Original research paper

Knowledge About Diabetes and Its Effect on Quality of Life Among Diabetic Patients in Kingdom of Saudi Arabia

Abstract:

Background

Quality of life (QOL) is an essential part in Diabetic patients since low QOL can decrease self-care which can lead to increased mortality and complications. The purpose of this study is to determine the effects of diabetes on QOL in Saudi Arabia, and to assess the knowledge about diabetes among these patients in order to know if there is a relation between diabetes knowledge and patient's QOL.

Method

Cross sectional study done in king Abdul-Aziz university hospital in Jeddah. The sample was on type 2 Diabetic patients (N=300), they were recruited from hospital wards and outpatient clinics during 2016. The questionnaire consisted of 3 sections: demographic and medical characteristic, knowledge of diabetes and QOL by 4 dimensions.

Result

The mean age of the study population was 55.6±10.1 years and 189 (63%) were female. The median duration of having diabetes was 10 years. The mean score of diabetes knowledge was 8.57±1.8 out of 12 indicating good level of knowledge. The worst score was for alcohol's effect on blood glucose, only 21.7% answered correctly. The mean score QOL was 34.1±7.7 out of 50 which indicates average level of lifestyle. Rereading effect of the knowledge on QOL, there was positive correlation with no significant association, expect for environment P-Value is 0.02.

Conclusion

Diabetes impairs QOL of patients, and the knowledge about diabetes affects QOL. We recommend the engagement of health professionals in educational settings in order to enhance health-related knowledge. Seminars, counseling sessions and workshop should be arranged periodically for diabetic patients to increase their awareness.

Key words:

Knowledge, Quality of Life , Diabetic Patients.

1.Introduction

Diabetes is a common chronic illness that have been increasing throughout the years, million people have diabetes in the world and more than 35.4 million people in the MENA Region (middle east, north African region); by 2040 this will rise to 72.1 million. There were 3.4 million cases of diabetes in Saudi Arabia in 2015(1).

People with diabetes who are living in low- or middle-income countries are four out of five where resources are little (2). Diabetic patients are usually older, overweight, less likely to exercise, and more likely to have comorbidities and complications. The increasing number of diabetes has harmful effects on quality of life outcomes. Quality-of-life issues are of absolute importance, because they may strongly predict an individual's capability to manage his disease and maintain long-term health and well-being (3). Diabetes mellitus imposes a heavy burden on individuals and health care systems (4). Quality of life is an essential part in Diabetic patients since low quality of life can decrease self-care which can prompt to increase mortality and complications (e.g. chronic renal failure, blindness, and lower limb amputations) which influence wellbeing and productivity (5).

The purpose of this study is to determine the effects of diabetes on quality of life in Saudi Arabia. We chose to learn about the quality of life among the diabetes mellitus patients in king Abdul-Aziz University Hospital; measuring different dimensions of quality of life,

including (general health, physical health, psychological health, social relationships, environment) , also assessing the knowledge about diabetes among these patients , that is in order to know if there is a relation between diabetes knowledge and patient's quality of life.

A lot of other studies came to the importance of health education because it is the theoretical and methodological basis for health promotion actions, as it can support both diseases prevention and rehabilitation and promote citizenship, personal and social responsibility related to health and contribute in the training of multipliers and caregivers (6).

2.Methods

This is cross sectional, interview- based study design conducted at King Abdul-Aziz University Hospital in Jeddah, the target population was diabetic patients who were attending the diabetes outpatient clinic. The data was collected from April 2016 to May 2016.The total number of patients that participated in the study was 300.Patients were included in the study if they had diagnosis of type 2 DM, were at between 18-70 years old and excluded if they were currently pregnant and were non- Saudi living less than 3 years in Saudi Arabia face to face structured interview questionnaire, was pre-tested on 10 diabetic patients a likely similar population to the study participants. The questionnaire was based on three major dimension: demographic data (consisting of 18 items), knowledge (general knowledge consists of 2 items, monitoring blood glucose consist of 2 items, factors affecting on blood glucose level consist of 2 items, complication of DM consist of 3 items) and QOL (physical health consist of 4 items, psychological health consist of 3 items, social relationship consist of 2 items, environment consist of 1 item). The questionnaire was based on thorough search of relevant literature and discussion with experienced Faculty members. The protocol for the study was approved by the Ethics committee for Health at King Abdul-Aziz University Hospital, and informed consent was obtained from all participants before participation in the study.

3.Results

Three hundred diabetes patients who attend outpatient clinics in KAUH were involved in this study, of which 189 (63%) were female & 111 (37%)were male , with mean age score 55.6±10.1 , 144 (48%) were Saudi ,and the majority (250-83.3%) were married. Only 56 (18.6%) had university degree & more than half (180- 60%) reported no job . three quarter (265- 89%) reported no smoking . (Table 1)

Table (1) Demographic data:

Variables	N	%
Gender		
Female	189	63.0
Male	111	37.0
Nationality		
Saudi	144	48.0
Non-Saudi	156	52.0
Martial statue		
Single	16	5.3
Married	250	83.3
Divorced	11	3.7
Widow	23	7.7
Employee		
Employed	68	22.7
Not employed	180	60.0
Retired	52	17.3
Education		
University and above	56	18.6
High school	60	20.0
Intermediate school	41	13.8
elementary school	58	19.3
Illiterate	85	28.3
Smoking		
No	265	89.0
Yes	35	11.0
Smoking type		
Cigarettes	21	60%
Shisha	14	40%
Variables	**Mean± SD**	**Rang (min-max)**
Age	55.6±10.1	(27-70)

Table 2 showed the medical characteristic of the participants, the median score of duration of being diabetes patients was 10 years, 255 (85%) reported taking medication on regular base ,

122 (40%) stated checking blood sugar 1-2 times per day ,the majority (249-83%) reported hyperglycemia experience , where two third (200- 66.7% reported hypoglycemia experience with main symptoms sweating (34.3%) followed by shacking (33.7%) then (32.7%) confusion. More than half (177-59%) stated seeing dietitian . The main source of knowledge was doctors (64.7%). (Table 2 & Figures 1&2)

Table (2) Medical characteristic:

Variables	N	%
Medications regularly		
Yes	**255**	**85.0**
No	**45**	**15.0**
Checking blood sugar		
Never	**76**	**26.0**
1-2 times per day	**122**	**40.0**
3-5 times per day	**30**	**10.0**
3 times or less per week	**72**	**24.0**
Experienced hypoglycemia		
Yes	**200**	**66.7**
No	**100**	**33.3**
If yes, list symptoms (Multiple symptoms)		
Not applicable	**95**	**31.7**
Shaking	**101**	**33.7**
Rapid heart beat	**88**	**29.3**
Sweating	**103**	**34.3**
Blurred vision	**84**	**28.0**
Confusion	**98**	**32.7**
No symptoms, only low reading	**12**	**4.0**
Experienced hyperglycemia		
Yes	**249**	**83.0**
No	**51**	**17.0**
Complain of other illness		
Yes	**208**	**69.4**
No	**92**	**30.6**
Saw dietitian		
Yes	**177**	**59.0**
No	**123**	**41.0**
Source of knowledge (Multiple sources)		
Doctors	**194**	**64.7**
Social media	**62**	**20.7**
Friends	**30**	**10.0**
Other	**31**	**10.3**
Nothing	**34**	**11.3**
Variables	**Median**	**Quartile (25-75)**

Duration of diabetes by years	**10**	**(5-15)**

Figure (1) Hypoglycemia symptoms(Multiple symptoms):

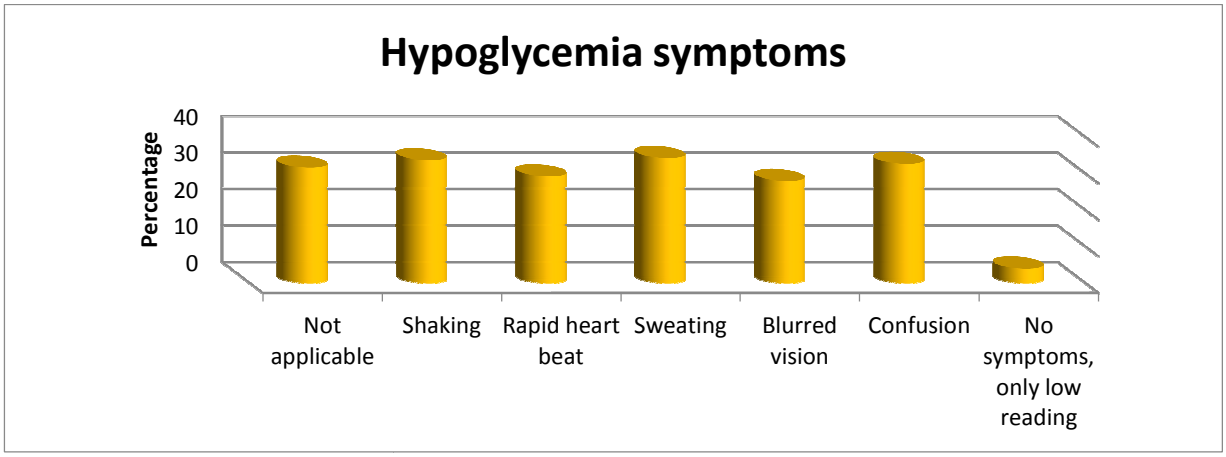

Figure (2) Source of knowledge (Multiple symptoms):

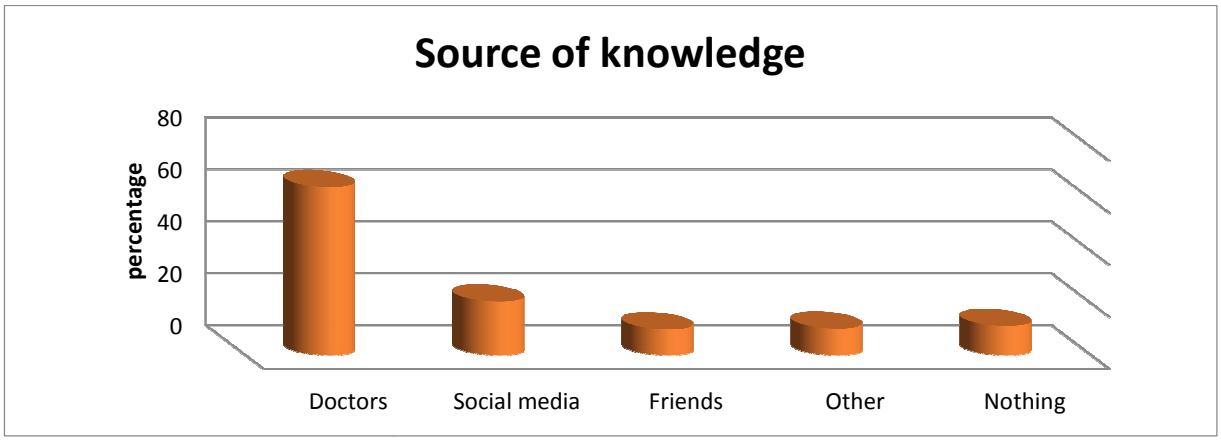

Table 3 showed the rate of choosing right information about DM, the higher rate was for (Exercise: Decrease DM) 92%, followed by (Carbohydrates & stress : Increase DM) 91.3% equally , (Home Monitoring: Blood testing) 89.3%, then (Hypoglycemia Correction: Drink juice) 87.3% , then (Complication of diabetes: Eye diseases) 79.3% , (Diet: low fat, high fiber, and low added sugar diet) 70.3% , (Infection : increase DM) 66.7% , then (Controlling DM: Glycosylated HB (HbA1c) & Diabetic foot: Check the feet and wash) 58.3%, followed by (Hyperglycemia signs: Numbness) 53.3%, and lastly (Alcohol: Increase DM) 21.7%. (Table 3)

Table (3) Participants' knowledge of DM:

Variables	N	%
Exercise: Decrease blood sugar	**276**	**92.0**
Carbohydrates: Increase blood sugar	**274**	**91.3**
Stress: Increase blood sugar	**274**	**91.3**
Home Monitoring of Blood Sugar: Blood testing	**268**	**89.3**
Hypoglycemia Correction: Drink juice	**262**	**87.3**
Complication of Diabetes: Eye diseases	**238**	**79.3**
Healthy Diabetic Diet: low fat, high fiber, and low added sugar diet	**211**	**70.3**
Infection: Increase blood sugar	**200**	**66.7**
Assessing Control of Diabetes: Glycosylated HB (HbA1c)	**175**	**58.3**
Diabetic Foot Care: Check the feet and wash	**175**	**58.3**
Hyperglycemia signs: Numbness	**160**	**53.3**
Alcohol: Increase blood sugar	**65**	**21.7**

Regarding participants' knowledge & relation with gender, martial statue & educational level , there was significant association between gender & stress increasing DM item (94.2% female vs 86.5%male, p=0.01),there was significant association between martial statue & Controlling DM: Glycosylated HB (HbA1c) item (p=0.03) , also there was significant association between educational level and two items (Hypoglycemia Correction: Drink juice) (p=0.03) & (Alcohol: Increase DM) (p=0.004), while all other items showed no significant difference.

Table 4 showed the mean scores of individual domain for knowledge dimension & lifestyle dimension and also the total score for each dimension , the mean score of total knowledge dimension was 8.57±1.8 which indicate good level of knowledge. While the mean score of total lifestyle dimension was 34.1±7.7 which indicate average level of lifestyle. (Table 4)

Table (4) Participants' knowledge of DM and life style scores :

Variables	Mean ± SD	RANG (Min-Max)
General knowledge	**1.56±0.6**	**(0-2)**
Monitoring Blood glucose	**1.47±0.6**	**(0-2)**
Factors affecting on blood glucose level	**3.64±0.9**	**(0-5)**
Complication of DM	**1.91±0.9**	**(0-3)**
Total score 1 (knowledge of DM)	**8.57±1.8**	**(0-12)**
Physical health	**12.8±3.9**	**(4-20)**
Psychological health	**10.7±3.1**	**(3-15)**
Social relationship	**8.02±1.7**	**(2-10)**
Environment	**3.8 ±1.1**	**(1-5)**
Total score 2 (quality of life)	**34.1±7.7**	**(10-50)**

Regarding Knowledge & lifestyle dimensions & relation with gender, martial statue & educational level , there was significant association between gender & physical activity domain where male are more interesting in physical activity than female (12.33±3.69 for female vs 13.57±4.14 for male , p=0.008) , also there was significant association between educational level & two domains Environment domain (p=0.001) & Monitoring Blood glucose domain (p=0.002) & significant association between educational level & total mean scores for Knowledge dimension was found (p=0.008) in all the domain there is increasing in lifestyle domains with high level of education, while all other domains showed no significant difference . (Tables 5,6 & 7)

Table (5) Comparing participants' life style & knowledge scores regarding gender:

variables		Mean	±	SD	P value
Physical health	Female	12.33	±	3.69	**0.008***
	Male	13.57	±	4.14	
Psychological health	Female	10.49	±	2.98	**0.09**
	Male	11.12	±	3.37	
Social relationship	Female	8.10	±	1.68	**0.29**
	Male	7.88	±	1.85	
Environment	Female	2.53	±	1.28	**0.31**

	Male	2.70	±	1.44	
General knowledge	Female	1.51	±	0.59	**0.05**
	Male	1.64	±	0.55	
Monitoring Blood glucose	Female	1.41	±	0.62	**0.07**
	Male	1.54	±	0.58	
Factors affecting on blood glucose level	Female	3.67	±	0.85	**0.31**
	Male	3.56	±	0.95	
Complication of DM	Female	1.85	±	0.90	**0.17**
	Male	2.00	±	0.89	
Total 1(Knowledge dimension)	Female	8.45	±	1.81	**0.17**
	Male	8.75	±	1.92	
Total 2 (Lifestyle dimension)	Female	33.47	±	7.05	**0.05**
	Male	35.29	±	8.21	

Table (6) Comparing participants' life style & knowledge scores regarding martial statue:

variables		**Mean**	±	**SD**	**P value**
Physical health	Single	13.87	±	3.42	**0.14**
	Married	12.89	±	3.89	
	Divorced	10.72	±	5.64	
	Widow	12.00	±	3.06	
Psychological health	Single	12.25	±	2.62	**0.15**
	Married	10.56	±	3.15	
	Divorced	11.18	±	3.45	
	Widow	11.26	±	3.07	
Social relationship	Single	7.62	±	1.85	**0.52**
	Married	8.04	±	1.73	
	Divorced	7.54	±	1.86	
	Widow	8.30	±	1.76	
Environment	Single	2.62	±	1.36	**0.23**
	Married	2.66	±	1.36	
	Divorced	2.09	±	1.30	
	Widow	2.17	±	1.11	
General knowledge	Single	1.50	±	0.63	**0.92**
	Married	1.56	±	0.58	
	Divorced	1.63	±	0.50	
	Widow	1.52	±	0.59	
Monitoring Blood	Single	1.68	±	0.47	**0.09**

glucose	Married	1.48	±	0.60	
	Divorced	1.36	±	0.92	
	Widow	1.21	±	0.59	
Factors affecting on blood glucose level	Single	3.37	±	1.08	**0.64**
	Married	3.64	±	0.89	
	Divorced	3.63	±	0.67	
	Widow	3.73	±	0.86	
Complication of DM	Single	1.75	±	0.93	**0.55**
	Married	1.89	±	0.90	
	Divorced	2.18	±	0.98	
	Widow	2.04	±	0.87	
Total 1(Knowledge dimension)	Single	8.31	±	2.12	**0.92**
	Married	8.57	±	1.84	
	Divorced	8.81	±	2.08	
	Widow	8.52	±	1.87	
Total 2 (Lifestyle dimension)	Single	36.38	±	6.28	**0.45**
	Married	34.15	±	7.76	
	Divorced	31.55	±	10.41	
	Widow	33.74	±	6.65	

Table (7) Comparing participants' life style & knowledge scores regarding educational level:

Variables		**Mean**	**±**	**SD**	**P value**
Physical health	University and above	13.69	±	4.12	**0.16**
	High school	13.33	±	3.74	
	Intermediate school	13.00	±	3.76	
	Elementary school	12.28	±	3.91	
	Illiterate	12.09	±	3.87	
Psychological health	University and above	11.07	±	3.34	**0.26**
	High school	10.20	±	2.93	
	Intermediate school	11.63	±	2.90	
	Elementary school	10.36	±	3.23	
	Illiterate	10.68	±	3.16	
Social relationship	University and above	7.92	±	1.69	**0.89**
	High school	7.95	±	1.74	
	Intermediate school	8.26	±	1.44	
	Elementary school	8.10	±	1.88	
	Illiterate	7.95	±	1.84	
Environment	University and above	2.94	±	1.41	**0.001***
	High school	2.98	±	1.30	
	Intermediate school	2.34	±	1.01	
	Elementary school	2.62	±	1.37	
	Illiterate	2.18	±	1.32	
General knowledge	University and above	1.67	±	0.54	**0.13**
	High school	1.65	±	0.51	
	Intermediate school	1.48	±	0.59	

	Elementary school	1.60	±	0.59	
	Illiterate	1.44	±	0.62	
Monitoring Blood glucose	University and above	1.63	±	0.58	**0.002***
	High school	1.60	±	0.58	
	Intermediate school	1.53	±	0.55	
	elementary school	1.41	±	0.59	
	Illiterate	1.25	±	0.63	
Factors affecting on blood glucose level	University and above	3.87	±	0.81	**0.06**
	High school	3.68	±	0.79	
	Intermediate school	3.78	±	0.82	
	Elementary school	3.58	±	0.91	
	Illiterate	3.41	±	0.99	
Complication of DM	University and above	1.92	±	0.878	**0.68**
	High school	2.03	±	0.82	
	Intermediate school	1.78	±	1.01	
	Elementary school	1.91	±	0.90	
	Illiterate	1.87	±	0.92	
Total 1(Knowledge dimension)	University and above	9.09	±	1.61	**0.008***
	High school	8.96	±	1.47	
	Intermediate school	8.53	±	1.93	
	Elementary school	8.52	±	1.93	
	Illiterate	7.98	±	2.03	
Total 2 (Lifestyle dimension)	University and above	35.64	±	8.6	**0.32**
	High school	34.47	±	7.5	
	Intermediate school	35.24	±	7.2	
	Elementary school	33.35	±	7.5	
	Illiterate	32.92	±	7.5	

Regarding the domain of quality of life .The mean scores of individual items are shown in Table (8) . One item (10.0%) (Item 4) its mean scores was (2.6) indicating poor quality of life, scores on 3 out of 10 (30.0%) (Items 1,2 & 5) were between (3.0-3.5), and 5 items(50.0%) (Items 3,6,7,9 &10) were between (3.6-4.0) which indicate average satisfaction, one item (10.0%) (Item 8) was (4.2) indicating good quality of life with positive trend. On the other each item of the domains was divided to three categories (poor, moderate and good) and percentage was calculate for each category , half of the participants reported poor level of practicing exercises , more than third reported moderate impact on their sleep , emotions and moderate level of physical pains , more than half stated moderate level of family supports and safety environments , more than half reported that diabetes condition

didn't affect their social life , daily activities, working performance and that they don't have any worries about their blood sugar changes. (Table 8)

Table (8) Dimensions of Quality of life:

Variables	Poor	Moderate	Good	P value	Mean± SD	Range
Physical Health						
1-Physical pain	98 (32.6%)	126 (42.1%)	76 (25.3%)	**0.002***	**3.3±1.2**	**(1-5)**
2-Sleep	100 (33.3%)	101 (33.6%)	99 (33.0%)	**0.0001****	**3.3±1.5**	**(1-5)**
3-Performance at work	80 (26.6%)	92 (30.7%)	128 (42.7%)	**0.0001****	**3.6±1.4**	**(1-5)**
4-Exercise	150 (50.0%)	112 (37.3%)	38 (12.7%)	**0.0001****	**2.6±1.3**	**(1-5)**
Psychological						
5-Emotions	101 (33.7%)	130 (43.3%)	69 (23.0%)	**0.0001****	**3.2±1.3**	**(1-5)**
6-Diabetes affect daily activities	74 (24.6%)	105 (35.1%)	121 (40.3%)	**0.0001****	**3.7±1.3**	**(1-5)**
7-Blood sugar changes worries	65 (21.6%)	89 (29.6%)	146 (48.8%)	**0.0001****	**3.8±1.4**	**(1-5)**
Social relationships						
8-Diabetes affect social life	35 (11.7%)	64 (21.3%)	201 (67.0%)	**0.0001****	**4.2±1.2**	**(1-5)**
9-Family support	50 (16.7%)	163 (54.3%)	87 (29.0%)	**0.0001****	**3.7±1.2**	**(1-5)**
Environment						
10-Home safety environment	32 (10.6%)	184 (61.4%)	84 (28.0%)	**0.0001****	**3.8±1.1**	**(1-5)**

Regarding the relation between level of knowledge and of quality of life, the results showed significant association between good level of knowledge and safety environment (p=0.02) , while in all other quality of life domains no significant difference was found. (Table 9)

Table (9) Relation between level of knowledge and of quality of life:

Variables	Level of knowledge			P value
	Poor N=5 (1.6%)	**Moderate N=143 (47.7%)**	**Good N= 152 (50.7%)**	
Physical health	**12.4±3.6**	**12.9±3.8**	**12.4±4.0**	**0.9**
Psychological health	**12.4±3.4**	**10.8±2.9**	**10.7±3.3**	**0.4**
Social relationship	**7.0± 2.5**	**7.9±1.7**	**8.0±1.7**	**0.4**

Environment	**1.2±0.4**	**2.5±1.4**	**2.7±1.3**	**0.02***
Total score	**33.2±6.1**	**34.2±7.1**	**34.2±8.3**	**0.9**

Concerning the correlation between total score of knowledge dimension & total score of lifestyle dimension there was a positive correlation but with no significant difference (r= 0.014 , p=0.82), while the correlation between total score of lifestyle dimension and age and duration of diabetes were negative correlation without significant difference (r= -0.103 , p=0.07) and (r= -0.063 , p=0.28) respectively.

4.Discussion

The current study show prevalence of T2DM in female (63%) is significantly higher than men (37%).similar result found in studies made in brazil and Saudi Arabia (6,9). On the contrary, studies show the opposite result with minimal differences (7,8,10). It is maybe due to larger number of females involve in the study compared to men.

Our result show significant increases of DM in married people compare to other patient with different marital status and maybe due to higher number of married patient (N= 250- 83.3%) compare to single patients (N=16 -5.3%), divorced (N=11- 3.7%), and widow (N=23 -7.7%). Studies from Brazil and Poland show the same result. (6,12)

Also, the study found increase prevalence of DM2 in not employed patients (60%). The same result in study made in Saudi Arabia (9).

The current study found illiterate diabetic patient have higher prevalence of diabetes than educated patients with minimal differences (28.3 %)This result agrees with other studies from Saudi Arabia (9) and Canada (11).

Study also show increase prevalence of DM 2 in non-smoker patients (89%). It may be due to a higher number of females compared to men in the study and smoking is less common in female in Saudi culture. The same result from study from Canada (11).

Medical characteristic:

Although the most of diabetic patients are taking their medication regularly (85%) and more than the half had saw dietitian (59%), it shows increase prevalence of experienced hypoglycemia (66.7%) and (83%) experienced hypoglycemia. May be due to poor sources of knowledge about this chronic disease as current study shows most of them have information from their doctors (64.7%),followed by Social media (20.7%), then (11.3%) had No source of knowledge (16) .As study from USA(13) and Thailand (14) found strong opposite relationship between patient education and glycemic control .The other reason that may contribute to having poor glycemic control is having other illness as the current study show highly prevalence (69.4%) of diabetic patient with other diseases .

The results of the current study found (40%) of DM2 patient are checking blood sugar at home and (26%) are never which may increase risk of diabetes complication (15).

Knowledge of DM:

The mean score of total knowledge dimension was 8.57±1.8 which indicate good level of knowledge, similar to another researches done in Saudi Arabia Riyadh in 2016 (20). Unlike 2 studies done in Vietnam with different regions (21,22) show insufficient knowledge of T2D in different geographical regions indicate the importance of education especially in rural areas.

Our study show No differences in knowledge were observed between men and women, and between different martial statues (single, married, divorced and widow). The same result regarding relation between sex and knowledge found in study conducted in Greece (17).

Patients with higher education demonstrated greater diabetes knowledge comparing to Illiterate people as better education attainment is indicative of better understanding of the

disease. The same result in studies conducted in Greece (17) and Ohio (18), and Pakistan (19).

The knowledge percentage of questions about treat hypoglycemia by different (drink juice) was 87.3% which is a good percentage comparing to incorrect answering in the studies (20,24,25).

Knowledge scores were high regarding questions about factors affecting the glucose level in blood which are (Exercise: Decrease DM), as study done at 2016(20) and (Carbohydrates: Increase DM). This finding disagree with those of other studies (23,24,25.). Also, high scores in answering the question (Home Monitoring: Blood testing) 89.3% with relatively same result in study done in Emirate (26).

Patients' awareness about complications was relatively average; 79.3% with same finding in a study (20). Other study show satisfaction result (26).

Knowledge scores were low regarding the both questions (Controlling DM: by (HbA1c) and diabetic foot: check the feet and wash) 58.3% as in the in Riyadh (23) show poor knowledge about Hba1c test but good knowledge about foot caring.

lastly, knowledge about (Alcohol: Increase DM) was significant low 21.7% maybe as Alcohol drinking is not allowed in Islam and is not socially accepted.

Quality of Life:

Diabetes affects negatively all quality dimensions, the quality of life score 34.1±7.7 out of 50. Many studies found similar results (5,27). In Saudi Arabia, the quality of life of diabetic patients was studied by multiple researchers using deferent questioners such as SF36 and EQ5d, they also reached the same result (9,20).

The main age of the sample was 55 years and most of the sample had diabetes for 10 years. The effect of age on quality of life showed negative correlation without significant difference ($r= -0.103$, $p=0.07$), while the correlation between duration of diabetes and quality of life also

showed negative correlation without significant difference (r= -0.063, p=0.28). These results were similar a research done in Portuguese (10).

Women had worse quality of life than men regarding physical health dimension only and similar results as men in other dimensions. The physical health score for female 12.33±3.69 out of 20, and as for male 13.57±4.14 and the P-Value is 0.008. This is similar to a research done India and Saudi Arabia in 2014 (5,9) This might be due to higher HbA1c and anxiety level and increased cardiovascular risk in female (10).

The safety of home and neighborhood conditions such as availability of stairs at home and places for exercise affects quality of life, the score for environment is 3.8 ±1.1 out of 5. In Saudi Arabia, a research was done to assess environment effect in lifestyle of diabetic patients and it shows a close relation between the environment setting, life style and health statutes (28).

The association between quality of life and level of knowledge about diabetes was studied. There was significant association between good level of knowledge about diabetes and a safe environment, P-Value is 0.02. Regarding effect of the knowledge on other dimensions of quality of life, there was positive correlation with no significant association. In contrast to a pilot study done in Saudi by Hana R. Al-Bannay, et al (29), which showed education program has increased all dimension of the quality of life not only environment dimension, this result is similar to another research done in Thai (14).

5.Conclusion

Diabetes impairs QOL of patients, and the knowledge about diabetes affects QOL. We recommend the engagement of health professionals in educational settings in order to enhance health-related knowledge. Seminars, counseling sessions and workshop should be arranged periodically for diabetic patients to increase their awareness.

6.Limitation of the study

The research consisted of two parts, knowledge about diabetes and quality of life, which compromised the number of questions that can be asked to patients. In kingdom of Saudi Arabia, the assessment of quality of life was done by different methods which made the comparison of the results between researches not accurate.

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