

SELF-MANAGEMENT IN PATIENTS WITH DIABETES MELLITUS FOR EFFECTIVELY CONTROLLING BLOOD SUGAR: A QUALITATIVE STUDY

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ABSTRACT:

The purpose of this study was to describe self-management for controlling blood sugar in patients with type 2 diabetes mellitus (DM). All participants were able to maintain their HbA1c under 7 for at least 1 year prior to the study. Eighteen patients with type 2 DM participated in this study. Data were collected by using in-depth interviews from August 15, 2011 to December 6, 2011. Each interview lasted 30 minutes for each subject. In-depth interviews allowed the subjects to express a wide variety of ideas, views, and experiences regarding diabetes self-management. The method of content analysis was used to study the collected data. Results showed the self-management strategies used by the type 2 DM patients' consisted of 7 categories as follows: (1) changing behavior from high to low calorie diet, (2) increasing physical activity, (3) coping with stress, (4) keeping physician's appointments, (5) taking medicine regularly, (6) having self-regulation, and (7) receiving social support from family and others

Keywords: Self-management, Diabetes mellitus, Blood sugar control, Qualitative research

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INTRODUCTION

The prevalence of type 2 DM has increased rapidly in globally; Thailand is no exception. Patients with type 2 DM have experienced a number of complications that are leading causes of blindness, renal failure and nerve damage, as well as increased risks of myocardial infarction, stroke and limb amputation. Moreover, the World Health Organization (WHO) [1] reports hyperglycemia is a common consequence of uncontrolled diabetes that causes damage to various body systems, particularly nerves and blood vessels. It is, therefore, essential that patients with type 2 DM control their blood sugar in order to reduce the incidence of complications. The Centers for Disease Control and Prevention (CDC) also recommended glycemic control. With every 1% reduction of the levels of HbA1c, the risk of developing microvascular diabetic complications is reduced by 40%. However, the CDC stated that

self-management is needed in successfully control the blood sugar level [2]. Regarding self-management, CDC [2] stated that three strategies were commonly used to regulate blood sugar level: adopting a low calorie diet, increasing exercise, and using stress minimize techniques. Some type 2 DM patients do succeed in finding effective ways to control blood sugar. However, long-term adherence was found to be lacking in others despite the existence of many patient education programs. According to several researches [3-5], many strategies of self-management that help the patients with type 2 DM control their blood sugar levels but they are often successful only in the short-term, such as for 3 or 6 months. After that most of the DM patients develop complications consequently.

This study focused on patients with type 2 DM who had had long term success at least 1 year in controlling their blood sugar. These patients are of particular interest to the researcher since they must have certain strategies of self-management. Those strategies could then be introduced to other patients. The researchers used in-depth interviews with this

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group of patients to determine their strategies for the benefits of those who are not successful.

MATERIALS AND METHODS

This qualitative study was carried out in a general hospital in central Thailand. The selected hospital reported that in 2010 it had 5,314 patients with type 2 diabetes, 12.58 % of whom (669) were able to control their blood sugar (HbA1c <7).

The selection of the participants was done according to criteria set by the researcher with the assistance of the GNs in the diabetic clinic. The researcher selected 50 volunteered to participate in the study. Then the details of the interviews and results of data analysis were shown to her advisors for comments and suggestions before the rest were interviewed. After the researcher had interviewed 18, she found that no more new data emerge so she stopped collecting data.

The criteria for participant selection were: (i) patients with type 2 DM receiving treatment at the selected hospital; (ii) patients who were able to control their blood sugar for at least 1 year maintaining HbA1c of less than 7 prior to the study; (iii) patients who were 40–60 years of age; and (iv) patients who were willing to take part in the study.

A literature review showed self-management is an important concept and core component of interventions to improve outcomes for people with chronic disease [6, 7]. Thus, self-management principles and strategies were adopted as guidelines to create questions for the semi-structured interview. The questions were not fixed questions, but mere guidelines. In the real interview context, questions used were flexible so that participants were encouraged to speak freely about their daily life and ways they used to control their blood sugar within normal levels. Each participant was interviewed 2–4 times. Each interview lasted for about half an hour to one hour. The researcher was the sole interviewer. The researcher used various instruments to collect the data including tape recordings, semi-structured interview forms, and notes. Data were collected from in-depth interviews between August 15, 2011 and December 6, 2011. Since the study was conducted with type 2 diabetics, the IRB number, R2011-007, was acquired under strict procedures.

The researcher followed the steps described by Colaizzi [9]. Data compilation was conducted by transcription from audio tape, word by word. Transcripts made from the audio tapes were read-reread and compared to the recordings for

accuracy. The transcripts were rechecked by the research advisor and co-advisor. The researcher then read the obtained information over and over several times for better understanding and put away separately key issues. Data were then organized into sub themes and main themes. Data of similar types were grouped under the same theme and data of different types were put into separate themes. Finally, the researcher analyzed the data using content analysis [8].

RESULTS

The findings indicated that the self-management strategies used by patients to control their blood sugar consisted of the following 7 categories: 1) changing from a high to low calorie diet; 2) increasing physical activity; 3) coping with stress; 4) taking medicine regularly; 5) keeping doctor's appointments; 6) self-regulation of blood sugar; and 7) social support from family and others. Findings are as follows.

1) Changing from a high to low calorie diet. All participants started self-management by cutting down the amount of calories consumed. They did this because they realized the effects of carbohydrates and fats on blood sugar. They used the principle of food exchange to reduce the amount of fat and sweet food in their diet. Some participants prepared their own food in order to limit the amount of calories in ingredients such as sugar and cooking oil from one large ladle to 2–3 tablespoons in one case as well as to use a healthier way of cooking such as boiling or stir-frying vegetables instead of cooking them with coconut milk. Some chose to swap foods, eating brown rice instead of white rice, eating noodles instead of rice, for example.

"When I cooked I used only a small amount of sugar, and oil. I drink only regular milk, not the sweetened kind... Sometimes when I returned from work, feeling tired and wanting to drink something sweet to refresh, I drank just a little." (G., Female, 59, 3)

2) Increasing physical activity. Some participants learned that doing exercise could help them control blood sugar levels. So they tried to do exercise more by running, jogging, cycling, using the hula-hoop, or twisting. Some did exercise by walking up and down stairs, washing clothes or doing gardening. Participants tried to exercise every day if possible or at least 2–3 days per week. After becoming aware of diabetes complications,

they adopted an exercise regime—usually of light workout—of approximately 20-60 minutes per day. They believed that doing exercise makes the body sweat and become refreshed. Moreover, in terms of additional benefits, their blood sugar level returned to normal.

"I was able to control my blood sugar because I exercised by cycling and walking rapidly approximately 20-60 minutes per day. I think exercise can help reduce diabetes symptoms. It makes me sweat and I feel fit. ... When I have my blood sugar checked, it is under control"(N., Male, 53, 4)

3) Coping with stress: participants were aware that whenever they felt stressed, their blood sugar level would rise. Therefore, they tried to find ways to reduce their stress. Each found their own ways. Some kept telling themselves not to worry but carry on their work and hope for a better future. Some sought diversions, such as watching movies or TV so they could be entertained, feel more at ease, less stressed, and be able to forget the uncomfortable truth. Some made merit by offering food to monks at the temple. Some talked about their problem with someone who could comfort them. Others practiced meditation or deep breathing exercise.

"I regularly practice meditation, which includes chanting prayers, for one hour before going to bed every night. After meditation I always feel calm. On my next appointment with physician, blood sugar level is found normal." (P., male, 56, 3)

4) Taking medicine regularly: diabetes medications help control blood sugar level. However, since type2 diabetes patients always forgot to take their medicine, it is necessary to use reminding strategies. For example, some chose to keep their medicine in a box on top of or beside the refrigerator so that they would be reminded about taking the medicine when taking water or anything else out of the refrigerator. Others placed the medicine on the dining table and took it upon finishing their meals.

"I always take the medicine according to physicians' recommendation. I hardly forget it as the medicine is placed on the dining table. I take it before meal; two diabetes pills in the morning before breakfast. The

medicine reduce my blood sugar level." (B., female, 49, 4)

5) Keeping physician's appointments: type2 DM is a chronic disease that need continued treatment and medicine. Physicians need to adjust the patients medicine. Participants adhered to physician's appointments schedule, even every 2-3 months. It happened some participants sought the physicians outside scheduled appointments when they experienced symptoms or complications such as palpitations or hyperglycemia. Having met their physicians, participants evaluated self-management efforts using the results of their FBS. Thus, patients realized the importance of consulting a physician. During these visits, the physician monitored patients' health and, if symptoms changed, further instructions were provided to assist self-regulation. By this mean, patients are encouraged to have more confidence and enhance their ability to control their blood sugar level.

"Every time I see the physician, I can check my physical condition. I would get the results of blood sugar tests. If my blood sugar level rises, the physician may adjust my medicine again.... The physician makes appointments at my convenience. I do not have to wait. I can have a blood check right away." (T., male, 55, 3)

6) Self-regulation of controlling blood sugar level: From experiences they learned the severe danger of complications. Their fear of long-term illness drove them to self-regulation. They became self-disciplined-eating healthy foods, keeping physician's appointments and increasing exercise. Self-regulation enabled them to control their blood sugar level.

"After one-year of diet control, I could control blood sugar level as well. I could make it because I reminded myself to eat proper food, to exercise, to take medicine and to keep appointments." (S., male, 59, 3).

7) Social support. Receiving social support from people around them encouraged the patients with type 2 DM in the study. They stated that social support helped them to maintain their blood sugar level and to stay calm and relaxed. Their family and friends provided them with what they needed, be it food, encouragement or company.

They accompanied the patients when and where they wanted to go and reminded them to take their medicine, etc. Family members were the first and closest supporters while some participants relied on friends for support. Some received emotional support from family, friends and health care providers which reinforced their motivation to take care of themselves.

“When I couldn’t control my blood sugar level, I was really stressed. I thought, I already had hypertension and now I have diabetes. I felt I had so many diseases. I relieved my stress by going to places with my friends who have cars. But it was not very convenient. I have many friends who give me mental support and ask me to travel to other provinces regularly.” (P., male, 58, 3)

DISCUSSION

From the study findings, some patients used all 7 self-management strategies to control their blood sugar but others used one some depending on their health conditions, health awareness, past experience, and daily activities etc. The strategies included (1) changing from a high to low calorie diet, (2) increasing physical activity, (3) keeping physician’s appointments, (4) taking medications regularly, (5) coping with stress, (6) self-regulation of blood sugar level, and (7) social support.

The first and most important strategy was changing from a high to low calorie diet. It helped the patients lower their blood sugar levels because it decreased the secretion of insulin [10]. Kongsakul [4] states that food exchange lists are also widely used by health care professionals and efforts have been made to update the tool to better manage nutrition-related chronic diseases, especially in diabetic patients, who must control their diets. To keep blood sugar at normal levels, the patients should eat food from all five main food groups but focus on vegetables and avoid food that is rich in sugar, starch and fat such as durian and dessert. However, for some participants trying to eat less led to hypoglycemia. They had to adjust until they found how much food would be appropriate for their health conditions.

Increasing physical activity was the important strategy for the participants who practiced running, jogging, and cycling, etc. Their goal was to exercise daily or at least 2-3 days per week, depending on their lifestyle, for approximately 20-60 minutes per day. The exercise helped regulate blood sugar by making insulin more effective.

Thus, regular exercise aided in the control of blood glucose, lessened cardiovascular risk factors, aided in weight loss, and helped to develop good health on the whole [4], [11]. Moreover, increasing physical activity will decrease insulin resistance, build more muscle cells and reduce fat cells [12]. According to the ADA [13], physical activity means movement of a person, for example walking, working or dancing. A person with type 2 DM can be physically active without joining a gym or playing sports in order to increase glycemic control and minimize LDL and increase HDL cholesterol [14]. Controlled exercise periods of at least 8-week duration have shown to lower HbA1c by an average of 0.66% in patients with type 2 DM [15]. However, too much exercise could be harmful for participants, so diabetic patients should take physician or health care provider’s suggestion before exercising.

Coping with stress was the third strategy for type 2 diabetic patients. Stress could induce oxidative stress and contribute to beta cell destruction in type 2 diabetics. Free fatty acids, which may be elevated during inadequate glycemic control, may play a contributory role in oxidative stress in diabetics [16]. One of the major functions of stress hormones like epinephrine and cortisol is to raise blood sugar to help boost energy. Emotional stress can promptly increase blood sugars [17]. Thus, it is important for diabetics to control stress levels. Participants in this study cope with stress in various ways, for instance, trying not to think of their problems, watching movies or TV, and practicing meditation. These strategies helped them feel calm and in control of their emotions. According to Carver and Antoni [18], stress does not affect all people equally. Some people have threatening experience but manage to cope well and do not get ill.

Taking medications regularly was the fourth strategy that enabled participants to control their blood sugar. Diabetes medications are able to lower blood glucose levels and to reduce the risk of complications, not to mention other clinical benefits. The participants realized that taking their medication as continuously prescribed was an important strategy in blood glucose control. If diet and exercise are not effective to control blood sugar within normal levels, oral hypoglycemic agents and insulin can be used [19]. All participants had a variety of their own methods to keep taking medicine on time, such as keeping medicine on the breakfast table, or having their care givers give them medicine. Therefore, health care providers should help patients to find out the method of

taking medicine that suits them, and encourage them to regularly take medicine on time.

Participants always kept their appointments with the physicians every 2-3 months. They were able to control their blood sugar by making adjustments to the schedule as needed. For example, those who experienced symptoms such as palpitations or hyperglycemia went to see the doctor outside of scheduled appointments to have the doctor evaluate their symptoms and make appropriate self-management adjustments. This is in accordance with the findings of Engelgau et al. [20] who reported that people with diabetes should receive medical care from a physician-coordinated team on a regular basis.

Self-regulation of blood sugar was the fifth important strategy of self-management that requires the patient's willpower. Self-regulation helped participants to make good decisions in changing their lifestyle such as using food exchanges, sticking to a low calorie diet, exercise, and other activities. Through behavior control, they were able to control their blood sugar levels. According to Leventhal and Diefenbach [21] the overriding goals of diabetes self-regulation are to empower individuals to avoid the short-term risks and long-term complications associated with diabetes as well as to maintain a good quality of life.

Social support from family and others was the last strategy of the participants' self-management. The participants received social support from several sources including family members, friends, and their health care team. Family supports were both physical and psychological. Friends always helped with entertainment and general advice to decrease stress. Health care team provided participants with health information and health education, as well as encouraged participants in positive ways, such as praising to encourage participants to keep on their good behaviors in blood sugar control.

With those supports, participants were better able to control their blood sugar through routines of daily life. Family members were found to be the first and closest supporters. The research of Anderson et al. [22] indicated that psychosocial support improved HbA1c level and mental health outcomes.

RECOMMENDATIONS

Results from this study have led to better understanding in the self-management to control blood sugar levels of diabetic patients. Diabetes education should be patient centered, focusing on individual patient's needs, and not simply on

transferring knowledge to a group of patients. The health-professionals team should set goals for patients to achieve good self-management. Further study might investigate patients' experiences with blood sugar control in urban areas. Due to changing social, professional, and cultural behaviors that environment are different from rural communities.

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