SUMMARY
Background and significance of the study

Diabetes, one of the most common non-communicable diseases in the world, is responsible for a significant amount of ill-health and premature deaths. In 2000, the World Health Organization (WHO) estimated that there were about 171 million diabetic individuals worldwide and predicted that this number is likely to increase to at least 300 million by 2025. Of concern was the prediction that developing countries would witness a significant increase in diabetes due to population growth, ageing, unhealthy diets, obesity and sedentary lifestyles. Diabetes self-management education has been considered an important part of the clinical management of individuals with diabetes. A large body of literature suggesting that, at least for the short-term, patient education improves diabetes knowledge and its management, as well as physiological measures such as metabolic control, body weight and blood pressure. Of equal importance, the literature suggests that patient education improves the quality of life for people with diabetes. Interestingly, however, the improvements demonstrated in physiological measures may be relatively unassociated with improvements in quality of life. Like other developing countries, diabetes looms as a potential challenge to health services in Yemen. There is very little information on diabetes in Yemen. In one of the few studies, diabetes mellitus in Yemen appeared to show a pattern,
which is a combination of that found in the developing and the developed countries. The incidence of Type 1 diabetes appeared very much like that of developed countries while the profile of Type 2 diabetes was similar to that in any other developing countries. Malnutrition-related diabetes was, however, non-existent. In this background, the impact of diabetes education becomes pertinent. This is the first study to examine the effect of diabetes education among adult diabetic patients in Yemen Republic.

Objectives and hypothesis

A-General objective

The objective of this study is to identify the effect of diabetes self-management education among adult diabetic patients over 40 years of age attending the diabetes center in Sana’a, Yemen Republic.

B-Specific objectives

1. To determine the impact of diabetes self-management education on diabetes knowledge and its management amongst patients over 40 years of age.

2. To determine the impact of diabetes self-management education on blood glucose levels amongst patients over 40 years of age.

3. To determine the impact of diabetes self-management education on body mass index amongst patients over 40 years of age.
4. C-Research hypothesis

- There will be a difference in the specific parameters described above between adult diabetic patients who receive diabetes self-management education and those who do not receive diabetes self-management education.

Research design and Methods

A-Study Setting

The study was conducted at the Diabetic Center located at Sana’a capital of Yemen. This center provides diabetic care for the patients and individual counseling about diabetes by the physicians.

B-Subjects

Diabetic subjects were contacted from the list of patients who had attended the out patient diabetic clinic or through telephone.

C-Study design

Two hundred diabetic patients who fulfilled the inclusion criteria were enrolled in the study. Subjects were randomly distributed into intervention and control groups. After enrollment, 50 patients dropped out of the study. The patients in the intervention group were given diabetes education for 1 to 2 hours (theoretical and/or practice sessions) once a week, every two
weeks for six months. Education sessions (lecture, practice and discussion) was carried out by the researcher, using visual aids that included posters, pamphlets and other educational materials. Baseline and endline data was collected for all subjects as described below.

**D-Data collection instrument and technique**

Data was collected through a structured questionnaire during a face-to-face-interview. The questionnaire consisted of two modules, the first module included demographics characteristics (name, age, sex, marital status, family income per month, level of education, occupation, weight, height and body mass index) and diabetes history (type of diabetes, duration of diabetes, visit frequency, type of treatment, family history, fasting blood glucose and 2-hours post-prandial blood glucose). The second module included of nature of diabetes, medications, self-monitoring of blood glucose and urine for ketones, diet, exercise and self-care (skin-care, foot-care, eye-care and teeth-care). Knowledge was assessed by a questionnaire containing 35 questions. For each response score of one was awarded for right answer. The value of blood glucose was determined at the pathology department of the Diabetic Center. Patients were assessed for fasting blood glucose and morning 2-hours post-prandial blood glucose. The body weight was measured with light clothes and without shoes.
E-Data analysis

Data was analyzed using Microsoft Excel and Statistical Package for Social Sciences (SPSS) Version 9.0. Data regarding demographic characteristics and diabetes history were presented using descriptive statistics (frequency, percentage) and Chi-Square test. Data regarding level of diabetes knowledge and its management, level of blood glucose and level of body mass index were measured at two points that is pre and post-diabetes education for both control and intervention groups. Pre and post diabetes education knowledge, blood glucose levels and body mass index (BMI) were compared between groups using Chi-Square test ($\chi^2$) and Z-test.

Results

1-The result of this study showed that prior to diabetes education, there was no statistical difference in knowledge about diabetes and its management between control and intervention groups ($\chi^2=3.211; df=2; p>0.05$) and (Z value=0.324; $p>0.05$). However, post-diabetes education the intervention group showed statistically significant improvement in knowledge on diabetes and its management ($\chi^2=14.601; df=2; p<0.001$) and (Z value=6.825; $p<0.001$).

2- Base-line measures of blood glucose in intervention and control groups showed no statistically significant difference between groups in fasting
blood glucose \( (\chi^2=4.479; df=2; p>0.05) \) and \( (Z \text{ value }=0.481; p>0.05) \) or in 2-hours post-prandial blood glucose values \( (\chi^2=5.146; df=2; p>0.05) \) and \( (Z \text{ value }=0.793; p>0.05) \). However, post-diabetes education, a statistically significant difference was seen between groups for fasting blood glucose values \( (\chi^2=11.608; df=2; p<0.05) \) and \( (Z \text{ value }=-6.640; p<0.001) \) and in 2-hours post prandial blood glucose values \( (\chi^2=11.772; df=2; p<0.05) \) and \( (Z \text{ value }=-7.312; p<0.001) \) with the intervention group showing a significant improvement in blood glucose levels.

3-The result of this study regarding effect of diabetes education on body weight showed that there was no significant difference between control and intervention groups pre-diabetes education \( (\chi^2=4.339; df=2; p>0.05) \) and \( (Z \text{ value }=0.113; p>0.05) \). Post-diabetes education statistically significant difference was observed between the groups \( (\chi^2=6.098; df=2; p<0.05) \) and \( (Z \text{ value }=-2.003; p<0.05) \).

The results of this study clearly suggest that diabetes education improved the patients' knowledge on diabetes and its management, glycemic control and body weight over the short period of this study. This study has important implications for initiating diabetes self-management education in diabetic clinics in Yemen.