Evaluation of dietary habits and related factors among type 2 diabetic patients: An innovative study in Iran

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ABSTRACT

Introduction: The aim of this study was to assess dietary habits and related factors among type 2 diabetic mellitus patients for designing an effective nutrition intervention.

Materials and Methods: A descriptive–analytical study was performed on 480 diabetic patients referred to four selected teaching hospitals affiliated to the Tehran University of Medical Sciences (TUMS) in Tehran for a period of nine months in 2012. Patients’ dietary habits were measured by a 51-item self-report instrument with four general questions about dietary habits and four subscales reflecting domains including general diabetes information (12 items), planning, shopping for, and preparing meals (6 items), eating meals (17 items), and family influence on dietary habits (12 items). The collected data was analyzed by using SPSS software version 11.5. Results were considered significant at a conventional P < 0.05 level.

Results: Mean age of the participants was 59.96 ± 11.53 years. Mean scores in the domains were (53.72 ± 19.83), (57.31 ± 23.82), (52.27 ± 12.13), and (64.72 ± 14.3), respectively. Family influence on dietary habits was highlighted as the most important domain in the dietary habits instrument. Study results revealed that there was a significant association between the four domains and socioeconomic and some variables related to dietary habits such as dietary self-management, planned healthy lifestyle and attending diabetes educational programs.

Discussion: The important role of family on dietary habits among type 2 diabetic patients highlighted the role of perceived social support from the family. The results of the sociodemographic variables stressed the necessity of tailoring specific intervention programs accordingly.

Key words: Diet, dietary habits, family, type 2 diabetic patients

INTRODUCTION

Type 2 diabetes is a group of metabolic disorder which can be described as uncontrolled blood glucose levels.[1] Type 2 diabetes is one of the most health problems in the world.[2] There is an increasing trend in the incidence of diabetes in both the developed and developing countries.[3,4] Disease chronicity has an increased risk of premature death, as well as short- and long-term complications.[5,6] It is estimated that there are more than three million diabetic patients living in Iran; this can increase up to seven million by 2030 if an effective preventive and control mechanism is not implemented.[6] In Iran, the prevalence of type 2 diabetes was 2%-10% in 2008.[7,8] It is a controllable disease,[11] and
lifestyle-related factors have been considered as potentially modifiable determinants to control it. One of the most important factors of a healthy lifestyle is adherence to a healthy dietary pattern. However, self-care is very important in diabetes control; self-management remains one of the bases of diabetes self-care mechanism. As such, SMBG (self-monitoring of blood glucose), carbohydrate counting, and activity regimens are important and essential tools for people living with diabetes, and should be individualized for each patient in everyday life. Diabetes care is complex and requires multifactorial risk-reduction strategies beyond blood sugar control. The complexity of diabetes self-management activities need lifelong support and education. Medical nutrition therapy is a fundamental part of diabetes self-management. Based on qualitative and quantitative research, Collier (2007) identified dietary habit principals (domains) including general diabetes information, shopping for and preparing meals, eating, and family influence on habits. As we have tried to indicate in the earlier paragraphs, dietary self-management has a unique role in the control and treatment of diabetes, especially dietary habits have a very important role. Because of this and the lack of evidence about dietary habits and related factors among type 2 diabetic patients in the Iranian literature; this study aimed to assess dietary habits and related factors among type 2 diabetic patients to tailor an effective intervention dietary program.

**MATERIALS AND METHODS**

A descriptive–analytical study was conducted for nine months in 2012 with continuous sampling of type 2 diabetic patients referred to four teaching hospitals affiliated to the Tehran University of Medical Sciences (TUMS) in Tehran, Iran. Eligibility of patient’s participation was confirmed, and it involved having a history of type 2 diabetes at least for one year and willingness to provide informed consent to participate in the study. This study recruited 480 patients on the basis of a P ratio between diabetic patients (0.5%) at 95% confidence level and 80% power test, considering 20% sample size reduction. Patients’ dietary habits were measured by a 51-item self-report instrument with four general questions about dietary habits and four subscales reflecting domains including general diabetes information (12 items), planning, shopping for, and preparing meals (6 items), eating meals (17 items), and family influence on dietary habits (12 items). The responses to each item domain were rated from 1 to 5 on a Likert scale. Therefore, in the earlier paragraphs, dietary self-management has a unique role in the control and treatment of diabetes, especially dietary habits have a very important role. Because of this and the lack of evidence about dietary habits and related factors among type 2 diabetic patients in the Iranian literature; this study aimed to assess dietary habits and related factors among type 2 diabetic patients to tailor an effective intervention dietary program.

The response rate was 90.5% (480/530). Two hundred and eighty-two (57.7%) participants were female, 81.8% (n = 393) was married, and 72.7% (n = 349) had education lesser than a diploma. Half of the participants had the disease for less than 5 years (49.6%). More than half of subjects were on a regimen of oral agents only (58.3%).

More than one-third of the subjects (36.3%) were overweight based on the World Health Organization (WHO) definition of overweight (1,2 Approximately half of patients reported one time self-monitoring of blood glucose SMBG) during a day (48.2%). Two-thirds of the participants reported at least moderate dietary self-management (66.2%). Only 15.8% of the participants followed a planned healthy lifestyle. A minority of participants (17%) reported two snacks (morning and afternoon), and evening snack was not reported at all. Of the total, 41% (n = 196) participants were used to the consumption of three meals at regular timings, and the most prevalent missing main meal was dinner (95.1%). More than three-fourths (74.8%) of the participants did not report attending any diabetes educational program.

Mean scores in the domains of general diabetes information, planning, shopping for, and preparing meals, eating meals, and family influence on dietary habits were (53.72 ± 19.83), (57.31 ± 23.82), (52.27 ± 12.13), (64.72 ± 14.3), respectively. “Family influence on dietary habits” was highlighted as the most important domain in dietary habits scale.

Study results revealed that there were significant associations between the general diabetes information domain and...
educational level \((P = 0.007)\), family income \((P < 0.001)\), occupational status \((P = 0.001)\), body mass index \((BMI) (P < 0.001)\), attending diabetes educational programs \((P = 0.001)\), type of treatment \((P = 0.03)\), and dietary self-management \((P < 0.001)\). Moreover, there were significant associations between the planning, shopping for, and preparing meals domain and being female \((P = 0.02)\), family income \((P = 0.008)\), occupational status \((P = 0.002)\), BMI \((P = 0.001)\), and attending diabetes educational programs \((P = 0.003)\). The findings showed that there were significant associations between the eating meals domain and education level \((P = 0.003)\), family income \((P < 0.001)\), BMI \((P = 0.03)\), type of treatment \((P = 0.009)\), and dietary self-management \((P = 0.001)\). Also, the study results indicated that there were significant associations between family influence on dietary habits domain and age between 45–64 years \((P = 0.003)\), education level \((P = 0.02)\), family income \((P < 0.001)\), occupational status \((P = 0.02)\), attending diabetes educational programs \((P = 0.02)\), and dietary self-management \((P = 0.009)\). However, there was no significant association between other variables and non-mentioned domains \([Table 1]\).

**DISCUSSION**

This study is one of the few studies that assessed dietary habits and related factors among type 2 diabetic patients for designing an effective nutritional intervention. The constructs of the domains and related factors were identified. Based on the study results, family influence on dietary habits was highlighted as the most important domain in the dietary habits instrument. This finding is in accordance with the study of Raberg and colleagues \((2010)\) that determined concerns about children., perceived expectations, and pressures from family member as barriers to a healthy dietary pattern.\(^{[16]}\)

On the other hand, the study of King et al. \((2010)\) revealed that dietary habits in diabetes self-management showed a significant association with social support. They proposed focus on social support intervention planning in diabetes self-management.\(^{[17]}\) Also, Nagelkerk et al. \((2006)\) reported that modification of dietary habits needs perceived social support from the family for motivation and maintenance of self-monitoring and self-management dietary behaviors.\(^{[18]}\) Based on the mentioned findings and study results, the role of the family in dietary habits and social support was highlighted as a reinforcing factor in healthy dietary behavior adoption. Reinforcing factors can provide support in diabetes prevention and control. Study results revealed that the eating domain showed the least mean score compared to others, and it was shown as a negative factor influencing desirable diabetes control. More specifically, Yu et al. \((2011)\) highlighted that adherence to a diet full of milk and meat rather than vegetables, fruits, and fish regimen put people more at risk for type 2 diabetes.\(^{[19]}\) A meta-analysis study by Wolfram et al. \((2011)\) confirmed the findings that better diabetes control and more sensitivity to insulin was a result of a healthy diet including high fiber and low fat.\(^{[20]}\) According to our findings, more of type 2 diabetic patients were not having three main meals and three snacks. This finding is in accordance with the study by Mekary et al., \((2012)\) which revealed that males who skipped breakfast and ate two main meals daily where 1.21 and 1.3 times more at a risk for type 2 diabetes, and they concluded that breakfast consumption has an influential impact on prevention and control of type 2 diabetes.\(^{[21]}\)

Based on the current study results which found a relationship between socioeconomic status \((SES)\) and diabetes dietary habits, Jaffiol et al., \((2012)\) in their study about diabetes and social deprivation found that SES as an undesirable outcome of deprivation can negatively affect diabetes dietary pattern. This class had a tendency to consume more carbohydrates and

Table 1: Relation between mean scores in dietary habits domains based on sociodemographic and diet-related variables

| Variables                  | General diabetes information | Planning, shopping for, and preparing meals | Eating | Family influence on dietary habits |
|----------------------------|-------------------------------|---------------------------------------------|--------|-----------------------------------|
| Age                        | NS                            | NS                                          | -NS    | 0.003                             |
| Gender                     | NS                            | 0.02                                        | NS -   | NS                                |
| Level of education         | 0.007                         | NS                                          | 0.03   | 0.02                              |
| Occupation                 | 0.001                         | 0.002                                       | NS -   | 0.02                              |
| Family income              | < 0.001                       | 0.008                                       | <      | < 0.001                           |
| BMI                        | < 0.001                       | 0.001                                       | 0.03   | NS                                |
| Type of treatment          | 0.04                          | NS                                          | 0.009  | NS                                |
| SMBG                       | < 0.001                       | NS                                          | <      | < 0.001                           |
| Dietary self-management    | < 0.001                       | < 0.001                                     | 0.001  | 0.009                             |
| Attending diabetes programs| 0.001                         | 0.003                                       | NS     | 0.05                              |
| Planned healthy lifestyle   | < 0.001                       | < 0.001                                     | <      | < 0.001                           |

NS = Not significant, BMI = Body mass index, SMBG = Self-Monitoring of blood glucose
less protein, vegetables, and fresh fruits because of low income. This lifestyle resulted in some indices such as an increasing BMI, which was in accordance with our findings.[22]

The present study faced a limitation in terms of the patient’s dietary habits instrument, its four domains, and comparison with socioeconomic variables. However, the results were similar to the finding of the study by Sumiyoshi et al., (2010) which found a significant association between gender (being male) and occupation and diabetic patients’ dietary practices, but in our study the association with gender (being female) was not in accordance with the Sumiyoshi study.[23]

Schuster et al. (2005) demonstrated financial support as an influencing barrier on the modification of dietary habits, which was in agreement with our study results, which revealed there was an association between economic status and dietary habits domains. Additionally, the mentioned study suggested diabetes education with family involvement to encourage the adoption of individual and familial diabetes self-management behaviors.[24] It was concluded that the perceived social support from the family was a very strong influential factor for adherence to diabetes dietary habits, which has been highlighted in several studies.[23-25] Murrock et al., (2013) in their qualitative research about dietary challenges of managing type 2 diabetes, queried about dairy routines, family responsibilities, and individual needs in the context of their personal lifestyle factors. They concluded that there were frequent difficulties in the modification and support of dietary habits and information gaps. This study highlighted the role of lifestyle modification factors for diabetes control which was in accordance with the present study results.[26] Therefore, according to findings of our study including the results, a tailor-made intervention based on an educational program to maintain appropriate dietary behavior in diabetic patients is required, considering the role of individual characteristics and family involvement. Similarly, Sharifirad et al. (2009) concluded the effectiveness of an intervention program based on the health belief model on nutritional diabetes education in their study.[27] The key point of the present study was the use of the patient’s dietary habits instrument for the first time after its development; different domains of this instrument can lead to more effective theory-based intervention programs. On the other hand, this study has some limitations such as (1) patients’ dietary habits instrument was based on self-report and there is a possibility that the results might not have contributed to exact estimation, (2) lack of sufficient research in the literature in terms of the patient’s dietary habits instrument and its four domains and socioeconomic variables, and (3) all confounding factors which might play a role in reporting the dietary habits scores were not considered.

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