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Research Article

ASSESSMENT OF DIABETES KNOWLEDGE USING DIABETES KNOWLEDGE QUESTIONNAIRE AMONG PEOPLE WITH TYPE 2 DIABETES MELLITUS

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ABSTRACT

Type 2 diabetes is a metabolic disorder, the effective management of which requires not only medication use but also patient diabetes knowledge for adopting necessary life-style modifications. Those with greater knowledge of diabetes are expected to maintain better glycemic control. Assessment of the diabetes knowledge using diabetes knowledge questionnaire (DKQ) among Type 2 diabetes mellitus (T2DM) subjects and its correlation with glycated hemoglobin (HbA1c) levels. A cross-sectional study was conducted at the outpatient clinics Department of Endocrinology, Osmania Hospital. Subjects with T2DM of either gender, between the age of ≥18 years and <85 years, capable of understanding and completing questionnaires were included. Subject who were not willing to participate and not capable of understanding and completing the questionnaires were excluded. DKQ adapted for South Asian population was used to assess patient's diabetes knowledge. DKQ score was based on 18 point scale with 0.2 and 18 points, with ≥9 score were considered as satisfactory score. Associations between DKQ scores and HbA1c and duration of diabetes were measured. 80 subjects with T2DM were enrolled in this study. 74 completed study and 6 not completed questionnaires due to various reasons. Mean duration of diabetes 6.5±5.9 years and DKQ score mean was 5.14±2.205. HbA1c levels (n=66) mean was 8.76±1.862. DKQ score did not show significant correlation with HbA1c levels but correlated with disease duration. Level of diabetes knowledge among study population was low. Majority of people were illiterate, and level of education was less among study population. Improving diabetes knowledge of people with diabetes might allow achieving better glycemic control. Involving a clinical pharmacist with endocrinologist might achieve this objective of improving patient knowledge of diabetes when followed longitudinally.

Keywords: Questionnaire, collaborative care, diabetes knowledge level, diabetes education, Barrier.

INTRODUCTION

According to the International Diabetes Federation Diabetes Atlas, India already has 63 million people with diabetes [1]. Type 2 diabetes is a metabolic disorder, the effective management of which requires not only medication use but also active patient awareness with appropriate life-style modifications. Major problem with diabetes is that if it is poorly controlled it leads to increase in complications associated with diabetes. Diabetes increases the risk of various microvascular and macrovascular diseases such as coronary artery disease, stroke, blindness, kidney failure, and foot amputation [2,3] leading to increased morbidity. However, diabetes and its complications can be controlled and prevented by proper and effective management. There is evidence that good glycemic control may prevent diabetes-related complications [4,5]. Poor diabetic control in Indian people with diabetes led to microvascular diabetic complications comparatively more than in UK and Mauritius people with diabetes [6].

Diabetes mellitus treated for life thus cost associated with diabetes [7] and its associated co-morbidities and complications imposes an extensive economic burden on cost of care [8,9] for individual [10], society [8,11-13] and healthcare system [10]. However, in order to achieve good metabolic control, it is necessary to measure glycated hemoglobin (HbA1c) as well as assess awareness about diabetes among diabetes subjects. Poor diabetes knowledge has a negative impact on self-care behavior [14]. Though education of patients has very important role in effective management of diabetes, there is a shortage of trained personnel in India to provide education about diabetes and its associated complications [15].

Formal assessment of knowledge about diabetes and its management of subjects with diabetes is a prerequisite. Thus, aim of our study was to assess diabetes knowledge using diabetes knowledge questionnaire (DKQ) among Type 2 diabetes subjects and its correlation with HbA1c levels and duration of diabetes.

METHODS

Cross-sectional study included adults with Type 2 diabetes mellitus (T2DM) who are visiting the outpatient clinics of Department of Endocrinology, Osmania Hospital Hyderabad, India for follow-up. Patients of either sex between the age of ≥18 years and below 85 years and capable of understanding and completing questionnaires and willing to give informed consent were included in this study. Subject who were not willing to participate in the study and not capable of understanding and completing the questionnaires were excluded from the study.

Adults with T2DM were invited to participate in this study, and they were enrolled during November 2014. At enrollment patient's demographic information, information about the duration of diabetes and HbA1c levels were collected using case report form. Case report form was prepared to suit this present study. Source of data were patient self-report and medical records of patients with diabetes.

We carried out the search to identify for validated questionnaire suitable and easy to use in Indian clinical setting. Worldwide many knowledge questionnaires have been developed for assessing diabetes patient's knowledge about diabetes and its management. DKQ [16] is a validated tool for evaluating diabetes knowledge among subjects with diabetes.

Modified DKQ was utilized for this study for assessing knowledge of people with diabetes. The entire questionnaire can be administered to patients with Type 1 or T2DM. Modified DKQ comprises 18 questions concerning patient's diabetes knowledge and their self-care practices and eleven additional demographic questions (Table 1). DKQ was then translated to Telugu and Hindi version. This DKQ was designed and written in simple languages (Telugu, Hindi, English) for people with low literacy level. Based on patient ability to read and/or understand DKQ in suitable language was used to assess patients' diabetes knowledge.

In the present study, it was assumed that all the questions can be answered by educated as well as illiterate people.

Under the supervision of endocrinologist (Rakesh Sahay) a clinical pharmacist administered DKQ by conducting face to face interview of people (orally to illiterate) with diabetes and asked patients to answer the questions orally by choosing correct options from multiple options. Clinical pharmacist provided assistance to complete the questionnaire to people who cannot read or write to complete the DKQ. If some people could not follow the terminology, then clinical pharmacist gave a simple explanation based on their understanding to further motivate them and extract answers. It was ensured that answers were given by patients in order to ensure that they understood questions completely. Literate people with diabetes were asked to complete the questionnaire themselves. The questionnaire took approximately 5-15 minutes to complete the interview. All these simple techniques allowed us to assess diabetes knowledge of diabetes subjects easily.

Scores of DKQ were calculated for each participant .Points was given for all the correct answer options for each question and no point for the incorrect answer. Total score was summed-up for diabetes knowledge score for each subject with diabetes. To assess the level of diabetes knowledge scores were utilized. Maximum score offered being 18 and (≥9) rated as satisfactory and (<9) as poor knowledge for the purpose of this present study. Higher score indicates better knowledge of diabetic subjects about diabetes.

The study protocol was approved by Osmania Medical College Ethics Committee Hyderabad, India. Written informed consent was obtained from all the participants prior to start of the study.

Data analysis

Data were tabulated and analyzed using descriptive statistical methods. Correlations of data were collected with Pearson tests. $p>0.01$ was considered as significant.

RESULTS

Participant's age range was from 36 to 75 years; mean age was 52.22 years. 78.38% were females and 21.62% were males, 59.45% were illiterate in this study, 75.67% were using oral hypoglycemic agents only, 24.32% were using insulin + oral hypoglycemic agents, none was reported to diabetes educator and 14.86% consulted dietician.

DKQ mean score was 5.14±2.205 points, which was poor. 2.7%, n=2, who were graduates had satisfactory knowledge of diabetes. Glycemic control degree was assessed through HbA1c. HbA1c levels were available for (89.18%, n=66). HbA1c mean was 8.76±1.862%. Duration of diabetes were available for (98.64%, n=73) mean was 6.5±5.9 years (Table 2). DKQ score did not show significant correlation with HbA1c levels but correlated with disease duration.

DISCUSSION

Formal assessment of diabetes knowledge of subjects with diabetes can be carried out by administering the DKQ in daily clinical practice with this simple DKQ either with written or oral evaluation. Process of identification of areas where patient's diabetes knowledge could be improved with diabetes education is easy with this DKQ. Input was obtained from people with diabetes and draft questionnaire was pilot-tested on a small group of people with diabetes, and their feedback was collected and included in modified DKQ prior to conducting this pilot study.

There is evidence for no relationship between metabolic control and diabetes knowledge among people with diabetes [17-21]. In this present study, we have noticed that there is no association between HbA1c levels and patient diabetes knowledge. There are many barriers for achieving glycemic control, the most important barrier was found to be inadequate knowledge and understanding about diabetes among people with diabetes [22]. In this present study majority of people have poor diabetes knowledge, which might be acting as a barrier to achieve glycemic target goals. We found that the majority of patients who were illiterate or with lower education level (up to school) had significantly lower DKQ score. Results of this study indicate that lower education level has an impact on diabetes knowledge, and it is similar to the evidence shown in earlier studies [23,24]. Though diabetes knowledge of patients have very important role in effective management of diabetes only 2.75% had satisfactory DKQ score in this study, which indicates that diabetes knowledge needs to be improved. In this present study disease duration significantly correlated with DKQ score and it is similar to findings of other investigator [14].

Osmania Hospital is a large tertiary care hospital, which provides free treatment and medical services to people belonging to low

Table 1: Modified DKQ comprise following domains

Demographic information (I)
Age, gender
Education
Duration of diabetes
Type of diabetes
Treatment
Diabetes education
Diet education
Language comfortable to speak, read and understand
Socioeconomic status
Source of medication
Disease knowledge (II)
Diet recommendations
Physical activity
Benefits of exercise
Lifestyle modification
Diabetes treatment approach
Importance of self-monitoring of blood glucose
Sick day management (e.g. flu, infection)
Management of diabetes to decrease the risk of complications
Risk of foot problems
Frequency of medical checkup for eyes, kidney and nerve
HbA1c levels
Targets for control
Disease management (III)
Monitoring treatment and use of diabetes medication
Management of hypoglycemia
Precautions to be taken prior to traveling
Precautions to be taken for drug reactions
Sick day management

HbA1c: Glycated hemoglobin, DKQ: Diabetes knowledge questionnaire

Table 2: Characteristics of respondents

Parameter	
Percentage of respondents were responded to the study and successfully completed the study	74 (92.5%)
Age year, mean	52.22
Male n (%)	16 (21.62)
Female n (%)	58 (78.37)
Level of education	
School, n (%)	25 (33.78)
Graduates	5 (6.75)
Illiterate/no response, n (%)	44 (59.45)
HbA1c % mean±SD, (n, %)	8.76±1.86 (66, 89.18)
Diabetes knowledge score mean±SD	5.14±2.205
People with diabetes receiving oral medication only, n (%)	56 (75.67)
People with diabetes receiving insulin+oral medication, n (%)	18 (24.32)
Duration of diabetes, year, mean±SD, n (%)	6.5±5.9, (73, 98.64)
Consultation with diabetes educator, n	0
Consulted dietician, n (%)	11 (14.86)

HbA1c: Glycated hemoglobin, SD: Standard deviation

socioeconomic status. Level of diabetes knowledge in people with diabetes attending Osmania Hospital was low. Majority of people were illiterate or their level of education was less. Improving diabetes knowledge of these people with diabetes might allow achieving better glycemic control. For effective management of diabetes involving a clinical pharmacist with endocrinologist might achieve this objective of improving patient knowledge of diabetes when followed longitudinally.

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