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Effectiveness of an educational program on type 2 diabetic patients' knowledge regarding preventive measures of diabetic foot

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Abstract---Evaluate effectiveness of educational program on type 2 diabetic patients' knowledge regarding preventive measures of diabetic foot after applying educational program. Find out the relationship between of type 2 diabetic patients' knowledge regarding preventive measures of diabetic foot and sociodemographic characteristics. quasi-experimental (one control group and one study group) design study, has been utilized for the current study. Study carried out in Imam AL-Hussein Medical-City. A non -probability (purposive) sample of (60) adult patients who are diagnosed with type2 diabetes mellitus these patients have met the study criteria and they are divided into two groups, (30) patients are assigned to a study group was exposed to the educational program, and (30) patients as a control group was not exposed to the educational program. Result show that mean of score of Knowledge item in Pre-test (MS=1.33) in study group, and (MS=1.35) in control group. After application Program (Post-test) study group Knowledge improve to become (MS=1.84), While control group knowledge still (MS=1.37).Conclusions: Applied educational program effectively improved the level of knowledge of the study group participants based on the findings of the study.

Keywords---Educational Program, Type 2 Diabetes, Knowledge, Diabetic Foot.

Introduction

Diabetes mellitus is defined as a disorder marked by persistently high blood glucose levels and disturbances in carbohydrate, lipid, and protein metabolism (Mohammed et al., 2020). Diabetes is becoming an epidemic and endemic problem over the world, posing a social and economic burden. The elderly have a higher prevalence, as well as co-morbidities and mortality, than young people.

One of the most serious and expensive diabetes complications is diabetic foot (International Diabetes Federation.2019). In people with diabetes mellitus, a diabetic foot is a break in the skin of the foot that involves at least the epidermis and a part of the dermis. It is typically associated with peripheral arterial disease and/or neuropathy in the lower limbs (van et al., 2020). One of the most serious and expensive diabetes complications is diabetic foot. Diabetes patients are 10 to 20 times more likely than non-diabetics to have their lower limbs amputated. After a diabetic foot ulcer, the five-year relative mortality rate is 48%. This is significantly greater than the average cancer rate (International Diabetes Federation.2019).

Method

Design of the Study: A quasi-experimental (one control group and one study group) design study, has been utilized for the current study, to evaluate the effectiveness of an educational program on type 2 diabetic patients' knowledge regarding preventive measures of diabetic foot.

Setting of the Study: The present study has been carried out in Imam AL-Hussein Medical-City.

Sample of the study: A non –probability (purposive) sample of (60) adult patients who are diagnosed with type2 diabetes mellitus these patients have met the study criteria and they are divided into two groups, (30) patients are assigned to a study group was exposed to the educational program, and (30) patients as a control group was not exposed to the educational program.

The Selection of patient was according to the following criteria:

Inclusion Criteria: (patient is ≥ 18 years old).

Exclusion Criteria: (Patients who become severely ill, and already have diabetic foot or amputation.

Study Instrument: instruments were developed by analyzing the literature available and interviewing doctors, and the expert's points of view. The questionnaire consisted of three sections, as follows

Section I: Demographic Information Sheet: Including (age, gender, residency, education level, occupation, family history related to diabetes mellitus, duration of diabetes, and other chronic diseases).

Section II: Patients' Interpretation of Neuropathy (PIN) scales:

Section III: Foot Care Outcome Expectations Scale:

Statistical Analysis: Statistical package for social science (SPSS) version 23 was used for the analyzing data in the current study.

Administrative Arrangement: After getting the approval of the College of Nursing Baghdad University on the study, the researcher has presented a detailed description, including copying from questionnaire and protocol to the ministry of planning Central Organization of Statistics & Information Technology (COSIT) in order to facilitate the task of the researcher in the collection of the sample.

Ethical Considerations: Each participant has the right to agree or disagree with engagement with the study. Therefore, informed consent was offered before taking an agreement to participate in the study

Result

Table (1)
Distribution of the Samples by Demographic characteristics

<i>Demographic Variables</i>	<i>Study Group (N=30)</i>			<i>Control group (N= 30)</i>	
	<i>Groups</i>	<i>F.*</i>	<i>%</i>	<i>F.</i>	<i>%</i>
<i>Gender</i>	<i>Male</i>	14	46.7	17	56.7
	<i>Female</i>	16	53.3	13	43.3
<i>Age</i>	<i>30-39</i>	5	16.7	4	13.3
	<i>40-49</i>	13	43.3	14	46.7
	<i>50-59</i>	11	36.7	10	33.3
	<i>≥ 60</i>	1	3.3	2	6.7
	<i>MS±SD =2.53±1.456</i>			<i>MS±SD =2.30± 1.268</i>	
<i>Residence</i>	<i>Urban</i>	26	86.7	21	70.0
	<i>Rural</i>	4	13.3	9	30.0
<i>Occupation</i>	<i>Housewife</i>	16	53.3	13	43.3
	<i>Farmer</i>	3	10.0	1	3.3
	<i>Employee</i>	1	3.3	1	3.3
	<i>Gainer</i>	10	33.3	14	46.7
	<i>Retired</i>	0	0	1	3.3
<i>Duration of DM</i>	<i>>5 years</i>	10	33.3	12	40.0
	<i>5-10 years</i>	13	43.3	13	43.3
	<i>> 11 years</i>	7	23.3	5	16.7

F=frequency, %= percentage, number, MS = mean score, SD= standard deviation,

Table (1) show that highest percentage of participants in study group was females (53,3%) while in control group was males(56.7%). Highest percentage in both groups was within age group (40-19) Years, and living in Urban. Regarding Occupation, study group show that highest percentage (53.3%) Housewives, while control group (46%) of them was gainers. Both groups appear the same result regarding duration of DM, Where highest percentage in both groups were from Five to Ten Years.

Table (2)
Demonstration of patient' Knowledge about Preventive Measures of Diabetic Foot for Study and Control Groups before and after Applying the Program

Knowledge items	Pre-test period						Post-test period					
	Study Group			Control Group			Study Group			Control Group		
	M.S	SD	Ass.	M.S	SD	Ass	M.S	SD	Ass.	M.S	SD	Ass.
1. Controlling blood sugar level well can prevent foot ulcers from occurring.	1.77	.430	G	1.83	.379	G	2.00	.000	G	1.73	.450	G
2. Examining feet every day can prevent foot ulcers from occurring.	1.40	.498	F	1.43	.504	F	2.00	.000	G	1.50	.509	F
3. Checking inside shoes before putting them on can prevent foot ulcers from occurring.	1.00	.000	P	1.00	.000	P	1.93	.254	G	1.17	.379	P
4. Washing feet every day can prevent foot ulcers from occurring.	1.70	.466	G	1.67	.479	F	2.00	.000	G	1.40	.498	F
5. Testing water temperature with hand or elbow before washing feet can prevent foot ulcers from occurring.	1.00	.000	P	1.00	.000	P	1.90	.305	G	1.23	.430	P
6. Drying feet thoroughly after washing can prevent foot ulcers from occurring.	1.10	.305	P	1.13	.346	P	1.90	.305	G	1.53	.507	F
7. Putting moisturizing cream on feet can prevent foot ulcers from occurring.	1.73	.450	G	1.70	.466	G	1.80	.407	G	1.33	.479	P
8. Cutting toenails straight across can prevent foot ulcers from occurring.	1.00	.000	P	1.00	.000	P	1.77	.430	G	1.30	.466	P
9. Wearing proper footwear can preventing foot ulcers from occurring	1.47	.507	F	1.70	.466	G	1.67	.479	G	1.37	.490	F
10. Seeing the diabetic doctors regularly can prevent foot ulcers from occurring	1.53	.507	F	1.63	.490	F	1.77	.430	G	1.43	.504	F
11. Immediately informing the diabetic doctors about any changes in my feet (E.g. numb, muscle cramp, lost or reduced feeling, any lesions, corns, calluses) can prevent foot ulcers from occurring	1.73	.450	G	1.83	.379	G	1.77	.430	G	1.53	.507	F

12. Never walking outside in barefoot can prevent foot ulcers from occurring.	1.77	.430	G	1.80	.407	G	1.80	.407	G	1.30	.466	P
13. Never using chemical agents or blades to remove corns on my feet can prevent foot ulcers from occurring.	1.40	.498	F	1.27	.450	P	1.73	.450	G	1.23	.430	P
14. Never putting my feet near hot devices/ tools articles can prevent foot ulcers from occurring.	1.00	.000	P	1.00	.000	P	1.67	.479	G	1.37	.490	F
15. It's important to wash feet daily. Which of these options best describes how they should be washed?	1.20	.407	P	1.17	.379	P	1.83	.379	G	1.20	.407	P
16. Which of these tips are true to prevent diabetic foot?	1.00	.000	P	1.00	.000	P	1.93	.365	G	1.40	.498	F
17. Patient with diabetes can walk barefoot:	1.03	.183	P	1.03	.183	P	1.90	.305	G	1.33	.479	P
18. Apply a moisturizing cream on the following part can prevent diabetic foot ulcers	1.00	.000	P	1.00	.000	P	1.77	.430	G	1.23	.430	P
19. If you have diabetic neuropathy that is a risk factor for diabetic foot, you may feel	1.50	.509	F	1.40	.498	F	1.87	.346	G	1.40	.498	F
20. Which of the following measures does not help to prevent diabetes complications?	1.40	.498	F	1.47	.507	F	1.87	.346	G	1.43	.504	F
Total mean score	1.33	.306	P	1.35	.296	F	1.84	.327	G	1.37	.471	F

M.S.MS =Mean of M.S= mean score, SD=standard deviation, Assess. =Level of assessment, 1-1.33 = Poor (P), 1.34-1.66= Fair (F), 1.67-2= Good (G),)

Table (2) presented that the vast majority of items regarding preventive measures of diabetes foot knowledge of study and control groups before applying educational program have been insufficient level based on their mean of scores. Furthermore, this table showed that mean of mean score was poor level for both study and control groups respectively (1.31, 1.35). The findings indicated that the mean scores of knowledge, items of the study group were higher than knowledge items in control group after applying the educational program furthermore the total mean score clearly indicates that change where the study group accounted (1.84) which is assessed as good based on MMS while the control group accounted (1.37) as fair based on total mean score.

Table (3):
Association between Socio-Demographic and Level of Patient Knowledge toward Diabetic Foot

<i>Socio-demographic variables</i>	<i>Knowledge level</i>		
	<i>Contingency Coefficients</i>	<i>P value</i>	<i>Sig.*</i>
<i>Age groups</i>	.708	.456	NS
<i>Gender</i>	.576	.135	NS
<i>Residency</i>	.433	.733	NS
<i>Occupation</i>	.708	.454	NS
<i>Duration of diabetes</i>	.668	.236	NS

* Sig. = significance level ≤ 0.05 = significant

This table (3) demonstrated the relationship between socio-demographic characteristics and knowledge following the educational program's implementation. The findings indicated that sociodemographic and knowledge variables had no correlation at p value ≤ 0.05 .

Discussion

The result of table (1) show that ages group has participants ranging in age from 30 to 62 years. The sample mean age was (2.531.456 years for the study group and 2.301.268 years for the control group), which indicated that almost half of the participants (43.3 %) were in the age range (40-49), and more than a third (36.7 %) were in the age group (50-59). The highest percentage of participants in the control group was males(56.7%), in contrast to the study group, where the high percentage of participants was females, where females represented (53.3%) from the total sample.

Concerning the control group's high percent, 14 (46.7 %) of them were in the age group (40-49) and more than one quarter 10 (33.3%) of them were in the age group (50-59). Patients in both groups tend to live in urban areas, while reminders tended to live in rural places. Regarding occupation, more than half (53.3%vs 43.3%) were housewife, (33.3vs46.7), (10.0vs 3.3%), (3.3%vs3.3%), and (0.0%vs3.3%) were gainer, farmer, employee, and retired respectively. Regarding the duration of diabetes more than one-third of study participants have diabetes (43.3%vs43.3%) from 5-10 years.

The study findings are similar to other study findings that reported that the mean age was (71.49 ± 4.35) in the intervention group, and (70.93 ± 4.89) in the control group (Cicek, & Gökdoğan, 2021).

Also, these findings were completely consistent with study which show that there was Age ($P = 0.0411$), gender ($P = 0.47$), among the diabetic patients that indicate no difference in each characteristic between the intervention and control groups (Abdelhamid et al., 2015).

Another study reported that the average age of the study participants was 55.4 (12.9) years, with 56.4 % being female. However, the majority of patients (54.1%) had diabetes for less than ten years, were female (56.5%), lived in cities (62.1%), and were illiterate or had only a primary education (73.1%) (Pourkazemi et al., 2020).

The results of table(2) showed in Pre-test that both groups had low knowledge about Preventive Measures of Diabetic Foot ,but After applying the program, there was a noticeable improvement in the answers of the participants in the study group, and this indicates the success of the applied program. These findings are corroborated with study which reported that both mean foot examination scores and lack of self-care knowledge on foot care decreased over time in diabetic seniors. Between the 1st-2nd and 3rd-4th assessments, there was a greater fall in self-care knowledge scores in the Intervention Group than in the Control Group (Cicek et al., 2021).

Findings in the table (3) showed that there was no significant association between demographic characteristic and patient' Knowledge about Preventive Measures of Diabetic Foot. In related to demographic characteristics according to study reported that the occupation position was associated with a substantial increase in post-test knowledge scores but not with other variables such as gender, age, family history, or awareness of the disease (Sehrawatet al., 2018)

Conclusion

It can conclude that the applied educational program effectively improved the level of knowledge of the study group participants based on the findings of the study. There was no significant association between socio-demographic characteristics with general knowledge about preventive measures of diabetic foot ulcer variables.

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