

The Effectiveness of the Diabetes Education Program on the Attitudes of Type 2 Diabetes Patients in Chamchamal City

Hawar Mardan Mohammed^{1*}, Samir Yonis Lafi¹

Department of Nursing, University of Raparin, Kurdistan Regional Government, Iraq

Corresponding author:

Hawar Mardan Mohammed
Department of Nursing,
University of Raparin,
Kurdistan Regional Government, Iraq,
E-mail: Hawar.mardan84@gmail.com

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Abstract

Type 2 Diabetes Mellitus is a chronic condition increased blood glucose levels, increased hunger, excessive thirst, and poly-urea. The study analyzes the effect of attitudes on diabetes control in patients with type 2 diabetes. Data was collected from 7-july 2020 until 7-November 2020, sample was obtained. One hundred twenty patients volunteered to participate in the trial. Attitude behavior evaluation questionnaire was used to determine Attitude scores. A correlation coefficient test and a t-test with a P-value of 0.05 for an alpha level of significance were applied to explore the sorts of the effectiveness of the Attitude with diabetes control. At a P-value of 0.01, the aggregate data reveal a positive link between Attitude behavior and disease control.

Keywords: Type 2 diabetes mellitus; Diabetes and attitude; Glycemic management; Complications of diabetes mellitus; Attitude management

Introduction

Diabetes Mellitus (DM) is a serious metabolic disorder that is marked by high levels of glucose in the blood. Type 2 diabetes is caused by not enough insulin or by cells that are resistant to insulin. It can hurt the organs of the human body, especially if glycemic control is not kept in check [1]. In addition to this, it has been linked to a number of problems, including cardiovascular illnesses, retinopathy, nephropathy, and neuropathy, all of which can result in permanent impairment or death [2].

Recent research conducted by the World Health Organization (WHO) found that diabetes affects more than 422 million people worldwide, the majority of whom live in low- and middle-income countries. According to diabetes mellitus WHO demitarian's research (no date), the disease is responsible for an estimated 1.6 million fatalities per year. There were 108 million individuals diagnosed with diabetes in 1980, but by 2014 that figure has increased to 422 million [3].

According to the International Diabetes Federation (IDF), the number of individuals throughout the world who were living with diabetes in the year 2000 was estimated to be 151 million. By 2009, its population had increased by 88 percent, reaching 285 million. At the present time, 9.3% of individuals aged 20 years–79 years are afflicted by the illness. Currently, there are 463 million people living with diabetes, and it is anticipated that this figure will grow to 578 million by the year 2030 [4].

Diabetes mellitus can be broken down into two primary subtypes: Type one, which is more common in children and young adults, and type two, which accounts for the vast majority of cases of the disease and is more common in people who are middle-aged or older. Both types can be found all over the world. It is possible to develop diabetes mellitus type 2 if the cells and tissues of the body become insulin-resistant, or if the pancreas does not produce enough insulin by its islets.

There has been a significant rise in the number of people suffering with diabetes all over the world. Despite this, diabetes care is generally inadequate around the world, particularly among less developed countries [5].

Diabetes patients need to be cared for in a contentious way if they are to avoid long-term problems. On the other hand, sustainability is one of the hardest things for health care facilities to do when they want to give patients full care. Because of this, the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) said that diabetic patients should be a part of the care plan to make it last. To get the best care, people with diabetes need to make changes to their lives, such as keeping track of their blood glucose level, eating right, getting health education, taking care of their feet, exercising regularly, and getting enough physical activity [6,7].

The study aims to determine the association between type 2 diabetes patients' personality practices and glycemic management. It also aims to examine participants' attitude behavior and the relationship between demographics and clinical factors. Patients can be trained on effective management such as footcare, dietary modification, medication adherence, physical activity, and exercise to improve FBG, HbA1c, and lipid profiles.

In addition, patients can lose weight, increase their Body Mass Index (BMI), and enhance their general health in order to overcome diabetic issues [8].

The American Diabetes Association (ADA) says that diabetes

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self-care is a patient's attitude that aims to manage the disease, control blood sugar, reduce long-term complications, and prevent short-term problems like hypoglycemia, diabetic ketoacidosis, and Hyperosmolar hyperglycemic state [9].

Attitude management is a key approach for glycemic control in T2DM patients. This helps individuals worry about their sickness. This chronic condition requires rigorous treatment to reduce acute and chronic consequences. Literature shows that self-care can lessen chronic and acute problems.

In diabetic patients, maintaining a healthy blood glucose level considerably lowers the chance of developing microvascular problems such as eye and kidney disorders, as well as sensory impairment. As a consequence, microvascular problems can result in conditions such as cataracts, glaucoma, renal failure, and the amputation of lower limbs. It also suggests that maintaining a healthy blood glucose level lowers the chance of developing macrovascular problems like heart attacks and strokes [6,10].

Methodology

Study design

Cross-sectional research was conducted with 120 patients from Diabetes and chronic disease control in Chamchamal, Iraq.

Population and sample size

The sample size was calculated using the Raosoft sample size calculator. After taking into account the 2000 active cases (P.2000) at the diabetes center as well as the parameters $\alpha=0.05$ and $CI=95\%$, the sample size of 120 patients was determined.

Sampling and data collection

A questionnaire about attitudes was designed in order to evaluate participants' attitudes and behaviors. The questionnaire is divided into three primary sections: socio-demographic factors, clinical parameters, and attitude behaviors evaluation. Each section uses a Likert scale to rate the respondent's degree of agreement with each statement. The participants' total replies were computed on a scale from 1 to 30, with Always=1, Sometimes=2, and Never=3; the attitude score was determined for each participant based on their responses to sets of 30 questions. After determining that the Likert questionnaire had a reliability of 0.92 based on the results of the Cronbach's Alpha test, the items were presented to all of the patients in the same order. After taking the patients' height and weight into account, the Body Mass Index (BMI) was calculated for each of them using the formula $BMI=kg/m^2$. This was done after recording the patients' height and weight.

Measures of the clinical parameters

Normal blood glucose levels fluctuate depending on the timing of the test. For instance, blood glucose can be checked at any time, but Fasting Plasma Glucose (FBG) must be taken 8 hours after the previous meal. Random Blood Glucose values between 80 and 199 mg/dl are considered normal or under control, whereas FBG values between 60 mg/dl and 125 mg/dl are considered normal or under control.

The normal value for HbA1c is 5.7%; if the level is between

5.7% and 6.4%, it suggests pre-diabetes, and HbA1C 6.5% implies diabetes mellitus. HbA1c is also important for care planning and follow-up with patients. The goal level of HbA1c for regulating blood glucose in diabetic patients is below 7%; nonetheless, a HbA1c level of 7 percent suggests inadequate glycemic management [11,12].

The Body Mass Index was classified according to the following WHO criteria for measuring BMI: Below 18.5 is regarded underweight, 18.5-24.9 is considered normal weight, 25.0-29.9 is considered pre-obesity, 30.0-34.9 is Obesity class I, 35.0-39.9 is Obesity class II, and beyond 40 is called Obesity class III.

Inclusion and exclusion

Adult patients with Diabetes Mellitus Type Two (T2DM) and those who gave their informed agreement to participate in the study met the requirements for inclusion in this research. Patients with type one diabetes, pregnant women with type two diabetes, patients with liver failure, patients with disabilities or special needs, and patients with gestational diabetes were not included.

Ethical considerations

This study was shown to the University of Raparin's College of Nursing's ethics committee. The nursing colleges' ethical committees made sure that everything was acceptable from a moral perspective. Participants in the study were told what the study was about and what its goals were. The patients gave their verbal and written informed consent in Kurdish. They were also told what could happen as a result of the study. Also, patients' rights, privacy, and data security are given a lot of thought.

Results

In this particular study, SPSS version 25 was utilized for the purpose of conducting data analysis, through which socio-demographic, clinical, characteristics, as well as attitudes, were investigated. The findings are displayed in Figure 1 data descriptive for demographics data (Figure 2).

A correlation matrix comparing Pre and Post with relation to the demographic data Correlation matrix about Pearson's r, between socio-demographic variables and the satisfaction about the simulation experience (In this Table 1 are reported only variable with a correlation at least significant at a p-value<0.05).

Effectiveness of Systematic Diabetes education program on Attitude The mean attitude score of the participants in the pre-test was 2.219 for males and 2.201 for females. The mean attitude score of the participants in the post-test was 1.353 for males and 1.308 for females. This was a non-significant decrease from the pre-test (Table 2).

When the means of attitudes from the pre-test and the post-test were compared, there was no significant difference between them.

The results of the Mann-Whitney U-Test for both the pre-test and the post-test divided by gender

Table 3 shows the results of the Mann-Whitney U-Test conducted to determine whether there was any significant difference between the results of the pre-test and those of the

		Age	Gender	level of education	Family member has Diabetes mellitus	Marital status	Occupation	Monthly income	Residential area	Duration of diabetes mellitus	Treatment method	Body Mass Index (BMI)	Do you smoke?	how many cigars per day?	For how many years have you smoked	How long ago did you quit smoking	Do you drink alcohol regularly? Or have you ever drunk alcohol?	For how many years have you been drinking alcohol?	Source of your information about disease
Statistics		Scale	Nominal	Ordinal	Scale	Nominal	Nominal	Nominal	Nominal	Ordinal	Nominal	Ordinal	Nominal	Ordinal	Scale	Scale	Nominal	Scale	Nominal
n	60	60	60	60	60	60	60	60	60	60	60	60	60	10	13	5	60	1	60
Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	50	47	55	0	59	0
Mean		58.070		1.680	2.000										19.230	7.600			5.000
Std. Error of Mean		1.331		0.120	0.238										2.254	1.503			
Median		57.5		1	2					1		3		3	15	10			5
Mode		55	1	1	0	2	5	3	1	1	1	3	2	3	15	10	2	5	1
Std. Deviation		10.309		0.930	1.841										8.126	3.362			
Variance		106.267		0.864	3.390										66.026	11.300			
Skewness		0.273		1.470	0.657										1.392	-0.806			
Std. Error of Skewness		0.309		0.309	0.309										0.616	0.913			
Kurtosis		-0.398		2.043	-0.148										2.573	-2.195			
Std. Error of Kurtosis		0.608		0.608	0.608										1.191	2.000			
Range		42	1	4	7	4	5	2	1	2	1	5	1	1	30	7	1	0	3
Minimum		39	1	1	0	1	1	1	1	1	1	1	1	2	10	3	1	5	1
Maximum		81	2	5	7	5	6	3	2	3	2	6	2	3	40	10	2	5	4
Percentiles	25	50.25		1	0					1		3		3	15	4			5
	50	57.5		1	2					1		3		3	15	10			5
	75	67		2	3					1.75		4		3	25	10			5

Figure 1: Shows the participants' sociodemographic and clinical information.

Correlations		Mean Pre	Mean Post
Age	Spearman Correlation	0.378**	-0.048
	P-Value	0.003	0.716
	N	60	60
level of education	Spearman Correlation	-0.268*	0.069
	P-Value	0.039	0.598
	N	60	60
Family member has Diabetes mellitus	Spearman Correlation	-0.069	0.334**
	P-Value	0.598	0.009
	N	60	60
Duration of diabetes mellitus	Spearman Correlation	0.049	0.034
	P-Value	0.712	0.795
	N	60	60
Body Mass Index (BMI)	Spearman Correlation	-0.072	-0.044
	P-Value	0.587	0.739
	N	60	60
how many cigars per day?	Spearman Correlation	0.291	0.541
	P-Value	0.415	0.107
	N	10	10
For how many years have you smoked	Spearman Correlation	0.16	0.243
	P-Value	0.601	0.424
	N	13	13
How long ago did you quit smoking	Spearman Correlation	0.335	0.335
	P-Value	0.581	0.581
	N	5	5

Figure 2: Correlation matrix between Pre and Post with the social demography data.

post-test by gender. A statistically non-significant difference was found in the post-test results in terms of gender.

Table 4 presents the findings of a Wilcoxon signed-rank test

that compared the participants' attitudes before and after the experiment. The results demonstrated a very significant difference between the two periods. The findings of the analysis indicate that there is a change in performance that is statistically

Table 1: compare means for Attitude by U-test (pre and post) by gender.

	Gender	N	Mean	Std. Deviation	Mann-Whitney U	P-Value
Mean Pre	Male	34	2.219	0.356	424.5	0.794 (NS) †
	Female	26	2.201	0.357		
Mean Post	Male	34	1.353	0.143	370	0.280 (NS) †
	Female	26	1.308	0.112		

Table 2: compare means for ATTITUDE by U-test (pre and post) by gender.

	Gender	N	Mean	Std. Deviation	Mann-Whitney U	P-Value
Mean Pre	Male	34	2.219	0.356	424.5	0.794 (NS) †
	Female	26	2.201	0.357		
Mean Post	Male	34	1.353	0.143	370	0.280 (NS) †

Table 3: Z (Wilcoxon Signed Ranks Test) for compare between pre and post.

	Mean	N	Std. Deviation	Z (Wilcoxon Signed Ranks Test)	P-Value
Mean Pre	2.2111	60	0.35344	-6.621	0
Mean Post	1.3334	60	0.13146		(HS)

Table 4: compare means for ATTITUDE by H-test (pre and post) by level of education.

	Level of education	N	Mean	Std. Deviation	Kruskal-Wallis H	P-Value
Mean Pre	Illiterate	33	2.307	0.222	7.167	0.127 (NS) †
	Primary	17	2.222	0.304		
	Secondary	7	1.943	0.647		
	Institute graduate	2	1.933	0.094		
	collage and post graduate	1	1.3	0		
	Total	60	2.211	0.353		
Mean Post	Illiterate	33	1.317	0.12	2.825	0.588 (NS) †
	Primary	17	1.386	0.155		
	Secondary	7	1.296	0.08		
	Institute graduate	2	1.317	0.259		
	collage and post graduate	1	1.267	0		
	Total	60	1.333	0.131		

significant between the pre-experiment and post-experiment scores of the participants who took part in the research.

Discussion

The median age of the 60 patients with type 2 diabetes was 57.5 years. Hence, the study population consisted of adult and elderly patients (Table 2).

According to the findings of a multi-center study conducted in Brazil about the prevalence of diabetes mellitus, the frequency of the condition steadily increases after the age of 50. The significance of this was highlighted in the same study. Diabetes is a health issue that is connected with the steadily increasing demographic trend toward an older population that been validated in the country of Brazil.

In this study, most of the people who took part were men (Table 3). Studies at the national and regional level have shown that there is no significant difference in how often diabetes mellitus in terms of gender in Brazil. The fact that most people in the Chamchamal were men may have something to do with how easy it is for men to go to hospitals and clinics, and that their work hours are more flexible.

It was found that 90% of those surveyed were married and elderly, both in terms of their occupational status and their marital status. Regarding educational attainment, 55 percent of

patients were illiterate, which is consistent with the findings of the study on the prevalence of the condition in Ribeiro Preto.

In order to implement the Diabetes Education Program, the researchers assessed the patients' attitudes regarding the disease's physiopathological and nutritional aspects, its treatments, as well as physical activity, patient education, self-monitoring, hypoglycemia, chronic complications, special situations, and family support at the beginning of the study. This evaluation has two primary objectives. In order to develop the Diabetes Education Program, the first step was to assess the patients' attitude requirements in relation to their disease. The second objective addressed the evaluation of the patients' attitudes after the implementation of the program. This method is consistent with the findings of another study, in which the authors state that adequate assessment of the outcomes of a diabetic education program necessitates both pre-intervention and post-intervention data gathering [13].

In the current study, it was shown that diabetics' attitudes toward the condition underwent a shift as a result of the study. However, it is not possible to assert that the patients' behaviours changed as a direct result of the new information that they gained. This means that it is not possible to say that the patients' lifestyles improved as a direct result of the new knowledge that they gained. In addition, the current research shows an improvement

in participants' attitudes toward illness prevention and control.

The results indicate that the diabetes education techniques had an effect on the attitude and behavior skills of the patients. However, the results for developed diet-related attitudes were smaller than those for diabetes knowledge in general, which is consistent with other studies. There is few research on diabetes education strategies administered by nurses. This is significant since these health professionals play an important role in educating diabetes patients about attitude. Some authors have also documented a statistically significant change in all measures used to assess patients' attitudes on elements of diabetes management.

Changing diabetes patients' attitude is influenced by a variety of factors, including their understanding of their condition, risk factors, and treatment options.

One research evaluated the efficacy of group education and found that it was successful in boosting and modifying attitudes regarding self-monitoring capillary glucose. This was determined by comparing participants' attitudes before and after the educational program was implemented [14].

The study discovered a considerable correlation between patient attitude and glycemic control, with better glycemic control among individuals with more positive attitudes. This conclusion was backed by a large body of literature and series of recent studies in a number of cultural environments [11].

Therefore, the American Diabetes Association suggests that individuals with T2DM engage in positive attitude to control their condition and postpone or prevent complications [15].

2018 research by Bukhsh A et al, in Pakistan established a relationship between positive attitude activities and glycaemic control. Bad glycaemic control was associated to poor self-care behaviors, while better disease management was related to a higher self-care score [15].

In this study, health literacy has a significant indirect effect on glycemic control, and education level was found to support positive and healthy behavior among T2DM patients. FBG mg/dl was shown to be lower in patients with a higher education level than in those with a lower education level. Those with a higher education have a better HbA1c percent condition than those with a lesser education. Several research with virtually identical findings suggests that patients' health education and health literacy can influence the disease's outcome, including disease control and the reduction of complications. Moreover, compared to patients with a lesser level of education, highly educated patients exhibited good attitudes [16].

Moreover, a number of studies have studied the relationship between health literacy and the avoidance of diabetic complications through the adoption of a positive attitude [17].

The research also found a significant improvement in the education on how to recognize the symptoms of hypoglycemia. This subject was focused by the researcher since it has been shown that inpatient treatment patients had better outcomes, which was confirmed during the program's implementation.

Nurses are important members of the multidisciplinary team.

Nursing consultations and group work allow them to demonstrate their role as caregivers. These activities allow for the discovery of the patients' true needs for illness coping. It also assists them in becoming co-participants in their care. The patients' active engagement in these programs should motivate them to adopt lifestyle changes in order to boost their self-esteem, want to learn, control diabetes, and increase their acceptance of the condition in their family and social communities.

Conclusion

Glycemic control in patients with Type 2 Diabetes Mellitus (T2DM) can be influenced by patients' commitment to good attitude choices. Alongside the use of pharmaceutical treatments, attitudes are considered to be an integral part of patients' overall management strategies. Patients' lifestyles and the actions they engage in on a daily basis have a significant impact on their overall health, including the targeted management of their blood glucose levels. There is a concerted effort being made all over the world right now to include patient attitude and health literacy into the treatment plan for diabetes patients. It has been thought that if patients improve their ability to monitor their glucose levels and make changes to their attitude, they can prevent acute problems and lower the risk of developing chronic complications from type 2 diabetes. Monitoring blood glucose levels, dietary changes, foot care, exercise, and the right amount of overall physical activity are some of the positive behaviors and, manage healthy, Physical activity, Regular blood sugar monitoring, taking medication regularly, problem-solving techniques, healthy coping, healthy lifestyle choices that can help patients achieve an acceptable level of glycemic control. A lot of research that was published in the medical literature points in this direction. Several studies have also shown that an important part of keeping a positive attitude is teaching patients about their own health. If people actually knew as much about health, it's possible that the disease's perspective would be better [18-20].

Conflict of Interest

There is no conflict of interest in this study.

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