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Exploring the Relationship between Attitudes and Blood Glucose Control among Patients with Type 2 Diabetes Mellitus in Chamchamal Town, Kurdistan, Iraq

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ABSTRACT

Background: Diabetes mellitus type 2 is an endocrine disorder characterized by a progressive elevation in blood glucose levels. It is a persistent and incapacitating illness that may result in mortality if not properly managed. **Objectives:** The objective of this research is to explore the relationship between the attitudes of individuals with type 2 diabetes mellitus and their ability to regulate blood glucose levels. In particular, the study aims to investigate the potential correlation between participants' attitudes and their capacity to manage blood glucose levels following their participation in an educational program. Moreover, the research seeks to analyze the association between individuals' attitudes and diabetes control. Ultimately, the study intends to evaluate the levels of participants' attitudes through appropriate measures. **Materials and Methods:** The study is designed as a cross-sectional investigation and utilizes data from a diabetic outpatient center in Chamchamal. The study population consists of outpatients from the evening public clinic and chronic disease control center. Participants are required to complete questionnaires on their diabetes attitude. The study was conducted between August 11, 2019, and January 5, 2022. To explore the efficacy of the attitude with diabetes control, we used a correlation coefficient test and a t-test with *P*-value of 0.05 as our alpha level of significance. **Results and Conclusion:** The study found that the majority of patients with type 2 diabetes mellitus had low levels of educational attainment, were married and had insufficient monthly income. In addition, 85% of the patients reported not smoking, and 48.3% were classified as overweight. These findings highlight the need for health-care providers to consider sociodemographic factors in the management of diabetes mellitus.

Index Terms: Attitude, Type 2 diabetes mellitus, Blood glucose control, Diabetic complications, Self-care management

1. INTRODUCTION

Diabetes is a major public health issue, projected to be the seventh leading cause of death by 2030 [3]. Patients with T2DM patients with suboptimal glycemic control and HbA1c levels are more likely to develop microvascular problems and cardiovascular disease [1,13]. HbA1c levels have been shown to be affected by modifiable psychosocial variables such self-care habits and attitude [2,5]. Without good self-care practices, it might be difficult to keep HbA1c levels in check [3,6] frequency, population distribution. The authors express concern that diabetes might develop into a regional public health problem and suggest measures to combat the disease [4,5]. Developing healthy self-care habits is essential for managing HbA1c levels, which can increase without proper

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self-care [6]. Attitude is the degree to which a person believes he or she is capable of doing a job, and attitudes precede actions [7,8]. The amount of self-assurance that individual possesses regarding their capacity to carry out a task [15]. is referred to as their attitude, and it is normal for an individual's attitudes to come before their actions. Patients with diabetes need to make lifestyle changes to manage their blood glucose levels [9]. This study aims to investigate the potential correlation between attitudes of individuals with type 2 diabetes mellitus and their ability to regulate blood glucose levels [10]. patients with diabetes can also improve their health and prevent further complications by losing weight and lowering their body mass index (BMI) [11]. Diabetes attitude is a patient's attitude toward managing the disease, controlling blood sugar, reducing complications, and preventing short-term problems [12]. Effective patient attitude management strategies can reduce the risk of chronic complications and prevent acute complications in type 2 diabetes [10]. Individuals who maintain optimal glycemic control are at a reduced risk of developing microvascular complications, such as those that affect the kidneys, nerves, and eyes. These complications can manifest in the form of cataracts, glaucoma, renal failure, and lower limb amputations. Conversely, when blood glucose levels are maintained at appropriate levels, macrovascular complications, including heart attacks and strokes, appear to be averted [14].

This study aims to investigate the relationship between attitude and ability to manage blood glucose.

2. METHODOLOGY

2.1. Study Design

Sixty patients were studied in this cross-sectional study from the Diabetes and Chronic Disease Control Center in the Chamchamal District of Sulaimaniyah, Iraq, between July 7, 2020, and November 7, 2020.

2.2. Sample Size

Raosoft's sample size calculator was used to determine the appropriate sample size. Only 60 patients out of a possible 2000 at the Diabetes and Chronic Disease Control Center were included in this research.

2.3. Inclusion Criteria

The research study exclusively included adult patients who had been diagnosed with type 2 diabetes and met the rigorous eligibility criteria set forth by the trial. To be included in the study, participants were required to provide informed consent and meet all the necessary prerequisites for research participation. The eligible individuals who met the inclusion criteria are described in detail below.

2.4. Exclusion Criteria

Patients with T1DM, pregnant women with T2DM, liver failure, impairments or special requirements, and gestational diabetes were excluded from the study.

2.5. Ethical Approval

The University approved the moral viewpoints expressed by the Ethics Committee of the College of Nursing at Raparin. In addition, participants were informed of the purpose and nature of the research.

2.6. Patient Informed Consent

Before data were collected, participants were asked to sign informed consent forms and give their verbal and written informed consent in Kurdish. They were also what might come out of the study. Furthermore, a lot of thought goes into patients' rights, privacy, and the safety of their information.

2.7. Questionnaire

A questionnaire to evaluate a patient's attitude and behavior was designed and composed of 3 parts that covered sociodemographic 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. Then, the attitude score was determined for each participant based on their responses to sets of 30 questions. The Likert questionnaire had a reliability of 0.92 based on the results of the Cronbach's Alpha test; then the items were presented to all patients in the same order. After taking the patient's height and weight, the BMI (BMI; kg/m^2) was determined. BMI stands for body mass index, and it is a measure of a person's body fat based on their height and weight. It is calculated by dividing a person's weight in kilograms by their height in meters squared (kg/m^2). BMI is a commonly used metric for determining whether an individual's weight is within a healthy range or if they are overweight or obese. It is often used in both clinical and research settings as a quick and easy screening tool for assessing a person's weight status and associated health risks. However, it should be noted that BMI is not a perfect measure and has certain limitations, such as not taking into account body composition or distribution of body fat, a researcher used a targeted sampling technique to obtain data.

2.8. Measure of the Clinical Parameter

The BMI was classified according to the WHO criteria in which <18.5 kg/m^2 = Underweight, 18.5–24.9 kg/m^2 = Normal weight, 25.0–29.9 kg/m^2 = Pre-obesity, 30.0–34.9 kg/m^2 = Obesity Class I, 35.0–39.9 kg/m^2 = Obesity Class II, and <40 kg/m^2 = Obesity Class III World Health Organization (2021).

2.9. Statistical Analysis

SPSS version 25 was utilized for conducting data analysis.

3. RESULTS

3.1. Participants' Demographic and Clinical Characteristics

Patients in this research had a mean age of 58.07 ± 0.309 years, a median age of 57.5 years, and an age range of 39–81 years. Regarding educational attainment, the majority of patients (55%) were illiterate, followed by elementary school graduates (28.3%), and only 1.7% were college graduates or postgraduates. In contrast, 90% of patients were married, compared to 1.7% who were single or separated (not living together). Regarding the patients' employment, the majority (40%) were housewives, whereas the minority (10%) were retirees. The majority of patients have insufficient monthly income (65%), reside in urban areas (73.3%), do not smoke (85%), and are overweight (48.3%). The majority of patients had T2DM for 10 years and took antihyperglycemic therapy orally (98.3%) (Table 1).

3.2. Changes in Attitudes and Practices before and after the Intervention

Table 2 shows the terms of some of the differences between the pre- and post-test attitudes toward controlling disease, the distribution of the mean scores of the pre- and post-test attitudes and practices toward the daily care of patients, and the associated constructs. The table also shows the attitudes and actions that have the most to do with stopping diseases. For example, the highest mean score for the total number of possible points in the pre-attitude group was 2.98 (I eat or drink regularly every day), while the lowest was 1.3 (I try to learn how to control my diabetes by going to different diabetes education programs) (Table 2a). The highest mean score for the total number of possible points in the post-attitude group was also 2.98. The point with the lowest mean score was 1.77, which said that herbal medicines have fewer side effects than medical ones (Table 2b).

3.3. Correlation between Attitudes and Sociodemographic Characteristics

Table 3 presents a correlation matrix that facilitates the examination of the relationship between attitudes (before

TABLE 1: The T2DM patients' (No.=60) sociodemographic and clinical information

Variable	Frequency	Percent
Level of education		
Illiterate	33	55.0
Primary school graduate	17	28.3
Secondary school graduate	7	11.7
Institute graduate	2	3.3
Collage and post graduate	1	1.7
Marital status		
Single	1	1.7
Married	54	90.0
Widow	2	3.3
Divorced	2	3.3
Separated (not living together)	1	1.7
Occupation		
Government employed	9	15.0
Self employed	12	20.0
Retired	6	10.0
House wife	24	40.0
Jobless	9	15.0
Monthly income		
Sufficient	4	6.7
Barely sufficient	17	28.3
Insufficient	39	65.0
Residential area		
Urban	44	73.3
Rural	16	26.7
Duration of diabetes mellitus		
≤10 years	45	75.0
≤20 years	12	20.0
>20 years	3	5.0
Treatment method		
Oral antihyperglycemic agents	59	98.3
Insulin	1	1.7
Do you smoke?		
Yes	9	15.0
No	51	85.0
How many cigarettes per day?		
11–20	1	10
21–30	9	90
Body mass index		
Underweight	1	1.7
Normal weight	10	16.7
Over weight	29	48.3
Obesity I	14	23.3
Obesity II	5	8.3
Obesity III	1	1.7
For how many years have you smoked?		
10	2	15.38
15	5	38.46
20	2	15.38
25	3	23.08
40	1	7.69
Source of information about disease		
Physician	40	66.7
Nurse	13	21.7
Books and magazines	1	1.7
Television	6	10.0

TABLE 2a: The participants pre-attitude behaviors evaluation

Variable	Always=3	Sometime=2	Never=1	Mean score	Rank	%
I visit hospital regularly according to doctor's appointment for examination or treatment of diabetes.	26	25	9	2.28	2	64
I take meals or refreshment regularly every day.	14	40	6	2.13	8	56.5
I eat as well-balance diet using a list of food exchanges	15	42	3	2.2	5	60
I take foods containing dietary fiber like grain, vegetable and fruit every day.	14	41	5	2.15	7	57.5
I set a limit of taking salt and processed foods.	29	20	11	2.3	1	65
I do a self-blood sugar test according doctors' recommendations.	14	30	16	1.97	10	48.5
I do a self-blood sugar test more frequently, when I feel symptoms of hypoglycemia such as tremor, pallor, and headache.	14	24	22	1.87	12	43.5
I try to maintain the optimal blood sugar level.	9	34	17	1.87	13	43.5
I control the size of meals or exercise according to a blood sugar level.	6	32	22	1.73	17	36.5
I am carrying food likes sweet drink, candy or chocolate just in case of hypoglycemia.	3	20	37	1.43	25	21.5
I try to maintain optimal weight by measuring my weight regularly.	5	32	23	1.7	18	35
I carry insulin, injection and blood sugar tester whenever I go to trip.	5	10	45	1.33	27	16.5
I try to get information on diabetes control by attending various diabetes educational programs.	4	10	46	1.3	30	15
I take my diabetes medication like insulin injection as prescribe observing dosage and time regularly.	6	14	40	1.43	26	21.5
I keep in touch with my physician.	16	41	3	2.22	4	61
Herbal medications have less complications than medical medications	3	27	30	1.55	20	27.5
Regular exercise helps me to control diabetes.	5	23	32	1.55	21	27.5
Reading handouts on proper footwear is necessary for me.	3	13	44	1.32	29	16
Blood pressure control helps me to control my diabetes mellitus.	8	38	14	1.9	11	45
Annual eyes examination is necessary for me.	9	34	17	1.87	14	43.5
Always I be relaxing and avoid stress and bad mood because its effects diabetes negatively.	10	43	7	2.05	9	52.5
I did not miss doses of my diabetic medication.	20	31	9	2.18	6	59
I inspect my feet during and after my shower/bath.	14	21	25	1.82	15	41
I use talcum powder to keep my inter-digital spaces dry.	6	20	34	1.53	22	26.5
I check the temperature of water before use.	2	16	42	1.33	28	16.5
I examine my feet daily.	6	17	37	1.48	23	24
I used to check my blood glucose level.	5	27	28	1.62	19	31
I used to check fasting blood glucose and 2 h after meal by glucometer.	6	37	17	1.82	16	41
I take my medication according of physician recommendation.	24	27	9	2.25	3	62.5
I did not wear tide shoes.	8	13	39	1.48	24	24

and after) and sociodemographic characteristics. The matrix displays only those variables that exhibit a statistically significant correlation ($P < 0.05$) as determined by Pearson's r, with regard to satisfaction levels of the simulation experience. The matrix allows for an assessment of the degree of association between sociodemographic factors and participant satisfaction with the simulation, providing valuable insights into the factors that may impact user experience. The Mann–Whitney U-test is used in.

3.4. Gender Differences in Attitudes before and after the Intervention

Table 4 to compare the means of attitudes (before and after) by gender. Before the test, the mean attitude score for males

TABLE 2b: The participant's post-attitude behaviors evaluation

Variable	Always=3	Sometime=2	Never=1	Mean score	Rank	%
I take foods containing dietary fiber like grain, vegetable and fruit every day.	58	2	0	2.97	4	98.5
I set a limit of taking salt and processed foods.	59	1	0	2.98	2	99
I do a self-blood sugar test according doctors' recommendations.	55	5	0	2.92	9	96
I do a self-blood sugar test more frequently, when I feel symptoms of hypoglycemia like tremor, pallor and headache.	47	13	0	2.78	13	89
I try to maintain the optimal blood sugar level.	41	19	0	2.68	15	84
I control the size of meals or exercise according to a blood sugar level.	37	23	0	2.62	21	81
I am carrying food likes sweet drink, candy or chocolate just in case of hypoglycemia.	10	46	4	2.1	29	55
I try to maintain optimal weight by measuring my weight regularly.	29	31	0	2.48	23	74
I carry insulin, injection and blood sugar tester whenever I go to trip.	14	43	3	2.18	28	59
I try to get information on diabetes control by attending various diabetes educational programs.	48	12	0	2.8	12	90
I take my diabetes medication like insulin injection as prescribe observing dosage and time regularly.	43	15	2	2.68	16	84
I keep in touch with my physician.	56	4	0	2.93	8	96.5
Herbal medications have less complications than medical medications.	12	22	26	1.77	30	38.5
Regular exercise helps me to control diabetes.	47	11	2	2.75	14	87.5
Reading handouts on proper footwear is necessary for me.	41	18	1	2.67	18	83.5
Blood pressure control helps me to control my diabetes mellitus.	55	5	0	2.92	10	96
Annual eyes examination is necessary for me.	58	2	0	2.97	5	98.5
Always I be relaxing and avoid stress and bad mood because its effects diabetes negatively.	36	24	0	2.6	22	80
I did not miss doses of my diabetic medication.	38	22	0	2.63	19	81.5
I inspect my feet during and after my shower/bath.	28	32	0	2.47	24	73.5
I use talcum powder to keep my inter-digital spaces dry.	17	43	0	2.28	27	64
I check the temperature of water before use.	28	32	0	2.47	25	73.5
I examine my feet daily.	19	40	1	2.3	26	65
I used to check my blood glucose level.	41	19	0	2.68	17	84
I used to check fasting blood glucose and 2 h after meal by glucometer.	38	22	0	2.63	20	81.5
I take my medication according of physician recommendation.	52	8	0	2.87	11	93.5
I did not wear tide shoes.	58	2	0	2.97	6	98.5

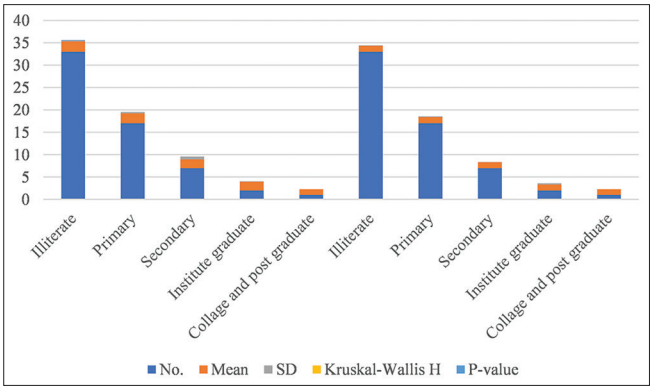

Fig. 1. Compare means of attitude (pre and post) by level of education using Kruskal–Wallis H-test.

was 2.219 and for females it was 2.201. After the test, the mean attitude score for males was 1.353 and for females it was 1.308. Neither score changed significantly from the pre-test. The results of the post-test showed that there wasn't a big difference between men and women using the Kruskal–Wallis H-tes.

3.5. Impact of Education Level on Attitudes before and after the Intervention

Fig. 1 shows the study compared the mean attitudes of participants before and after the intervention with respect to their level of education. The results indicated that there was no statistically significant difference between the mean pre-test and post-test attitudes of the participants.

TABLE 3: Correlation matrix of attitude (pre and post) with the socio-demographic data

Variable	No.	Pre-attitude		Post-attitude		
		P-value	Spearman rank correlation	No.	*P*-value	Spearman rank correlation
Age	60	0.003	0.378**	60	0.716	−0.048
Level of education	60	0.039	−0.268*	61	0.598	0.069
Family member has diabetes mellitus	60	0.598	−0.069	62	0.009	0.334**
Monthly income	60	0.002	0.384**	63	0.753	0.041
Duration of diabetes mellitus	60	0.712	0.049	64	0.795	0.034
Body mass index (BMI)	60	0.587	−0.072	65	0.739	−0.044
How many cigars per day?	10	0.415	0.291	66	0.107	0.541
For how many years have you smoked?	13	0.601	0.16	67	0.424	0.243
How long ago did you quit smoking?	5	0.581	0.335	68	0.581	0.335

*Significant at 0.001 level, **Significant at 0.05 level.

TABLE 4: Compare means of attitude (pre and post) by gender using Mann-Whitney U-test

Attitude	Gender	No.	Mean	SD	Mann-Whitney U	*P*-value
Mean pre	Male	34	2.219	0.356	424.5	0.794
	Female	26	2.201	0.357		
Mean post	Male	34	1.353	0.143	370.0	0.280
	Female	26	1.308	0.112		

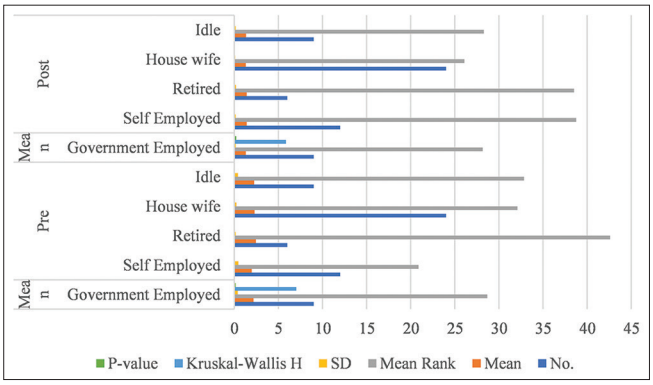

Fig. 2. Compare means of attitude (pre and post) by occupation using Kruskal–Wallis H-test.

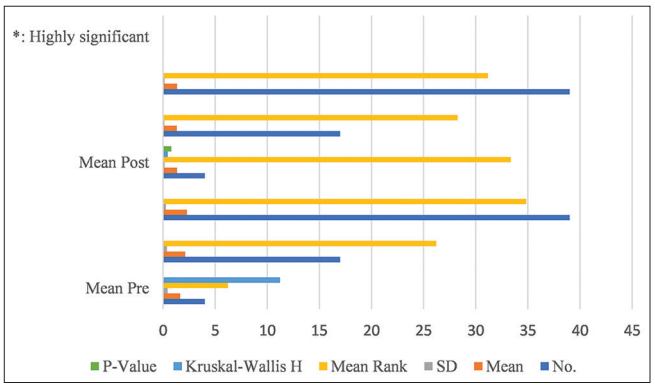

Fig. 3. Compare means of attitude (pre and post) by monthly income using Kruskal–Wallis H-test.

These findings suggest that the intervention did not have a significant impact on the attitudes of participants toward the research topic, regardless of their level of education.

3.6. Impact of Income Level on Attitudes before and after the Intervention

Fig. 2 contrasts the perspectives of patients who participated in the Pattern-Making training before and after which training. It indicates that each group's post-test results for each attitude component differ significantly.

3.7. Statistical Analysis of Income Levels before and after Intervention

In Fig. 3, to assess whether there was a statistically significant difference in the mean rank of income levels, the Kruskal–Wallis test was employed. The results indicated a highly significant difference between the pre-test and post-test means for each income level, with a $P < 0.05$. Specifically, the pre-test mean values ranged from 2.305 to 1.63, while the post-test means ranged from 1.339 to 0.316. The highest pre-test mean was observed as 2.305, while the lowest was 1.63. These findings suggest that the intervention had a

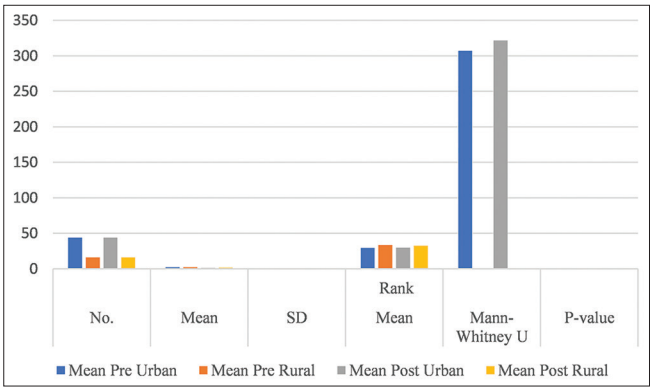

Fig. 4. Compare means of attitude (pre and post) by residential area using Kruskal-Wallis H-test.

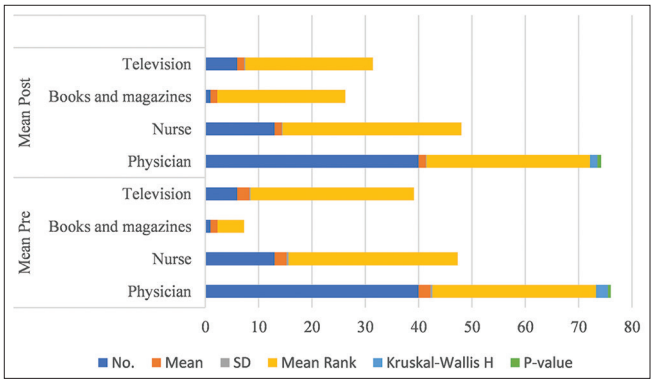

Fig. 5. Compare means of attitude (pre and post) by source of your information about disease using Kruskal–Wallis H-test.

significant impact on the attitudes of participants towards the research topic across all income levels, and support the need for continued efforts to improve attitudes and perceptions. However, to increase the p-value further, it may be necessary to adjust the alpha level or consider a larger sample size.

3.8. Impact of Residential Area on Attitudes before and after the Intervention

In Fig. 4, Mann–Whitney test was conducted to compare the pre- and post-test attitude averages of participants by their residential area. The analysis revealed no significant differences between the pre- and post-test attitudes. The mean attitude score before the intervention was 0.451, while the mean score after the intervention was 0.608.

3.9. Relationship between Source of Knowledge and Attitudes before and after the Intervention

Fig. 5 shows the analysis shows that there is no correlation between the mean attitudes (pre- and post-intervention) and the source of knowledge about the illness. The mean score for the pre-test was 0.529, and for the post-test, it was 0.704, with $P = 0.05$. The average attitude score before the intervention was 0.529, while after the intervention, it was 0.704. The findings indicate that there is no significant relationship between the attitudes of participants before and after receiving information about the disease ($P > 0.05$).

4. DISCUSSION

The median age of T2DM patients in this research was 57.50 years. Consequently, the research population consisted of adults and the elderly. After 50 years of age, the prevalence of (DM) grows progressively, according to the findings of various research conducted in various nations [20]. The majority of our participants were also male. However, national and regional investigations have revealed no substantial gender disparity in the frequency of DM [21]. Therefore, the fact that the majority of our patients were males might be attributed to the fact that men had easier access to hospitals and clinics and more flexible work hours than women.

Before the initiation of the education program, the mean attitude score was found to be similar between the case and control groups. However, after the program was implemented, significant differences were observed between the two groups on multiple attitude-related questions. These findings are consistent with earlier research that employed alternative intervention methodologies, as reported by [23].

In addition, substantial patients completed diabetes self-management education in the current research (DSME). Consequently, they were more likely to comply with the recommended diabetic care standards and their pharmaceutical treatment regimens. This result is consistent with earlier research demonstrating that the Hba1c levels of patients fell considerably following diabetes education program treatments [16]. In addition, another study comparing the opinions of 252 health professionals and 279 individuals with diabetes revealed major disparities in their perspectives. Both groups agreed on the severity of T2DM, the necessity for strict glycemic control, and the psychosocial effect of the condition, but they disagreed on the importance of patient autonomy. This study found no significant differences in the severity of the illness between T1DM and T2DM individuals. In addition, people with diabetes who had previously received diabetes education had elevated rates of disease [17].

There is no significant correlation between gender attitude and program intervention, according to the current study. In contrast, the majority of married couples displayed a level of self-care that fell somewhere in the center. According to Iranian study, married participants in diabetes self-management programs had a more optimistic outlook than their single counterparts [18].

For instance, a separate study found that T2DM patients with stronger marital connections and mutual support have better self-care attitudes and self-management [19]. In addition, there was a substantial correlation between self-care and social support in Iran cross-sectional research [23].

We also demonstrated a substantial relationship between education level and attitude. Patients with higher levels of education, for example, demonstrated more positive attitudes when engaging in diabetic self-management programs. This was especially the case when the programs were implemented. Moreover, illiterates were shown to have a much poorer level of self-care. In addition, it was shown that those with greater levels of education engage in more beneficial kinds of self-care than those with lower levels of education. One study including 125 individuals of diverse racial origins with T2DM found a substantial favorable connection between education and diabetes management [20].

At the outset of the study, the Diabetes Education Program (DEP) evaluated the perspectives of patients with type 2 diabetes on various aspects of the disease, including its physiopathological and nutritional components, treatments, physical activity, patient education, self-monitoring, chronic complications, special situations, and family support. The initial phase of the DEP's development involved assessing the patients' attitude needs toward their illness, followed by an evaluation of their attitudes following the program's implementation. This approach is consistent with the previous studies that have recommended pre- and post-intervention data collection to accurately evaluate the effectiveness of diabetes education programs [24].

The study results suggest that there was a significant change in diabetic patients' perceptions of their illness after participating in the investigation. However, it is difficult to make a conclusive statement about the direct impact of this newfound knowledge on the patients' behavior and lifestyle. While the study revealed that the DEP had a positive effect on the patients' attitudes and behavioral abilities, it was found that the improvements in diet-related attitudes were less significant than those observed for general diabetes knowledge. These findings provide concrete support for the notion that patient education programs can have a positive impact on patients' perceptions of their illness and their ability to manage it effectively. However, further research is needed to determine the specific factors that contribute to behavior change in diabetic patients.

Changing the attitudes of diabetes patients is impacted by a number of factors, including their knowledge of their illness, risk factors, and treatment alternatives. The study investigated the efficiency of group education and determined that it successfully improved and altered attitudes toward self-monitoring of capillary glucose. This was discovered by comparing the attitudes of participants prior to and following the instructional program [25].

This study found a significant association between patient attitude and glycemic control, with patients with more optimistic attitudes exhibiting better glycemic control. This result was supported by a substantial body of literature and contemporary research conducted in several cultural settings [26]. Consequently, according to the American Diabetes Association (ADA), individuals diagnosed with type 2 diabetes mellitus (T2DM) should possess a positive attitude towards their condition to effectively manage the illness and mitigate potential complications. Inadequate glycemic control was associated with a low self-care score, whereas better disease management was associated with a higher self-care score [28].

In the present study, health literacy is shown to significantly influence glycemic control, while higher education levels are associated with favorable health behaviors in patients. Literature supports the notion that health education and literacy can considerably influence illness outcomes, disease management, and prevention of complications. Moreover, patients with higher education levels exhibit more optimistic attitudes compared to those with the lower education levels [27].

Moreover, existing research has established a correlation between health literacy and the mitigation of diabetes complications through the adoption of a positive mindset (Mukanoheli et al., 2020). Furthermore, we observed a notable enhancement in the educational intervention concerning the identification of hypoglycemic symptoms, as inpatient care has been shown to yield better results, a finding that was reinforced during the program's implementation.

5. CONCLUSION

The willingness of patients with type 2 diabetes to adopt a positive attitude and participate in positive behaviors is a significant factor in the effective control of their blood glucose levels in patients with type 2 diabetes. In addition to receiving medical treatment, patients have the additional responsibility of prioritizing healthy daily routines and habits. These may include monitoring their blood glucose levels, making alterations to their food, engaging in physical activity, and caring for their feet. These healthy practices have the potential to have a major influence on the patients' general health and to enhance their capacity to keep their blood glucose levels under control.

6. ACKNOWLEDGMENTS

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7. CONFLICT OF INTEREST

There is no conflict of interest in this study.

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