

Knowledge, Attitude and Barriers Towards Self-care Practices in Patients with Diabetes Mellitus in North Batinah, Sultanate of Oman

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To cite this article

Firdous Jahan, Ibrahim Al Shibli, Zaid Mukhlif, Jawaher Ali Khamis Al Moqbali. Knowledge, Attitude and Barriers Towards Self-care Practices in Patients with Diabetes Mellitus in North Batinah, Sultanate of Oman. *International Journal of Public Health Research*. Vol. 6, No. 3, 2018, pp. 63-70.

Received: May 15, 2018; **Accepted:** June 13, 2018; **Published:** July 23, 2018

Abstract

Prevalence of diabetes is rapidly increasing in Oman similar to other regions in the world. Self-care can improve diabetic control as well as delay the complication and is also important to reduce the cost on diabetic control. Self-care includes regular exercise, taking recommended diet, proper intake of prescribed medications and blood glucose monitoring. The purpose of this study was to identify knowledge, attitude and barriers of self-care in diabetic patients presenting in primary health care center. A cross sectional survey based study was carried out in Sohar Poly clinic, North Batinah region in Oman. Data was collected on self-administered questionnaire in which core elements were divided into Demographics, clinical characteristics, diabetes self-care, knowledge, attitude and barriers of self-care. Statistical analysis was performed using SPSS (IBM SPSS Statistics 20.0). Data were expressed in frequencies, mean and percentages. Eighty three patients were participated, of which one fourth of study participants were aged less than 40 years and 42.2% were male. The mean HbA1c value was 8.3% with the range of 5.34-13.54%. Majority of the study participants were Type 2 diabetics (95.2%) and more than half (59%) were on oral hypoglycemic drugs. Results showed high proportion of diabetic retinopathy (43.4%) as compared to neuropathy (21.7%), nephropathy (13.3%) and vasculopathy (18.1%). No significant statistical difference was observed between male and female responses involving diabetic's knowledge of diabetes self-care, perception and barriers of good glycemetic control. Study results concluded that there is a need to provide diabetes self-care education, awareness and after-effects of risk factors for diabetes among the population.

Keywords

Diabetes, Knowledge, Attitude, Barriers, Self-care

1. Introduction

Prevalence of diabetes mellitus (DM) is growing very rapidly worldwide. Projections for 2020, based on modeled estimates by world health organization (WHO), show a marked escalation of diabetes related burden in. By 2025, the worldwide prevalence is projected to be 6.3 percent, a 24-

percent increase compared with 2003 [1, 2]. In the developed countries the prevalence of diabetes is reaching up to 16 percent. It has been predicted that in year 2025 the number of people with diabetes will have been doubled. In the Arabian Gulf countries, we are facing a huge challenge with a similar increase in the prevalence of diabetes [3].

In Oman, the prevalence is not very different. In 2000, the age-adjusted prevalence of diabetes among Omanis aged 30-

64 years reached 16.1% compared with 12.2% in 1991. Diabetes treatment and its complications will soon consume most of its national health care budget. In a study involving six health centers from the Muscat region, only 2.4% of diabetic patients achieved international recognized goals for all 6 diabetes factors [4]. American Diabetes Association publishes standards of medical care yearly to promote the importance of achieving optimal glycemic control [5]. Poor glycemic control is correlated with acute and chronic occurrence of early complications. The treatments goal in diabetic management is to prevent or minimize the acute or chronic complications mainly by following the self-care practices which includes regular exercise, taking recommended diet, proper intake of prescribed medications and blood glucose monitoring [6, 7]. The goal of self-care and drug therapy is to maintain glucose levels in a target. To prevent complications and mortality, diabetes treatment requires appropriate self-care behaviors, including food choices, physical activity, proper medications intake and blood glucose monitoring and foot care [8, 9]. Self-care attitude and behavior depends on diabetic patient's knowledge, motivation, emotional factors and physician approach to help them. The self-care of DM improves quality of life [10]. Appropriate and adequate practices of self-care in diabetic patient and the barriers for not doing it is important to determine so health care workers can focus in that area in future for better diabetic control. There are many barriers that affect diabetes care, including the health care workers, health care system, financial resources, and lack of professional human resources, inadequate laboratory support and availability of medications [11]. The main purpose of this study was to identify knowledge, attitude and barriers of self-care in diabetic patients presenting in primary health care center Oman.

2. Methods

A cross sectional survey based study was carried out in Sohar Poly Clinic, North Batinah region in Oman. The study was approved by ethical review committee of Oman Medical College and Ministry of Health, Oman. Study information was provided to the potential participants and they had opportunity to ask questions about their participation. Participation was voluntary and written informed consent was obtained from study participants.

2.1. Data Collection

Data was collected using a structured questionnaire developed after literature search and several brains storming sessions with the experts. Experienced and especially trained bi-lingual (Arabic and English) research assistants conducted structured interviews. In the Survey Questionnaire: information obtained regarding demography, clinical characteristics, diabetes duration, co-morbidities, self-management behavior for diet, exercise, adherence to hypoglycemic drugs, blood glucose testing, foot checks, and smoking status. Clinical measures to identify complication of

diabetes and examination finding from computer record. Physician initiated preventive care for diabetes record of HbA1c was checked as per requirement of treatment given by ministry of health, Oman. Last section of questionnaire was about self-care knowledge and attitude of patient as well as barriers not doing diabetic self-care.

2.2. Data Analysis

Data analysis was performed using SPSS (IBM SPSS Statistics 24.0). Descriptive statistics analyses (mean, SD for interval variables, and frequency with percentages for categorical variables) were performed for the study variables. χ^2 test was applied to test for associations between gender and independent variables and independent sample t-test was utilized to assess the difference between male and female responses regarding their knowledge, perception and barriers of self-care diabetes.. All statistical tests were two-sided with significance established at an α of 0.05 levels.

3. Results

Eighty three (n=83) patients who met the study's inclusion criteria were participated. About one fourth of study participants were aged less than 40 years and majorities (55%) were between 40-60 years age group. 42.2% were male and 57.8% were female patients. The mean HbA1c value was 8.3% with the range of 5.34-13.54%. More than one third (38.6%) of study participants were not educated and unable to read and write. Majority of the participants were married (85.5%) and nonsmokers (89.2%). Table 1 shows general characteristic of study participants.

Table 1. Demographics of study participants (n=83).

	Numbers	Percentages
Age		
<30 years	3	3.6
30-40 years	16	19.3
40-50 years	22	26.5
50-60 years	24	28.9
>60 years	18	21.7
Gender		
Male	35	42.2
Female	48	57.8
Education		
Illiterate	32	38.6
Read & write	14	16.9
Primary	7	8.4
Secondary	7	8.4
High School	15	18.1
College	1	1.2
University	7	8.4
Marital status		
Married	71	85.5
Single	5	6.0
Widowed	7	8.4

	Numbers	Percentages
Smoking		
Ex-smoker	6	7.2
Non-smoker	74	89.2
Smoker	3	3.6

Table 2 shows participants' responses regarding their diabetes, complications, and co-morbidities. Majority of the study participants were Type 2 diabetics (95.2%) and more than half (59%) were on oral hypoglycemic drugs. Results

showed high proportion of diabetic retinopathy (43.4%) as compared to neuropathy (21.7%), nephropathy (13.3%) and vasculopathy (18.1%). More than two third of the study participants had family history of diabetes (79.5%), hypertension (54.2%) and ischemic heart disease (19.3%). Nearly half of the study population (56.6%) reported 5 servings/week fruits and vegetables intake and 47% perform daily exercise for more than 30 minutes. Common comorbidities included hypertension (53%), rheumatoid arthritis (18.1%) and ischemic heart disease (15.7%),

Table 2. Clinical characteristics of study participants (n=83).

	Total-n (%)	Male-n (%)	Female-n (%)	p-Value
Type of DM				0.173
Type 1-DM	4 (4.8)	3 (8.6)	1 (2.1)	
Type 2-DM	79 (95.2)	32 (91.4)	47 (97.9)	
Duration of DM				0.713
<10 Years	47 (56.6)	19 (54.3)	28 (58.3)	
>10 Years	36 (43.4)	16 (45.7)	20 (41.7)	
Medications				0.179
Oral	49 (59)	18 (51.4)	31 (64.6)	
Insulin	14 (16.9)	9 (25.7)	5 (10.4)	
Oral and Insulin	20 (24.1)	8 (22.9)	12 (25)	
Complications of DM				
Retinopathy	36 (43.4)	16 (45.7)	20 (41.7)	0.719
Neuropathy	18 (21.7)	9 (25.7)	9 (18.8)	0.456
Nephropathy	11 (13.3)	6 (17.1)	5 (10.4)	0.379
Ischemic Heart Disease	13 (15.7)	8 (22.9)	5 (10.4)	0.126
Stroke	2 (2.4)	2 (5.7)	0	0.099
Family history				
Diabetes	66 (79.5)	26 (74.3)	40 (83.3)	0.321
Hypertension	45 (54.2)	18 (51.4)	27 (56.3)	0.661
Ischemic Heart Disease	16 (19.3)	5 (14.3)	11 (22.9)	0.331
Hypothyroidism	6 (7.2)	3 (8.6)	3 (6.3)	0.693
Life Style				
Fruit Veg-5 servings/week	47 (56.6)	19 (54.3)	28 (58.3)	0.719
High Fat Food-6 times/week	18 (21.7)	11 (31.4)	7 (14.6)	0.070
Exercise > 30 min/day	39 (47)	15 (42.9)	24 (50)	0.526
Co-morbidities				
Hypertension	44 (53)	16 (45.7)	28 (58.3)	0.261
Ischemic Heart Disease	13 (15.7)	6 (17.1)	7 (14.6)	0.759
Stroke	2 (2.4)	2 (5.7)	0	0.099
Asthma	2 (2.4)	0	2 (4.2)	0.222
Rheumatoid arthritis	15 (18.1)	4 (11.4)	11 (22.9)	0.182
Hypothyroidism	6 (7.2)	1 (2.9)	5 (10.4)	0.196
Liver Disease	1 (1.2)	1 (2.9)	0 (0)	0.243
Kidney disease	7 (8.4)	5 (14.3)	2 (4.2)	0.107
Depression	2 (2.4)	0	2 (4.2)	0.222
Other	3 (3.6)	1 (2.9)	2 (4.2)	0.757

Figure 1 shows the patients self-care regarding their glycemic control and foot care. Near half of the study participants (51.8%) monitor their blood sugar level less than three times a week. Similarly, 61.4% of patients perform self-examination of their feet and sole (66.3%) less than three times a week.

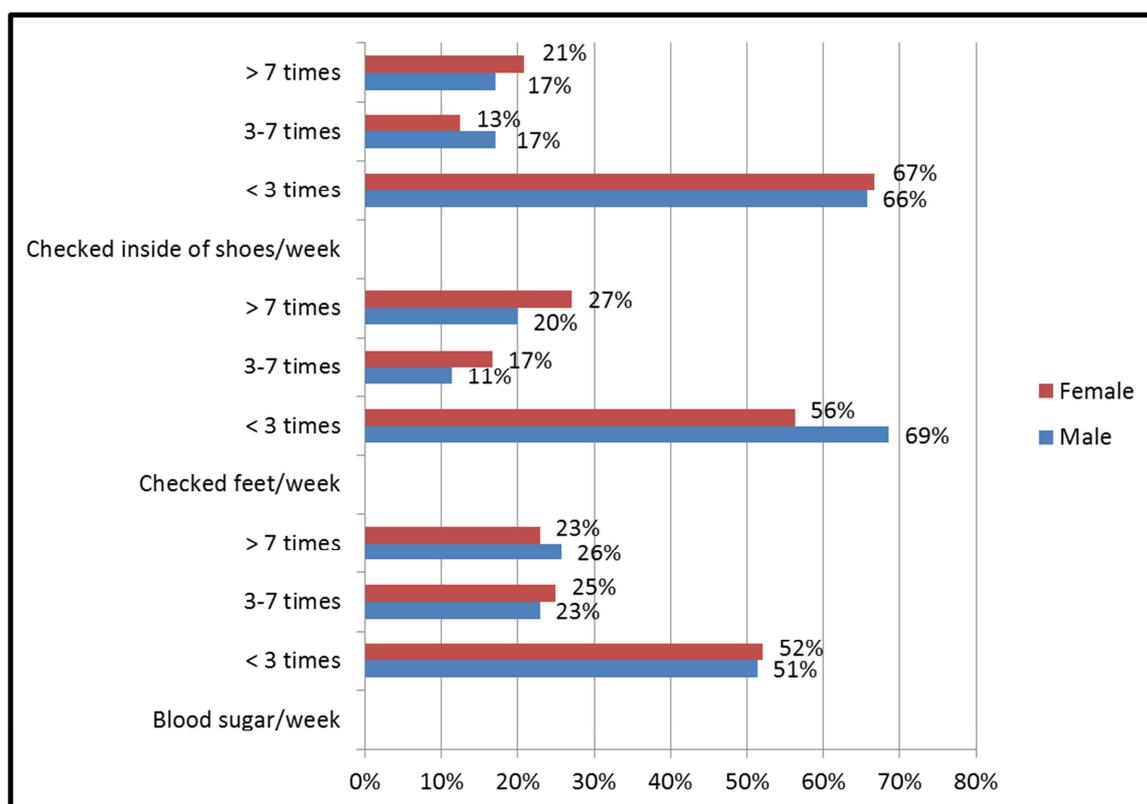


Figure 1. Diabetes Specific Self-Care.

Participants were asked multiple questions regarding knowledge of diabetes and self-care. More than two third (75.9%) of the participant's believe that diabetes affects almost every part of a diabetic person's life and maintaining blood sugar within normal range helps to prevent diabetes complications. Similarly, participants (81.9%) showed an agreement about importance of family and friends support. Disagreement was lowest (18.1%) for the statements suggesting glycosylated hemoglobin is a test is for average

blood glucose level in the past week, however 37.3% did know about the glycosylated hemoglobin test. Less than quarter of study participants (20.5%) believes that regular exercised increases blood glucose level and drugs for diabetes increases risk of complication (Table 3). No significant statistical difference ($p=0.645$) was observed between male (mean score-23.6) and female (mean score-23.9) responses involving diabetic's knowledge of diabetes and self-care.

Table 3. Knowledge of Diabetes and Self-care.

	Yes-n (%)	No-n (%)	Don't know-n (%)
General Knowledge			
Diabetes affects almost every part of a diabetic person's life	63 (75.9)	18 (21.7)	2 (2.4)
Keeping the blood sugar close to normal can help to prevent the complications of diabetes	76 (91.6)	4 (4.8)	3 (3.6)
Blood sugar testing is not needed for people with Type 2 diabetes	20 (24.1)	62 (74.7)	1 (1.2)
support from family and friends is important in dealing with diabetes	68 (81.9)	11 (13.3)	4 (4.8)
Glycosylated hemoglobin (HbA1c) is a test is for average blood glucose level in the past week	37 (44.6)	15 (18.1)	31 (37.3)
Numbness and tingling may be symptoms of nerve disease	50 (60.2)	10 (12)	23 (27.7)
Long term complication of diabetes: IHD, eye, kidney, brain and nerve disease	71 (85.5)	10 (12)	2 (2.4)
Self-care knowledge			
Regular exercise increases blood glucose level	17 (20.5)	64 (77.1)	2 (2.4)
Diabetic diet is a healthy diet for most people	49 (59)	28 (33.7)	6 (7.2)
Honey and juices are not good for diabetes	57 (68.7)	22 (26.5)	4 (4.8)
Vegetable and fruits increases blood sugar level	25 (30.1)	53 (63.9)	5 (6)
Smoking is a risk factor for heart disease	75 (90.4)	4 (4.8)	4 (4.8)
Drugs for diabetes increases risk of complication	17 (20.5)	56 (67.5)	10 (12)
Regular check-ups identify early signs of complications	76 (91.6)	3 (3.6)	4 (4.8)
Mention 2 symptoms of hypoglycemia (sweating, palpitation, weakness, dizziness)	67 (80.7)	11 (13.3)	5 (6)
Do not give sweet or sugar when blood sugars are low	20 (24.1)	59 (71.1)	4 (4.8)

Table 4 shows participants' responses regarding their perception about their role in the management of diabetes. Majority of the participants reflect that active lifestyle (91.6%), adherence to medication (97.6%), and stick to the medical advices provided by health care professionals (94%) can improve their glycemic control. While nearly less one

third of participants (21.7%) think self-education about diabetes doesn't make any difference in their diabetes management. No significant statistical difference ($p=0.630$) was observed between male (mean score-9.03) and female (mean score-8.85) responses involving diabetic's perception about their role in the management of diabetes.

Table 4. Perceived role as a Patient.

	Yes-n (%)	No-n (%)	Don't know-n (%)
Be physically active	76 (91.6)	7 (8.4)	0
Adherence to medication	81 (97.6)	2 (2.4)	0
Follow medical advices of health care professionals	78 (94)	5 (6)	0
Self-education about diabetes	63 (75.9)	18 (21.7)	2 (2.4)
Practice Self-Monitoring of Blood Glucose	75 (90.4)	6 (7.2)	2 (2.4)
Maintain a sense of mental wellbeing	76 (91.6)	3 (3.6)	4 (4.8)
Attend appointments on time	81 (97.6)	1 (1.2)	1 (1.2)
Practice good foot care	69 (83.1)	11 (13.3)	3 (3.6)

Study participants were asked series of questions about barriers of diabetes self-care. In this study cohort, more than half of the participants felt that lack of motivation from the society, lack of personal interest secondary to depression and low level of education hamper knowledge gain (Table 5). No significant statistical difference ($p=0.709$) was observed between male (mean score-18.2) and female (mean score-18.4) responses involving barriers of diabetes self-care.

Table 5. Barriers of Diabetes Self-care.

	Yes-n (%)	No-n (%)	Don't know-n (%)
Lack of knowledge about self-care	26 (31.3)	48 (57.8)	9 (10.8)
Physicians/ Nurses doesn't give enough information	16 (19.3)	66 (79.5)	1 (1.2)
Lack of family and social support	23 (27.7)	60 (72.3)	0
It's a lifelong management, time constrain	39 (47)	39 (47)	5 (6)
Cost is a barrier	24 (28.9)	56 (67.5)	3 (3.6)
Lack of motivation is the culture	45 (54.2)	31 (37.3)	7 (8.4)
Depression causes lack of personal interest	43 (51.8)	38 (45.8)	2 (2.4)
Low literacy levels hinders knowledge gain	54 (65.1)	26 (31.3)	3 (3.6)
Availability of drugs	21 (25.3)	62 (74.7)	0
Delayed referral to specialist clinic	29 (34.9)	54 (65.1)	0
In adequate laboratory support	16 (19.3)	65 (78.3)	2 (2.4)

4. Discussion

Prevalence of diabetes is rapidly increasing in Oman as other Middle East countries and in the world [12]. Self-care practices can improve diabetic control and delay the complication. Self-care includes regular exercise, taking recommended diet, proper intake of prescribed medications and blood glucose monitoring [13, 14]. A patient when involved in self-management of disease through guidance, education and awareness programs becomes more compliant toward life style changes and drug therapy which help both the practitioner [15].

In this study majority of participants were Type 2 diabetics and more than half were on oral hypoglycemic drugs. Furthermore, study results showed high proportion of diabetic retinopathy followed by neuropathy, nephropathy and vasculopathy. More than two third of the study participants had family history of diabetes and other risk factors for heart disease and 15.3% had already diagnosed

ischemic heart disease. Diabetic complications are more pronounced in poorly controlled diabetics as reported in literature [16].

In this study the participants have shown adequate self-care practice. Nearly half of the study population reported 5 servings/week fruits and vegetables intake and perform daily exercise for more than 30 minutes. Self-care regarding their glycemic control and foot care, nearly half of the study participants monitors their blood sugar level less than three times a week. More than half patients perform self-examination of their feet and sole less than three times a week. Current self-care practices seem to be in adequate in our study participants. Patients perception might be influenced by their culture and self-motivation as reported in literature [17].

More than two third of the participant's believe that diabetes affects almost every part of a diabetic person's life and maintaining blood sugar within normal range helps to prevent diabetes complications. Participants showed an agreement about importance of family and friends support.

Similar study has shown the influence of surrounding and culture may positively or negatively effect on perception and attitude of patient managing self-care [18].

Majority of the study participants reflect that active lifestyle adherence to medication, and stick to the medical advices provided by health care professionals can improve their glycemic control. While nearly less one third of participants think self-education about diabetes doesn't make any difference in their diabetes management. Literature has shown different attitude exhibit by diabetic patients. Karimi reported that a large number of diabetic patients have a poor self-care capability [19, 20].

As also reported by other researchers that diabetic patients largely depend on prescribed medications to control their blood sugar level. The importance of proper self-care practices for effective management of diabetes is not adequately emphasized in diabetes care centers and patients lack sufficient knowledge for proper self-care. Ahmed, reported that adherence to medication in diabetic patients in the primary health clinics was found to be poor. Nonadherence could lead to a worsening of disease. Improving medication knowledge by paying particular attention to different age groups and patients with comorbidities could help improve adherence [21, 22]

One third of study participants did know about the glycosylated hemoglobin test. Less than quarter of study participants had poor knowledge regarding the effect of regular exercised and drugs for diabetes increases risk of complication. Omani patients seemed aware and displayed satisfactory diabetes knowledge and good practices except adherence to regular exercise. There is a need to design and develop diabetes educational programs that could help Omani patients in diabetes management and improvement of quality of life [23, 24]

Study participants have shown positive motivation regarding self-care and practice. They are aware of factors affecting their diabetes management. Adherence to medication and stick to the medical advices provided by health care professionals can improve their glycemic control. Health education involving patient and their families may influence positively in self-care practices [25]. Patient's full adherence to diabetes treatment is associated with beliefs in medications for disease control, as shown in literature. It is necessary to develop good communication by health care provider to effect health beliefs and practices of care [26, 27].

Although study participants seems to be motivated and aware of active life style influence and self-care improves glycemic control, however, the actual practice in diabetes needs to be more frequent and self-motivated. Eknithiest has reported the same finding regarding knowledge, perception, and practice about type 2 diabetes mellitus among patient were significantly poor. Gender work and practice were found significantly correlated with glycated hemoglobin [28, 29]. Another study conducted by Kav has shown the association between self-efficacy and self-care activities was positive and health care workers should improve patients'

self-efficacy and self-care [30].

More than half of this study participants felt that lack of motivation from the society, lack of personal interest secondary to depression and low level of education hamper knowledge gain and barriers for self-care. Literature has shown same findings regarding perceptions of medications including safety concerns, convenience and their necessity; religious healing practices and beliefs [8, 31, 32].

There is a need for a comprehensive program which benefits and low barriers to participants. This multi-disciplinary approach will benefit effective interaction with health care providers to improve lifestyle modification and satisfaction with the program [12, 33]. Perceptions about the self-care practices, experiences with their healthcare providers and the healthcare system with appropriate diabetes education; and perceived self-efficacy and social support will benefit more [31, 34, 35].

5. Conclusion

Patients' knowledge and awareness about the disease can have positive influence on attitude and practices that could lead to better management of diabetes and eventually good quality of life. A knowledge, perception, and self-care practice among diabetic patients in this study is inadequate and insufficient. However, participants have shown a positive reflection towards life style management and importance of medication adherence. This is imperative to address the barriers of not doing self-care in comprehensive multi-disciplinary approach in community.

Acknowledgements

The authors appreciate the statistical help done by Dr Muhammad Asad Siddiqui in this research study

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