

Assessment of Barriers to Self-Care in Diabetic Patients in Port-Said City Family Medicine Centers

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Abstract

Background: Chronic diseases often occur as comorbidities. Diabetes mellitus is a common problem leading to compromised health problems, without proper treatments many complications can occur. Successful management depends on adequate self-care. Self-care barriers affect the performance of the patient. **Aim:** to assess the barriers of self-care in diabetic patients. **Patients and Methods:** It is a cross sectional study, conducted on 228 diabetic patients attending three family medicine centers in Port Said city. A self-administered modified structured questionnaire was given to each participant to assess barriers of self-care and determine degree of self-care in diabetic participants. **Results:** Eighty-four percent (n= 192) of the patients did not follow their self-care program in an accepted manner, taking treatment of diabetes regularly was the most followed domain in the program of the self-care by 85.5% (n= 195). The most frequent barrier to self-care was difficulty in following recommended exercise in 74.1% (n= 169) participants, and the least frequent barrier was poor adherence to medications in 11.8% (n= 27). **Conclusions:** The most frequent barriers of self-care among the surveyed diabetic patients are: difficulty in following recommended exercise, low education level, difficulty in following recommended dietary plans and annual investigation respectively. Therefore, we recommend that family physicians and their health care teams should pay attention to the most frequent barrier to self-care among the diabetic patients to help them to achieve their glycemic goals.

Keywords: diabetes mellitus; chronic care model; self-care components

Introduction

Chronic diseases are long-term diseases that are not contagious and largely preventable. They include diseases such as obesity, diabetes, cardiovascular diseases, cancer and osteoporosis, and present a growing burden for society⁽¹⁾. Diabetes mellitus is one of the most common chronic diseases nowadays and is considered a public health problem around the world. The total number of people with this syndrome reached 171 million in the year 2000 and is projected to reach 366 million by

2030⁽²⁾. Genetic and lifestyle factors, such as history of gestational diabetes, excessive food consumption and physical inactivity, are likely to account for the increased prevalence of type 2 diabetes among different ethnic populations⁽³⁾. On the other hand, socioeconomic status (SES) is associated with poorer access to health care; however, healthcare access and utilization among diabetics is high⁽⁴⁾. Self-care is a major component of chronic disease management because the majority of illness management takes place outside of formal care⁽⁵⁾. Having multiple chronic illnesses

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can influence a patient's ability to self-manage their health⁽⁶⁾. One possible explanation for the poor health outcomes among patients with diabetes is poor self-management practices^(4,7). Poor adherence to standard diabetes care recommendations is associated with adverse outcomes in clinical practice^(8,9). Suboptimal adherence to standard diabetes care recommendations is frequently observed in patients who have poor communication with their provider, lack of understanding/knowledge of the disease, polytherapy, suboptimal self-monitoring of blood glucose and psychosocial factors such as depression^(10,11). Suboptimal adherence, once viewed as a patient problem, is now seen as an indication of patients' self-management of chronic disease within the interactive framework of providers, healthcare systems, families, and communities⁽¹²⁾. Within this framework, the dynamic interaction of patient, healthcare providers and systemic factors can influence the overall management of diabetes⁽¹³⁾. The care of patients with diabetes has largely encompassed new and more efficacious diabetic treatments and improved medication delivery systems⁽¹⁴⁾, but literature highlights the importance of integrating self-management education^(15,16). Identifying barriers is a first step in collaborating with patients to improve medical self-care. For this reason, this study was conducted to assess perceived barriers to self-care among patients with diabetes.

Patients and Methods

This cross sectional study was carried out in the family medicine centers providing care for diabetic patients in Port Said city which is a coastal area at the north east of Egypt; three family medicine centers were selected randomly from 12 centers; i) El-Manakh family medicine center, ii) Othman Ebn

Afan family medicine center and, iii) El-Kuwait family medicine center.

Patients

A sample size of 228 patients was calculated using the prevalence of barriers to self-care in diabetic patients from previous studies as 18%⁽¹⁷⁾ with an error of 0.05 and confidence interval of 95% and z equal to 1.96.

Inclusion criteria: Patients with diabetes mellitus from both genders regardless of their age, history of diabetes of more than 3 years, and living in the study area for more than 6 months were included in the study.

Exclusion criteria: We excluded any diabetic patients who had any mental or physical problems that could affect their responses such as mood disorders or psychotic diseases (assessed by standardized minimal state examination) or had difficulties in hearing (assessed by whispering test) or came to the family medicine center in emergency.

Sampling method

The researchers used multi stage sampling technique to choose the sample. Firstly, a simple random sample was carried out to choose 3 centers from the 12 family health centers in Port Said city which are: El-Kuwait, El-Manakh & Othman Ebn Afan. Secondly, the sample size was 228 patients: was distributed equally between the chosen family health centers; about 76 patients from each center. Thirdly, 76 patients from each family medicine center from the registry office were selected by a simple random sample technique using a sampling software program. Patients who fulfill the inclusion criteria were recruited from the chosen family practice centers and were subjected to study procedure.

Tools of the study

A 55 items self-administered modified structured questionnaire was tested on 20 diabetic patients as a pilot study to test the reliability, validity, and internal consistency with acceptable Cronbach alpha. The pilot study subjects were not included in the study sample⁽¹⁸⁾. The questionnaire consisted of three parts: 1) The first part collects the socio-demographic characteristics (age, sex, marital status, and job). 2) The second part consisted of 10 items assessing self-care ability. The patients who had self-care score ≥ 70 were considerably had acceptable self-care. 3) The third part assesses the potential barriers to self-care (education level, multi morbidity, poly pharmacy, presence of depression).

Ethical considerations

The research methodology and ethical committees of the Faculty of Medicine Suez Canal University approved the research protocol. A verbal consent was obtained from each participant and explained the research' aims and procedures. Confidentiality of the patient data was preserved. The researchers funded the whole study.

Statistical analysis

The data obtained from the questionnaires was coded and processed with Statistical Package for the Social Sciences (SPSS) version 20 (2011) for windows and the results were presented in tables and graphs. Descriptive statistics were presented as frequencies and percentages for categorical variables and Means and standard deviations (SD) for continuous variables. For internal statistics, we used student t test for normal distributed continuous variables, Chi square test for comparison categorical variables e.g. sex, and spearman test for correlation. Multiple logistic regressions used to identify the predictors.

Results

The present study was a cross sectional study aimed to assess barriers of self-care and determined the affecting degree of self-care in diabetic patients. A multi stage simple randomly 228 diabetic patients [26% (60 males) and 73% (females)] were selected from 3 family medicine family centers in Port Said city. The mean age was 54.73 (SD=9.52) years. The main duration of diabetes was 11 ± 7 years. Results in table 1 show that 137 patients (60.1%) were uncontrolled as they had Glycated hemoglobin A1c more 7% where in controlled group only 91 patients (39.9%) were achieved their glycemic goal with almost similar sex distribution (male :female is 1:3). On the other hand, the main age group in uncontrolled and controlled group was from 51 to 60 year old (48.2%, 34.1%) respectively with a significant difference ($p = 0.02$). Also, in uncontrolled group the highest percentage of patients were illiterate (39.4%), while in controlled group the highest percentage of patients had the average education (36.3%) with highly significant difference ($p = 0.001$). Statistical analysis shows that most of uncontrolled group did not have enough income (63.5%) but in controlled group almost equally distributed between sufficient and insufficient income with significant different ($p = 0.023$). Unfortunately, most of the uncontrolled group had a diabetic complications (83.2%) while in controlled group only half of them had the diabetic complications with highly significant difference ($p = 0.001$).

Regarding self-care: results show that only 15.8% of the participants had acceptable self-care score ($\geq 70\%$). Detailed statistical analysis in table 2 show the frequency of self-care items between accepted and unaccepted groups as most of patients (85.5%) in acceptable self-care had Anti-

diabetic drug regularly and 62% of them were willing for change unhealthy behavior. On the other hand, not only most of the unacceptable self-care group did not testing their blood sugar regularly nor had

healthy diet and had enough vegetables and fruits in their meals but also did not examine their feet in the last week nor had exercise regularly. Finally, 89.9% of the unacceptable self-care groups were smokers.

Table 1: Distribution of diabetic patients according to their socio-demographic characteristics between different diabetic controlled groups

Socio-demographic characteristic Variable		DM Control				p-value
		Uncontrolled (n = 137)		Controlled (n = 91)		
		No.	%	No.	%	
Sex	Male	36	26.3	24	26.4	0.987
	Female	101	73.7	67	73.6	
Age (years)	31 – 40	6	4.4	15	16.5	0.023*
	41 – 50	34	24.8	24	26.4	
	51 - 60	66	48.2	31	34.1	
	61 - 70	27	19.7	18	19.8	
	> 70	4	2.9	3	3.3	
Mean± SD	54.73± 9.52					
Marital status	Married	100	73.0	68	74.7	0.706
	Single	1	0.7	2	2.2	
	Widow	27	19.7	17	18.7	
	Divorced	9	6.6	4	4.4	
Qualification	Illiterate	54	39.4	32	35.2	0.001*
	Basic education	45	32.8	13	14.3	
	Average education	30	21.9	33	36.3	
	University education	8	5.8	13	14.3	
Work status	No	105	76.6	67	73.6	0.872
	Engineer	15	10.9	11	12.1	
	Teacher	17	12.4	13	14.3	
Income	Sufficient	50	36.5	47	51.6	0.023*
	Insufficient	87	63.5	44	48.4	
Smoking	Yes	17	12.4	9	9.9	0.558
	No	120	87.6	82	90.1	
Co-morbid diseases	No (DM only)	27	19.7	20	22.0	0.678
	Yes:	110	80.3	71	78.0	
Care provider	Family physician	77	56.2	49	53.8	0.726
	Specialist	60	43.8	42	46.2	
DM Duration (yrs)	Mean± SD	11.8 ± 7.1		11.5 ± 7.6		0.729
Complication	Complicated	114	83.2	45	49.5	<0.001*
	Not complicated	23	16.8	46	50.5	

*Statistically significant at p-value <0.05; Chi-square test, Student t-test

Table 2: Frequencies of self-care items among study sample according to different accepted levels (N=228)

Self-care items	Not accepted ($< 70\%$)		Accepted ($\geq 70\%$)	
	No.	%	No.	%
DM Treatment	33	14.5	195	85.5
Willing for change	86	37.7	142	62.3
Fatty meal	100	43.9	128	56.1
Aspirin	112	49.1	116	50.9
Blood sugar testing	143	62.7	85	37.3
Healthy diet	150	65.8	78	34.2
Vegetables & fruits in diet	152	66.7	76	33.3
Foot examination (in Last week)	160	70.2	68	29.8
Exercise	187	82.0	41	18
Smoking (in Last week): NO/Yes	205	89.9	23	10.1

Table 3: Frequencies of Potential barriers to self-care among study sample (N=228)

Potential barriers to self-care	No.	%
Difficulty in following recommended exercise	169	74.1
Financial constraints	159	69.7
Anxious about the health condition	156	68.4
Lack of insurance coverage	154	67.5
Disabling bad emotional state	150	65.8
Difficulty in following recommended dietary plans	140	61.4
Exhausting frequency of visits	130	57.0
Frustration from delayed response to treatment	126	55.3
Physical limitation	98	43.0
Time management constraints	90	39.5
Lack of knowledge about the health condition	89	39.0
Poor communication with healthcare provider	81	35.5
Target level to be achieved by the management plan was not identified	80	35.1
Lack of Social support	77	33.8
Poor compliance with management plan	72	31.6
Compound effect of other health condition/disease	69	30.3
Low self-efficacy/ sense of loss of control	69	30.3
Compound effects of medications (therapeutic & side effects)	45	19.7
Low education level/ Health literacy	35	15.4
Transportation constraints	32	14.0
Poor adherence to medications (Schedule and coordination of medications)	27	11.8

The study results show in table 3 that the most frequent potential barriers to self-care among the participants were difficulty in following recommended exercise (71.1%), financial constraints (69.7%), anxious about the health condition (68.4%), and lack of insurance coverage (67.5%). The results show in table 4 that there was reversible relationship between the annual investigation results and achieving acceptable self-care level as 50.5% of unacceptable self-care group had a normal annual investiga-

tion results while only 41.7% of the acceptable self-care group had normal annual investigation results ($p=0.01$). also, we found that 77.8% of the acceptable self-care level group had enough knowledge about diabetes mellitus and its complications, while only 57.8% of the unacceptable self-care level group had the same knowledge ($p=0.024$). On the other hand the other disease characteristics were insignificant ($p>0.05$).

Table 4: Relationship between the disease characteristics and different self-care level

		Self-care				p-value
		Not accepted (n = 192)		Accepted (n = 36)		
		No.	%	No.	%	
Care provider	Family physician	108	56.3	18	50.0	0.489
	Specialist	84	43.8	18	50.0	
DM Duration (yrs)	Mean± SD	11.6 ± 7.5		12.1 ± 6.2		0.707
Complication	Complicated	132	68.8	27	75.0	0.454
	Not complicated	60	31.3	9	25.0	
Annual investigation	Not done	49	25.5	4	11.1	0.01*
	Normal	97	50.5	15	41.7	
	Abnormal	46	24.0	17	47.2	
Degree of control (FBS/ HbA1C)	Uncontrolled	117	60.9	20	55.6	0.545
	Controlled	75	39.1	16	44.4	
Knowledge about DM	No	81	42.2	8	22.2	0.024*
	Yes	111	57.8	28	77.8	
Knowledge Source	Doctor	92	47.9	28	77.8	0.752 ^a
	Nurse	6	3.1	1	2.8	
	Media	28	14.6	5	13.9	
	Relatives/friends	18	9.4	5	13.9	

* Statistically significant at p-value <0.05; Chi-square test, spearman's test; ^a Fisher's exact test

Regarding the relationship between the potential self-care barriers and the different self-care level results in table 5 show that the strongest correlation was found between difficulty in following recommended exercise barrier and difficulty in following recommended dietary plans barrier with the acceptable self-care level ($p<0.001$). Followed by disabling bad emo-

tional state and low education level/ Health literacy barriers that had a significant correlation with acceptable self-care level ($p=0.001$, $p=0.005$) respectively. And finally, the potential barriers which are target level was not identified and low self-efficacy had a correlation with acceptable self-care level with lowest significant level ($p=0.032$, $p=0.016$) respectively. On the other hand

the other potential barriers were not significantly correlated to the self-care level ($p > 0.05$). Multiple logistic regression analysis for the predictors of self-care among the participants in table 6 revealed that difficulty in following recommended exercise and recommended dietary plans were the most predictors to unacceptable self-care where as $p = 0.02$ and the adjusted OR was 3.11. Another predictor was annual investi-

gation as the diabetic patients who did not make their annual investigation could be expected to have unacceptable self-care ($p = 0.49$, adjusted Odds Ratio (OR) 2.53). Finally, the educational status of diabetic patient could predict the possibility of achieving acceptable level of self-care as the illiterate is a predictor to unacceptable self-care as $p = 0.03$ and the adjusted OR was 3.12.

Table 5: Relationship between the self-care level and the potential barriers

Potential barriers	Self-care				p-value
	Not accepted (n = 192)		Accepted (n = 36)		
	No.	%	No.	%	
Anxious	129	67.2	27	75.0	0.355
Lack of insurance coverage	131	68.2	23	63.9	0.610
Frustration	104	54.2	22	61.1	0.442
Financial constraints	137	71.4	22	61.1	0.220
Exhausting frequency of visits	110	57.3	20	55.6	0.847
Difficulty in following recommended exercise	153	79.7	16	44.4	<0.001*
Lack of Social support	61	31.8	16	44.4	0.140
Disabling bad emotional state	135	70.3	15	41.7	0.001*
Overwhelmed by a single illness	56	29.2	13	36.1	0.405
Physical limitation	85	44.3	13	36.1	0.364
Lack of knowledge about the health condition	77	40.1	12	33.3	0.445
Low education level/ Health literacy	24	12.5	11	30.6	0.005*
Poor communication with healthcare provider	71	37.0	10	27.8	0.290
Time management constraints	80	41.7	10	27.8	0.118
Difficulty following recommended dietary plans	131	68.2	9	25.0	<0.001*
Poor compliance with management plan	64	33.3	8	22.2	0.188
Compound effect of treatment	37	19.3	8	22.2	0.683
Target level was not identified	73	38.0	7	19.4	0.032*
Poor adherence to medications	22	11.5	5	13.9	0.778 ^a
Low self-efficacy	65	33.9	4	11.1	0.016* ^a
Transportation constraints	29	15.1	3	8.3	0.283

* Statistically significant at p -value <0.05; Chi-square test; ^a Fisher's exact test

Discussion

The present study was conducted on 228 diabetic patients to assess the barriers to

self-care and determines the degree and factors affecting self-care. The socio-demographic characteristics of the study sample include the mean age of the partic-

ipants which was 54.7, accordingly, the study of George and colleagues (2013)⁽¹⁹⁾ found out that the mean age of the participants was 54.4 years. The largest group of participants was married (73.7%) as reported previously⁽²⁰⁾. This study showed that 19.3% of the participants were widow. Also Otero et al., 2012⁽²¹⁾ found that 18.5% of the investigated patients are widowed. They explained the importance of such factor that could affect diabetes management, since, in some cases, losing one's spouse

causes health changes, such as depression and loss of the will to live. The present study also showed that 37.7% of the participants were illiterate. Previously, George et al., (2013)⁽¹⁹⁾ reported that 25.5% of the participants had not received any formal education however, others⁽²⁰⁾ reported that the majority of the respondents were collegiate level or graduates. One explanation for that is related to our urban study area where most of the people are keen on learning.

Table 6: Multiple logistic regression analysis for the predictors of self-care among study population (N= 228)

Predictor variables ^a	Coefficient	p-value	OR	95% CI
Work status (no)	0.155	0.76	1.17	0.44-3.11
Annual investigation (no)	0.929	0.049*	2.53	1.0-6.38
Sufficient income (yes)	0.635	0.17	1.89	0.76-4.71
Knowledge about the condition (no)	0.351	0.52	1.42	0.49-4.14
Difficulty in following recommended exercise (yes)	1.146	0.02*	3.14	1.23-8.05
Difficulty following recommended dietary plans (yes)	1.134	0.02*	3.11	1.23-7.87
Disabling bad emotional state (yes)	0.761	0.08	2.14	0.90-5.07
Low self-efficacy (yes)	1.049	0.09	2.85	0.83-9.79
Target level to be achieved by the management plan was not identified (yes)	0.577	0.26	1.78	0.65-4.85
Low education level (no)	1.139	0.03*	3.12	1.12-8.72
Constant	-5.658	<0.001*	0.003	

Model fit ($\chi^2=52.06$; $p < 0.001$); * Statistically significant at $p < 0.05$. ^a Variable (Reference category)

This study showed that the mean duration of the diabetes mellitus among the studied subjects was 11.67 ± 7.2 years, which differs from the results of Brides et al., 2012⁽²⁰⁾ who found that 44% of the diabetics suffered from the disease 6 years on, but not longer than 10 years. This could relate to the chronic nature of the diabetes mellitus disease, in addition to the inability to follow healthy diet and exercise regimen. The current study showed that only 39.9% of the

participants have controlled blood sugar tests (glycated hemoglobin A1c <7%). Accordingly, George et al., (2013)⁽¹⁹⁾ had noticed poor glycemic control among about half of their subjects. This was explained by i) the low motivation of the patients, ii) the patients did not feel as partners in management plan, or iii) they did not have the empowerment needed to take control of their condition. This study also showed that 61% of the participants have knowledge and

information about diabetes mellitus and its complications. In contrast, others^(22,23) found that nearly all patients lacked understanding of how to manage their diabetes effectively, and how the disease affects the human body. This could be due to the way of estimating the knowledge by asking one closed end question not a well-structured knowledge assessment.

The present study showed that the major source of knowledge for the diabetic patients were the doctors followed by the media. Previously,⁽²⁴⁾ the two primary sources of information were the physician or the nurse at the physician's office. This difference could be explained by good doctor patient relationship and the progress of media. Results of the present work showed that 85.5% take their anti-diabetic drug in an accepted manner. In accordance to this study, Ary et al. (1986)⁽²⁵⁾ found that the vast majority of the subjects were taking their diabetes medications on time. Also, Hill-Briggs & Misir, (2013)⁽²³⁾ found that one in three diabetes patients fail to take the medications according to their physicians' prescription for high blood sugar due to their knowledge about their condition. The present study showed that 37.3% of the participants check blood sugar regularly by themselves as instructed by their doctor. In accordance to results of Hill-Briggs & Misir (2013)⁽²³⁾ who found that 35% of the participants self-monitored their blood sugar also, Tan & Magarey, (2008)⁽²²⁾ found that only 15% of the subjects practiced their self-blood sugar monitoring. This may be because of the low income so that not all the patients are able to measure blood sugar frequently, or because patients did not realize the importance of regular glucose monitoring. Concerning the self-care barriers, we found that most of the participants suffer from financial problems that are considered as a barrier, and affect their diabetes self-care. However, others⁽²³⁾ found

that nearly one in three of their participants reported financial problems as a barrier to following a good diabetes control regimen. This may be because most of our participants were not working, and 57.5% reported insufficient income. In the same manner of self-care barriers, the current study showed that 68.4% of the participants suffered troubled emotional state regarding their health condition, and 65.8% found difficulty to follow up their health state when they have depressed mood. In contrast, others⁽²³⁾ found that symptoms of depression made it difficult to take care of diabetes in only 25% of the patients. These could be caused by the fear from uncontrolled diabetes or the existence of multiple chronic illnesses. In addition, we should take in our considerations the difference between depression and depressive symptoms. Among the other potential self-care barriers was the frustration. The present study showed that 55.3% of the participants who could not achieve their acceptable self-care level, were frustrated from delayed response to treatment. These results are in agreement with a previous study⁽²⁶⁾ that reported frustration in their patients due to the complexity of disease management. Another important self-care barrier was poor compliance. The present study showed that 31.6% of the participants had poor compliance to management plan, these results were little different from Al-Maskari and colleagues (2013) who found that 10% of the participants admitted non-compliance with their medications due to different health care programs and follow up visits⁽²⁷⁾.

Conclusion

The results of the present study show a low acceptable level among the diabetic patients to their self-care program. The self-care is greatly affected by difficulty in fol-

lowing recommended exercise program, and low education level of the participants, in addition to difficulty in following recommended dietary plans and annual investigation. All these self-care barriers could be used as predictors to expect who of the diabetic patients could not achieve an acceptable level of self-care. So according our results, we recommend that family physicians and their health care teams should pay attention to the most frequent barrier to self-care among the diabetic patients, which is difficulty in following recommended exercise program to figure out it.

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