

Evaluation of Dietary Habits Effect among Saudi Patients with Type II Diabetes Mellitus



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Abstract

Improving the dietary habits of type two diabetes mellitus patients could decrease the disease complications.

Aim: This study aimed to evaluate the effect of dietary habits of a sample of Saudi patients on type two diabetes mellitus.

Methodology: a cross-sectional study was carried out on 200 patients (100 male and 100 female) using the first item of the validated version of Personal Diabetes Questionnaire (PDQ).

Results: most of the study participants (73.5%) were up to 50 years old and (87%) were obese or overweight. Half of the study participants (50%) had a good level of diet knowledge and skills, only (6%) of them taken the good decision, (62%) taken a fair decision. Most of the study participants (71.0%) did not have any eating problems or diet barriers (47.5%).

Conclusion: modifying lifestyle of T2DM patients and controlling weight control help to reduce the national burden of this disease and improving the health for T2DM patient.

Keywords: Diabetes mellitus; Dietary habits; Personal diabetes questionnaire

Abbreviations: DM: Diabetes Mellitus; T2DM: Type Two Diabetes Mellitus; KAUH: King AbdulAziz University Hospital; PDQ: Personal Diabetes Questionnaire; HbA1C: Glycosylated Hemoglobin; BMI: Body Mass Index; SPSS: Statistical Package for Social Science

Introduction

Diabetes mellitus (DM) is one of the most important global health problems growing swiftly. The international diabetes federation estimated that 382 million people have diabetes worldwide and 3.8 million in Saudi Arabia in 2014 [1].

Type II DM has a complex etiology associated with irreversible risk factors that includes age, ethnicity, race and genetics; as well as reversible risk factors including diet, smoking and physical activity. The major factors that contribute to the rapidly rising incidence of DM in developing countries are dietary habits and sedentary lifestyles [2]. T2DM has several consequences, associated with increased risks of hypertension, premature atherosclerosis, retinopathy, renal failure, neuropathic diseases [3] and cardiovascular diseases [4,5].

The gulf area experienced a dramatic change during the past four decades pertaining the living conditions that resulted in an unhealthy obesogenic environment and physical inactivity [6,7]. These new nutritional habits are owned to the proliferation

of westernized life style and food [8,9] therefore dietary management and food choices are unsatisfactory [10,11]. The T2DM management requires lifestyle interventions that are specifically designed to influence the individual's food intake and physical activity [12,13]. All individuals should receive a standard diabetes education that specifically focuses on dietary interventions with increasing the physical activities valuable importance. Moreover, promoting a therapeutic lifestyle is fundamental at the diagnosis stage; periodic counseling should be integrated into the treatment program. Improving glycemic control and other cardiovascular risk factors through weight reduction attained by either dietary means alone or with adjunctive medical or surgical intervention. The individuals physical activity should be encouraged to ideally aim for at least 150min/week of moderate intensity that include flexibility, aerobic and resistance training [14]. The study aims to evaluate a sample of Saudi national patient's dietary habits of both genders with type II diabetes mellitus in Jeddah, Saudi Arabia.

Study Methodology

It was a cross-sectional study carried out in the department of internal medicine-King Abdulaziz University Hospital (KAUH) for a period of two months from September through October 2016. Ethical approval was obtained from Research Ethics Committee of Biomedical Ethics, in addition to Research Ethic committee of KAU faculty of Medicine. It was applied on two hundred Saudi nationality patients diagnosed with type II diabetes mellitus: 100 male and 100 female, aged between 30-65 years.

Sample selection criteria

All diabetic patients who fulfilled the inclusion criteria constituted the study population.

Inclusion criteria: Male and female Patients with T2DM attending the department of internal medicine- King Abdulaziz University Hospital (KAUH) aged between 30 to 65 years. Patients who suffer from T2DM for at least a year. Saudi Arabian nationality.

Exclusion criteria: All the patients had type I DM, Patients with type II DM not in the age group (30-65) years, Non-Saudi nationality and Pregnant women.

Assessment of the dietary habits

The first item of the validated version of Personal Diabetes Questionnaire (PDQ) was used with T2DM patients to allow them to describe the diabetes self-care behaviors in one major domain and the nutritional management, in addition to assess the dietary habits for them. The scoring scheme for the PDQ was based on grouping items by behavioral domain. Subscales were developed to represent each self-care behavior, or in the case of diet, different aspects on the behavior. A PDQ formatted for self administration may be downloaded from the internet (PDQ survey: <http://healthbehavior.psy.vanderbilt.edu/PDQ.pdf>) [15].

Glycosylated hemoglobin (HbA1c)

The study participants were classified as <7 Excellent control, 7.1-8 Good control, 8.1-11 Fair control, ≥11.1 Poor control [16].

Blood pressure (Systolic pressure/Diastolic pressure)

The study participants were classified as low Blood Pressure 70-89\40-59, normal Blood Pressure 90-119\60-79, pre-hypertension 120-139\80-89, hypertension 140-190\90-100 [17].

Anthropometric measurements

Anthropometric measurement includes weight and heights were measured for all study samples in a screening room and the BMI was calculated.

Weight: Body weight was measured to the nearest 0.5kg by kilograms using a calibrated electronic weighing scale (LAICA-LC76 electronic scale).

Height: Height measurements was carried out by cm using a portable stadiometer scale in the standing position, without footwear, to the nearest 0.1cm. Height was converted to Meters in order to use it in further calculations.

Body mass index: BMI was calculated using as weight (in kilograms) divided by height (in meters) squared. It was classified as underweight <18.5, normal weight 18.5-24.9, overweight 25.0-29.9 or obese >30.0 [18].

Statistical analysis

Data analysis was carried out using the Statistical Package for Social Sciences (SPSS ver. 22.0). Descriptive statistics were applied (i.e., frequency, percentage, mean and standard deviation) for continuous variable.

Results

Table 1: The study participants characterizations.

Variables	Frequencies	Percentage %
Age		
30-40	14	7
41-50	39	19.5
51-60	82	41
61-65	65	32.5
BMI		
<18.50 Underweight	1	0.5
18.50-24.99 Normal Weight	23	11.5
25.00-29.99 Overweight	63	31.5
≥30.00 Obese	113	56.5
Glycosylated hemoglobin (HbA1c)		
<7 Excellent	29	14.5
7.1-8 Good	62	31
8.1-11 Fair	91	45.5
≥11.1 Poor	18	9
Blood pressure (Systolic pressure/ Diastolic pressure)		
low 70-89\40-59		
normal 90-119\60-79	0	0
pre-hypertension 120-139\80-89	19	9.5
hypertension 140-190\90-100	81	40.5
	100	50

Most of the study participants (73.5%) were up to 50 years old of which (56%) were obese, (31%) overweight and only (11.5%) had normal weight. Most of the study participants (45.5%) had fair level of HbA1c (31%) had good level (14.5%) had excellent level and (9%) had poor level. Half of the study participants (50%) were suffered from high blood pressure (hypertension) and (40.5%) had pre- hypertension, while only (9%) had ideal or normal blood pressure Table 1. Data from Table 2 showed that the study participant's weight which ranged between 42 and 140kg with mean 83.23±18.52Kg. The mean

height was 162.27±9.62cm. The BMI was ranged between 16.40 and 50.78kg/m² with mean BMI 31.55±6.29 kg/m².

Table 2: Anthropometric measurements of the study participants.

Variables	Minimum	Maximum	Mean±SD
Weight (kg)	42	140	83.23±18.52
Height (cm)	134	192	162.27±9.62
BMI (kg/m ²)	16.40	50.78	31.55±6.29

Most of study participants (42.5%) control their blood glucose by diet and medication while (25.5%) by diet, exercise, medication and herbs and (25.5%) with no plan to control their blood glucose. Moreover, only (6.0%) trying to follow a diet plan to control their blood glucose, while (80%) were not following a plan but they conscious of how food affects their blood sugar, (12.0%) not paying attention to how food affects their blood sugar.

Results showed that half of the study participants (50%) had a good level of diet knowledge and skills, (38.5%) with fair level and (11.5%) with bad level. Data of diet decision making showed that only (6%) of them taken the good decision, (62%) taken a fair decision and (31.5%) taken a bad decision. Nevertheless, most of the study participants (71.0%) does not had eating problems or diet barriers (47.5%) Table 3.

Table 3: The dietary habits of the study participants.

Variable	Frequencies	Percentage %
Plan to control blood glucose level by		
diet and medication	85	42.5
diet, exercise	54	27
medication and herbs		
medication only	10	5
no plan	51	25.5
Trying to follow a diet plan		
Yes (action)	12	6
-No, I am not following a plan, but I am conscious of how food affects my blood sugar (contemplation)	160	80
-No, I really do not pay attention to how food affects my blood sugar (pre-contemplation)	28	12
Diet knowledge and skills		
Bad	23	11.5
Fair	77	38.5
Good	100	50
Diet decision making		
Bad	63	31.5
Fair	125	62.5
Good	12	6
Eating problems		
Good (No problems)	142	71
Fair	46	23

Bad(There is a problems)	12	6
Diet barriers		
Good (No Diet Barriers)	95	47.5
Fair	93	46.5
Bad (There is a Diet Barriers)	12	6

Discussion

Age considered as the strongest predictor of T2DM and prediabetes followed by obesity. People aged 50 years or over almost half of them had DM and another (10-15%) had prediabetes leaving only a small proportion of people in this age group with normal glycaemia [19-21]. Obesity is well documented to be associated with increased risk of various chronic diseases, including T2DM [22,23]. A study done in Saudi Arabia founded that obesity and, in particular, abdominal obesity is the second most important predictor of both DM and prediabetes [21]. Glycemic control becomes an important measurement for preventing long-term complications and provides a better quality of life to diabetic patient. Current guidelines for diabetes patients recommend maintain HbA1c of less than (7%) [24].

Hypertension is highly prevalent among Saudi adults 30-70 years of age, affecting a quarter of the population [25]. In patients with T2DM the risk of diabetic complications was strongly associated with raised blood pressure. In addition, diabetes may leads to developing high blood pressure [9]. The risk of cardiovascular disease expected to rise by a factor of two to three at every level of systolic blood pressure [26]. Male and female diabetics patients but not prediabetes significantly associated with the presence of hypertension [21].

Any reduction in the blood pressure is likely to reduce the risk of DM complications, with the lowest risk being in those with systolic blood pressure less than 120mm Hg [27]. The T2DM and hypertension may be indirectly related to each other [28]. Metabolic and hormonal changes in obesity lead to increased blood pressure [29], and disturbance in lipid metabolism [30] hence there is an association between hypertension, dyslipidemia and T2DM. The effects of obesity need time to become apparent, so it was not noted in people with prediabetes. Obesity seems to be the main culprit in the development of both DM and prediabetes, and its long term effects might have mediated the association of DM with hypertension and dyslipidemia [21].

Interventions to reduce diabetes risk should primarily target weight reduction [31]. The calorie restriction program has an important role on metabolism of obese patients with non-insulin-dependent diabetes mellitus that is independent of weight loss [32]. In addition to reducing calories, exercise training also approved to reduce weight and the complications of diabetes. The results of [33] showed that physical activity in addition to educational programs of healthy lifestyle for diabetics provide significant weight loss and control of HbA1c [34] added obesity affects insulin resistance; therefore, weight

loss is an important therapeutic objective for overweight or obese individuals with pre-diabetes or diabetes. A good diet plan should fit in with diabetic schedule and eating habits. The right diet plan will help patients to improve their blood glucose, blood pressure, and cholesterol level [35].

One of the barriers for a diet programming of T2DM patients is the presence of psychological problems, such as depression, and the untreated depression for diabetic may lead to negative and harmful behaviors concerning life-style (avoiding physical effort) [36], emotional overeating [37] including night-eating syndrome [38]. This also might leads to nutritional disorders -psychological anorexia and bulimia [39].

Conclusion

Special attention should be given to the role of diabetic awareness programs, in the form of modifying lifestyles; hence, reducing complication of T2DM, obesity and overweight prevalence by weight control. As well as promoting a correct knowledge and skills about diet, improving the right diet decision making and adapting a healthier eating habits which in the long run, help to reduce the national burden of this disease and improving the health for T2DM patient.

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