Diabetes & Metabolic Syndrome: Clinical Research & Reviews 10S (2016) S114–S119

Contents lists available at ScienceDirect

Diabetes & Metabolic Syndrome: Clinical Research & Reviews

journal homepage: www.elsevier.com/locate/dsx

Original Article

Diabetes knowledge, attitude and practice (KAP) study among Iranian in-patients with type-2 diabetes: A cross-sectional study

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ARTICLE INFO

Keywords:
Attitude
Diabetes complications
Diabetes mellitus
Knowledge
Patients practice

SUMMARY

Aim: Recent studies highlight barriers of diabetes educational programs in Iran and also present some successful experiences carried out for improving the knowledge, attitude, and practice (KAP) of type-2 diabetic patients. Hence, evaluation of patients' KAP seems to be needed. We designed a multicenter study evaluating level of KAP in type-2 diabetic patients in the capital city of Tehran and identifying variables that affect this KAP level.

Methods: This multicenter analytical cross-sectional study was approved by Shahid Beheshti University of Medical Sciences Ethics Committee. Questionnaires were designed for evaluation of diabetes-related KAP in patients. After validating the questionnaires by endocrinologists, test–retest method was used for questionnaire reliability by checking in 15 diabetic patients. Two hundred type-2 diabetic patients admitted to 4 hospitals of Tehran filled out the questionnaires. Using SPSS software, the level of KAP and its confounders were evaluated in patients.

Results: Two hundred type-2 diabetic patients with the mean age of 60.17 years were evaluated (106 male and 94 female). The mean diabetes duration was 13.06 years. The levels of patients' good knowledge, attitude, and practice were 61.41%, 50.44% and 52.23%, respectively. Age, treatment methods, DM duration, and existence of diabetic retinopathy had significant correlations with KAP level.

Conclusions: The results of this study showed that recent educational programs in Iran improved KAP level. Patients' KAP increases as their condition worsens/progresses. Hence education should be considered as a priority for newly diagnosed patients and those with lower KAP levels before occurrence of diabetes complications.

Introduction

Diabetes is one of the most common chronic conditions in human history. It is a major public health concern worldwide with a prevalence of 8% in the United States [1,2] and 7.7% in Iran [3]. Progression of type-2 diabetes in most cases results in chronic complications, which lowers patients' quality of life and increases their morbidity and mortality; it also imposes a great economic burden on health systems [4,5]. The final outcome of diabetes depends on patients' knowledge and medical management [6].

It has been proved that self-care is the cornerstone of diabetes treatments, since this has been proven in various studies and populations [6,7]. Prior to beginning an educational program for diabetic patients, their current level of knowledge (K), attitude (A), and practice (P) should be evaluated.

Current practice in management of diabetes in Iran focuses on medical treatment and little attention is paid to educational programs and self-care of diabetic patients [5,8,9]. While prior studies have emphasized the importance of diabetes education [9], some recent articles have highlighted barriers to implementing diabetes educational programs in Iran [10] and have also presented successful experiences carried out for improving the knowledge, attitude, and practice of type-2 diabetic patients [8,11]. Patients

Abbreviations: KAP, knowledge attitude and practice; DM, diabetes mellitus; HTN, hypertension; BMI, body mass index; HbA1C, glycated hemoglobin; R-CVI, C-CVI, and S-CV, Irelevance clarity and simplicity content validity index.

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http://dx.doi.org/10.1016/j.dsx.2015.10.006
1871-4021/

are at least once educated at the first year of their initial diagnosis of diabetes. [8] Hence evaluation of knowledge, attitude, and practice among patients in Tehran (capital of Iran), where the most educational programs had been held, seems to be needed.

While studies to evaluate patients' knowledge, attitude, and practice (KAP studies) have been performed in many countries around the world, few studies have investigated the situation in Iran [9,12,13]. The most of these studies have been published in Persian and failed to develop a valid and reliable questionnaire.

We designed a multicenter study to evaluate the levels of knowledge, attitude, and practice of type-2 diabetic patients in the capital of Iran and also to identify variables that affect their KAP level.

Methods

In this multicenter analytical cross-sectional study, a simple random sampling method was used to select 200 type-2 diabetic patients who were admitted to 4 govermental hospitals (Loghman-e-Hakim, Imam Hossein, Shahid Labbafinejad, and Shohada-ye-Tajrish) of Tehran, the capital of Iran from February to September 2014. According to the American Diabetes Association (ADA) 2013 diagnostic criteria, diabetes is defined as the presence of fasting plasma glucose $\geq$126 mg/dL (7 mmol/L), symptoms of hyperglycemia and a plasma glucose $\geq$200 mg/dL (11.1 mmol/L), or glucose $\geq$200 mg/dL (11.1 mmol/L) 2 h after glucose load, and/or hemoglobin A1 C $\geq$6.5% [2], and any known cases of diabetes mellitus receiving anti-diabetic medication. Inclusion criteria were: type-2 diabetic patients older than 18 years admitted to surgery, internal medicine, ophthalmology, urology, and otorhinolaryngology wards by any indications except diabetes-related complications (such as glycemia management, diabetic foot, diabetic retinopathy, nephropathy and neuropathy) with at least 1 year past the initial diagnosis of diabetes (this 1 year was for assuring at least one time training about diabetes). Exclusion criteria were patients with gestational diabetes mellitus, patients younger than 18 years, outpatients, patients with diabetes duration less than 1 year, and patients admitted for uncontrolled diabetes.

After approving the validity and reliability of the questionnaire, 200 patients were enrolled. They filled out the questionnaire and their level of knowledge, attitude, and practice as well as the affecting factors were evaluated.

Measurements and definitions

Body mass index (BMI) was calculated using weight (kg) divided by the height squared (m^2) and the BMI $\geq$30 was considered as obesity. The number of years since initial diagnosis was considered disease duration. All laboratory findings were measured using Pars Azmoon lab kits (Pars Azmoon Co., Tehran, Iran) at the Central Laboratory of Labbafinejad Hospital Central Laboratory. Fasting plasma glucose was measured using glucoseoxidase by a Pars Azmoon kit, and glycated hemoglobin (HbA1C) concentration was determined using a Nyco Card Reader II analyser [14].

Systolic and diastolic blood pressures were measured by an expert nurse using an automatic monitoring system (Cardioset FX7, SaIRAN Medical Industry-Iran).

Diabetes was defined according to ADA 2013 criteria [2] and whether patients were receiving anti-diabetic medications, and systolic blood pressure higher than 140 mmHg or diastolic 90 mmHg was considered as hypertension [15]. Known cases of dyslipidemia receiving medication were considered as dyslipidemia. Proliferative (new vessels or neovascularization of the disk and vitreous or preretinal hemorrhage) and non-proliferative (at least one microaneurysm/hemorrhage) were both considered as diabetic retinopathy [16]. Previously known cases of diabetic nephropathy (presence of macroalbuminuria, or "severely increased albuminuria" in the new nomenclature) were considered as nephropathy. Existence of at least one of polyneuropathy, autonomic neuropathy, radiculopathies, mononeuropathies, and mononeuropathy multiplex was considered as neuropathy.

Ethical consideration

This study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences (Meeting Feb 2014, No. 151). The details of the study were explained to the patients and written informed consent was obtained from all patients. Enrollment in the study did not disrupt the patients' treatment process. All patients' information was kept secure and anonymous.

Statistical analysis

Data were analyzed using statistics package for social science (SPSS) version 21 for Windows. All continuous data are expressed as mean (SD), and categorical variables are expressed as number and percent. Quantitative variables were checked for normality using the Kolmogorov–Smirnoff test. Differences of continuous variables between groups were analyzed using independent *t*-test for Gaussian data and Mann–Whitney for non-Gaussian data. Additionally, Chi-square test was run for comparison of dichotomous variables which were expressed as percentages.

Moreover, the correlation between variables was tested using the Pearson test and two-tailed Spearman's rank correlation considering the Gaussian and non-Gaussian distribution of variables, respectively.

The effect of medication on knowledge, attitude, and practice was measured by One-Way ANOVA and Tukey's post-hoc tests. *P*-values less than 0.05 were considered significant.

Questionnaire design

A questionnaire was designed by researchers and validated by eight endocrinologists. To check the questionnaire's reliability, fifteen patients completed the questionnaire two times with a 1-week interval.

The questionnaire had four parts including demographic information, knowledge (10 questions), attitude (10 questions), and practice (11 questions). Questions of the knowledge part were multiple choice questions with 0–1 and 0–4 scores, based on the numbers of correct choices. Questions of the attitude part were −2 to +2 Likert-like (strongly agree, agree, no idea, disagree, and strongly disagree). Each question in the practice part belongs 1 point for correct practice and 0 point in case of incorrect practice. The total scores ranges were between 0 and 22 for knowledge part, −20 to +20 for attitude part, and 0 to 10 for practice part. The knowledge, attitude and practice scores were changed to percentage by dividing the total score of each part by the max score of same part, and then the KAP level means KAP percent.

The content validity ratio ($CVR = (n_e - N/2)/(N/2)$) and relevance, clarity, and simplicity content validity index (R-CVI, C-CVI, and S-CVI) were used for instrument validation. The internal consistency of the questionnaire was checked using pretest–posttest and Cronbach's alpha. The reliability of each question was also checked by McNemar and Kappa tests.

The questionnaire items were scored for necessity, relevance, clarity, and simplicity by eight endocrinologists and the CVR R-CVI, C-CVI, and S-CVI were measured. Level of significance was considered 0.75 according to Lawshe's Table. None of the items had CVR and CVI lower than 0.75. Fifteen patients completed the questionnaire 2 times with a 1-week interval to determine the questionnaire's reliability. The internal consistency was approved (overall $\alpha = 0.788$. knowledge part $\alpha = 0.755$, attitude part $\alpha = 0.769$, and practice part $\alpha = 0.845$). There were no significant