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## Original Article

# Impacts of self-management education on glycaemic control in patients with type 2 diabetes mellitus

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## ABSTRACT

**Objectives:** Dietary and physical activity advice have been considered to be seminal ingredients in prevention and management of type 2 diabetes mellitus. In this regard, the impacts of a three-month self-management intervention on glycemic control in patients with type 2 diabetes were examined in the present study.

**Study design:** A Double-arm post-test intervention study.

**Methods:** In the current post-test intervention study, three two-hour educational sessions on dietary habits and physical activity designed according to Health Belief Model were presented to 16 non-complicated type 2 diabetic patients and their dietary, physical activities, and biochemical outcomes were compared to a 23 patient-control arm in Iraq in 2017. The level of physical activity was measured through International Physical Activity Questionnaire (IPAQ), dietary habits through UK Diabetes and Diet Questionnaire (UKDDQ), and biochemical indicators including HbA1c were measured after three months of program completion.

**Results:** The study showed that walking, taking vegetable, fruit, and bread were higher and taking full-fat cheese and full-fat spread was lower among experimental group significantly compared to control arm. In addition, the experimental group had a substantial higher albumin and lower urea, ALP-Phosphatase, and glucose levels in comparison with control patients. No substantial change was seen in HbA1C and no change in milk and fish products.

**Conclusions:** The substantial positive changes in physical activity, dietary habits, and some biochemical indicators were seen following intervention completion in the experimental arm.

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## 1. Introduction

Type 2 diabetes mellitus (T2DM) is growing across the world dramatically. It is the major responsible factor for kidney failure, blindness, heart attack, stroke, and lower limb amputation resulting in a substantial burden on socioeconomic and quality of life. In addition, it has a main role in mortality and morbidity and direct and indirect costs [1]. It is projected that currently close to 150 million individuals are affected by this disease worldwide and perhaps this number will be doubled by 2025. In Iraq, the number

of patients affected by type 2 diabetes were 561,000 and 678,000 persons in 1995 and 2000, respectively and it is estimated that this number be reached to 1,739,000 by 2025 [2].

The seminal strategies shown to be related to partial or overall control on glycaemic control in patients with type 2 diabetes are establishing awareness about risk factors, symptoms, dietary counseling, increasing physical activity, glycaemic monitoring, medications, and insulin use in agreement with normalization of carbohydrate, protein, and fat metabolism. The cornerstone of diabetes is a change in patient lifestyles through self-management in accordance with clinical guidelines to reach a reduction in disease-related mortality and morbidity [3].

The Diabetes self-management (DSM) refers to the concept that each person systematically has to involve in its medical and non-medical management conditions. The challenge has been seen here is whether the scientific evidence supports the self-management

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education strategy on diabetes mellitus according to the needs of patients [4,5] Currently, the self-management education is being used for a variety of chronic diseases, for instance, Jaramillo et al. [6] showed that self-management approach is one of the top priorities in osteoarthritis [7].

Some of the previous researchers have shown that the self-management education is an effective technique for glycemic control in patients with diabetes type 2 from baseline to 3 months (immediate effects) and from baseline to 12 months (longitudinal effects) in HbA1C in  $-0.7\%$  and  $-1.0\%$ , respectively [8]. Moreover, a number of meta-analysis studies have shown that diabetes self-management education (DSME) is associated to clinically improvement glycated hemoglobin (A1C) in type 2 diabetic patients between  $0.36\%$  and  $0.81\%$  [9–11] in contrast with some other clinical trials [12].

Although to some extent the diabetic patients are advised routinely to follow healthy diets and dietary changes such as modifications in food and meal patterns, the pieces of dietary advice have not been done and evaluated systematically.

The impact of a three month period Diabetes Self-Management intervention on glycemic control in patients with non-complicated type 2 diabetes was examined in the present study. More specifically, the study took its consideration to evaluate its effects on biochemical indicators, physical activity, and dietary habits.

## 2. Methods

### 2.1. Study design and sampling methods

In the current double-arm posttest interventional clinical trial, the 87 patients visited the Duhok Diabetes Center of Azadi Teaching Hospital in Duhok – Iraq were consecutively screened for

the eligibility criteria by the study internist purposively between May 15th and June 17th, 2017.

The patients met eligibility criteria were included in the study and underwent a three-week self-management health education (face-to-face group session) and followed up individually for a three month period and the patients in control arm were followed-up for the same period as an experimental group without exposure to any educational course. The patients were included if they were 25 years and older; male or female; diagnosed with type 2 diabetes by the study internist; without any diabetes complications; living in Duhok city and be able to sit for 2 h for each educational sessions.

The newly diagnosed patients with type 2 diabetes were not invited for this kind of intervention. Moreover, the patients diagnosed with type 1 or with severe and long complications such as liver or heart failure, amputation, nephropathy or retinopathy were excluded from the study. Pregnant women and those with individual situations such as medical conditions in which any change in diet and physical activity put them at a contraindication like renal failure or previous amputation were not included in the study [8].

The patients carefully were screened in detailed medical evaluations and by proper diagnostic tools by the study internist for the presence of macro- and microvascular complications worsening by physical activity program to minimize the possible consequent risks. Careful medical history and physical examination were conducted by the study clinician to recognize the signs and symptoms of diseases could affect the heart and blood vessels, kidneys, eyes, feet, and nervous system.

Of the total patients lived in Duhok city and screened in detail for eligibility criteria, 45 of them met all eligibility criteria and were randomly assigned into the experimental arm ( $n=22$ ) and control arm ( $n=23$ ) through the computer random digit

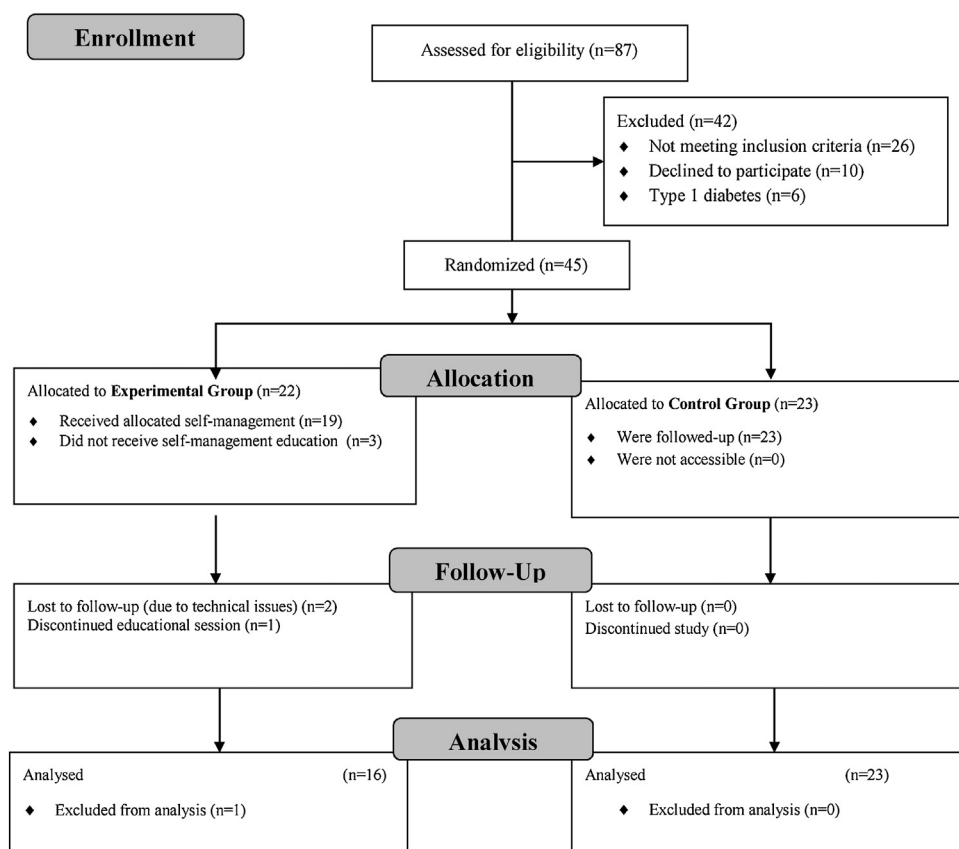


Fig. 1. Research flowchart.

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