diabetes mellitus. In a study conducted in Indonesia by Primanda et al. (2011), in the education session of their dietary self-management program they included general information of dietary management in T2DM, the patient's calorie needs, the healthy diet, arranging meal plans, and managing dietary challenges. In this study, she provided an Indonesian version of a dietary self-management booklet for the patients.

***Duration of interventions*.** The duration of intervention could be divided into three categories: short-time (less than 6 months or 24 weeks), medium (6 months until 12 months or 24-48 weeks), and long-term (more than 12 months or more than 48 weeks). Most of the studies examined in the literature review involved in short term period. This indicated that for dietary behavioral change, the positive and significant effect can be seen in short-duration and vary across time.

Follow-up strategies. Follow-up interventions can be categorized into five strategies, including computer-assisted, telephone call, short message service, home visit, and

in-person visit, depending on the medical setting (Ardi, 2010; Bastiaens, Sunaert, Wens, Sabbe, Jenkins et al, 2009; Glasgow, Toobert, Hampson & Strycker, 2002; Kim & Oh, 2003; Primanda et al., 2011; Tang et al., 2010).

Measurement tools. In the studies, several measurement tools were employed for measuring post-intervention dietary changes, including the Kristal Food Habits Questionnaire (Thoolen, de Ridder, Bensing, Gorter & Rutten, 2009), the Food Frequency Questionnaire (Amend, Melkus, Chyun, Galasso, & Wylie-Rosett, 2007; Bastiaens, et al., 2009; Parr, Veierød, Laake, Lund, & Hjartåker, 2006), the Fat Consumption Questionnaire (Thoolen, de Ridder et al., 2009), the Effectiveness of Goal Setting instrument (Shilts, Horowitz, Marilyn, Townsend, 2004), and the Self-Management Dietary Behavior Questionnaire (SMDBQ) (Primanda et al., 2011; Taru, Tsutou, Nakawatase, Usami, & Miyawaki, 2008).

In conclusion, utilizing the tool that is most responsive to dietary behavioral changes that is useful to determine the effect of an intervention without overestimating its effects and be able to capture the patients' daily practice should be considered in order to look at behavioral and also psychological or emotional changes. Currently, it seems the most useful choice would be the SMDBQ, as it has similar outcomes and has also been used previously with some success in an Indonesian context. The SMDBQ might be better to determine the outcomes in this study and it should be able to accurately capture the Indonesian patients' dietary behavioral changes.

Family-based dietary self-management support program for improving dietary behaviors

The family-based dietary self-management program is currently being developed by the authors, based on a self-management method previously developed by Funnell and Anderson (2004), with sections specifically directed to improving family member's involvement considered following the earlier work of Ryan and Sawin (2009). The intervention will involve 5 processes; (1) working with the patient, helping them reflect on their past and/or current self-management, (2) discussing emotions and feelings, (3) problem identification, (4) education and counseling, and (5) goal-setting and action planning. The intervention will be carried out over 4 weeks, as follows:

Week 1

The subjects and their family member will be initially approached, and the

objectives and details of the program explained to them. If they agree to participate, the five stages of the program will be explained to them, as follows:

Reflecting on self-management experiences. The researcher will work with the patient and their family members to help them identify their current dietary behaviors. They will be encouraged to share their experiences related to their dietary management. The subjects and family members will be asked about how they select the food for, and prepare the patient's and family meals, and the normal meal times. The researcher will help clarify the patient's and family's current dietary behaviors.

Discussing emotions and feelings. In the second session, along with the researcher they will discuss their emotions and feelings in terms of living with diabetes, and dealing with a diabetic patient and managing dietary needs and behaviors.

Problem identification. The third session will focus on identifying any problems around the patient's dietary behaviors. In this session, the patient will be encouraged to collaboratively identify any problems about dietary behaviors with their family members and how they could try to solve the problems.

Education and counseling. The fourth session will be about education and counseling. In this session, every patient and their family members will have an opportunity to discuss any misunderstandings they have about dealing with diabetes, and identify and clarify any unclear information they might have. The subject and their family members will receive information about the potential complications of diabetes, and other information related to dietary management in T2DM. The researcher will explain to the patient and their family members about the importance of proper self-management of dietary behaviors and the effects of un- or poorly managed dietary behaviors and the positive impacts of good management of dietary behaviors in T2DM patients. To help the subjects and family members maintain their goals around dietary management learned and decided on during the education and counseling sessions, they will be given a dietary behaviors management booklet.

Goal-setting and action planning. The subject and family members will participate in a session which will explain how to set appropriate goals and make an action plan by using the goal and action planning form. The family members will be asked to help the patients to set goals and create an action plan, and the researcher will emphasize the importance of reminding the patient about the goals and action plan. The subjects and their family members will collaboratively set the goal and action plan with the assistance of the researcher. The goals will focus on the dietary behaviors of the patient. The action plan will focus on achieving specific behavioral changes, especially those which can be evaluated in a

short term period (at least one week). The patients and family members will be shown examples of how to set goals and make an action plan. They will be given a goal setting and action planning form which they will then complete collaboratively.

Weeks 2 and week 3

The patient will receive two times follow-up by phone call; one phone call in week 2 and one phone call in week 3 at which time they will be asked about the progress of their goals and action plan. The researcher will evaluate the situation based on the patient's responses, and ask about any problems in following the action plan. Then, the researcher will assist the patients to justify whether they are meeting their goals or not. If they can follow the action plan and achieve their goals, they will be motivated to continue their plan.

Week 4

The patient and their family members will receive a face-to face follow-up visit to evaluate the achievement of the patient's goals. In this session the researcher will evaluate the overall patient's achievements, based on their program, and will discuss further planning to maintain the current improvements, or try for more improvement, of their dietary behaviors.

Pilot study

A pilot study will be conducted to examine the feasibility of the planned intervention procedure. Three patients who met the inclusion criteria based on the literature review findings were recruited for the pilot study. The pilot study will be conducted within one week with one time follow-up by phone, and one time face-to face follow-up.

Conclusion

The dietary self-management support program will aim to improve the dietary behaviors of T2DM patients, and to give them confidence to achieve behavioral changes. A collaborative relationship with each patient and their family is critical to the success of a self-management support program. The collaboration of the patient, their family and their health care professionals can have a positive impact on self-management behaviors of patients with T2DM.

The literature review found that self-management programs are effective in improving dietary behaviors in T2DM patients. Although the populations, settings, teaching strategies, contents, educational materials, and follow-up strategies varied in the studies, they all showed improved that a dietary self-management support program provided benefits in improving the patient's dietary behaviors patients with T2DM.

The family of a diabetic patient has an important influence on the dietary self-

management behaviors of patients, as most patients live with their family. However, this influence can be negative in some situations, and the patient's health care manager must be alert to this situation, and be ready to offer assistance and counseling if needed. Further study is needed to increase awareness of the important role of psychosocial and behavioral factors in diabetes management, and highlight the importance of integrated family support in routine diabetes management.

Recommendations

Since patients with T2DM have a high risk to develop complications, dietary behaviors become an important role of diabetes management. Proper dietary management can reduce or delay diabetic complications. A dietary self-management approach is recommended for patients with T2DM, and since most diabetes patients lives with their family, family support is an important factor in improving dietary behaviors.

Further researches are needed in dietary self-management using individual approaches and individual with family involvement approach, especially in Indonesia. A collaborative relationship between the patient and their family is critical to the success of a self-management program. Further studies are needed to examine the best way to involve the family to empower the patient in a self-management support program. Several elements should be considered and appropriately used to achieve the effectiveness of the program.

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