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Original Research

Effectiveness of Instructional Program on self-care for Clients with Diabetic Mellitus

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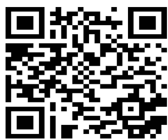

Abstract

Objectives: to evaluate the effect of an instructional program on self-care for clients with diabetes mellitus in popular medical clinics. To find out the association between self-care for clients with diabetes mellitus and their socio-demographic characteristics.

Methodology: The application of the quasi-experimental design has been done with the application of pre- and post-tests for both study and control groups to obtain the study goals toward the effect of an instructional program on clients's knowledge and activities toward self-care, sample of 80 diabetes mellitus patients was conducted. The study lasted from October 13, 2023, to May 30, 2022. A probability (randomized) sample was used to obtain representative and accurate data. The instrument of the study was constructed to achieve the desired study objectives. The instrument has been tested for validity and reliability.

Results: There are statistically significant differences between pretest and posttest levels of self-care knowledge and self-care activities in both the study and control groups. Results reflected that there were significant correlations between patients's self-care knowledge at the posttest level with their education level (p =.018), between patients' knowledge at the pretest level with income (p =.004), and between knowledge at the posttest level with chronic disease at p =.05.

Conclusions: Males are more frequently diagnosed with diabetes mellitus than females. The family history factor was clearly observed. There was an increase in knowledge level about DM among the participants after the application of the instructional program. Also, a difference was shown in self-care activities after using the instructional program.

Keywords: Diabetes Mellitus, Self-Care, Knowledge, Activities

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Introduction

Diabetes mellitus is one of the most common total diseases in the world, and it happens when the pancreas does not create sufficient insulin or when the body cannot viably utilize it. It is classified into two fundamental types: type 1 (already known as insulin-dependent) and type 2 (non-insulin-dependent). The predominance of diabetes is expanding, and in 2014, an estimated 9% of young adults and older adults had diabetes. Type 1 diabetes accounts for around 10% of diabetes cases, while type 2 diabetes accounts for 90% (1).

Diabetes is a serious condition caused by high glucose levels. A long-lasting disorder can lead to hypertension, kidney disorders, and cardiovascular

diseases (2). Diabetes mellitus (DM) is a global pandemic that includes numerous problems associated with altered glucose metabolic homeostasis and related frameworks (3).

In spite of the fact that diabetes can appear as an immune system illness of pancreatic islet cells (the essential component in type 1 diabetes), gestational diabetes, or is optional to prescriptions, by far most (90%–95%) of people with diabetes have type 2 diabetes mellitus (T2DM). Insulin obstruction and different irregularities found in metabolic disorders are ordinarily found in T2DM. The encumbrance of diabetes is developing universally, with an overall assessed prevalence of 2.8% in 2000 expected to rise to 4.4% by 2030. In the US alone, diabetes was liable for in excess of 70,000 passing and was the seventh driving reason for death in 2014 (3).

Diabetes mellitus is a vital health issue around the world, with an expanding number of cases. According to Universal estimations in 2021, roughly 537 million people around the world have DM, and the number is anticipated to rise each decade. DM can lead to persistent complications affecting almost all body organs (4). Diabetic gastroenteropathy, or gastroparesis, could be a common complication in diabetic patients with poor glycemic control that can extraordinarily impede the quality of life. The gastroenterological complaints in diabetes mellitus include stomach pain, sickness, tooting, heaving, acid reflux, constipation, loose bowels, and fecal incontinence (4).

The two primary types of DM are type I and type II; the second is the most common type, which accounts for 90–95% of all cases. The treatment of DM incorporates both progressing therapeutic care and proceeding non-pharmacological self-care by the diabetic patient (5). Cardiovascular disorders could be a major cause of death and inability among individuals with DM. Grown-ups with DM generally have a better predominance rate of CVD than grown-ups without it, and the hazard of CVD increases persistently with rising fasting plasma sugar levels, indeed some time recently coming to levels adequate for a DM determination (6).

Many researchers have characterized the connection between glycemic control and irresistible infections. A few expansive population-based studies have detailed solid affiliations between higher HbA1c and infections for both sort 1 and sort 2 diabetes. Prove recommends that better glycemic control might diminish disease hazards (7).

Progresses in the treatment of DM and, thusly, experiences have brought about the rise of proof of the presence of alternate lesser-recognized DM complexes. With declining mortality from vascular illness, which once represented over half of passing among individuals with DM, cancer and dementia presently are the main sources of death in individuals with DM in certain nations or districts (8). Moreover, studies have exhibited significant connections between DM and an expanded rate of comorbidities, including mental degradation, disability, emotional changes, obstructive apnea, and liver malfunction, and have refined how we might interpret the relationship between DM and infections (8).

Methodology:

Design of the Study:

A quasi-experimental design was used with the application of pre- and post-tests for both study and control groups. The study was conducted to evaluate the instructional program on self-care for clients with diabetes mellitus in popular medical clinics and to find out the association between self-care for clients with diabetes mellitus and their demographic characteristics.

The Setting of the Study:

The study was conducted in the popular medical clinics. ALswera a city. The researcher had chosen this place because this place had many diabetic patients who come to medical Clinics to receive medication and infesitcation.

Sample and Sampling of the Study:

A non- probability (convenient) sample was selected to obtain representative and accurate data. From (60) patients in their a period of recovering from diabetes mellitus type I &type II patients at medical clinics, (6) patients were excluded for the

pilot study. So, the total number of patients participating in the study was (54) patients in order to obtain accurate data and a representative sample.

Inclusion Criteria:

1. Diabetes mellitus type I& type II patients, Both male and female.

2. Adult patients 20-70 years of age.

3. Patients who were agree to participate in the present study.

4.Level of education for these patients at least read and write.

5- Being psychologically capable of answering a questionnaire by interview.

Instrument of the Study:

It was designed by the researcher after reviewing of related literature (suja a kareem) which consists of two parts.

Part1: consists about demographic characteristics, which consists of (ten) items including age, gender, educational level, marital status, occupation status, monthly income, Duration of disease, BMI, Smoking, Alcoholic (Appendix C).

Part 2: consists of (5) axes about Knowledge on the late complications for patients with diabetes mellitus type I & type II:

First axes: consists of (8) items about Knowledge to patients about the complications involving the cardiovascular system.

Second axes: consists of (9) items about Knowledge to patients about the complications involving the urinary system,

Third axes: consists of (8) items about Knowledge to patients about the complications involving the eye disease.

Fourth axes: consists of (10) items about Knowledge to patients about the complications involving the nervous system.

Five axes: consists of (9) items about Knowledge to patients about the complications involving the foot problems.

An instrument was constructed through the use of (3) level for the assessment of patient's knowledge. The rating score of the A-patient's Knowledge Regarding of late complications instrument was (3) for I know, (2) for uncertain and (1) for I don't know.

Validity and Reliability of Scale: Validity of Scale:

After obtaining the permission from sauja, the instrument tool and program was assessed by giving it to was presented to (12) experts evaluation in term of content validity.

Method of Data Collection:

A Pre-test for knowledge was completed before applying instructional program. The time required to answer the questionnaire test by self-report method was (10-15) minutes. A post-test for diabetic patients in the interventional group after applying an instructional program has been done.

Method of Statistical Analysis:

The statistical package for social sciences (SPSS) version 24.0 application of statistical analysis framework was used to analyze the results. The resulting research was analyzed and evaluated using the subsequence statistical data analysis technique.

Appendices

Table (1): The Distribution of the Study Samples according to their Demographic characteristics.

Variable	Groups	Study		Control	
		Freq.	%	Freq.	%
Age	39 and less	6	15	5	12.5
	40 – 49	13	32.5	14	35
	50 – 59	16	40	17	42.5

	60 and above	5	12.5	4	10
	Mean ± SD	48.1	10.33	49.6	8.2
Sex	**Male**	23	57.5	25	62.5
	Female	17	42.5	15	37.5
Level of education	**Illiterate**	13	32.5	16	40
	Elementary	13	32.5	8	20
	Secondary	6	15	10	25
	College	8	20	6	16
Marital status	**Single**	3	7.5	0	0
	Married	29	72.5	28	70
	Divorced	4	10	5	12.5
	Widowed	4	10	7	17.5
Occupation	**Governmental employee**	1	2.5	4	10
	Free work	20	50	20	50
	Retired	17	42.5	15	37.5
	Student	1	2.5	0	0
	Housewife	1	2.5	1	2.5
Monthly income	**Less than 500,000**	24	60	29	72.5
	500.000 – 900.000	16	40	11	27.5
Resident	**Urban**	20	50	19	47.5
	Rural	20	50	21	52.5

Freq. = frequency, % = percentages

Table (2): The Distribution of patients' history

Variable	**Groups**	**Study**		**Control**	
		Freq.	**%**	**Freq.**	**%**
How many years ago were you told that you have diabetes	**Mean ± SD**	10.47	4.9	10.17	5
How many years have you taken medication to control your diabetes	**Pills (Mean, SD)**	5.8	4.9	7	4.7
	Insulin (Mean, SD)	4.6	5.7	3.1	4.9
What kind of diabetes	**Pills**	8	20	6	15
	Insulin	18	45	21	52.5

medication do you take?	**Both**	14	35	13	32.5
Family history of DM	**No**	15	37.5	19	47.5
	Yes	25	62.5	21	52.5
If yes	**Father**	12	30	11	27.5
	Mother	10	25	6	15
	Sibling	3	7.5	4	10
Chronic disease	**No**	25	62.5	24	60
	Yes	15	37.5	16	40
If yes	**Heart disease**	3	7.5	1	2.5
	Hypertension	12	30	10	25
	Stroke	0	0	5	12.5

Freq. = frequency, % = percentages

Table (3): the distribution of Self - Care of Patients with Diabetes Mellitus Type II (study group)

List	Items	Results			
		pretest		posttest	
		Mean	Ass.	Mean	Ass.
1	The diabetes diet is a healthy diet for most people*	.77	H	1	H
2	A pound of chicken has more carbohydrate in it than a pound of potatoes	.6	M	.97	H
3	Unsweetened fruit juice raises blood sugar levels.	.3	L	.71	H
4	Consuming a can of diet soda helps treat low blood sugar levels	.72	H	.82	H
5	Glycosylated hemoglobin (HbA1c) is a test that Measures your average blood glucose level in the past week.	.75	H	.97	H
6	Diuresis test and blood test are both equally good for testing blood sugar level.	.85	H	1	H
7	A person who exercises regularly does not affect blood sugar levels.	.72	H	.93	H
8	The infection is likely to cause an increase in blood sugar levels.	.6	M	.87	H
9	Wearing a shoe size larger than usual helps prevent diabetic foot ulcers.	.3	L	.77	H

10	Numbness and tingling are symptoms of neuropathy.	.07	L	.69	H
11	Lung problems are often associated with diabetes.	.25	L	.81	H
12	Lung problems are often associated with diabetes.	.32	L	.86	H
13	Having regular checkups with your doctor will help you detect early signs of diabetes complications	.5	M	.79	H
14	Failure to get your diabetes checked leads to the development of diabetes complications.	.05	L	.63	M
Total score		.48	M	.7	H

Cut off point of knowledge score was .33. L = low (0 - .033), M = moderate (.034 - .66), H = high (.067 – 1)

Table (4): the distribution of Self - Care of Patients with Diabetes Mellitus Type II (control group)

List	Items	Results			
		pretest		posttest	
		Mean	Ass.	Mean	Ass.
1	The diabetes diet is a healthy diet for most people*	.8	H	.82	H
2	A pound of chicken has more carbohydrate in it than a pound of potatoes	.77	H	.72	H
3	Unsweetened fruit juice raises blood sugar levels.	.47	M	.37	M
4	Consuming a can of diet soda helps treat low blood sugar levels	.82	H	.77	M
5	Glycosylated hemoglobin (HbA1c) is a test that Measures your average blood glucose level in the past week.	.6	M	.67	H
6	Diuresis test and blood test are both equally good for testing blood sugar level.	.8	H	.75	H
7	A person who exercises regularly does not affect blood sugar levels.	.8	H	.72	H
8	The infection is likely to cause an increase in blood sugar levels.	.52	M	.55	M
9	Wearing a shoe size larger than usual helps prevent diabetic foot ulcers.	.5	M	.47	M
10	Numbness and tingling are symptoms of neuropathy.	.1	L	.1	L
11	Lung problems are often associated with diabetes.	.37	M	.47	M

12	Lung problems are often associated with diabetes.	.22	L	.57	M
13	Having regular checkups with your doctor will help you detect early signs of diabetes complications	.3	L	.25	L
14	Failure to get your diabetes checked leads to the development of diabetes complications.	.17	L	.15	L
Total score		.51	M	.53	M

Cut off point of knowledge score was .33. L = low (0 - .033), M = moderate (.034 - .66), H = high (.067 – 1)

Table (5): correlation between demographic characteristics of the study group with their self-care knowledge

Demographic characteristics		qtotal	qptotal
age	Pearson Correlation	-.093	-.016
	Sig. (2-tailed)	.567	.921
	N	40	40
sex	Pearson Correlation	-.136	-.111
	Sig. (2-tailed)	.403	.495
	N	40	40
Education level	Pearson Correlation	-.001	.373*
	Sig. (2-tailed)	.996	.018
	N	40	40
Marital status	Pearson Correlation	-.100	.214
	Sig. (2-tailed)	.538	.185
	N	40	40
income	Pearson Correlation	-.442**	-.048
	Sig. (2-tailed)	.004	.766
	N	40	40
job	Pearson Correlation	.259	.082
	Sig. (2-tailed)	.107	.615
	N	40	40
residence	Pearson Correlation	-.120	-.020
	Sig. (2-tailed)	.459	.903
	N	40	40
Duration of DM	Pearson Correlation	.042	-.097
	Sig. (2-tailed)	.797	.552
	N	40	40
Type of DM	Pearson Correlation	-.165	.151
	Sig. (2-tailed)	.310	.351
	N	40	40
Duration of insulin use	Pearson Correlation	.246	-.037
	Sig. (2-tailed)	.126	.819
	N	40	40
Duration of drug use	Pearson Correlation	-.247	-.053
	Sig. (2-tailed)	.125	.744
	N	40	40
Family history of DM	Pearson Correlation	.314*	.066
	Sig. (2-tailed)	.048	.684
	N	40	40
Chronic Disease	Pearson Correlation	-.121	-.312

	Sig. (2-tailed)	.458	.050
	N	40	40
Type of chronic disease	Pearson Correlation	-.078	-.296
	Sig. (2-tailed)	.633	.064
	N	40	40

Results:

(Table 1) shows that the mean age of the study group was 48.1 and that of the control group was 49.6. In addition, the highest percent of the study group (57.5%) were males, and 62.5 percent of the control group were also males. The study group had a study group had a significant level of education; 32.5 percent were illiterate, and 40 percent of the control group were also illiterate. 72.5 percent of the study group were married, and 70 percent of the control group were married. About the same level of study and control groups (50 percent) have free work. Related to income, 60 percent of the study group and 72.5 percent of the control group have less than 500.000 Iraqi dinars per month. Approximately the same percent of the sample lived in urban and rural areas for both groups.

(Table 2) shows that the mean year that the patients told us they had DM was 10.47 years for the study group and 10.17 years for the control group. In addition, the mean years of using diabetic pills were 5.8 for the study group and 4.7 years for the control group. While the mean year of using insulin therapy was 4.6 years for the study group and 3.1 years for the control group, The highest percent of people using diabetic medications in recent times was insulin for both groups, at 35 percent in the study group and 52.5 percent in the control group. 62.5 percent of the study group and 52.5 percent of the control group have a family history of DM, which mostly came from their fathers. In addition, 37.5 percent of the study group and 40 percent of the control group have other chronic diseases, most commonly heart disease and hypertension.

(Table 3) presented the distribution of patients' knowledge about self-care in the study group. Results reflected significant shifts in the mean of responses from a low and moderate level in pretest time to a high level of knowledge at posttest time.

(Table 4) presents the correlation between the study group's demographics and their self-care, and the results reflect that there were significant correlations between patients's self-care knowledge at the posttest level with their education level (p =.018, between patients' knowledge at the pretest level with income (p =.004), and between knowledge at the posttest level with chronic disease (p =.05).

Discussion:

The results in (Table 1) show that the mean age was 48–49 years. More than half of the sample were males in both the study and control groups, and the majority of them were married. Approximately one-third of the sample was illiterate in both groups. The same percentage of the study and control groups had free work. Sixty to seventy percent of the study group and the control group sample have less than 500.000 Iraqi dinars per month in income and live in urban and rural areas. Participants in a recent study on the treatment of diabetes mellitus were 56 years old on average. Approximately two-thirds were female, with about a half of the sample married. About half of the sample had completed their education and retired (9,10,11,12). Otherwise, another study that corresponds with the current study's findings shows that half of the sample was male, with nearly two-thirds of those over the age of 55, and the bulk of them were married urban inhabitants. The majority of the sample had just primary education, and two-thirds were unemployed. The higher percentage of the sample was low income, ranging between 150,000 and 300,000 IQ (13,14,15,16).

Based on the findings shown in (Table 2) the average duration of DM diagnosis for the patients was roughly 10 years. Furthermore, the average duration for taking diabetes pills was six years. The study group had insulin therapy for five years, whereas the control group received it for three

years. Insulin has recently been the most commonly prescribed treatment for both types of diabetes. Approximately fifty to sixty percent of the sample population had a familial history of DM, predominantly inherited from their fathers. Furthermore, up to one third of the sample population suffers from various chronic diseases, with heart disorders and hypertension being the most prevalent. These findings show that most DM patients neglect their treatments for years after diagnosis. Although they have a family history of the disease and know the complications of untreated.

Half of sample were diagnosed with diabetes mellitus and others with hypertension (17). A recent study finding shows that the highest percentage two-fifth have been living with DM for (2-5) years of experience in diabetes. most of patients in a previous study were have duration with diabetes from (6-10) years (18, 19). Other study reveals there is a significant association between duration of the disease and diabetic foot occurrence (20). The less duration of having DM associated with better Foot Care Self-Efficacy (21). (Table 3) presents an increase in patients' knowledge about self-care in the study group. (Table 4) shows a fixed patient's knowledge about self-care in the control group in both the pre- and post-tests. The statistical findings emphasized the educational program's effect on self-care for diabetes mellitus patients after application. Which accepts the alternative hypothesis. Using the instructional program for patients with diabetes mellitus enhances their knowledge, which in turn affects their practices and activities. This improvement included knowledge about the effects of unsweetened fruit juice, the importance of wearing larger shoes, the symptoms of neuropathy, lung problems, and the impact of diabetes checkups on the status of DM patients.

A study conducted in Al-Basra city reveals that participants' knowledge was enhanced due to the program, which was reflected in their answers to a post-test. The researchers explain that before the instructional program, patients in the target sample didn't have adequate sessions, despite the fact that the fact that the diabetes center staff provided them with information but maybe didn't include all patients (13,26).

The results of previous study revealed that most of the diabetic elderly are lower knowledge to dietary management (23). While other study shows that about two-thirds of people knew the possible causes of diabetes. Among these causes were obesity, stress, excess sugar in food, bad ecology, and others. Also, most of the participants were able to name the symptoms of diabetes, like dry mouth, thirst, and increased blood glucose levels. Participants were unsure of the disease's cause, symptoms, and side effects. The study aimed to determine if respondents knew how to improve their blood sugar levels. The majority believed that a healthy diet could improve blood sugar levels, while half knew that regular exercise could also improve blood sugar levels. Weight control was also considered beneficial, with about one-third believing that medication could improve blood sugar levels. The study found that the majority of respondents had excellent knowledge of lifestyle modification practices recommended for people with diabetes mellitus (DM). Healthcare personnel, the media, relatives, and friends were the sources of information. The majority understood that lifestyle modification practices included both healthy dietary habits and regular physical exercise. (10). Despite obstacles pertaining to the acquisition of diabetic knowledge, such as limited resources and restricted access to pertinent information, nurses should prioritize investigating patients' perceptions regarding their drugs and advocating for a precise understanding of cardiac medications. This should also encompass an emphasis on the capacity to independently administer and replenish medications while considering the unique circumstances and environments of individuals and localities, such as the geopolitical landscape of the Middle East (27,28).

The (Table 5) presented the correlation between the study group's demographics and their self-care, and the results reflected that there were significant correlations between patients' self-care knowledge at the posttest level with their education level, between patients' knowledge at the pretest level with income, and between knowledge at the

posttest level with chronic disease. These findings reflect the effect of education level on self-care. Whereas, educated patients have more capability to get care information. Also, high income improves accessibility to different sources of information about the disease and its care. Patients with chronic diseases tend to seek complications to prevent them.

A similar study found that there was no association between knowledge score and socio-demographic variables like age, educational qualification, family history, and diagnosis. However, there was an association between knowledge and gender (15).

A previous study revealed an association between nutritional knowledge and overall dietary compliance. Statistically, if a respondent had good nutritional knowledge, they were more likely to comply with dietary recommendations than those who had poor nutritional knowledge. Also, nutritional knowledge was associated with the consumption of complex carbohydrates, a low-fat diet, and controlled portions of proteins (23). DM patients have a high risk of obstructive sleep apnea specially who suffered from snoring, as well as they feeling tired when waking up (24). Other studies found that there was no significant relationship between gender and knowledge score. Age had a nonsignificant, weak, negative correlation with the total knowledge score. There is no significant relationship between age and knowledge grade. Other demographics were insignificant (16). As well as, no significant association between demographic and knowledge toward contributing factors and preventive measures of diabetic Foot ulcer variables (25).

Having good knowledge about the complications was seen to be affected by different factors, although male gender, higher educational status, having a job, and receiving diabetic education are significantly associated with having good knowledge about the complications. Findings revealed that only being married, having a job, and receiving diabetic education have two times better knowledge about the disease complications (14). In the post-test, the overall mean knowledge score indicated that DM patients had very good knowledge. It was evident that there was a significant gain in the mean knowledge score (15).

Conclusion

Based on our findings from the present study, it can be concluded that:

1- Males are more frequently diagnosed with diabetes mellitus than females, especially in the age group older than 45. The family history factor was clearly observed.

2- A gap has been found between the onset of the diabetes mellitus diagnosis and initiating treatment. The treatment options include DM control pills followed by insulin therapy.

3- There was an increase in knowledge level about DM among the participants after the application of the instructional program. Also, a difference was shown in self-care activities after using the instructional program.

4- The statistical findings emphasized the instructional program's effect on self-care for diabetes mellitus patients after application. Which accepts the alternative hypothesis.

5- A notable association has been shown between patients' level of education and their knowledge of self-care. Additionally, there was a correlation between pretest knowledge and income. There is a correlation between the degree of knowledge in the posttest stage and chronic illness.

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