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RESEARCH ARTICLE

LEVEL OF AWARENESS ON DIABETES, ITS COMPLICATIONS AND MEDICATIONS AMONG DIABETIC PATIENTS ATTENDING KING FAISAL HOSPITAL INTAIF CITY: A CROSS-SECTIONAL STUDY.

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Abstract

Background:- Several challenges in diabetes management need to be tackled in Saudi Arabia, including the growing prevalence, particularly among children and young adults, micro-and macrovascular complications, lifestyle changes, late diagnosis, poor awareness and high treatment costs.

Objectives: To assess the level of awareness on diabetes, its complications and medications among diabetic patients in Taif City.

Subjects and methods:- This is a cross-sectional study carried out among a convenient sample of 100 diabetic patients of both genders and aged over 30 years attended diabetic clinics, King Faisal Hospital in Taif City. Data were collected using a valid questionnaire contained question about socio-demographic characteristics of the patients, questions on patient's diabetic characteristics and 15 questions inquiring about patients' knowledge regarding diabetes. In addition last level of HbA1c has been obtained from patients' medical files.

Results:- One hundred patients with type 2 diabetes were recruited for the study. Forty percent of them were in the age group of ≥ 60 years. Half of them were females. Insufficient knowledge regarding diabetes was reported among 61% of the diabetics. However, among those treated with insulin, 93.1% stored it in the fridge and 41.4% reported changeable sites for insulin injection as shown in figure 2. Majority of diabetic patients were aware about diabetes risk factors (95%). On the other hand, only 9% of patients were aware of the diabetic complications and almost one third of them were aware of the normal level of blood glucose (31%), normal level of blood glucose during fasting (35%) and two hours after meal (38%). University graduated patients were more significantly had higher sufficient knowledge of diabetes than illiterates (62.9% versus 20.6%), $p=0.013$. Working patients were more knowledgeable than not working patients (61.9% versus 24.4%), $p=0.011$. Duration of diabetes was a significant predictor for having sufficient awareness and knowledge about the disease as 47.9% of those whose duration of diabetes exceeded 10 years compared to none of those with less than two years of diabetes had sufficient knowledge about the disease, $p=0.047$. Controlled diabetic patients (HbA1c% 6.5-7) had higher sufficient knowledge

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about diabetes compared to those whose HbA1c exceeded 10% (71.4% versus 40%). The difference was statistically significant, $p=0.041$.

Conclusion:- Diabetic patients in Taif have enough knowledge of the risk factors and symptoms of diabetes. However, they are not very well aware of the diabetes associated secondary complications.

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Introduction:-

According to the American Diabetic Association (ADA), diabetes mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. It is a worldwide health problem.¹ Saudi Arabia has the second highest rate of diabetes in the Middle East and is seventh highest in the world, according to the World Health Organization (WHO).²

DM is considered a major public health problem in Saudi Arabia as the prevalence was 34.1% in males and 27.6% in females according to Alqurashiet al (2011).³

Several challenges in diabetes management need to be tackled in Saudi Arabia, including the growing prevalence, particularly among children and young adults, micro-and macrovascular complications, lifestyle changes, late diagnosis, poor awareness and high treatment costs.⁴

Diabetes Mellitus (DM) has many complications that divided into micro-vascular such as diabetic retinopathy, nephropathy and neuropathy and macro-vascular complications such as coronary artery disease, peripheral vascular disease, stroke and diabetic foot.⁵

Although the importance of educational programs in the prevention and control of DM is well recognized,⁶ there are concerns whether these programs are achieving the desired goal of increasing awareness of DM in developing countries. Indeed, several studies have consistently shown that awareness of the DM in the general population seems to be low.⁷⁻¹⁴

With proper education, awareness, early detection and management, many complications and co-morbidities can be reduced in diabetic population.¹⁵

Although diabetes is a silent disease that affects patients' life style there is lack of knowledge about diabetes among diabetic populations. Therefore, this study was carried out to assess the level of awareness on diabetes, its complications and medications among diabetic patients in Taif City.

Subjects and Methods:-

This is a cross-sectional study carried out among a convenient sample of 100 diabetic patients of both genders and aged over 30 years attended. It is a tertiary care hospital. The study was carried out throughout one month (August, 2016).

Sample size was estimated using Epi-info Version 7 software StatCalc key. The size of the adult population from which the sample would be selected was the adult population of Taif city (approximately 250000) and the expected frequency of diabetes was 27.6%.³ This gave a sample size of 98 patients at 99.9% confidence interval.

Data were collected using a valid questionnaire adopted from that uses in a study carried out by Prasad.¹⁶ It contained question about socio-demographic characteristics of the patients such as gender, age, marital status, residence, level of education and job status. Also, it included questions on patient's diabetic characteristics such as duration of diabetes, family history, family support, diabetic complications and source of information on diabetes. In addition last level of HbA1c has been obtained from patients' medical files. The participants' verbal consents were obtained prior to participation.

Data entry and analysis were performed using SPSS version 22. Frequency and percentage were applied for data description whereas chi-square test was used for analysis of data and p-value less than 0.05 was used as a cut-off level for statistical significance.

Results:-

One hundred patients with type 2 diabetes were recruited for the study. Table 1 presents their socio-demographic characteristics. Forty percent of them were in the age group ≥ 60 years. Half of them were females. Majority were married and resided urban areas (85%). Almost one-third of them (34%) were illiterate and 21% were university graduated. Less than half of the participants (45%) were not working whereas 21% were workers.

Table 1:- Socio-demographic characteristics of the participants.

	Frequency	Percentage
Age		
30-39	7	7.0
40-49	25	25.0
50-59	28	28.0
≥ 60	40	40.0
Gender		
Male	50	50.0
Female	50	50.0
Marital status		
Single	7	7.0
Married	85	85.0
Others	8	8.0
Residence		
Urban	85	85.0
Rural	15	15.0
Educational level		
Illiterate	34	34.0
Primary	30	30.0
Intermediate/high	15	15.0
University	21	21.0
Job status		
Working	21	21.0
Not working	45	45.0
Retired	34	34.0

As illustrated in table 2, 48% of patients had diabetes since over 10 years. Family history of diabetes was reported among 66% of them. Family support in management of diabetes was present in 65% of patients. Slightly less than half of them (47%) reported diabetic complications, including 19% foot infection. Their source of information regarding diabetes was mainly from physicians or pharmacists (60%). HbA1c% exceeded 10 among 10% of the participants.

Table 2:- Diabetes-related characteristics of the participants.

	Frequency	Percentage
Duration of diabetes (years)		
<2	6	6.0
2-5	27	27.0
6-10	19	19.0
>10	48	48.0
Family history of diabetes		
Yes	66	66.0
No	34	34.0
Family support		
Yes	65	65.0
No	35	35.0
Diabetic complications		

Yes	47	47.0
No	53	53.0
Foot infection		
Yes	19	19.0
No	81	81.0
Source of information about DM		
Friends/family members	17	17.0
Physician/pharmacist	60	60.0
Social media/books	14	14.0
Others	9	9.0
HbA1c (%)		
6.5-7	7	7.0
7.1-10	19	19.0
>10	10	10.0
Don't know	64	64.0

As demonstrated in figure 1, insufficient knowledge regarding diabetes was reported among 61% of the diabetics. However, among those treated with insulin, 93.1% stored it in the fridge and 41.4% reported changeable sites for insulin injection as shown in figure 2.

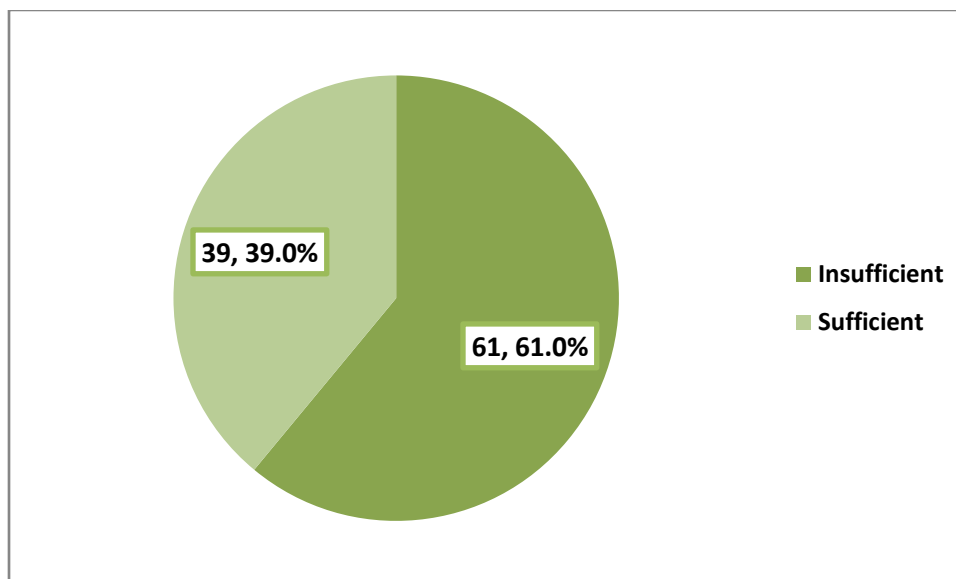


Figure 1:- Knowledge level of the diabetic patients in Taif regarding diabetes.

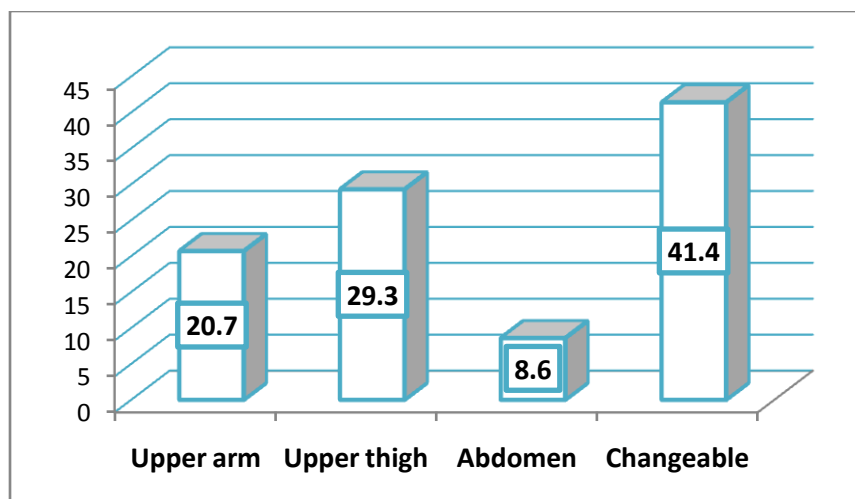


Figure 2:- Site of insulin injection among insulin-treated patients (n=58)

Table 3 shows that majority of diabetic patients were aware about diabetes risk factors (95%), the importance of extra-care during cutting toenails (92%), regular eye checkup (91%) and diabetic patients heal more slowly (81%). On the other hand, only 9% of patients were aware of the diabetic complications and almost one third of them were aware of the normal level of blood glucose (31%), normal level of blood glucose during fasting (35%) and two hours after meal (38%).

Table 3:- Responses of the participants to knowledge questions.

	Right answers	
	N	%
What is meant by diabetes Mellitus? It means having too much sugar in the blood because of lack of insulin	44	44.0
Which of the following is the commonest type of diabetes found in Taif Type 2	70	70.0
What are the factors that increase a chance of getting type 2 diabetes Family history, high levels of fats in the body, overweight and > 40 years of age	95	95.0
Diabetes is a condition which can be: Controlled	78	78.0
What are the commonest symptoms of diabetes? Feeling very thirsty and going to the toilet often	77	77.0
What is the normal blood sugar level? 75-100 mg/dL	31	31.0
What is the normal blood sugar level for diabetic patients when fasting? 80-130 mg/dL	35	35.0
What is the normal blood sugar level for diabetic patients taken two hours after eating food? <180 mg/dL	38	38.0
When should you take your diabetes medication in regards to food? Before food	72	72.0
When the blood sugar level remains high for a long period of time certain parts of the body get damaged. Which of the following occur due to diabetes not controlled well? Eyes problem, kidney damage, heart disease, stroke, and feet problems	9	9.0
Numbness and tingling may be symptoms of nerve disease	43	43.0
What are some of the signs of low blood sugar levels? Sweating, hunger, headache, confusion, rapid heartbeat, weakness and feeling faint	79	79.0
Should diabetic patients have regular eye check up? Yes	91	91.0
Diabetic patients should take extra care when cutting their toenails: Yes	92	92.0
Cuts in diabetic patients heal more slowly Yes	81	81.0

Table 4 shows factors associated with awareness and knowledge regarding diabetes. University graduated patients were more significantly had higher sufficient knowledge of diabetes than illiterates (62.9% versus 20.6%), $p=0.013$. Working patients were more knowledgeable than not working patients (61.9% versus 24.4%), $p=0.011$. Duration of diabetes was a significant predictor for having sufficient awareness and knowledge about the disease as 47.9% of those whose duration of diabetes exceeded 10 years compared to none of those with less than two years of diabetes had sufficient knowledge about the disease, $p=0.047$. Controlled diabetic patients (HbA1c% 6.5-7) had higher sufficient knowledge about diabetes compared to those whose HbA1c exceeded 10% (71.4% versus 40%). The difference was statistically significant, $p=0.041$.

Table 4:- Factors associated with awareness and knowledge of diabetes among diabetic patients, Taif.

	DM knowledge		p-value
	Insufficient (n=61)	Sufficient (n=39)	
Age (years)			
30-39 (n=7)	4 (57.1)	3 (42.9)	0.755
40-49 (n=25)	14 (56.0)	11 (44.0)	
50-59 (n=28)	16 (57.1)	12 (42.9)	
≥60 (n=40)	27 (67.5)	13 (32.5)	
Gender			
Male (n=50)	32 (64.0)	18 (36.0)	0.539
Female (n=50)	29 (58.0)	21 (42.0)	
Marital status			
Single (n=7)	4 (57.1)	3 (42.9)	0.691
Married (n=85)	51 (60.0)	34 (40.0)	
Others (n=8)	6 (75.0)	2 (25.0)	
Residence			
Urban (n=85)	51 (60.0)	34 (40.0)	0.626
Rural (n=15)	10 (66.7)	5 (33.3)	
Educational level			
Illiterate (n=34)	27 (79.4)	7 (20.6)	0.013
Primary (n=30)	19 (63.3)	11 (36.7)	
Intermediate/high (n=15)	7 (46.7)	8 (53.3)	
University (n=21)	8 (38.1)	13 (61.9)	
Job status			
Working (n=21)	8 (38.1)	13 (61.9)	0.011
Not working (n=45)	34 (75.6)	11 (24.4)	
Retired (n=34)	19 (55.9)	15 (44.1)	
Duration of diabetes (years)			
<2 (n=6)	6 (100)	0 (0.0)	0.047
2-5 (n=27)	20 (74.1)	7 (25.9)	
6-10 (n=19)	10 (52.6)	9 (47.4)	
>10 (n=48)	25 (52.1)	23 (47.9)	
Family history of diabetes			
Yes (n=66)	39 (59.1)	27 (40.9)	0.586
No (n=34)	22 (64.7)	12 (35.3)	
Family support			
Yes (n=65)	36 (55.4)	29 (44.6)	0.117
No (n=35)	25 (71.4)	10 (28.6)	
Diabetic complications			
Yes (n=47)	27 (57.4)	20 (42.6)	0.493
No (n=53)	34 (64.2)	19 (35.8)	
Foot infection			
Yes (n=19)	8 (42.1)	11 (57.9)	0.061
No (n=81)	53 (65.4)	28 (34.6)	
Source of information about DM			
Friends/family members (n=17)	10 (58.8)	7 (41.2)	0.476
Physician/pharmacist (n=60)	39 (65.0)	21 (35.0)	
Social media/books (n=14)	6 (42.9)	8 (57.1)	
Others (n=9)	6 (66.7)	3 (33.3)	
HbA1c (%)			
6.5-7 (n=7)	2 (28.6)	5 (71.4)	0.041
7.1-10 (n=19)	8 (42.1)	11 (57.9)	
>10 (n=10)	6 (60.0)	4 (40.0)	
Don't know (n=64)	45 (70.3)	19 (29.7)	

Discussion:-

The present study demonstrates that the overall diabetes knowledge among diabetic patients attended diabetic clinics; King Faisal Hospital in Taif City was inadequate as insufficient knowledge was reported among 61% of them. Bivariate analysis revealed that, the higher educated patients had more sufficient knowledge than low educated patients. The data is consistent with previous studies from other parts of the world that showed the association between level of education and the increase in DM knowledge.⁽¹⁷⁻²⁰⁾ In addition, the same finding has been reported in Saudi Arabia by Mohiudein, et al (2011).⁽²¹⁾

Some important areas of deficiency and misconception have been identified for targeted health education effort in the present study such as the normal level of random and fasting blood sugar, normal post-prandial blood sugar and the proper time of taking diabetic therapy as majority of patients reported after sometimes of a meal.

In fact, DM is a chronic disease that requires ongoing monitoring and treatment.⁽²²⁾ Recently, Sabra et al. (2010)⁽²³⁾ have reported in their cross-sectional study conducted in Eastern Saudi Arabia among primary health care centers attendees, that a quarter of the attendees (of whom 92% were Saudi) held the misconception that, treatment should be stopped if diabetes is well controlled for months. This misconception for the majority may lead to an increased number of diabetics over the next years in the region, especially due to increasing urbanization and general changes in behaviour patterns and sedentary lifestyles. Contrast to that, in the present study, fortunately the majority of the participants believed that DM is not a curable disease but can be well controlled.

Saudi Arabia has experienced a rapid increase in wealth over a relatively short period of time, as a consequence of the financial gains rendered by the oil industry, paralleled with swift industrialization and urbanization.^(24, 25) This was accompanied with increase in the prevalence of DM.⁽²⁶⁾ In the current study, fortunately, the majority of them recognized the risk factors for diabetes.

Among important findings of the present study is finding that controlled patients were more knowledgeable and aware of the disease. This confirms the usual impact of awareness and knowledge of the diabetes on its control.

Majority of the participants could recognize the common risk factors for diabetes in the present study. This result contradicts that done by Aljoudi and Taha (2009)⁽²⁷⁾ who reported lack of knowledge of risk factors of DM in Eastern Saudi Arabia and in accordance to that reported by Mohiudein et al, 2011 who reported that the knowledge of risk factors and symptoms of DM was 63.4 and 80.8% respectively.⁽¹³⁾ Moreover, the good knowledge on the symptoms of DM in this study, may imply the high prevalence of DM among Saudi population in. Unlike good knowledge on symptoms of DM, this study revealed low level of awareness about the complications of DM. This lack of knowledge regarding complication of DM, may lead to expect the limited knowledge about the fact that diabetic patients may develop a silent serious outcomes.⁽²⁸⁾

Awareness about complications of DM was found to be lower also in Pakistan. Ulvi et al.⁽²⁹⁾ reported that, approximately 88% of respondents in that study were unable to say that, they had any idea as to what the complications of diabetes might be. Moreover, this demand for required efforts to educate general population about complications of DM was reported from India and Malaysia.^(30, 31)

Regarding the sources of information about DM among the participants, the healthcare professionals represented the highest percent (60%). Lower percentage (17.8%) was reported by Sabra et al. (2010)⁽²³⁾ from Eastern Saudi Arabia. In support of that view, Al-Rubeaan (2003)⁽³²⁾ claimed that "there is a serious gap in the provision of basic educational services to the majority of people with diabetes in the region". Primary health care (PHC) is the first level of professional contact in the community and forms the corner-stone strategy for the attainment of level of health that will permit socially and economically productive life.⁽³³⁾

Conclusively, diabetic patients in Taif have enough knowledge of the risk factors and symptoms of diabetes. However, they are not very well aware of the diabetes associated secondary complications. Therefore, we recommended educating diabetic patients about DM within the PHC, particularly, complications. This may be achieved by using audio-visual aids, as well as posters showing patients with diabetes complications and their consequences such as lower limb amputation, blindness, and renal dialysis.

The results of this study could contribute positively and meaningfully to the design of future educational programme and materials. An improved educational programme that tackles the areas of weaknesses or misconceptions can potentially increase the level of public awareness of diabetes.

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