Dietary habits, diabetes self-management, and some vascular risks among patients with type 2 diabetes, Tabuk, Kingdom of Saudi Arabia

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ABSTRACT

Objectives: We aimed to study the dietary habits, diabetes self-management, and some vascular risks among patients with type 2 diabetes in Tabuk, Saudi Arabia. Methods: This cross-sectional descriptive study conducted among fifty diabetic patients in King Khalid Military Hospital, Tabuk, KSA during the period from March to September 2015. The participants signed a written informed consent then interviewed using a structured questionnaire to collect demographic characteristics, dietary habits, medication management, follow-up, physical activity, smoking, stress, self-monitoring of blood glucose, and knowledge of diabetes complications. The ethical committees of both the University of Tabuk and King Khalid Military Hospital approved the research and The Statistical Package for Social Sciences (SPSS) was used for data analysis. Results: Out of fifty diabetic patients 52% were males, their ages ranged from 28-80 years old. Only 24% of patients were following dietary advice, 48% and 28% were regularly consuming dates and honey respectively, while 64% were taking fruits and vegetables, less than half of patients were monitoring their blood sugar, 76% were on regular follow-up, while 52% knew diabetes complications. Conclusion: The current data present poor adherence and misconception to diet, suboptimal diabetes management, and lack of physical activity among patients with diabetes in Tabuk.

Keywords: Dietary habits, self-management, diabetes, Tabuk

INTRODUCTION

Diabetes mellitus is becoming a global epidemic and is alarmingly increasing both in developed and developing countries; the number is expected to creep from the current number of 285 million to 438 by the year 2030. The Asian countries are suffering the bulk of the rise, and the Kingdom of Saudi Arabia is ranked top among countries with the highest prevalence of diabetes mellitus (International Diabetes Federation 2015; Khuwaja et al., 2010).

Type 2 diabetes mellitus in children and adolescent is on the rise worldwide (Hsia et al., 2009), type 2 diabetes is usually asymptomatic in early stage and may remain undiagnosed thus could present with complications (Si et al., 2010). Living with diabetes complication for such a has
long time could place a significant social and financial burden on the patients, the families, and the community as a whole (Lee et al., 2011). The intermediate stage of developing overt diabetes is called prediabetes and an increasing risk of myocardial infarction. Prediabetes is reversible condition through dietary and lifestyle modifications, so reducing the increased vascular and the long-term morbidity and mortality (Li et al., 2009).

Several randomized control trials provide convincing evidence about the role of regular physical exercise and healthy diet in preventing and delaying the progression from prediabetes to overt diabetes mellitus and hence the deleterious consequences of the disease (Harris et al., 2003).

The risk of developing diabetes mellitus was significantly increased among men with Westernized diet pattern (more fat, red meat, dessert, sweets, etc.) than those consuming fresh fruits and vegetables, whole grain, and fish (van Dam et al., 2002).

Early detection of the modifiable risk factors for diabetes mellitus of high priority for the primary prevention, few researchers have studied the lifestyle factors among patients with type 2 diabetes in Tabuk Saudi Arabia, thus we conducted this research to investigate dietary pattern, physical activity, and diabetes self-management among patients with type 2 diabetes in Tabuk, KSA.

### MATERIAL AND METHODS

This cross-sectional descriptive study conducted among patients with diabetes mellitus attending an outpatient diabetes clinic in King Khalid Military Hospital, Tabuk, KSA during the period from March to September 2015. Patients were selected by simple randomization technique in a ratio of 1:2. All participants signed a written informed consent, then interviewed using a structured questionnaire to collect the following information: Demographic data, type of diabetes mellitus, regular exercise, adherence to medication uptake, family support in drug intake, checking expiration of medication, insulin preparation and storage, regular changing of insulin injection sites, self-adjustment of insulin dose, and proper handling of medication on travel. Patients were also asked about regular follow-up if they fell under constant strain, family history of diabetes, and knowledge about the complications of diabetes. Regarding the diet the following information was collected: Adherence to dietary advice and regular meal intake with medications, date, honey, and desert intake, consumption of fruit, vegetables, and complex sugar. The ethical committees of the University of Tabuk and King Khalid Military Hospital approved the research.
Table 2. Dietary factors among the study group

<table>
<thead>
<tr>
<th>If following dietary advice</th>
<th>12 [24%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex sugar intake (≥3 times/week)</td>
<td>42 [84%]</td>
</tr>
<tr>
<td>Regular consumption of honey</td>
<td>14 [28%]</td>
</tr>
<tr>
<td>Fruits and vegetables intake</td>
<td>32 [64%]</td>
</tr>
<tr>
<td>Regular meal intakes with medications</td>
<td>38 [76%]</td>
</tr>
<tr>
<td>Regular dates intake (≥8/day)</td>
<td>24 [48%]</td>
</tr>
<tr>
<td>Regular dessert intake</td>
<td>18 [36%]</td>
</tr>
<tr>
<td>Adequate fluid intake</td>
<td>38 [76%]</td>
</tr>
</tbody>
</table>

**Statistical analysis**

The Statistical Package for Social Sciences (SPSS) was used for data analysis, data were presented as mean±SD or percentages unless otherwise specified.

**RESULTS**

Out of fifty patients with diabetes mellitus their ages ranged from 28-85 years, 52% were males, 20% were affected by type 1 diabetes, while type 2 diabetes was reported in 80%. Only one-third of them was on regular exercise, 72% were adherent to the medication regimen, 68% were checking drug expiration, 52% were supported by their families in medication uptake, 76% were taking and properly storing their medications on travel, and 44% were checking their blood sugar regularly. Regarding insulin: The majority (72%) knew insulin preparation, 84% knew the proper insulin storage, 68% were frequently changing insulin injection sites, while 62% knew how to adjust insulin dose. Seventy-six were on regular follow-up, near half of participant (44%) were constantly feeling under strain, 72% of patients had a family history of diabetes, while 52% knew the diabetes complications Table 1 above.

Regarding the diet, only minority (24%) were following dietary advice, 48% consume dates regularly (three or more times/week), 28% reported regular consumption of honey, while dessert consumption was found in 36% of patients. Table 2 depicted other dietary characteristics.

**DISCUSSION**

The rapid economic growth in the Kingdom of Saudi during the last four decades with the remarkable increase in the living standards and the adoption of a Westernized diet, jobs involving long time of physical inactivity, and lack of physical exercise leads to a rapid surge in the rates of type 2 diabetes, genetic predisposition and higher rates of consanguineous marriage could exacerbate the matter further (Al-Hazzaa., 2004; Elhadd et al., 2007). Researchers concluded that a healthy diet and regular physical exercise might significantly decrease the risk of type 2 diabetes in spite of the family history (Midhet et al; 2010).

In the present study, we concluded low rates of physical activity, and fruits and vegetable intake, (36% and 64% respectively), the current data are higher than a study conducted in Saudi Arabia and found a physical activity, and fruits and vegetable intake of 22.9% and 8.9% respectively (Mohieldein et al., 2011). The present finding is in accordance with (Mohamed et al., 2013) in term of fruit and vegetable consumption but higher regarding physical exercise, plausible explanations could be the difference in sample size and the place of the studies.

Lack of a well-constructed health education program could give a place for wrong believes in diabetes management, in the current study, 48%, and 28% of patients were consuming dates and honey regularly, our finding supported previous studies from Saudi Arabia who concluded the wrong belief by diabetic patients that dates and honey are useful items for diabetes, this genuine misconception arises due to culture since dates and honey are local products. These items may affect the plasma sugar if not taken in moderation (Al-Saeedi et al., 2002).

In the present study, only 24% were compliant with the diet, 44% were checking their blood sugar regularly, only half of patients were aware of diabetes complications, 72% were taking medications regularly, while 76% were on regular follow-up. The same applied to insulin management regarding proper storage, dose preparation and adjustment, and regular changing insulin injection sites within the same region. The same observations were concluded by previous literature (Murad et al., 2014; Pouwer, 2009). This of great concern because it is imperative for diabetic patients to be counseled regarding self-management of diabetes, the importance of regular follow-up, the need to follow a healthy diet, and the role of physical activity in the prevention of diabetes. Massive training and educational programs aiming at the counseling of diabetic patients about all aspects of self-care are highly needed.

Smoking is an independent modifiable risk factor for type 2 diabetes mellitus, in the current study 12% of patients were current smokers, similarly, a previous
Continuous stress through stimulation of the sympathetic nervous system, the release of cytokines, and platelets aggregation could increase the insulin resistance leading to poor glycemic control and hence diabetes complications, in the present study 44% of patients felt that they were under continuous stress, in accordance to (Murad et al., 2014) who reported stress in 32.6% of diabetic patients.

**In conclusion**

Our data present a sample of Saudi diabetic patients with poor adherence to healthy diet, misconception towards certain food items, and other unwanted features like non-adherence to medications, lack of physical activity, poor diabetes self-management, stress, and cigarettes smoking, a well-structured diabetes counseling, and educational programs are highly needed to alleviate the patient suffering and reducing the deleterious consequences of this common morbid life-long disease.

**Limitations**

This study has many limitations: The small size of the survey sample, the reliance on a self-administered questionnaire is more prone to subjectivity, and the fact that the research was carried at a single diabetic sample so generalization cannot be insured, further larger multii-center studies are needed.

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**REFERENCES**


International Diabetes Federation (2015), Middle East, and North Africa.


