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ORIGINAL ARTICLE

Effectiveness of an Educational Program on Type 2 Diabetic Patients' Knowledge Regarding Risk Factors of Diabetic Foot

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ABSTRACT

Background: Diabetes is a group of metabolic disorders characterized by high blood sugar caused by defects in insulin secretion, action, or both

Objectives: Evaluate effectiveness of educational program on type 2 diabetic patients' knowledge regarding Risk Factors of Diabetic Foot .Find out the relationship between of type 2 diabetic patients' knowledge regarding Risk Factors of Diabetic Foot

Methodology: 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.

Results: Result show that mean of score of Knowledge item in Pre-test (MS=1.31) in study group, and (MS=1.32) in control group. After application Program (Post-test) study group Knowledge improve to become (MS=1.85) , While control group knowledge still (MS=1.31).Conclusions: Applied educational program effectively improved the level of knowledge of the study group participants based on the findings of the study

Conclusion: The results of the needs assessment show that the level of knowledge about the risk factors for the diabetic foot of the patients was low.

Keyword: Educational Program, Type 2 Diabetes, Knowledge, Risk Factor, 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[1].

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[2].One of the most serious and expensive diabetes complications is diabetic foot[2]

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[3].

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[2]

METHODOLOGY

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: The instruments which consisted of (4) items and other structured knowledge questionnaire containing (11) questions were developed by researcher based on the existing resources to assess knowledge of patient regarding diabetic foot causes and risk factors.

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**.**

RESULTS

Table 1: Distribution and Comparison of the Samples by Socio-Demographic Features Of the Study and Control Groups

Demographic Variables	Study Group (N=30)			Control group (N= 30)		C.S. T test Value
	Groups	F.*	%	F.	%	
Gender	Male	14	46.7	17	56.7	0.142
	Female	16	53.3	13	43.3	NS
Age	30-39	5	16.7	4	13.3	.4720

	40-49	13	43.3	14	46.7	NS
	50-59	11	36.7	10	33.3	
	≥ 60	1	3.3	2	6.7	
	MS±SD = 2.53±1.456	MS±SD = 2.30± 1.268				
Educational level	Illiterate	8	26.7	6	20.0	0.627 NS
	Read & write	3	10.0	6	20.0	
	Primary school	10	33.3	9	30.0	
	Secondary school	8	26.7	5	16.7	
	University	1	3.3	4	13.3	
Residence	Urban	26	86.7	21	70.0	0.043 NS
	Rural	4	13.3	9	30.0	
Family history of diabetes	Yes	17	56.7	22	73.3	0.227 NS
	No	13	43.3	8	26.7	
Duration of DM	>5 years	10	33.3	12	40.0	0.076 NS
	5-10 years	13	43.3	13	43.3	
	> 11years	7	23.3	5	16.7	

F= frequency, %= percentage, number, MS = mean score, SD= standard deviation, C.S. = comparison of significance, NS=non-significant

Table 2: Demonstration of patient Knowledge of Risk factors for 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. Changes in foot shape can cause foot ulcers.	1.17	.379	P	1.13	.346	P	1.93	.254	G	1.13	.346	P
2. Ill-fitting shoes can cause foot ulcers	1.50	.509	F	1.70	.466	G	2.00	.000	G	1.67	.479	G
3. Excessive hard skin formation (callus) can cause foot ulcers.	1.67	.479	G	1.77	.430	G	2.00	.000	G	1.63	.490	F
4. Dry skin on the feet can cause foot ulcers	1.70	.466	G	1.67	.479	G	2.00	.000	G	1.40	.498	F
5. Which of the following conditions increase risk of developing foot ulcers?	1.07	.254	P	1.10	.305	P	1.90	.305	G	1.23	.430	P
6. One of the following diseases increase risk factors for development and progression of foot ulcer.	1.30	.466	P	1.27	.450	P	1.87	.346	G	1.30	.466	P
7. Foot ulcers that result from poor blood circulation, may be caused by	1.17	.379	P	1.10	.305	P	1.83	.379	G	1.17	.379	P
8. Why diabetic patients need to take extra care of foot?	1.20	.407	P	1.23	.430	P	1.90	.305	G	1.17	.379	P
9. What are diseases that related to macrovascular complications and may cause foot ulcer?	1 .30	.466	P	1.17	.379	P	1.77	.430	G	1.30	.466	P
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.
10. can increase risk to get diabetic foot	1.27	.450	P	1.13	.346	P	1.77	.430	G	1.10	.305	P
11. It is one of the risk factors for get diabetic foot	1.53	.507	F	1.33	.479	P	1.80	.407	G	1.33	.479	P
12. Which of the following factors that increase the risk of developing diabetic foot?	1.30	.466	P	1.27	.450	P	1.87	.346	G	1.30	.466	P
13. All of the following conditions are risk factors to increase chance get of diabetic foot, except	1.27	.450	P	1.47	.507	F	1.67	.479	G	1.40	.498	F
14.Many factors influence foot self-care in diabetic patients, except:	1.03	.183	P	1.10	.305	P	1.57	.504	F	1.23	.430	P
15. Which of the following measures contributes to an increased risk of developing diabetic foot?	1.30	.466	P	1.37	.490	F	1.97	.183	G	1.30	.466	P
Total mean score	1.31	.421	p	1.32	0.411	p	1.85	.291	G	1.31	438	P

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 (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, with primary school education, living in Urban, have family history with diabetes , and duration from (5-10) Years

Table (4:2) presented that the vast majority of items regarding contributing factors 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, 1.32). 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 (1.85) which is assessed as good based on MMS while the control group accounted (1.31) as poor based on total mean score.

This table (4-3) demonstrated the relationship between socio-demographic characteristics and knowledge following the educational program's implementation. The findings indicated that

socio-demographic and knowledge variables had no correlation at p value ≤ 0.05.

Table 4-3: Association between Socio-Demographic and Level of Patient Regarding Risk Factors of Diabetic Foot

Socio-demographic variables	Knowledge level		
	Contingency Coefficients	P value	Sig.*
Age groups	.708	.456	NS
Gender	.576	.135	NS
Residency	.433	.733	NS
Educational level	.772	.300	NS
Family history of diabetes	.506	.413	NS
Duration of diabetes	.668	.236	NS

* Sig. = significance level ≤ 0.05= significant

DISCUSSION

In the table (1), regarding age 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).

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). Three-quarters (33.3%) of participants in the study group had completed primary education, whereas a high percentage (30.0%) of participants in the control group had completed primary education, (26.7 percent vs. 20.0 percent), (10.0 percent vs. 20.0 percent), (26.7 percent vs. 16.7 percent), and (3.3 percent vs. 13.3 percent) were illiterate, read and write, secondary, and college graduates, respectively. Patients in both groups tend to live in urban areas, while reminders tended to live in rural places. The result shows the family history for diabetes mellitus, that the majority of the participants have a family history related to diabetes mellitus in the study group (56.7 %) and the control group (73.3 %) and reminder haven't family history of DM (43.3vs26.7) respectively. On the other hand, regarding the duration of diabetes that was more than one-third of study participants have diabetes (43.3%vs43.3%) from 5-10 years. Finally, these data indicated that no significant difference existed between the study and control groups. In addition to that, additionally, no statistically significant differences in age (P = 0.472), gender (P = 0.142), level of education (P = 0.627), occupation (P = 0.467), family history of diabetes (P = 0.227), duration of diabetes (P = 0.076), and residence (P = 0.043) were observed between the study and control groups at (p>0.05).

Consistently, these findings indicated that there were no statistically significant variations in socio-demographic factors between the two study groups, these findings are the same line with the outcomes of the study which reported that there was no statistically significant difference in socio-demographic factors between the intervention and control groups[4].

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[5].

Also, these findings were completely consistent with the finding of the study, which demonstrated that there was Age (P = 0. 0.411), gender (P = 0.47), educational level (P = 0.099), and smoking (P = 0.32) among the diabetic patients that indicate no difference in each characteristic between the intervention and control groups[6].

However, According to another study, the majority of the respondents in the control and intervention groups were between the ages of 40 and 59, and the majorities of the control and intervention group respondents are female, unemployed, and have completed elementary school. Furthermore, this result revealed that there was no significant difference in age (P = 0.791), gender (P = 0.576), educational level (P = 0.999), or occupation (P = 0.253) between the experimental and control groups[7].

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%) [8].

In terms of socio-demographic characteristics, the current study's findings are consistent with study done in Egypt, who conducted an experimental design study on (132) patients, with more than half having a family history of diabetes (55.9 percent & 57.8 percent, respectively) [4].

These findings were corroborated by a quasi-experimental study , which employed a quasi-experimental pre-posttest on two groups of participants. The majority of participants was female, aged > 58 years, attended elementary school, and had diabetes mellitus for more than 5 years[9].

The current study's showed that patients have a low level of knowledge towards risk factors before applying to the educational program in both groups , and after applying education program the knowledge of study group is become high level These findings are consistent with results obtained from many studies. Expecting patients to perform diabetic foot care without proper education or continuing support will result in poor outcomes. Researchers have noted baseline diabetic foot care knowledge at low levels 53.6% in study, and 54.3% in another study in some regions, and the rate of formal diabetes education is 51.7% in the United States[10 1112]. Other researchers report baseline knowledge as high as 70%12 and 76.6% [13 14].

These findings in the table (3) showed that there was no significant association between demographic and knowledge toward contributing factors and preventive measures of diabetic Foot ulcer variables (at p-value ≤ 0.05). In related to demographic characteristics according to study ,which 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[15].

According to another study that corroborated the research findings, there were significant relationships between knowledge score and gender, disease duration, occupation, place of residence, level of education, having DFU, having a history of hospitalization, amputation, and complication[16].

CONCLUSION

There are no significant differences were found between study and control samples regarding demographic variables. The results of the needs assessment show that the level of knowledge about the risk factors and preventive measures for the diabetic foot of the patients was low.

Recommendations: The Ministry of Health work to organize periodic educational campaigns for type 2 diabetic patients. These campaigns should increase knowledge on contributing factors for diabetic foot.

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