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Research Article

KNOWLEDGE OF DIABETES MELLITUS COMPLICATIONS AMONG DIABETIC PATIENTS IN RIYADH, SAUDI ARABIA

Amani Muaybid Almutairi^{*1}, Sara Edrees Aldrees², Khulud Abdulhadi Alqahtani¹

Majed Meshal Almutairi³, Noor Nahar Bu Murah⁴, Israa Abed Alfadhli⁵, Hajar Aown Allah

Alsulami⁷, Mansour Ali Alghuri⁶, Reemah Ahmad AlSumairi⁷, khaled Abdullah Alzahrani⁸

¹Al Maarefa University, Riyadh, Saudi Arabia, ²King Faisal University, Al-Ahsa, Saudi Arabia, ³Imam
Mohammad Bin Saud University, Riyadh, Saudi Arabia, ⁴Imam Abdulrahman Bin Faisal University,
Damman, Saudi Arabia,

⁵Umm Al-Qura University, Makkah, Saudi Arabia, ⁶Ibn Sina National College, Jeddah, Saudi Arabia,

⁷Taif University, Taif, Saudi Arabia, ⁸University of warmia and Mazury-Olsztyn-Poland.

Abstract:

Background: Diabetes Mellitus (DM) is one of the most widely prevalent diseases in Saudi Arabia. Health education is considered an essential component to improve knowledge and change behavior. People affected by diabetes often have inadequate knowledge about the nature of diabetes, its risk factors and associated complication.

Objectives: The aim of this study was to assess the awareness of the Saudi population with various aspects of diabetes mellitus.

Methods: A cross-sectional study was carried out in Saudi Arabia. The study was carried out on Saudi nationals from different age groups that were selected by systematic random sampling. Data was collected by means of personal interview with the participants using a pre-designed questionnaire, which was administered by the medical students for each diabetic patient. Data were analyzed by SPSS version 15, using descriptive statistics and Chi-square test.

Results: A total of 702 participants were interviewed, among them 201 (28.6%) males and 501 (71.4%) females, and most of them (77.8%) had high educational level, 10.4% were diabetics, 78.9% did not have regular checkup visits to the doctor and 58.5% did not perform any regular exercises, including walking, 60% thought that DM was due to partial or total decrease in insulin secretion and 12.4% thought that it was due to excess sweet eating. Additionally, 48.7% of the respondents thought that lack of exercise and obesity were the major risk factors of DM, 33.2% thought that it was a genetic disease. The majority (86.3%) of the participants believed that the treatment of DM was a combination of healthy diet, exercise and medication and more than half (63.1%) said that weight loss and modification of life style were the most important preventive measures of DM. Regarding participants' knowledge about DM complications, 24.5% knew about retinopathy and loss of vision, 8.3% knew about retinopathy, loss of vision, low sensation and numbness in extremities, 24.9% said that symptoms of DM were thirst and frequent urination.

Conclusion: This study recommends that health policy makers conduct more effective health education sessions to increase knowledge of diabetic patients and their caregivers about diabetes and the importance of compliance with its treatment.

Keywords: Awareness, Diabetes, Knowledge, Saudi Arabia.

Corresponding author:

Amani Muaybid Almutairi,

Al Maarefa University, Riyadh, Saudi Arabia.

QR code



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INTRODUCTION:

Diabetes Mellitus (DM) is one of the most widely prevalent diseases, its incidence is increasing, recent estimates that 415 million people aged 20-79 years have had diabetes in 2015, this number is expected to reach 552 million by 2030 [1] and 642 million by 2040. The prevalence of diabetes in Saudi Arabia is of the highest, there were 3.4 million cases of diabetes in Saudi Arabia in 2015. Saudi Arabia is a member of UNO and a signatory to the HFA declaration, the public sector health system in Saudi Arabia has seen a rapid expansion during the last three decades [2]. Health education is considered an essential component to improve knowledge and change behavior; there is evidence that people affected by diabetes often have inadequate knowledge about the nature of diabetes, its risk factors and associated complication. If uncontrolled, diabetes mellitus can be the cause of damage to the eyes and potentially cause blindness, damage to the kidneys, which may lead to renal failure, and damage to nerves, which could lead to impotence, foot disorders and possible amputation. Furthermore, it can cause an increased risk of heart disease, stroke, and poor blood supply to the limbs [3]. Public health centers (PHCs) are considered to be the best places to provide health education to patients and the general population. Most Saudi Citizens are registered at PHCs and have family health records where they can receive all the required primary health care including management and follow up of diabetes mellitus. One of the main elements of PHCs is health education that must empower and motivate people to take informed decisions on activities to ensure attainment of health [2]. In the near future, this latent, but imminent, burden on public health could create considerable challenges to the healthcare systems and economies of a great number of developing nations. One of the reasons for this is because a substantial number of people who suffer from DM in these countries are within the reproductive age [4,5]. These individuals are the same people who are expected to assist in the development of their nations' economy so as to achieve the approved millennium development goals [3]. If these individuals are affected by uncontrolled diabetes mellitus, it could lead to enduring problems, which are commonly associated with increased morbidity and mortality [3,6]. The aim of this study is to assess the awareness and knowledge of various aspects of diabetes mellitus and its complications among males and females in Saudi Arabia.

MATERIAL AND METHODS:

This study was done during the period from January 2018 to October 2018 in Saudi Arabia. A cross-sectional study was carried out and random,

representative samples from male and female Saudi nationals from different age groups were included in the study. We took systemically random samples from the attendees of five randomly chosen primary health care centers, of whom 501 were females and 201 were males. Data were collected by means of personal interview with the participants, after training the medical students for weeks before starting collection of data and research activities, a well-constructed questionnaire translated into Arabic was administered by the medical students for each diabetic patient (male or female) covering the following items: age, sex, residence, education level, physical activity, knowledge of what diabetes is, causes, complications, management and prevention measures of DM, whether the participant has/had a family member who is/was diabetic, duration of illness since diagnosis of diabetes was established, concurrent morbidities with diabetes mellitus. A total of 702 samples were collected; the primary focus of health education was on the risks associated with unhealthy diet, smoking, and physical inactivity. Filled questionnaires were reviewed for completeness and accuracy before data entry, and then the data were coded and analyzed by SPSS version 15 (SPSS Inc., Chicago, Illinois, USA) using Chi-square test. Participants were informed that participation was completely voluntary, a written consent was obtained from each participant before research, no name was recorded on the questionnaires and all of the personal information of participants was kept confidential.

RESULTS:

Table 1 shows the background characteristics of studied participant. A total of 702 participants were interviewed, among them 201 (28.6%) were males and 501 (71.4%) were females and most of them (77.8%) had high educational level. Table 2 shows the percentage of presence of DM and participants' life style. As shown, it was found that the majority of participants (89.6%) were free from DM, 78.9% did not have regular checkup visits to the doctor and 58.5% did not do regular walking or any other exercises. Most (92.3%) of the participants had a diabetic relative or friend and more than 60% had sufficient knowledge about DM. When we asked the participants about their idea about the nature of DM, 60% of the participants thought that DM was through partial or total decrease in insulin secretion, 21.4% thought it was through the decrease in the response of body tissue to insulin and 12.4% thought it was through excess sweet eating. Asking some questions assessed risk factors, treatment and preventive measures. As shown in Table 3, 48.7% of the respondents thought that lack of exercise and obesity were the major risk factors of DM, 33.2% thought that

it was a genetic disease when only 3.7% thought that it was through hypertension. The majority (86.3) of the participants believed that the treatment of DM was a combination of healthy diet, exercise and medication, and more than half (63.1) of the total said that weight loss and modification of life style were the most important preventive measures of DM. Table 4 shows the knowledge of DM complications, as shown in the table, 24.5% of participants knew about retinopathy and loss of vision, 8.3% knew about retinopathy, loss of vision, low sensation and numbness in extremities, 1.6% knew about retinopathy, loss of vision, low sensation and

numbness in extremities, reduced immunity and increased incidence of infections. The most frequent answer (24.9%) when we asked about the symptoms of DM was thirst and frequent urination. Table 5 shows participants suffering from other chronic diseases and family history of DM, a low percentage (only 5.4%) suffered from asthma, 3.27% from hypertension, 2.3% have hypercholesterolemia and 2.1% suffered from peptic ulcer. A considerable number of the participants have family history of DM, 2.8% of the participants have both parents suffering from DM and 12.7% have only their father diseased.

Table 1. Sociodemographic characters of the study population

Variables		Frequency (n=702)	%
Sex	Female	501	71.4
	Male	201	28.6
Educational level	Elementary	13	1.9
	Secondary	117	16.7
	University	546	77.8
	Non	1	0.1
	Intermediate	25	3.6

Table 2. Percentage of diabetic subjects and life style characteristics of the participants

Items of questionnaire		Frequency (n=702)	%
Presence of DM	No	629	89.6
	Yes	73	10.4
Period of having DM (in years)	No DM	623	88.7
	> 1	19	2.7
	1-5	27	3.8
	6-10	17	2.4
	> 10	16	2.3
Do you have regular checkup visits to your doctor?	No	604	78.9
	Yes	98	14.0
Physical exercise	Regular walking	89	12.7
	Irregular walking and other exercise	411	58.5
	No exercise	202	28.8
	Regular walking and other exercise	89	12.7
Having diabetic relative or friend	No	54	7.7
	Yes	648	92.3
Having knowledge about DM	No	251	35.8
	Yes	451	64.2
Attending health education sittings and benefit from its brochures	No	452	64.4
	Yes	250	35.6
Participant's idea about nature of DM	Decrease in the response of body tissue to insulin	150	21.4
	Partial or total insulin secretion	421	60.0
	Excess sweet eating	87	12.4
	Don't know	44	6.3

Table 3. Participant's knowledge about risk factors, treatment and preventive measures of DM

Items of questionnaire		Frequency (n=702)	%
Risk factors of DM (Participant's knowledge)	Hypertension	26	3.7
	Previous gestational diabetes	32	4.6
	Aging	25	3.6
	Lack of exercise and obesity	342	48.7
	Genetics	233	33.2
	Don't know	44	6.3
DM treatment (Participant's knowledge)	Only medication	16	2.3
	Only healthy diet	10	1.4
	Healthy diet and medication	70	10.0
	Healthy diet, exercise and medication	606	86.3
DM preventive measures	Stop alcohol and smoking	17	2.4
	Keep normal BP	50	7.1
	Weight loss and modification of life style	443	63.1
	Don't know	52	7.4
	Exercise five times weekly.	140	19.9

Table 4. Knowledge of the participants about DM complications and symptoms

Items of questionnaire		Frequency (n=702)	%
DM complications	Retinopathy and loss of vision	172	24.5
	Retinopathy and loss of vision, low sensation and numbness in extremities	58	8.3
	Retinopathy and loss of vision, low sensation and numbness in extremities, reduced immunity, increased incidence of infectious rate.	11	1.6
	Retinopathy and loss of vision, chronic kidney disease	20	2.8
	Low sensation and numbness in extremities, retinopathy and loss of vision, chronic kidney disease	30	4.2
	Retinopathy and loss of vision, chronic kidney disease, low sensation and numbness in extremities and reduced immunity, increased incidence of infectious rate	13	1.8
Symptoms of DM	Thirst and frequent urination	175	24.9
	Thirst and frequent urination, poor wound healing	28	4.0
	Thirst and frequent urination, poor wound healing, blurred vision	37	5.3
	Thirst and frequent urination, increase of appetite to eat with loss of weight	7	1.0
	Thirst and frequent urination, increase of appetite to eat with loss of weight, poor wound healing	11	1.6

Table 5. Participants suffering from other chronic diseases and family history of DM

Items of questionnaire		Frequency (n=702)	%
Chronic diseases	Hypercholesterolemia	16	2.3
	Heart disease and hypercholesterolemia	3	0.4
	Heart disease, hypercholesterolemia and asthma	2	0.3
	Hypertension.	23	3.27
	Heart disease and hypertension	2	0.3
	Hypertension and hypercholesterolemia	6	0.85
	Asthma	38	5.4
	Peptic ulcer	15	2.1
Family history of DM	Father	89	12.7
	Father, brother	2	0.3
	Father, brother, sister, aunt and uncle	2	0.3
	Father, mother	20	2.8
	Father, mother, brother	10	1.4
	Father, mother, brother, sister	4	0.6

DISCUSSION:

The study was carried out to evaluate the awareness of DM among the Saudi population in Saudi Arabia. The findings of our study will help physicians to focus more on counseling the family members of diabetic patients on lifestyle modifications that will prevent the onset of diabetes or postpone the complications in the population. The specific objective of this study was to assess the awareness and knowledge of various aspects of diabetes mellitus and its complications among the Saudi community. A total of 702 participants (501 females and 201 males) were counted. About 77.8% of them were highly educated. A total of 11.4% of the sample was diabetic. This was a low percentage if compared with the study of Khalid Alqurashi et al., which showed that 30% of the studied population had DM [8]. This was close to Mansour M. Al-Nozha et al. studies, which found 23.7% of the studied population had DM [9]. Our finding is less than that reported prevalence data from the Gulf region in Bahrain (25.7%) and Oman (16.1%) [10,11]. Environmental factors substantially contribute and are closely related to the development of DM [12]. Additionally, it was noted that as the educational level increases, the likelihood of regular exercise also increases. About lifestyle; only 12.7% did regular walking and exercise and 58.5% irregularly. A study conducted in India found that among the study subjects 48% followed dietary modifications to prevent diabetes. The Indian Diabetic Risk Score (IDRS) guidelines were used to assess physical activity at workplace, home and involvement in physical exercise. Most of them had a sedentary to mild physical activity pattern, 47% did not undertake any physical exercise [13]. Furthermore 92.3% of participants had a

diabetic relative or friend. Another study in Turkey [14] showed less percentage (57.5%). A study conducted on African Americans reported that 95% of the cases had a diabetic relative [15]. Our study showed that only 64.2% of the participants had sufficient knowledge about diabetes. About knowledge 21.4% of them knew that DM was caused by decrease in tissue response to insulin, 60% knew that it was a cause of partial insulin secretion and 12.4 thought excess sweet eating caused it. About knowledge of DM risk factors, 48.7% knew that lack of exercise and obesity were risk factors of DM, 33.2% knew it was genetic and only 3.7% knew that hypertension was a risk factor. In a Foma et al. study, the results showed that of the 199 participants, only 47% said they knew what DM was. By, the same token, 53% of the participants in the study were unaware of the causes of DM and around 50% were unsure of the methods of prevention. Additionally, 67% knew that DM could result in loss of sight while 46.5% knew that DM could cause insufficient wound healing [16]. In this study 86.3% said that healthy diet, exercise and medication were the best treatments for DM and 63.1% thought that weight loss and change to life style was the best preventive way. In the study by Foma et al. [16], almost half of the study participants had no clue on how the condition could be prevented while a very small number thought that weight loss (0.5%) and exercise (5.6%) were important measures in preventing the condition. Similar observations have been reported from India [17], Oman [18] and Tanzania [19]. Participants knew the complications of DM like retinopathy (24.5%) and loss of vision, retinopathy (8.3%) loss of vision, low sensation and numbness in extremities, reduced immunity and increased

incidence of infectious rate. In another study, few respondents knew that DM could lead to kidney failure (13.5%), skin sepsis (12.0%), heart failure (5.5%) and stroke (4.5%) [16]. The most frequent answer when we asked about the symptoms of DM was thirst and frequent urination as 24.9% of participants agreed that it was the main symptom of the disease.

CONCLUSIONS:

Diabetes mellitus poses a major health challenge both epidemiologically and economically in KSA. However, awareness of this pathological condition among diabetics is low in many Saudi settings, let alone the general population. Our study shows that the majority of participants have poor knowledge on several aspects of the condition including its causes, complications, management and prevention. Hence there is an urgent need to raise the level of awareness of this silent but deadly condition in the Saudi population.

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CONFLICT OF INTEREST:

There is no conflict of interest to be declared.

AUTHORS' CONTRIBUTIONS:

All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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