



Contents lists available at ScienceDirect

# Diabetes & Metabolic Syndrome: Clinical Research & Reviews

journal homepage: [www.elsevier.com/locate/dsx](http://www.elsevier.com/locate/dsx)



Original article

## Effect of electronic education based on health promotion model on physical activity in diabetic patients

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### ARTICLE INFO

Article history:  
Available online xxx

**Keywords:**  
Health promotion model  
Physical activity  
Type II diabetes  
Multimedia training

### ABSTRACT

**Background:** By high prevalence of inactivity, particularly in diabetic patients, the need to effective interventions to promote physical activity is essential. The aim of this study was to determine the effects of education based on health promotion model (HPM) through multimedia on the physical activity in diabetic patients.

**Method:** In this quasi-experimental study, 76 patients with type II diabetes were evaluated (40 patents in intervention group and 36 patients in control group). The intervention group members and a friend or a family member, that could be supportive in physical activity, received teaching CD based on health promotion model. Both group members at the beginning of the study, two weeks and three months after the training, completed questionnaires. After data collection, statistical analysis was conducted using independent T-test, chi-square test, and repeated measurement of ANOVA.

**Results:** Finding showed that self-efficacy ( $P < 0.001$ ), health status ( $p = 0.032$ ), benefits ( $P < 0.001$ ) and friends support in physical activity ( $P < 0.001$ ) were perceived to be higher, and barrier of physical activity ( $P < 0.001$ ) was perceived to be lower in multimedia group compared to control group 3 months after training. There was a significant difference in average of metabolic equivalent of task (MET) between two groups after the intervention ( $P < 0.001$ ).

**Conclusion:** Planning of education based on the HPM and implementation through multimedia can change belief about physical activity and increase participation in physical activity.

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### 1. Introduction

Today, the rate of diabetes is significantly rising [1] as based on the World Health Organization report, the prevalence of diabetes in 2004 was around 194 million and this amount by the year 2025 will be 333 millions of people around the world and about half of the population will be in Asia and Oceania. According to the report of international diabetes federation, it is estimated that in 2014, the prevalence of diabetes in Iran was 8.43% [2].

Type 2 diabetes has high direct and indirect costs so has allocated 15% of the costs of health cares in the United States of America [3], and in many countries around the world, at least 10% of the total cost of health care is spending for diabetics [4].

Environmental factors such as poor nutritional habits and especially lack of physical activity are effective in the development

and progression of diabetes [5]. Physical activity through increasing the number of insulin receptors, increasing tissue level of glucose transporters and improving insulin sensitivity, causes long-term effects in increasing sensitivity to insulin [6,7]. Therefore, the World Health Organization has reported at least 30 min of daily average physical activity for at least 5 days a week or 25 min of vigorous physical activity for at least 3 times a week as a minimum physical activity to maintain good health and prevent diabetes [8]. In high-income countries, 26% of men and 35% of women and in low-income countries 12% of men and 24% of women are physically active, and studies have shown that the physical activity in diabetic patients is even less than the general population so in Great Britain 68% of the type II diabetes patients and 61% of patients with type II diabetes were classified as inactive [9]. International Diabetes Association believes that for preventing complications of diabetes, education in self-management behaviors, including physical activity can be successful up to 80%, however, the impact of education depends on the appropriate use of behavioral change theories and appropriate educational techniques [10].

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Since the base of diabetes control is on self-care and the main emphasis of health promotion model is also on self-regulation, so health promotion model for behavior change seems to be effective in this group of patients. This model includes three concepts including individual characteristics and experiences, behavioral specific cognition and affects and behavioral outcomes. The concept of individual characteristics and experiences include prior related behavior and personal factors and the concept of behavioral specific cognition and affects including constructs of perceived benefit and barrier, perceived self-efficacy, activity related affect, interpersonal influences (social support and norms) and situation influences. Professor Pender identified constructs of the model that were effective in more than 50% of studies including the prior related behavior, personal factors (perceived health status), perceived benefit and barrier, perceived self-efficacy and social support [11].

Nowadays researchers have used from technological development for provide interventions of health promotion. Multimedia easily communicates with users, due to its dynamic and attractive graphical effects and use of various visual and audio media. In this method, the learner will find the opportunity to practice more to reach the proficiency level. So, given the increasing use of computer as a communication tool, we can teach educational concepts in a charming and diverse atmosphere by the help of multimedia [12,13]. So considering the importance of physical activity in diabetes patients, this study aimed to determine the

effect of education based on HPM using multimedia on physical activity in type II diabetic patients (Fig. 1).

## 2. Materials and methods

### 2.1. Study design

This quasi-experimental study has been carried out since October 2016 to February 2017 to assess the effect of electronic education on physical activity of diabetic patients with type II diabetes referring to two diabetes clinics in the city of Bushehr, a southwestern province in Iran.

Inclusion criteria for this study included being able to read and write, having no diabetic foot ulcers, willingness to participate in the study, having diabetes for 1 or more years; and exclusion criteria included functional inability to walk without a cane, inability to walk 1 mile with no rest, inability to continue participation in study for at least 3 months, and having cardiovascular disease.

The sample size was estimated based on similar study [14], 36 subjects for each group and with considering attrition rates (10%) in three months follow up, about 40 subjects were required for each groups. Two diabetes clinics were selected for sampling; reviewing 1775 records of patients in Haftom-e-Tir diabetes clinic, and 514 records in diabetes clinic of the Social Security Hospital taking into account the inclusion criteria, 145 patients in Haftom-

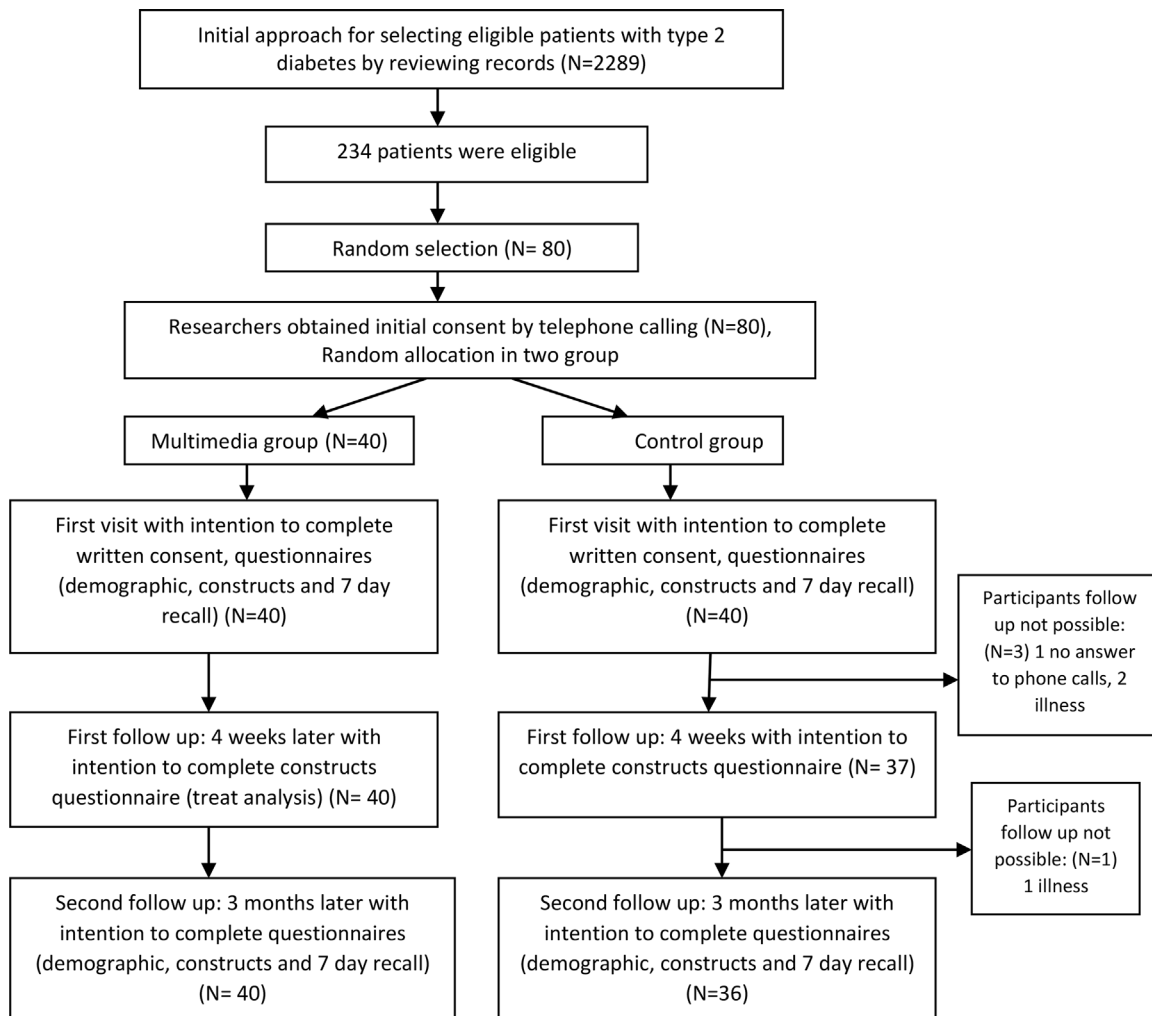


Fig. 1. Consort flow chart of participants.

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