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Analysis of The Effect of General Medicine-Based Education in Type 2 Diabetes Mellitus Patients in Neijiang City, China

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Abstract: *Objective:* To investigate and analyze the current situation of cognition, attitude, behavior, and influencing factors of Type 2 Diabetes Mellitus (T2DM) patients in Neijiang City, and to explore the effectiveness of the application of the education program based on the popularization of science in general medicine. *Methods:* Seventy cases of T2DM patients in Neijiang City were selected and randomly divided into 35 cases each in the observation group and the control group. The observation group received general medicine science education intervention and the control group received traditional health education. Indicators such as cognitive level, attitude, and behavioral change between the two groups were compared to assess the effect of general medical science education. *Results:* Before the intervention, there was no difference between the two groups in terms of knowledge, beliefs, and behaviors in general medicine, glycemic control, body mass index (BMI), and satisfaction with health education ($P > 0.05$). After 3 months of the intervention, there was a highly significant difference in the aforementioned levels between the two groups ($P < 0.05$). *Conclusion:* The approach of general medicine popularization had a significant effect on the treatment and management of T2DM patients in Neijiang City. It improved the patient's cognitive level and self-management ability of the disease, increased their treatment adherence, and improved the therapeutic effect.

Keywords: General medicine; Type 2 diabetes; Effect evaluation

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1. Introduction

Diabetes mellitus (DM) is a chronic metabolic disease whose pathogenesis involves a variety of factors such as immune dysfunction, genetic factors, and psychiatric factors. It can lead to pancreatic islet hypoplasia and insulin resistance, which trigger a series of metabolic disorders including disorders of glucose, fat, water, electrolytes, and proteins [1,2]. According to statistics, there were about 4.63 billion adults with diabetes worldwide in 2019, with the most incidences in China. Type 2 Diabetes Mellitus (T2DM) is predominant, accounting for 90% of the total number of diabetic patients [3]. T2DM is an endocrine disease mainly characterized by hyperglycemia. Its etiology has not been completely clarified, but it is generally believed to be closely related to the environment, genetics, insulin resistance, and defective pancreatic β-cell function [4]. T2DM patients who have inadequate glycemic control often experience a state of persistent hyperglycemia, leading to chronic damage that affects the patient's nervous system, kidneys, blood vessels, and other organs [5]. T2DM patients are usually resistant to insulin. They have body cells that are less sensitive to insulin, resulting in the weakening of the effect of insulin in the process of regulating blood glucose. T2DM patients have a decreased function of pancreatic β-cells. The pancreatic β-cells gradually lose their normal function and are unable to secrete enough insulin to cope with hyperglycemia. As their blood glucose levels continue to rise above the normal range, T2DM patients are prone to hyperglycemia. T2DM patients also have a higher risk of complications such as cardiovascular disease, kidney disease, neuropathy, retinopathy, etc. Currently, there is no cure for T2DM, and it is mainly based on medication, dietary control, physical exercise, and lifestyle changes. However, after patients leave clinical treatment, hospitals lack family-assisted treatment for patients, which leads to the occurrence of an irrational diet, irregular exercise, unstandardized medication, etc. For this reason, effective treatments oriented to the patient and their family should also be actively explored [6]. Popularization of general medicine refers to disseminating medical knowledge to the public through several ways, which can be taught to the public through hospitals, communities, public places, and other channels to improve the knowledge of patients with T2DM about their disease. This will help better control the disease and reduce disability and mortality rates. By popularizing diabetes-related information, we can increase their level of awareness of the disease, inspire their confidence in facing the disease positively, and encourage them to adopt effective self-management measures. Such popularization of general medicine may help promote the recovery and quality of life of diabetic patients, which is of positive significance for the prevention and treatment of the disease. Based on this, this study aims to explore the effect of promoting general medicine knowledge among T2DM patients in Neijiang City from the perspective of general medicine, to provide a reference and support for diabetes prevention and treatment. Through the development of this study, we can gain a deeper understanding of the effect of the application of generalization of general medicine in the treatment of T2DM, provide more scientific and effective guidance for future clinical practice, and contribute to the health management of T2DM patients.

2. Information and methods

2.1. General information

Seventy cases of T2DM patients with an average age of 72.65 ± 6.60 years old were sampled from Trench Pass Community, Neijiang City, China. Inclusion criteria: (1) Patients aged 65 years and above; (2) Patients diagnosed with T2DM and received relevant treatment; (3) Patients consented. Exclusion criteria: (1) Patients who have not studied the knowledge related to general medicine; (2) Patients who withdrew from this experiment by themselves; (3) Patients who did not participate in the free consultation; (4) The initial scale score is greater than 50.

2.2. Methods

The General Information Questionnaire was used to assess the knowledge, attitude, and behavior of general medicine among T2DM patients. After 3 months, the relevant questionnaires were conducted again. Based on the results of the survey and literature review, the popularization team determined the popularization contents of general medicine among T2DM patients, such as basic knowledge, treatment and management, healthy lifestyle, knowledge misunderstandings, psycho-spiritual, social situation, the concept of general medicine, and services, and produced popularization videos, prevention and treatment demonstration boards, and other content. Every month, a free consultation with a general practitioner was conducted to provide face-to-face popularization of the relevant education to patients. The observation group received generalized education based on general medicine in addition to health education on T2DM in routine health services. The control group received only T2DM routine health service health education. The intervention lasted for 3 months.

2.3. Observation indicators

2.3.1. The level of knowledge, belief, and behavior

The effect of generalization of general medicine was measured by evaluating the patient's knowledge of general medicine of T2DM, the change of attitude, and behavior. A self-developed "Questionnaire on Knowledge, Attitude, and Behavior of Family Medicine-Type 2 Diabetes Mellitus" was used, which has 39 entries. It includes 12 questions on the level of knowledge, with a full score of 36 points. There were 15 questions on attitude, with a full score of 45 points; and 12 questions on behavior, with a full score of 36 points. The total score ranges from 0–117. A higher score indicates a better effect of general medicine popularization.

2.3.2. Glucose control

The patient's blood glucose levels (FPG, 2hPG, HbA1c) were monitored and the glycemic control of the two groups before and after the intervention were compared to assess the effect of general medicine popularization on glycemic control.

2.3.3. BMI level

The patient's body mass index (BMI) was analyzed and the changes in BMI level of the two groups before and after the intervention were compared to assess the impact of general medicine popularization on the patient's weight management.

2.3.4. Satisfaction with health education

The hospital-designed nursing satisfaction questionnaire was utilized to assess the patient's satisfaction and feedback on general medical science education. The questionnaire included a total of 10 items in the areas of health guidance, psychological comfort, professional skills, and service attitude, with satisfaction counted as 1 point and dissatisfaction counted as 0. The total score was 10 points, and participants were rated according to the degree of satisfaction.

2.4. Statistical methods

Continuous variables (e.g., level of knowledge and belief in general medicine, blood glucose control, BMI level), using mean ± standard deviation (SD) to describe the centralized trend and degree of dispersion of the data; comparison of the two groups was made using the two-sample mean t or chi-square test, and the difference was considered to be statistically significant at $P < 0.05$.

3. Results

3.1. Level of knowledge, belief, and behavior in general medicine before and after intervention

As shown in **Table 1**, before the intervention, there was no significant difference between the scores of general medicine knowledge, attitude, and behavior of the two groups of patients ($P > 0.05$). After the intervention, the three items of the observation group were significantly higher than those of the control group ($P < 0.05$).

Table 1. Comparison of general medicine knowledge, belief, and behavior scores between the two groups of patients before and after intervention (mean ± SD, points)

Groups	Knowledge		Belief		Behavior		Total	
	Before	After	Before	After	Before	After	Before	After
Control group (n = 35)	14.51 ± 4.48	20.62 ± 3.01	18.25 ± 6.93	25.04 ± 4.19	16.38 ± 4.79	20.17 ± 4.42	49.14 ± 6.20	65.83 ± 5.18
Observation group (n = 35)	14.69 ± 4.31	28.81 ± 5.32	18.24 ± 6.86	31.84 ± 4.76	15.31 ± 4.83	31.43 ± 5.20	48.24 ± 6.34	92.08 ± 5.32
t	0.171	7.927	0.006	6.344	0.931	9.761	0.600	21.915
P	0.865	0.000	0.996	0.000	0.355	0.000	0.550	0.000

3.2. Blood glucose control

As shown in **Table 2**, before the intervention, there was no significant difference in the three items of blood glucose levels between the two groups of patients ($P > 0.05$). After the intervention, all three blood glucose items in the observation group were lower than those in the control group ($P < 0.05$).

Table 2. Comparison of blood glucose levels between the two groups of patients before and after intervention (mean ± SD)

Group	FPG (mmol/L)		2hPG (mmol/L)		HbA1c (%)	
	Before	After	Before	After	Before	After
Control group (n = 35)	9.75 ± 1.25	8.30 ± 0.54	12.53 ± 1.00	10.34 ± 0.84	10.34 ± 1.23	8.32 ± 1.25
Observation group (n = 35)	9.63 ± 1.05	7.45 ± 0.92	12.34 ± 1.05	9.25 ± 1.20	9.78 ± 1.19	7.41 ± 1.90
t	0.435	4.714	0.775	4.402	1.936	2.367
P	0.665	0.000	0.441	0.000	0.057	0.021

3.3. BMI level

As shown in **Table 3**, after the intervention, the BMI indexes of the observation group were lower than those of the control group ($P < 0.05$).

Table 3. Comparison of BMI levels between the two groups of patients before and after intervention (mean ± SD)

Group	BMI	
	Before	After
Control group (n = 35)	26.38 ± 1.36	24.95 ± 1.21
Observation group (n = 35)	26.21 ± 1.09	24.06 ± 1.18
t	0.577	3.115
P	0.566	0.003

3.4. Satisfaction with health education

As shown in **Table 4**, the satisfaction with health education of the observation group was significantly higher than that of the control group ($P < 0.05$).

Table 4. Comparison of health education satisfaction scores of patients between the two groups (mean ± SD, points)

Group	Cases, *n*	Satisfaction rating
Control group	35	6.24 ± 0.56
Observation group	35	7.08 ± 0.65
t		5.792
P		0.000

4. Discussion

As a patient-centered medical model, general medicine focuses on the overall health status of patients and the long-term sustainability of treatment effects and can provide comprehensive, continuous, and integrated medical services for patients [7]. The development of general medicine in China has benefited from the promotion of healthcare reform policies and the increased demand for primary healthcare services [8]. The Chinese government has been committed to improving the quality and coverage of primary healthcare services, and general medicine, as one of the core elements of primary healthcare services, has received more attention and support. By comprehensively assessing the patient's conditions and individual differences, personalized treatment plans are developed to help patients control blood glucose, manage their lifestyles, and manage disease complications.

The results of the current study showed that general medicine improved the patient's knowledge and practice of general medicine, reduced blood glucose levels and BMI, and controlled blood glucose fluctuations. By improving dietary habits and increasing physical activity, patients were able to better manage their blood glucose and reduce the risk of complications. In addition, personalized treatment plans can be developed to help patients control their blood glucose more effectively and achieve better treatment outcomes. Under the guidance of general practitioners (GP), patients learn how to rationalize their diet, control the amount of exercise monitor their blood glucose to better manage the disease. This improved self-management ability helps patients to better control their disease and reduce the possibility of relapse and exacerbation. The promotion of general medicine also promotes the optimal utilization of medical resources. Patients can obtain more comprehensive and continuous healthcare services and avoid frequent visits to the doctor to cope with recurrent conditions. Not only does this reduce the financial burden on patients but also improves the efficient utilization of healthcare resources. GPs can also provide personalized health education and preventive healthcare advice according to the patient's specific conditions, helping them to better prevent and control their diseases. Therefore, GPs play an important role in the treatment of T2DM and play an important role as the main force of healthcare services [9]. This should be promoted and applied more in clinical practice to improve the treatment effect and quality of life of patients.

5. Conclusion

General medicine popularization has achieved remarkable results among T2DM patients in Neijiang City. Not only does it improve the patient's glycemic control, enhance their self-management ability, and optimize the use of medical resources but also improves their mental health. In the future, we can continuously strengthen the promotion application, and education of general medicine science and provide comprehensive, continuous, and high-quality medical services for T2DM patients.

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Disclosure statement

The authors declare no conflict of interest.

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