

Impact of Diabetic Complications awareness on Patient's Self Care Activities.

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Abstract : Background: Self-care practices in diabetes patients are crucial to keep the illness under control and prevent complications. Effective management of diabetes will be a difficult task without adequate understanding of the existing level of practice related to diabetes self-care.

Aim: this study was conducted to investigate the impact of diabetic complications awareness on patient's self-care activities. **Patients and method:** A Quasi-Experimental design was used. Two tools were used; I. Structured interview questionnaire: included two parts; first: Sociodemographic characteristics and medical profile, second: diabetic patient's related complications. II. Summary Diabetes Self-Care Activities Scale (SDSCA) **Results:** the participants mean age was 48.13 ± 8.08 . Most of the sample (90.7 %) suffered from hyperglycemia. There was an improvement in almost patient's self care activities items following diabetic complications awareness. **Conclusion:** Based on the study findings, there were inadequate self care activities performed by the patients before the awareness, but improved after that. The researchers thought that this awareness was working as a red alarm for those patients. Data from this study re-enforce the continuing need for more diabetic related education that are intended to improve self care activities among diabetics.

Keywords: Complications awareness, Diabetes Mellitus, Diabetic complications, SDSCA, Self-care activity.

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I. Introduction

Diabetes mellitus (DM) is a chronic progressive metabolic disorder characterized by hyperglycemia mainly due to supreme or relative lack of insulin hormone⁽¹⁾. Prevalence of diabetes mellitus has been increased all over the world in past 30 years. One in eleven adults had diabetes, 35 million diabetic adults in the Middle East and North Africa (MENA) region. It is estimated that chance to increase to 84 million by 2045. Egypt is representing the first country in top 5 countries in MENA region in terms of the number of diabetics. Diabetes was also confirmed to have caused 373,000 deaths in the IDF MENA Region in 2017⁽²⁾.

Diabetic complications are becoming common community problems. That can cause expanded hospitalization, expanded direct patient expenses, and mortality⁽³⁾. Multiple complications and premature mortality from uncontrolled type two diabetes often create a significant burden on the individual, family, and society⁽⁴⁾. Hence, the common causes of diabetic complications are poor control of diabetes because of non adherence, poor behaviors towards the disease and its complications, unhealthy diet, lack of physical activity, and poor management by the health care professionals⁽⁵⁾.

Studies have reported that strict metabolic control can delay or prevent the progression of complications associated with diabetes. The needs of diabetic patients are not only limited to adequate glycemic control but also correspond with preventing complications; disability limitation and rehabilitation⁽¹⁾. Acute complications of Type 2 Diabetes include either Hyperglycemic or Hypoglycemic crises. A hyperglycemic crisis occurs when patients do not have sufficient circulating insulin related to too much circulating glucose leads to a hyperosmolar hyperglycemic state (HHS) or, less commonly, to diabetic ketoacidosis (DKA). Hypoglycemia occurs when a person's blood glucose is too low, usually below 70 mg/dl. The progression of diabetes and its complications are mainly influenced by poor awareness and practices among patients with diabetes^(6,7). It can be prevented by proper self-care that maintains optimal glycemic control. Chronic diabetes complications are commonly categorized into microvascular and macrovascular complications. Microvascular complications include neuropathy, nephropathy, and retinopathy, while macrovascular complications consist of cardiovascular disease, stroke, and peripheral artery disease⁽⁸⁾.

Diabetes self-care activities refer to the behaviors that people with or at risk of DM enforce in order to effectively manage their disease on their own⁽⁹⁾. Self-care is the cornerstone of diabetes care⁽⁴⁾. Inadequate self-

care in diabetics is as a major problem which health care providers encounter. This issue not only has an impact on mortality rates but also, increases treatment costs. The results of various studies showed that diabetics have not suitable self-care condition and do not participate in day care process while the treatment results of diabetes depends a lot on self-care behaviors⁽¹⁰⁾.

Studies by Waltson⁽¹¹⁾, Kitis⁽¹²⁾, Schilling⁽¹³⁾, Bukhsh . et al.,⁽¹⁴⁾ concluded that patients with better self-care achieve better glycemic control. Studies by Heisler⁽¹⁵⁾, Rubbin⁽¹⁶⁾, and Mahmoodi⁽¹⁷⁾ showed a positive self effect on blood sugar and HbA1c control. A study by Parchman also showed that diabetic patients who were self-caring continuously had lower HbA1c rates⁽¹⁸⁾. Khattab , et al.,⁽¹⁹⁾ stated in their study, patients who did not adhere to diabetes self-care management behaviors were had poor glycemic control.

The majority of patients with diabetes can significantly reduce the chances of developing long-term complications by improving self-care activities. Despite this fact, compliance or adherence to these activities has been found to be low, especially when looking at long-term changes⁽¹⁾.

II. Significant of Study

Whereas glycemic control is the main aim in diabetic management and therefore alleviates its complications, it is essential for more committed to a healthy diet with regular exercise, monitoring glucose and food care which are components of self- care activities. The researcher believes that patients' complications awareness is working as a red light in the patients' mind to motivate them for better self-management and disease control. Therefore, the current study imperative to investigate the impact of diabetic complications awareness on patient's self- care activities.

III. Methodology

3.1 Aim

The conducted study aimed to investigate the impact of diabetic complications awareness on the patient's self-care activities.

3.2 Research hypothesis

Diabetic patients who receive complications awareness will have improvement in their self-care activities.

3.2 Research design;

A quasi-experimental design was used.

3.3 Setting

The study was carried out at diabetes outpatient clinic at Specialized Medical Hospital, Mansoura University, from May to September 2017.

3.5 Participants

A150 randomly selected type 2 diabetic patients visited the diabetic clinic of the hospital during the study period. The inclusion criteria were adult patients aged between 20-60 years, diagnosed with DM at least for one year, can communicate verbally and has no neurologic or mental health problems.

3.6 Tools;

Two tools were used for data collection;

Tool I: Structured interview questionnaire consisted of two main parts; Part 1: Sociodemographic characteristics and health related data, Part 2: Diabetic related complications. It was designed by the researcher in Arabic and based on literature reviews and content-validated through experts' opinions (medical-surgical and internal medicine professor).

Tool II: Summary Diabetes Self-Care Activities Scale (SDSCA). It has proven to be reliable and valid self-report tool⁽²⁰⁾. It consisted of a core set of 11 items that have all been used in several studies along with the expanded list of 14 additional questions that may be of use to researchers or clinicians. The instrument is based on the self-reported frequency of completing recommended activities during the past 7 days; Diet (4 items), Exercise, Blood Sugar Testing, and foot care each of them include (2 items) and smoking (1 item). Mean scores were calculated for each of the following four items: General diet (by finding mean of items 1 and 2), Exercise (by finding mean of items 5 and 6), Blood sugar test (by finding mean of items 7 and 8) and Foot care (by finding mean of items 9 and 10).

The scale translated by the researcher into Arabic, then examined by a panel of expert to test its validity after translation. Items were rated on an 8-point Likert scale, a higher score indicating a better level of self-care

3.7 Pilot study

A pilot study was carried out on 10% of diabetic patients to assess the clarity and the applicability of the tools, and the necessary modifications were done prior to data collection. Those patients were excluded in the main study.

3.8 Fieldwork

The study sample was recruited according to the set criteria then data were collected via personal interviews. The data were collected throughout three phases (assessment, implementation and evaluation)

At the first phase, the researcher builds a rapport with each participant after explaining the purpose, method, and procedure of the study. The researcher asked for their verbal consent if willing to participate in the study. Participants were asked to answer the structured questionnaire which contains sociodemographic data, health data and self-care activities scale.

At the second phase, the researcher introduced the most prevalence complications through a simple colored brochure to the participants. The material explained to each participant and ensuring understands of each information. The colored brochure was given to each participant to review it at any time in home.

Finally the third phase; one month later, at follow up visit, the researcher distributed the same questionnaire to the participants. The results were compared the pretest results to evaluate the impact of complication awareness on self-care activities.

3.9 Ethical considerations:

The required permissions were obtained from the Research Ethics Committee. Oral approval was secured from each participant after verbal explanation of the study nature and objective were reported to all research participants. All patients were informed about their rights to agree or disagree to participate in the study and they were permitted to leave from the research at any point of time and this will not affect their care.

3.10 Statistical analysis;

Data were analyzed using SPSS (V.20). Qualitative variables were presented as number and percentage. Quantitative variables were presented as mean \pm SD. To check the difference between two groups independent t-test was used. $P \leq .05$ was considered statistically significant.

IV. Results

Findings shows that around half (47.3%) of the participants aged from 50 to 60 years with mean age 48.13 ± 8.08 . The highest proportions of study participants were female (63.3%), married (94%). Also it represents that around half of the patients were non-educated (48.7%). More than two third of them were not working; housewife or retired (69.3%). Furthermore, it shows that the highest percentage (47.3%) from the sample was diagnosed with diabetes since 3 years. Also it displays that there is 60 % of the participants have a positive family history related DM (Table 1).

Table 1: Frequency distribution of socio-demographic characteristics and health relevant data (n = 150).

Demographic data	No	%	
Age (years)	20-	7	4.7
	30-	12	8
	40-	60	40
	50-60	71	47.3
Mean \pm SD	48.13 \pm 8.08		
Gender	Male	55	36.7
	Female	95	63.3
Marital status	Married	141	94
	Divorced	2	1.3
	Widow	7	4.7
Education	Non-educated	73	48.7
	Read and write	45	30
	Secondary	16	10.7
	University	16	10.7
Occupation	Manual work	31	20.7
	Office work	15	10

	Not working & Retired)	104	69.3
Residence	Urban	114	76
	Rural	36	24
Duration of disease (years)	1	3	2
	2	52	34.7
	3	71	47.3
	4	23	15.3
	6	1	0.7
Family history	Positive	90	60
Smoking	Yes	27	18

Table (2): Frequency distribution of reported complications and /or associated diseases among participants (n=150).

Complications/ associated diseases	No	%
Renal	7	4.7
Hypertension	114	76
Diabetic foot	26	17.3
Ocular	15	10
Hepatic	6	4
Cardio	11	7.3
Hypoglycemia	63	42
Once	12	8
Twice	27	18
3 times	9	6
>3 times	15	10
Hyperglycemia	136	90.7
Twice	7	4.7
3 times	15	10
>3 times	106	70.7

Table (2) demonstrates that 90.7% of the participants experienced hyperglycemia at least twice in their life. Highest proportion (76%) of the participants reported that they suffered from hypertension followed by 42% experienced hypoglycemia at least one time.

It is apparent from table (3) that there were statistically significant differences between SDSCA items pre and post complication awareness in diet (Q1, Q2, and Q3), exercise (Q5), blood sugar (Q7, Q8) and foot care (Q9-Q10). While question 4 related to specific diet and question 6 about specific exercise did not change significantly. Regarding smoking, as expected, there is no totally difference between pre and post complication awareness.

Table (3): Mean score of Diabetes Self-Care Activities pre and post the complication awareness

Q	SDSCA items	Pre complication awareness	Post complication awareness	T P
		Mean ±Sd	Mean ±Sd	
1	Diet How many of the last SEVEN DAYS have you followed a healthful eating plan?	1.56±1.10	2.86±1.47	10.67 .000*
2	On average, over the past month, how many DAYS PER WEEK have you followed your eating plan?	1.06±1.10	2.83±1.40	13.60 .000*
3	On how many of the last SEVEN DAYS did you eat five or more servings of fruits and vegetables?	2.19±1.36	2.76±1.67	3.31 .001*
4	On how many of the last SEVEN DAYS did you eat high fat foods such as red meat or full-fat dairy products?	1.22±0.86	1.21±0.81	1.41 .158

5	Exercise On how many of the last SEVEN DAYS did you participate in at least 30 minutes of physical activity? (Total minutes of continuous activity, including walking).	1.97±1.17	2.62±1.16	7.93 .000*
6	On how many of the last SEVEN DAYS did you participate in a specific exercise session (such as swimming, walking, biking) other than what you do around the house or as part of your work?	0.18±0.56	0.19±0.57	1.41 0.158
7	Blood Sugar Testing On how many of the last SEVEN DAYS did you test your blood sugar?	0.12±0.42	0.50±0.74	7.02 .000*
8	On how many of the last SEVEN DAYS did you test your blood sugar the number of times recommended by your health care provider?	0.11±.35	0.39±.63	6.15 .000*
9	Foot Care On how many of the last SEVEN DAYS did you check your feet?	1.14±1.12	2.33±1.54	10.62 .000
10	On how many of the last SEVEN DAYS did you inspect the inside of your shoes?	0.31±0.78	1.88±1.56	12.85 .000*
11	Smoking Have you smoked a cigarette—even one puff—during the past SEVEN DAYS?	1.26±2.69	1.26±2.69	
	Number of cigarettes you smoke on an average day	22.59±10.59	21.48±8.29	1.44 .161

* P < 0.05 (significant)

Table (4): Mean of days adherent to different self-care activities pre and post the complication awareness

SDSCA items	Pre complication awareness	Post complication awareness	T / P
	Mean ±Sd	Mean ±Sd	
General diet	2.63±1.93	5.70± 2.85	13.17 / 0.000*
Exercise general	2.15± 1.35	2.81± 1.42	8.06 / 0.000*
Blood glucose	0.24±0.77	0.90± 1.34	15.07 / 0.000*
Foot care	1.46±1.56	4.22± 2.57	6.84 / 0.000*

*P < 0.05 (significant)

Table (4) represented that the best mean was regarding general diet (2.63±1.93, 5.70± 2.85) pre and post complication awareness respectively. And the least mean was Blood glucose monitoring (0.24±0.77, 0.90± 1.34) pre and post complication awareness respectively. The findings also prove that there were statistically significant in all activities of self-care p=0.000.

V. Discussion

Diabetes Mellitus is a rapidly growing health problem in Egypt that has a major impact on morbidity and mortality⁽²¹⁾. Diabetes is generally managed through self-care activities by the patient. Self-care is a core concept in health promotion and restoration of health. Based on that, any deficiency in patients' self-activities leads to an increase of diabetes problems⁽²²⁾. This study was done to investigate the impact of diabetic complications awareness on the patient's self-care activities.

The findings of this study showed that, near half of the participants aged from 50 to 60 years with mean age 48.13 ± 8.08. This is similar to the study of Assaad, et.al, 2018⁽²³⁾, conducted at Alexandria, found that diabetes was most common in people older than 50 years. Furthermore, study conducted at Tanta by Abu-elenin 2018⁽²⁴⁾, illustrated that the mean age was 53.44 (±13.75) years. The current study also illustrates that more than sixty percent of study participants were female and the most of them were married. This is in accordance with study done in Oman by Al Bimani. et.al,(2015)⁽²⁵⁾ demonstrated that about sixty percent were women and the majority of them were married. In the same line, study done at Saudi Arabia in 2018 demonstrated that more than half of the participants were female; 50 years of age and older; married and unemployed⁽²⁶⁾. The findings of our study also represent that about half of the patients were non-educated, more than two third of them were not working; housewife or retired.

The study results concluded that regarding health relevant data, the highest percentage of the sample was diagnosed with diabetes since 3 years. Also it displays that there is sixty percent of the participants have a positive family history of DM. Similarly, Al Bimani . et.al, 2015⁽²⁵⁾ reported two third of their participants have family history of diabetes. Study done, in kufa by Mohammed-Ali , and Hamza 2016⁽²⁷⁾, indicated that 14% and 28% of the study sample have a positive family history from father and mother sides respectively.

Regarding diabetic complications, seventy percent exposed more than three times to hyperglycemia. Hypoglycemia also reported by forty two percent of the sample. Hypertension represented 76% of the participants, and diabetic foot resembles about seventeen percent. A similar pattern of results was obtained by Mohandas et.al 2018⁽²⁸⁾ who found that majority of the sample suffering from complications. These results

are inconsistent with Mohammed-Ali, and Hamza 2016⁽²⁷⁾ findings, which demonstrated, forty percentages were not suffering from complications. This may indicate that our patient has uncontrolled DM.

The most studies done related to self-care activities of diabetics were conducted to explore the adherence to these activities; Bonger et.al,(2018)⁽²⁹⁾ reported in their study that the majority of the study participants did not adhere to recommended dietary. Mohandas A et.al 2018⁽²⁸⁾ also found one third of the study participants had a maximum score of 7 for a general diet and only 1.8% for a specific diet. All these data were inconstant with Kushwaha, et.al 2016,⁽³⁰⁾ showed that three fourth of the patients adhered to a diet plan for at least five days a week with more than one third following it every day. The present study showed low mean score regarding committed general diet pre introduction of complication awareness, but on the other hand, there were significant improvement of mean scores post complication awareness with highly statistically differences.

As regards exercise, there was a statistically significant difference related practices half an hour of physical activity between pre and post complication awareness , while there is no significant change when assess patients participation in a specific exercise session such as swimming, walking, biking. This may be related to the specific exercise sessions associated with lifestyle plan and most of them did not change their plan may be related to work, or age specially the most percentage were had more than 40 years.

Overall self-care activities, this study showed that, pre complication awareness, diet was the best practiced activity while, blood glucose testing were the least frequent of self-care activities among participants, followed by foot care. This somewhat in parallel line with Bariyyah, et al.2018⁽³¹⁾, found in that the least frequent self-care activities was blood glucose testing. But the best practiced activity was foot care. While the findings of the current study were congruent with Ashur , 2016⁽³²⁾ who represented that the best-practiced self-care activity was diet care, while the least practiced activity was blood glucose testing. This may be explained by numerous factors or barriers as mentioned in Ong, et.al , 2014⁽³³⁾ study were; cost of test strips and needles, frustration related to high blood glucose reading, fear of needles and pain, lack of motivation and self-efficacy knowledge.

Regarding smoking, the current study shows no statistically significant differences between pre and post complications awareness. Smoking is a difficult habit to quit; in the current study, complications awareness was not enough to motivate smokers to quit, we thought smokers need specific program to help them to stop smoking.

Our study novel finding is, the mean of days per week that participants committed to self-care activities improved significantly in most of the scale items (8 out of 11 items), showing that diabetic complications awareness was effective method in increasing the orientation of self-care activities. Hegazi, et.al, 2015⁽²¹⁾, in created strategies to improve diabetes care in Egypt, one of these strategies related to incorporation self-management plans. This gives our paper work good weight whereas, our results cast a new light on one of the methods for improving self-care activities.

VI. Conclusion

This study concluded that, compliance or adherence to self-care activities has been found to be low. In addition, there was significantly better change in self-care activities achieved after diabetic complications awareness. The results now provide evidence that awareness was working as a red alarm for those patients.

VII. Recommendations

Every effort should be made to increase the perception of self-care activities among diabetics by introducing diabetic complications awareness in their teaching plan. There is a need for ongoing self-management education programs in all hospitals, for patients and caregivers and one-to-one counseling sessions for diabetic patients

Recommended for further studies, evaluate the adherence of self-care activities on a series long times.

Conflict of interest

The authors declare that they have no conflict of interests

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