SELF MANAGEMENT EDUCATION MODEL FOR IMPROVING THE COMPETENCE IN EARLY DETECTION OF HYPOGLYCEMIA AMONG PEOPLE WITH DIABETES MELLITUS IN DR. MOEWARDI HOSPITAL

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Abstract

As a chronic disease, Diabetes Mellitus (DM) requires long-termed attention and treatment to prevent complications. People with DM are obliged to have appropriate and adequate knowledge, skills and behaviors so they can manage their lives by themselves. Research showed that 50–80% people with DM have inadequate knowledge to manage their disease. Through the self-management education, people with DM are expected to improve their competences in early detection of hypoglycemia so it will increase the quality of life and reduce the risk of further complications. The purpose of this study was to investigate the effect of diabetes self-management education towards early detection of hypoglycemia among patients with DM. A quasi-experimental pre-post design with control group was used to investigate the impact of using self-management education. Total of 40 participants were divided into the intervention group and control group. Purposive sampling was used to obtain the sample and independent t-test was used to analyze the data. This study indicated the competence of people with DM in detecting early symptoms of hypoglycemia increased from 6.1 with SD 13.7 to 71.7 with SD 19.2. Subsequently, the model of self management education was evidenced to enhance the competence of people with DM in the early detection of hypoglycemia with P value of 0.011 ($\alpha = 0.05$). The findings showed that the self-management education could improve the competence of patients with DM in the early detection of hypoglycemia.

Keywords: self-management education, hypoglycemia.

Presenting Author's Biography.

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INTRODUCTION

As a chronic disease, Diabetes Mellitus (DM) needs long-termed attention and treatment to prevent or delay complications. People with DM must have adequate knowledge, skills, and behaviors so they can manage their lives by themselves. This disease requires long-termed medical attention and treatment to prevent complications as well as to treat the disease itself. Therefore, people with DM should facilitate themselves with knowledge and appropriate behavior, thus, they can manage and treat their disease independently. Some of the researches noted that 50 to 80% people with DM have inadequate knowledge and skills in managing their illness [1].

Health education or counseling regarding with the health care for people with DM is one of the critical elements of disease management. Education as a nursing intervention should be conducted in order to increase patients' motivation in controlling the disease and therapeutic regimens at home effectively. Furthermore, it is expected to prevent the occurrence of re-hospitalization and delay the complications.

Diabetes Self Management Education (DSME) is a process to facilitate people with DM with the knowledge, skills and behavior, especially on how to manage or self-care their disease. This process requires the cooperation of the needs, goals, and life expectancy of people with DM by providing the guidance. The goal is to support decision making, self care behavior, and problem solving as well as to collaborate actively with the health team to enhance health status or quality of life. Furthermore, the DSME is also the process of teaching people to manage their disease [1].

The process of Diabetes Mellitus Self Management Education (DSME) includes: (1) the assessment of the education's need specifically; (2) the identification of specific objectives which should be achieved; (3) the provision of education; (4) the evaluation of the achievement or the goals that have been set in prior. Self management education for DM is expected to enhance knowledge of the patients in general and the elderly and their families in particular on how to manage diabetes mellitus as well as to improve the psychosocial status of the elderly and their families related to diabetic beliefs and attitudes toward the treatment programs and coping mechanisms [2, 3].

People with DM who are facilitated with education and several guidelines in self-care will improve the life style and can control their blood glucoses properly. He also stated that health education will be more effective when health workers have sufficient understanding regarding with the level of patients' knowledge, attitudes, and daily habits [3].

OBJECTIVES

The study was undertaken to identify the effect of self management education (DSME) towards the competence of early detection of hypoglycemia among the patients with DM in Dr. Moewardi Hospital Surakarta Indonesia.

RESEARCH METHODS

The study was used a quasi-experimental design with pre-test and post-test of control group. It involved 40 respondents who were selected through Purposive Sampling and subsequently divided into the intervention and control group. Independent t-Test was applied to analyze the data. The test for data normality was conducted by *kolmogorov smirnov*. Furthermore, this study has been approved by Research Ethics Committee of Sebelas Maret University. Written informed consent was also obtained from the entire respondents.

Pre-test was carried out to measure the ability of the respondents, both in the intervention and control group. To detect the early symptoms of hypoglycemia, an instrument of questionnaire was distributed to the respondents as many as 30 questions. The reliability of the instrument was r alpha 0.778 Cronbach's (r alpha > 0.361). Subsequently, the intervention group was provided by education on self management by using a guide in addition to nursing care for DM. Finally, the respondents were re-evaluated by performing a post-test. As for the control group, a nursing care for DM was provided without any program of self management education.

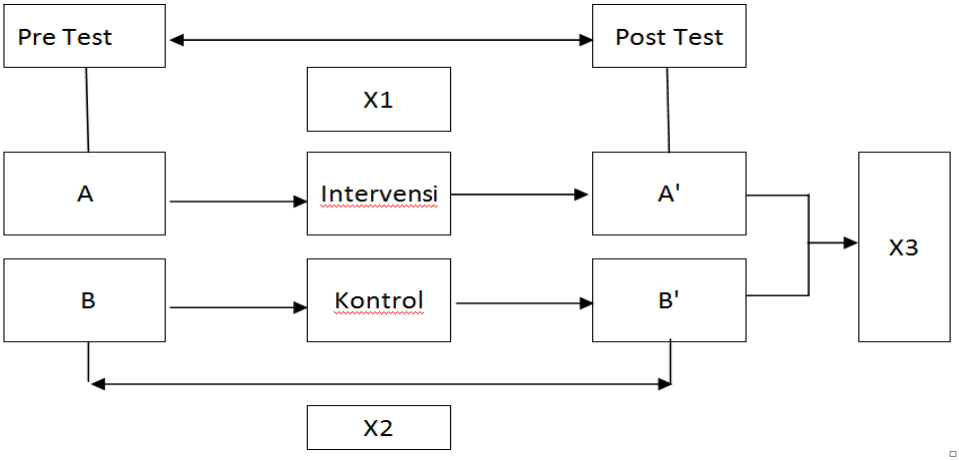

Figure 1. Research Design

Note

A : The ability to detect hypoglycemia of the intervention group before self management education.

A' : The ability to detect hypoglycemia of the intervention group after self management education.

B : The ability to detect hypoglycemia of the control group before self management education.

B' : The ability to detect hypoglycemia of the intervention group after self management education.

X1 The change of ability to detect hypoglycemia of the intervention group before and after self management education.

X2 : The change of ability to detect hypoglycemia of the control group before and after self management education.

X3 : The differences of ability to detect hypoglycemia between the intervention and control group after self management education.

RESULT

The Subject Characteristics

In a period of two months, as many as 40 patients who were selected based on the criteria were divided into two groups: (1) Intervention group consisted of 20 patients aged between 32 to 69 years old with a mean age of 52.2, and (2) Control group consisted of 20 patients aged between 33 to 62 years old with a mean age of 50.6. Furthermore, the characteristics of the respondents based on the DM diagnose are presented in Table 1. In the intervention group, the average was 8.7 year the SD of 4.7 years, whereas in the control group, the average diagnosed DM was 7.7 with a standard deviation of 5.8. The characteristics of respondents based on diagnosed DM are shown in Table 1.

Table 1. Characteristics of respondent based diagnosed DM

	Intervention Group	Control Group
Mean	8.7	7.7
SD	4.8	5.8
Minimal – Maximal	2 – 21	1 – 20

The respondents' ability in detecting Hypoglycemia

The ability to detect the early symptom of hypoglycemia in both the intervention and control group is presented in Table 2.

Table 2. The ability to early detection of hypoglycemia

No	Respondent	Mean	SD	Min – Max
1	Intervension Group	61.0	13.7	37 – 87
2	Control Group	58.7	9.3	40 – 73

The ability in detecting Hypoglycemia of respondents in the intervention group

The ability to detect hypoglycemia before and after the intervention among respondents included in the intervention group was expressed by the increase of average value. The average before the implementation of self management education model was 61.0 with standard deviation of 13.7 ranging from 37 - 87. In addition, the average after the implementation of self management education model was 71.7 with standard deviation of 19.2 ranging from 37 - 97. The characteristics of respondents in the intervention group based on their abilities to detect Hypoglycemia before and after the intervention are shown in Table 3.

Table 3. The ability of respondents in the intervention group to detect hypoglycemia before and after intervention

	before	after
Mean	61.0	71.7
SD	13.7	19.2

Minimal – Maximal	37 – 87	37 – 97

The ability differences of respondents in the intervention group in detecting Hypoglycemia before and after intervention.

The statistical test showed that the P value in the intervention group of 0.000 (α = 0.05) so that it can be concluded that the model of self management education has increased the ability of the respondents in detecting early symptoms of hypoglycemia. The result of statistical test is presented in the following table.

Table 4. The differences of ability to detect hypoglycemia among respondents in the intervention group

Variabel	Mean	SD	SE	P Value	N
Pre Intervention	61.00	13.68	3.06	0.000	20
Post Intervention	71.67	19.24	4.30		

The differences of ability to detect hypoglycemia among the respondents in the intervention group and control group, before and after intervention.

The differences of respondents' ability in detecting hypoglycemia before and after self management education between the intervention and the control group were assessed. The Levene's test noted that P value of 0.002 (α = 0.05) which suggested the variant difference, as the statistical of independent t-test obtained P value of 0.011 (α = 0.05). It means that self management education influences the patients' ability in recognizing the early symptoms of hypoglycemia.

Table 5. The differences of respondents' ability in detecting hypoglycemia between intervention and control group

	Levene's Test	P Value
The differences of patients' ability in detecting hypoglycemia between the intervention group – control group	0.002	0.011

DISCUSSION

The results of statistical tests showed that the P value in the intervention group was 0.000 (α = 0.05), thus, it can be concluded that the Self Management Education was evidenced to affect patient' ability to detect the early symptoms of hypoglycemia.

Education is an effort to guide how the community behaves or adopts healthy lifestyle by means of persuasion, call, available information, awareness, and so on, through the activities of health education. The purpose of health education is to develop people awareness, provide or improve public knowledge about the maintenance and enhancement of health lifestyle within families and communities [7]. Self Management Education is an

ongoing process undertaken to develop the awareness or knowledge, skills, and behavior of patients with DM to perform self-care [11, 12, 13] and provide the knowledge or education for patients with DM on the implementation of self-care strategies independently to maintain optimal metabolic control, prevent complications, and improve the quality of life [14].

Education programs can be successfully actualized with the supports of various elements, including the media. The media will be effectively used to convey a message or information delivered by the communicators. It can also be disseminated through diverse media, such as, posters, leaflets, brochures, stickers, and fliers. This study used a module that contained information about diet, activity, medications, exercise and blood sugar control that could be used as a guide in the implementation of the self–management among people with DM.

The approach of Self Management Education varied widely that was commenced by learning assessment, goal setting, intervention formulation, and evaluation. The process can be done both in group and individual. In this study, the process of SME was conducted individually. It was initiated by determining the learning objectives. The objectives were set up by health professionals and patients with DM with a consideration they would be accepted easily by the patients as they felt appreciated as well as recognized the necessity of the knowledge. By patients' involvement, openness and high motivation would be gained as they are required for the education process. The success of an education program is also influenced by motivation. The Royal Australian College of General Practitioners that conducted a study of SME on people with hypertension reported behavioral self management of patients with hypertension were influenced by motivation, where the motivation will likely increase when there is a change of experience [15]. It is confirmed by Akinsola who provided fact that patients performing self-management is motivated by knowledge, skills, positive attitude, confidence, and optimism to improve their health [16].

The components of Self Management Education of DM include diets, medication therapy, self monitoring blood glucose, and physical activity or sport. Patients with DM were facilitated this education with an expectation those components will increase patients' knowledge and skills on self-care. The approach will provide sufficient information related with DM. It is highly expected that the information will improve patients' knowledge and awareness to behave as the expected attitude [7].

Norris explained that Self Management Education can produce a variety of outcomes, namely the short-term, medium-term, and long-term outcomes. Short-term results include glycemic control, physical control, lifestyle modification, and mental status control. Medium-term outcomes include increased knowledge, skills, psychological status, and utilization of health service facilities. Long-term outcomes include the prevention of complications both macrovascular and microvascular, decreased mortality, increased quality of life, and socio-economic improvement [1].

Previous study located in America that involved 75 respondents also indicated similar result. It figured out that self management education is proven to have a positive influence towards the ability of the self-care especially on blood glucose self-monitoring [1].

Hypoglycemia is one among the complications encountered by patients with diabetes mellitus. Unlike diabetic nephropathy and diabetic retinopathy, which are chronic, hypoglycemia occurs acutely and suddenly as well as life threatening. It is due to the glucose is the only energy source of the brain which only be obtained from blood circulation as the brain tissue has incapability to reserve glucose. Low blood sugar levels or hypoglycemia can

definitely damage the brain cells. This condition is fatal for people with diabetes mellitus where it was reported 2% to 4% of patients' demise related to hypoglycemia

Nursing diagnosis which may be enforced in association with education is the absence or lack of cognitive information related to cognitive limitations, the misinterpretation of information, the lack of motivation to seek information, and the unknown sources of information.

Interventions to enhance the competence of patients with DM include providing information or knowledge regarding with the process of disease, treatment, as well as prevention of complications. Education can be provided through a health promotion. Health promotion is the process of society empowerment in order to maintain and improve community health. The process of society empowerment should be expanded on an attempt to change a person's behavior and attitude instead of only providing the information (such as health education), thus, health promotion can simultaneously improve the patients' cognitive, affective, and psychomotor [1].

CONCLUSION AND SUGGESTION

The average value of ability to detect hypoglycemia in the intervention group before the implementation of Self Management Education was 61.0 with SD 13.7, ranging between 37—87. After Self Management Education was applied, the average value of the ability to detect hypoglycemia was 71.7 with SD 19.2, ranging between 37—97. Self Management Education was evidenced to affect the competence in detecting hypoglycemia in patients with diabetes (Independent t-test, P value 0.011 ($\alpha = 0.05$).

The result suggests that Self Management Education can be used as a health promotion program in the health care services and adopted as subject in health services education. The model of the Self Management Education can serve as a source of information and reference for nurses, students, health care institutions, and researchers who want to conduct research related to diabetes self management education.

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