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Evaluation of empowerment model on indicators of metabolic control in patients with type 2 diabetes, a randomized clinical trial study

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ABSTRACT

Aims: Diabetes education is a major subject in achieving optimal glycemic control. Effective empowerment approach can be beneficial for improving patients' health. The aim of this study was to evaluate the effect of empowerment model on indicators of metabolic control in patients with type 2 diabetes.

Methods: a randomized controlled trial of 103 patients with type 2 diabetes were randomly assigned to either the intervention (empowerment approach training) or the control group (conventional training) 2014. Empowerment approach training were performed for the experimental group for eight weeks. Data collection tool included demographic information form and indicators of metabolic control checklist. Analysis was performed by one-way analysis of variance, chi-square test, paired *t*-test, independent *t*-test and multiple linear regression.

Results: Before the intervention, two groups were homogeneous in terms of demographic variables, glycosylated hemoglobin (HbA1C), and other indicators of metabolic control. After the intervention, average HbA1C and other metabolic indicators except for LDL showed significant differences in the experimental group compared to the control group.

Conclusion: study results indicated the positive effects of applying the empowerment model on the metabolic control indicators. Therefore, applying this model is recommended to nurses and the relevant authorities in order to improve clinical outcomes in diabetic patients.

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1. Introduction

Diabetes mellitus (DM) is characterized by defects in both insulin secretion and insulin action [1] and it is a chronic illness that requires continuing medical care and ongoing patient self-management education and support to prevent acute complications and to reduce the risk of long-term complications [2]. DM has imposed a heavy health burden on society in terms of morbidity and mortality [3] and it is certainly one of the most challenging health problems around the world in the 21st century [4].

According to the World Health Organization (WHO) and International Diabetes Federation (IDF), diabetes has been a primary healthcare challenge in the twenty-first century and this challenge is more serious in the Middle East [5,6]. The number of DM patients in the world has been reported about 382 million people, in which 80% of these patients live in low-and middle-income countries; moreover, there will be 1.5 million deaths due to the disease until the end of 2013, which causes a cost of over 548 billion dollars in the societies [5]. More than four million Iranian adults have DM which has increased by 35% over the past seven years [7].

Long-term hyperglycemia (poor metabolic control) is considered as a major problem and can lead to dysfunction and failure in the eyes, kidneys, nerves, heart and blood vessels [8]. Previous studies have shown that rigid control of blood glucose, blood pressure and cholesterol could reduce the complications of DM to the lowest possible level [9]. The nature of the DM is very complicated and its control is affected by several factors [10]. Glycemic control is an important criterion for glucose control in people with DM, and it represents the exposure to glucose over a cumulative period of time [11]. Improvement of glycemic control in diabetic patients improves severe micro vascular complications of diabetes [12]. Conventional methods for the assessment of DM control includes measurement of blood glucose level and an effective method for long term control of DM is measurement of glycosylated hemoglobin(HbA1C) [13].

Due to the complications of DM, it is important to invest in its education and control [10]. Patient education is an integral part of high quality care of DM [14]. Patient education is a continuous process, which should assist patients in better management of glycemic control, overcoming behavioral and psychological barriers, improvement of self-management skills, and empowerment to make informed choices [15]. Several studies have shown that the caring role of nurses for patients education, patients involvement in self care, and also regular follow up and evaluation of diabetic patients by nurses resulted in reduction of mortality rate, and despite comprehensive intervention and applying multiple specialties, the nursing care intervention had a good effect, and it is essential that the patients' health problem will be studied more deeply [16].

A new approach of thinking is required to recognize that patients are in control of and responsible for the daily self-management of diabetes should be based on the issues of 'empowerment' to be more applicable about day to day activities in diabetic patients [17]. In empowerment approach, consistency with patients' needs and illustration of their experiences in living with DM are required in order to identify and improve their strength and make the informed choice and it is proved that increasing the awareness about DM is not solely sufficient for initiating, preserving and maintaining the self-management behaviors and long-term control of DM [18]. This process is facilitated by interaction between the patients and the caregiver and it leads to interpersonal and intrapersonal relationships [19]; moreover, it is one of the achievable goals for people in terms of health, in which people strive for their health promotion by active participation and decision-making [20]; therefore, in order to fulfill their professional responsibility, nurses require to recognize the needs, choices and abilities of the patients, and offer nursing based on the notion of empowerment [21]. The positive effects of empowerment educational program on various aspects of DM have been shown. Results of various studies suggested the improvement of quality of life [22,23], an increase in self-efficiency [24]. This study aimed to determine the effect of empowerment model on metabolic control indicators in diabetic patients.

2. Methods

This randomized, Double-blind clinical trial study was carried out on patients with type 2 diabetes. Population consisted of patients with type 2 diabetes (DM2), and inclusion criteria for this study were: age over 18, definite diagnosis of diabetes and presence of medical record in a diabetic center, no specific mental illness, and the ability to participate in educational program. Shahroud diabetes center was selected as a sampling unit due to the ease of access to the samples and it is referral center for patients with diabetes in this city.

The instruments used in this study included a demographic questionnaire (17 questions), checklist for recording HbA1C and laboratory indicators consist of fasting and non-fasting blood sugar, triglyceride, cholesterol, and high and low density lipoproteins.

Subjects were selected by stratified random sampling from patients with T2DM referring to diabetes center and according to HbA1C test result, patients were divided to three categories: optimal (less than 7%), medium (7–10%) and poor (more than 10%), and random sampling was applied to allocate patients from each category to case and control groups. HbA1C was used to determine the metabolic control, in which the normal amount of HbA1C for patients with diabetes is less than 7% and the amount over 10% shows very poor blood sugar control [1]. Also Patients based on block randomization method were placed in the experimental and control groups.

The sample size was determined based on study of Pibernik-Okanovic et al. [25]. Considering one unit in HbA1C of two groups, the required sample size for each group with 95% confidence and power of 90% was obtained according to the following formula, which was approximately equal to 49. By taking into account of 10% attrition of sample units in each group, the calculated sample size for each group was 53 and