Impact of Self-Care Education Program on the Knowledge of Patients with Type II Diabetes Mellitus in AL-Hill Diabetic Center

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Abstract
Diabetes mellitus (DM) is a major global source of morbidity and death, and is a major challenge for public health. Foot issues are a typical DM consequence that are a growing public health issue and a major contributor to hospitalisation, amputation, and death in diabetes patient.
Keywords: Type II Diabetes Mellitus, Education Program on the Knowledge, Patients

1. Introduction

Diabetes mellitus (DM) is a global public health issue that is the primary causes of mortality and morbidity. The global incidence of diabetes is quickly growing, and this rise in diabetes prevalence is anticipated to be accompanied by an increase in diabetes - related complications among people who have diabetes. Foot problems are a major consequence of diabetes; they are a serious public health problem and a main cause of hospitalizations, amputation, and death in people who have diabetes **(1,2).**
It is a serious emerging public health and clinical issue, causing about (5.9%) of all mortality globally. More than(23) million individuals in the United States are believed to have diabetic, with about a (1/3) of these cases going undiagnosed. Every year, roughly one million individuals are diagnosed with this disease (3).
Diabetes mellitus is a collection of metabolic disorders defined by high blood glucose levels (hyperglycemia) caused by insulin action, insulin production, or both. Diabetes' persistent hyperglycemia is linked to organ damage, failure, and malfunction over time, particularly in the nerve, eye, kidney, heart, and arteries. It is also the greatest cause of non-traumatic lower limb amputation, new instances of blindness, and renal failure in adult in the *United States* (4,5).
Diabetic foot is a frequent consequence of poorly managed diabetes, and it is one of the most incapacitating chronic problems. Diabetic foot ulcers are defined by an inability to self-heal in a timely and orderly way, and they develop as a result of the interplay of multiple contributing factors, the factors classified as internal factors ("neuropathy, peripheral vascular disease, and diabetes severity") and external factors (wound infections, callus development, and excessive pressure to the area) (6).
The prevalence and incidence of diabetic continue to rise as a result of sedentary lifestyles and an increase in obesity. Amputations of the lower limbs due to diabetic foot ulcers have also become widespread. With the globe confronting a T2DM pandemic, this global burden is anticipated to rise the need for more knowledge on how to avoid diabetic foot problems is necessary (7).

Objective of the Study

1- To evaluate the Impact of the Self-Care Preventive Instructional Program on the knowledge for patient with diabetes mellitus after construction and administration of the instructional sessions.
2- To find out the relationship between self – care knowledge and demographical variables of the study sample such as (age, gender, educational status).

2. Methodology

The Study Design

A quantitative study quasi-experimental design is used to determine the Impact of Self-Care Education Program on the Knowledge of Patients with Type II Diabetes Mellitus from the period between (20.sep.2020 to 8. june .2022) at diabetic center in AL-Hilla city.

The Study Sampling

Non-probability purposive sample drawn from the target population who satisfied particular requirements over a set period of time. (20) patients were chosen to evaluate the patient's requirements for this programme, and another ten individuals were chosen to participate in the pilot study, while (80) patients with Diabetic millets(DM) having the same inclusion criteria are divided into two groups: (40) patients act as experimental group (20) females and (20) males, and the other (40) patients are treated as control group (20) females and (20) males, who scheduled for frequent visits to the center for treatment and consultation.

Setting of the Study

Diabetic Center which establishes to receive patients in (2014), was the unique rich specialist selected as a setting in order to carry out this prospective study.

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The Study Form

In order to determine the Impact of Self-Care Education Program on the Knowledge of Patients with Type II Diabetes Mellitus a comprehensive review of related literature was performed to prepare the proper form to determine the effectiveness of the program content of the patient's knowledge.
Divided to three parts:

Part 1: Demographical characteristic of the patients

This part consists of (6) items state (age, gender, marital status, residence, working status and level educational).

Part 2: Clinical Data

The second part's contents involve (3) items regarding the patients' clinical data (Type of diabetes, Duration (years), Treatment.

Part 3: this part content two domains arranged as the following

First domain: foot care knowledge: This domain consists (6) items.
Second domain: this part content two domains foot self –care assessment, includes(5)items.
And self-care procedures include (14) items.

Scoring- Rating System

the first part of the questionnaire which consist the (6) items related to demographical characteristics of the sample and used Scoring- rating according to infiltration existing information and using individual interview to complete to collect all the questionnaire items, the second part of the questionnaire to evaluated the Clinical Data related to Diabetic Patients Foot which content (10) Yes/No questions prepared. The following patterns have been used to rank and score the items as: Yes=2 No=1
Three items to consider Part 3: Likert Scales is rated and scored using likert scales. (Section One) A foot care knowledge quiz with (6) questions. The following patterns have been used to rank and score the items:
I know=3 not sure=2 I do not know=1
and (Section Two) Foot Self-Care assessment that contents tow domains:
diabetic Foot care knowledge contents of (5) items:
I know=3 not sure=2 I do not know=1
And the second domains are Self-care procedures contents (14) items.
The items have been rated and scored according to the following patterns:
I always do= 3 Sometimes=2 I do not do=1

The Validity

Contents validity of the education program and the prepared form two version Arabic and English distributed among (20) experts who specialized in the field, their experience not less than (5) years.

Reliability

For obtaining the reliability of the prepared form internal consistency which shows how closely related to the set of items with distributed as a group, the computed calculation of the used questionnaire was recorded r = (0.90).

Ethical Considerations

For obtaining administrative and formal permission the following steps take place:

1- A study proposal, title, objectives and importance, were presented in special seminar which carried out by the Scientific Postgraduate Committee - University of Babylon - College of Nursing in 20/9/2020 in order to obtain formal agreement to start the study.
2- Special protocol paper was filled as a first step to obtain formal approval of the study by the Scientific Committee of adult nursing department (22-9-2021).
3- After confirming the educational program's quality and preparing a questionnaire for collection of data, three forms completed for the ethics committee to achieve formal agreement.
4- After obtaining agreement from the Presidency of the Health of Babylon- Training and Development Division Department- An official permission is obtaining from Marjan teaching hospital to utilise the / Dr. Wissam Abdel Hamid Al Salami Diabetes Center as a proper setting to facilitic data collection.
5- Oral permission obtained to start data collection from the director of the center after explaining the study purpose and objectives to secure the cooperation of the healthcare provider to facilitate data collection and presentation of the instructional program sessions.

Data Collection

To achieve the main objective of the study which directed to evaluate the impact of foot care instructional program on the knowledge and behavior of the diabetic patients foot self-care.the steps of the data collection and presentation of the program performed as the following:

1. Patient who participate select related to special criteria.
2. The total sample number divided to two groups (40) for the experimental group and the remain (40) patients assigned as a control group.
3. All the study sample (experimental and control group) full special foem as pre-test which consider as baseline test.
4. The control group complete the first post- test after two weeks of the pre-test, which the second post-test collected after two weeks later from the first post-test. No interventional activities received by the control group members they only receive their routine follow-up services and treatment.
5. The experimental group members (20) patients exposed to the pre-test at the same period of

the control group, educational session presented by them as a small group to maintain physical distance between person to person which should be not less than (2) meters and wearing masks, maintain the classroom ventilation and cleanliness. The participant receives three sessions which structured to cover all the information related to domains of self- care management. The patient attends the sessions according to them planed scheduled to the center, all sessions started in the early morning, usually begin at (8.30 am) and It takes about (45) minutes, because of the follow-up and treatment after take rest and patients complete all needs from center repack to study room to take other sessions that started from (10.30) and finished (11.15). When all sessions finished, they exposed to the first post-test, after (15) day they exposed to the second post-test.

6- All the facilities which needed by the patients during the educational session pen, paper notebooks, masks detergents drinking water were prepared previously to facilitate ongoing sessions.

The presentation of the educational program sessions takes about (30) days, which the total period for data collection takes about (63) days. It started from (3 January 2022 to 6 march 2022).

3. Results

In current chapter that results of analyzing data were done by statistical package for social science (SPSS). A total of (80) participants were enrolled in this study divided into two groups: intervention group (40) and control group (40).

Table 1: Distribution of the Study Sample Regarding to Their Demographical Characteristics

Variables		Groups				*P- Value*
		Intervention group (N=40)		Control (N=40)		
		F	%	F	%	
Age groups	20-30 years	7	17.5	7	17.5	0.99
	31-40 years	5	12.5	5	12.5	
	41-50 years	8	20	6	15	
	51-60 years	20	50	22	55	
Gender	male	20	50	20	50	1.00
	female	20	50	20	50	
Marital Status	Single	8	20	6	15	0.418
	married	28	70	30	75	
	Widowed	4	10	4	10	
Residency	Urban	18	45	23	57.5	0.99
	Rural	22	55	17	42.5	
Job	Student	1	2.5	2	5.0	0.99
	Employment	7	17.5	6	15.0	
	house wife	19	47.5	20	50.0	
	Free Job	10	25	11	27.5	
	retired	3	7.5	1	2.5	
Level of Education	Primary school graduated	10	25	11	27.5	0.859
	Intermediate School	14	35	11	27.5	
	preparatory school graduated	8	20	11	27.5	
	College or Institution	8	20	7	17.5	

Table 2: Distribution of the study sample related to Their Clinical Data

Variables		Groups				Total (N=80)	
		interventional (N=40)		Control (N=40)			
		F	%	F	%	F	%
Type of DM	Type I	7	17.5	6	11.3	13	16.25
	Type II	33	82.5	34	64.2	67	83.75
DM duration	1-10 years	28	70	23	57.5	51	63.75
	11-20 years	12	30	17	42.5	29	36.25
Treatment	Insulin use	35	87.5	28	52.8	63	78.75
	Decrease glucose medications	5	12.5	12	27.2	17	21.25

Table 3: Comparison between the Pre-test of both Groups

No.	Items	Groups		P value	Significance
		interventional group	Control group		
		Mean±SD	Mean±SD		
1	Patients' knowledge related to diabetic foots	1.64± 0.307	1.37± 0.635	0.532	N.S.
2	Patients' self-care knowledge related to diabetic foots	1.61± 0.249	1.57± 0.198		
3	Patients' self-care management	1.92± 0.411	1.87± 0.416		
General mean		1.72± 0.170	1.60± 0.251		
P value ≤ 0.05, N.S.= non-significant					

Table 4: Comparison between the interventional Group Knowledge Related to General Information of Diabetic Foot (Pre- Posttest)

No	Items	Interventional Group				Control Group			
		Pre-test	Post-test (1)	Post-test (2)	P	Pre-test	Post-test (1)	Post-test (2)	P
		Mean±SD	Mean±SD	Mean±SD		Mean±SD	Mean±SD	Mean±SD	
1	Do you know that sitting with one leg above the other leads to complications of diabetic foot.	1.18 ±0.501	3.00 ±0.000	2.73± 0.452	0.00	1.03 ±0.158	1.13 ±0.152	1.01 ±0.159	0.924
2	It is important to refrain from using open shoes or sandals for diabetic patients.	1.67 ±0.797	3.00 ±0.000	2.90± 0.304		1.58 ±0.712	1.62 ±0.722	1.50 ±0.709	
3	The shoes should be made of leather.	1.47 ±0.716	3.00 ±0.000	2.95± 0.221		1.30 ±0.608	1.37 ±0.618	1.36 ±0.610	
4	Diabetics use special socks of a certain type.	1.57 ±0.781	3.00 ±0.000	2.92± 0.267		1.45 ±0.714	1.40 ±0.714	1.39 ±0.714	
5	Smoking is one of the causes of poor blood circulation to the feet.	1.95 ±0.714	3.00 ±0.000	2.67± 0.474		1.98 ±0.660	1.98 ±0.660	1.98 ±0.660	
6	Is wearing shoes without socks a cause of sores.	2.00 ±0.679	3.00 ±0.000	2.70± 0.464		1.93 ±0.694	1.90 ±0.691	1.89 ±0.690	
General means		1.64± 0.307	3.00± 0.000	2.81± 0.124		1.37± 0.635	1.56± 0.329	1.52± 0.360	
P= 0.05 (*P*= probability, SD= Standard Deviation)									

Table 5: Comparison between the interventional Group Knowledge Related to Self –Management of Diabetic Foot (Pre- Posttest)

No	Items	interventional Group				Control Group			
		Pre-test	Post-test (1)	Post-test (2)	P	Pre-test	Post-test (1)	Post-test (2)	P
		Mean±SD	Mea±SD	Mea±SD		Mean±SD	Mean±SD	Mean±SD	
1	Washing the feet using warm water and soap daily is a necessary foot care.	1.97 ±0.357	1.97± 0.357	2.45± 0.504	0.00	2.18± 0.385	2.10 ±0.385	2.15 ±0.385	0.984
2	Avoiding scratching, especially between the toes, when relieving is a necessity of foot care.	2.05 ±0.552	2.05± 0.552	2.42± 0.781		1.92± 0.526	1.90 ±0.526	1.91 ±0.526	
3	Covering sores or blisters with bandages is an important procedure.	1.82 ±0.844	1.82± 0.844	2.93± 0.350		1.75 ±0.776	1.70 ±0.776	1.72 ±0.776	
4	Cutting the toenails in a straight line and not removing the sides of the nails is an appropriate procedure.	2.38 ±0.490	2.38± 0.490	2.85± 0.362		2.23 ±0.620	2.20 ±0.620	2.23 ±0.620	
5	Avoid walking barefoot indoors.	1.87 ±0.404	1.87± 0.404	2.52± 0.640		1.97 ±0.480	1.91 ±0.480	1.91 ±0.480	
6	One of the causes of infection for the feet is the use of open shoes and sandals.	2.62 ±0.586	2.62± 0.586	1.72± 0.716		2.63 ±0.586	2.61 ±0.586	2.65 ±0.586	
7	It is preferable not to wear new shoes for more than an hour.	1.17 ±0.385	1.17± 0.385	2.15± 0.622		1.13 ±0.335	1.12 ±0.335	1.13 ±0.335	
8	Looking inside the shoe before wearing is a daily routine that you do.	1.43 ±0.501	1.43± 0.501	2.98± 0.158		1.38 ±0.490	1.31 ±0.490	1.33 ±0.490	
9	The toe of the shoe should be about 1.5 cm longer than the toe.	1.35 ±0.580	1.35± 0.580	2.65± 0.533		1.23 ±0.530	1.23 ±0.530	1.23 ±0.530	
10	To ensure the temperature of the water used to wash the feet is one of the important steps, we usually use the elbow.	1.68 ±0.526	1.68± 0.526	2.80± 0.464		1.63 ±0.540	1.60± 0.540	1.63 ±0.540	
11	When exposed to scratches or ulcers of the foot (go) to the specialist doctor directly.	2.05 ±0.677	2.05± 0.677	2.75± 0.439		1.93 ±0.572	1.93± 0.572	1.92 ±0.572	
12	I treat scratches or ulcers when they occur at home by myself.	2.05 ±0.749	2.05± 0.749	2.78± 0.480		2.00 ±0.641	2.00 ±0.641	2.10 ±0.641	
13	It is necessary to refrain from walking or exercising when there is a scratch in the foot.	2.10 ±0.496	2.10± 0.496	2.98± 0.158		2.08 ±0.526	2.08 ±0.526	2.08 ±0.526	
14	For the purpose of removing dead skin (ossified), it is necessary to consult a specialist.	2.38± 0.540	2.38± 0.540	2.93± 0.267		2.20± 0.648	2.20 ± 0.648	2.23± 0.648	
General means		1.92± 0.411	1.92± 0.411	2.63± 0.360		1.87± 0.416	1.84± 0.417	1.87± 0.427	
P= 0.05 (*P*= probability, SD= Standard Deviation)									

4. Discussion

The Finding in table (1) this presented the study sample members distributed related to their demographical characteristics as, the higher percentage (50,0 %) and (55.0 %) in both group were with (51-60) years old, (70.0 %), (75.0 %) married, most of them were male in both group, with respect to their residency (57.5%) of the control group were lived in urban area and (55.0 %) of the interventional group were rural resident .

This finding goes a line with a study entitled as (16) (Sex Differences in Osteomyelitis of the Foot in Persons with Diabetes Mellitus: A Meta-Analysis) which revealed that, the average age of the diabetic patients who participate in the study were (65.2) years, (32.03 %) were male and (30.0 %) were female, (8) who carried out descriptive study to assess diabetic patients' knowledge find that most of the participant were married.

Table (1) revealed that most of the study sample in (both group) were house wife (50.0%) , (47,5%) respectively within the control and interventional group , regarding to the educational status most of the interventional group members 14 (35.0%) were with intermediate degree, while the control group members distributed equally between primary ,intermediate and preparatory degree 11 (27.5%) for every each other these finding not agree with study done by (9) that present the high percent of study sample were at primary school level.

Finding to table (2) showed that the results related to clinical characteristics, recorded (82.5%) of interventional group had DM type II and (64.2%) of control group the type of diabetes mellitus showing that total study sample with type 2 diabetes accounted for (83.75) this finding agree with study by (10) who mention ,that among 5640 patients with T1DM (255) developed a diabetic foot ulcer, corresponding to an incidence of (5.8 per 1000)patient years. Among 6953 patients with T2DM (310) developed a diabetic foot ulcer that mean the most of the sample the prevalence of diabetic foot ulcer higher in type 2 diabetes mellitus.

According to the duration of DM most of the study sample (1 to 10) years, distributed between interventional (70%) and control group (57.5%). Majority of them were treated with insulin in both group (87.5%) ,(52.8%), these finding supported by (11) who revealed that total of (121) participants have 8 ± 0.6 years as mean duration of the disease(DM). (12) revealed that high percent of study sample who diagnosed with diabetes mellitus treatment with insulin .

Finding of table (3) the levels of participants knowledge in their pre-test for both group related to self-care, indicated no significant differences, this results not consistent with study done by (13) that revealed foot care knowledge was significantly better in intervention vs. control in three of seven studies. In general, studies assessing secondary endpoints including quality of life and ulcer/amputation incidence tended not to identify significant clinical improvements.

Finding of table (4) this table demonstrates that the knowledge related to diabetic foot general information among the interventional group patients recorded significant differences in (P=0.5) between their (pre and posttest) after their participation in the educational sessions, while the no significant differences in (P =0.5)founded between the (pre- posttest) of the control group patients , This educational program on the patients knowledge, these results supported by the study carried out by (14)the finding present that the analysis of diabetic patients knowledge about their disease shows significant improvement after the educational program.

Results of table (5) this table demonstrates that the knowledge related to diabetic foot self – management among the interventional group patients recorded significant differences in (P=0.5) in their (pre-posttest) after their participation in the educational sessions, while the no significant differences in (P =0.5) between the (pre- posttest) of the control group patients , these finding supported by the results of (15) that present that educational program team members play a critical role in the education of patients and in identifying people at high risk of developing diabetes, diabetic foot management and daily self-care, cleaning feet and clipping toenails, suitable footwear for diabetics, and adherence to the diabetes team's recommendations were some of the primary points of patient education. Patient education alone does not seem to be beneficial in reducing the frequency of ulcers and amputations. The need for more study to establish the importance of diabetic foot care education is considerable.

5. Conclusion

According to the tabulated results, the researcher has been able to make the following conclusions:

- Most of the participants (both group)were within (51-60)years old ,married , equally distributed related to gender , Most of there were housewives , The interventional group members intermediate education level with rural residency.
- Most of the diabetic patients who participate in the study were with type two diabetic.
- As complication of diabetic foot most of the study sample in both groups suffer from crone.
- The pre-test indicated no significant differences related to the foot self-care for patients who participate in the study (both group), the results reverted low level of knowledge .
- Diabetic patients knowledge related to foot self-care (general care, assessment and management) recorded low level in the pretest and tow posttest for the control group, while significant changes recorded between the pretest of the interventional group member and their two post-test .which clearly pointed to the positive impact of the educational instructions upon the patients knowledge .
- Significant relationship founded between the foot self-care knowledge and diabetic patient's demographical variable such as (age, gender and educational level).

6. Recommendation

Use video tape in the waiting room which present foot self-care content to facilitating thinking and

problem solving to assist patients to engage effectively in the learning process.

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