Original research

Disease-specific knowledge and lifestyle behavior in patients with diabetes mellitus

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ABSTRACT

Aim: To investigate whether people with diabetes mellitus (DM) have different disease-specific knowledge according to gender, DM type and centre of education and if they have adopted appropriate changes in their lifestyle according to their DM-related knowledge.
Patients and methods: A total of 76 patients with DM (males: 31, females: 45; age 18–82 years; DM type 1: 45, DM type 2: 31) participated in this cross-sectional, multi-center, questionnaire-based study. The Revised Michigan Diabetes Knowledge Scale questionnaire includes disease-specific questions on DM, diet and exercise. The "Diabetes Care Profile" questionnaire of the Michigan Diabetes Research and Training Center was applied to identify the demographic characteristics of the individuals, the education in diabetes, nutrition and exercise and the changes in lifestyle according to the given instructions.
Results: The overall score of correct answers was 69%. Gender did not present any difference in knowledge about DM ($p = 0.259$), diet ($p = 0.971$) and exercise ($p = 0.262$). In contrast, patients with DM type 1 achieved higher scores in knowledge about DM ($p < 0.001$) and foot care ($p = 0.019$) compared to the patients with DM type 2. Patients attending private DM-specific support centers achieved more correct answers compared to those attending public hospitals' outpatient clinics ($p = 0.003$).
Conclusions: Patients with DM type 1 and patients who attend private DM-educational centers receive more education on practical aspects of DM management and have superior knowledge related to it.

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1. Introduction

Glycemic control plays a key role in the outcome of diabetes mellitus (DM). Diet along with exercise are important factors in achieving glycemic control, either alone or in combination with medication. The knowledge of a person with DM about his/her disease contributes in a positive way to its management (Clarke-Farr et al., 2006; Dunn et al., 1990). This knowledge is related to general issues on DM (medications, complications, control of glucose concentrations and factors that affect them), diet (equivalents of carbohydrates, treatment of hypoglycemia, food composition) and exercise (benefits).

There is evidence that many people with DM do not know the complications that are associated with the disease, ignore the symptoms of hypoglycemia, are unaware of the targets for the fasting and the post-prandial glucose concentrations and, although they may be aware of the significance of a laboratory test, they postpone or ignore it (Clarke-Farr et al., 2006; Gulabani et al., 2008). In some cases, women seemed to have lower levels of knowledge about DM than men, who appeared to understand better its symptoms, its complications and the importance of healthy eating (Hawthorne and Tomlinson, 1999; Mehrotra et al., 2000).

The benefits of education are mentioned but not limited to the following: achieving a better metabolic control, preventing the dysregulation of DM, reducing the risk of amputations, the treatment costs, the frequency and severity of complications and hospitalization, achieving a better quality of life and decreasing the psychological distress (Mehrotra et al., 2000; Karamitsos, 2009; Rubin et al., 1989; Malone et al., 1989; Asha et al., 2004). Furthermore, the structured educational programs for glucose self-control, help to set and achieve goals about nutrition and physical activity (Duran et al., 2010).

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A continuous interactive training in small groups seems to have a positive effect on patients with DM, as it allows them to interact with each other, exchange ideas and gain new information about their disease (Garcia and Suarez, 1996). Furthermore, such activities increase the social support, the sense of independence, promote skills for the daily care of the disease and reduce the number of hospital admissions and usage of emergency services (Garcia and Suarez, 1996). In addition, education about the disease appears to help people with DM moderate the perception of the disease as "a sad fact" and show more interest for its management (Dunn et al., 1990). The participation of people with DM in educational programs is often influenced, among other factors, by the knowledge they have about the disease (Clarke-Farr et al., 2006).

Although there are studies measuring the disease-specific education and knowledge of people with DM, none of them combined the results with the changes in lifestyle through application of the instructions.

The aim of this study was to investigate whether people with diabetes mellitus (DM) have different disease-specific knowledge according to gender, DM type and centre of education and if they have adopted appropriate changes in their lifestyle according to their DM-related knowledge.

2. Patients and methods

2.1. Patient selection

In Greece, DM-specific education is fulfilled in public hospitals or private patients' support centers. Thus, the sample was recruited from two outpatients DM clinics of public hospitals (General Hospital of Thessaloniki "Papanikolaou", General Hospital of Thessaloniki "AHEPA") and two private centers [one DM-specific patient support group (Diabetes Association of the Prefecture of Thessaloniki "Agios Dimitrios") and one outpatient DM clinic of private hospital].

2.2. Sample size estimation

Based on a small pilot study, we assumed a difference of 35% in the main study parameters (education about DM, knowledge about DM) between the groups (males vs. females, DM1 vs. DM2, public hospitals vs. private centers). On the basis of these assumptions, we needed to enroll 66 subjects for the study to have a power of 80% with a type I error rate of 0.05 to detect a 35% absolute difference between study groups, assuming equal numbers in each comparison. Study power was calculated with GPower 3 (version 3.1.9.2, Universität Kiel, Germany).

2.3. Patients

A total of 76 patients with DM [males: 31 (41%), females: 45 (59%); age 18–82 years; DM type 1: 45 (59%), DM type 2: 31(41%)] participated in this cross-sectional, multi-center, questionnaire-based study.

2.4. Questionnaires

The first questionnaire was a "True/False"-type, simplified form of the multiple choice format questionnaire "Revised Diabetes Knowledge Scale" (University of Michigan, 2015). Comparison between the two forms revealed that the simplified "True/False"-type was easier to get completed (Collins et al., 2011). The total score was reported as a percentage of correct answers, with no negative marking for the wrong answers, or the ones that were answered as "do not know".

The second questionnaire consisted of queries about the demographic characteristics of the individuals, such as gender, age, educational level and profession, and questions about the duration of the disease, the control of glucose concentrations, medication, existing complications, education in diabetes, foot care, nutrition and exercise and application of the given instructions. This questionnaire was part of the "Diabetes Care Profile" (DCP) questionnaire (Section IX – Diet Adherence Scale, Section XII – Monitoring Barriers and Understanding Management Practice Subscales) of the Michigan Diabetes Research and Training Center (University of Michigan, 2015).

The individuals were informed about the purpose of this study and were asked to fill a consent form which was given separately from the questionnaires, so as to keep anonymity.

2.5. Statistical analysis

The statistical analysis of the data was carried out with SPSS for Windows software (version 19).

3. Results

3.1. Overall DM knowledge

The score of total correct answers were 69% (range 28%–95%). Correct answers about issues related to DM were 58% (9%–100%), nutrition 80% (29%–100%) and exercise 80% (0%–100%).

3.2. Knowledge according to gender

There was no significant difference between men and women in mean age, disease duration, BMI, education and knowledge about diabetes, foot care, diet, exercise and application of the given instructions (Table 1).

3.3. Knowledge according to DM type

Type of DM seems to affect related to the disease knowledge, as there were statistically significant differences between the two types of DM (Table 2).

Table 1
Baseline characteristics and disease-specific knowledge according to gender.

	Men (n = 31)	Women (n = 45)	p value
Age (years)	47.3 ± 19.3	49.6 ± 17.0	0.587
Duration of DM (years)	15.4 ± 10.8	18.7 ± 12.6	0.257
BMI (kg/m^2)	28.6 ± 5.0	27.7 ± 5.7	0.503
Education			
about DM (%)	61.3	77.8	0.259
about foot care (%)	77.4	88.9	0.164
about diet (%)	93.5	93.3	0.971
about exercise (%)	67.7	77.8	0.262
Knowledge			
about DM (%)	56	60	0.377
about diet (%)	77	81	0.450
about exercise (%)	79	80	0.822
General score of knowledge (%)	67	71	0.134
Changes in lifestyle			
related to diet	3.3 ± 0.2	3.6 ± 0.2	0.378
related to exercise	3.0 ± 0.2	3.0 ± 0.2	0.764

Data are expressed as mean ± standard error of the mean (SEM) or as percentage (%) of correct answers. BMI: body mass index; DM: diabetes mellitus. Application of the instructions is expressed on a 1–5 scale, where 1 = never, 2 = rarely 3 = sometimes, 4 = often, 5 = always.