

Clinical Application of Patient Participation Health Model in the Health Management of Patients with Type 2 Diabetes

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Abstract: *Objective:* To analyze the clinical effects of the patient participation health model in the health management of type 2 diabetes mellitus. *Methods:* A total of 124 patients with type 2 diabetes admitted to the hospital from June 2023 to June 2024 were randomly assigned to either the control group (64 patients) or the intervention group (60 patients). Patients in the control group received routine health management, while those in the intervention group were managed using a patient-participation health model with progressive, stage-based interventions. Outcomes were assessed based on blood glucose control, disease awareness, and self-management behaviors. Adverse reactions during health management were closely monitored in both groups. *Results:* Patients in the intervention group showed significantly better outcomes in blood glucose control, disease awareness, and self-management behaviors compared to the control group. *Conclusion:* The patient participation health model demonstrated significant clinical value, effectively enhancing self-management abilities, improving glycemic control, and increasing disease awareness. This model is recommended for widespread adoption in the health management of type 2 diabetes to achieve better therapeutic outcomes and improve patient quality of life.

Keywords: Type 2 diabetes; Health management; Patient participation health model; Clinical application

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1. Introduction

The increasing prevalence of diabetes, driven by social and economic development and lifestyle changes, has become a significant global public health concern. Type 2 diabetes, the most common form of the disease, poses a substantial burden on patients' quality of life. Traditional health management approaches have primarily focused on medication and physician guidance, often neglecting the active role of patients in managing their condition.

In recent years, the patient-participation health model has emerged as a novel approach to health management. This model emphasizes the active involvement of patients in disease management, empowering them to take on a central role in their health care. By promoting education and self-management, this approach aims to improve

treatment outcomes and overall quality of life.

This study seeks to evaluate the effectiveness of the patient participation health model in the management of type 2 diabetes. By comparing traditional health management practices with the patient participation model, this research assesses improvements in blood glucose control, disease awareness, and self-management behaviors. The findings aim to provide a scientific foundation for advancing health management strategies for patients with type 2 diabetes and to propose innovative approaches for clinical practice.

2. Materials and methods

2.1. General information

A total of 124 patients with type 2 diabetes admitted to the hospital from June 2023 to June 2024 were selected as study participants using the convenience sampling method.

Inclusion criteria: (1) Aged between 18 and 75 years; (2) Meeting the diagnostic criteria for type 2 diabetes; (3) Capable of understanding and voluntarily participating in the study; (4) Proficient in using the WeChat application.

Exclusion criteria: (1) Presence of other serious chronic diseases or mental illnesses; (2) Cognitive impairment or communication difficulties; (3) Participation in other clinical trials; (4) Severe liver or kidney dysfunction, malignancy, or other severe conditions; (5) Use of medications significantly affecting blood sugar, such as hormone drugs or immunosuppressants.

All participants provided written informed consent before enrollment. To minimize inter-group contamination, the 124 patients were divided into two groups based on their admission sequence. Patients admitted between June and December 2023 (64 patients) formed the control group, while those admitted between January and June 2024 (60 patients) formed the intervention group ^[4]. The control group comprised 38 male and 26 female patients, and the intervention group included 32 male and 28 female patients. The mean ages of the two groups were 58.3 and 57.9 years, respectively, aligning with the inclusion criteria. In terms of educational attainment, 40% of patients in the control group and 45% in the intervention group had university-level education or higher, indicating comparability in educational background. Baseline data, including height, weight, blood pressure, blood glucose levels, disease cognition, and self-management behaviors, were collected from all patients before enrollment. No statistically significant differences were found between the two groups ($P > 0.05$).

2.2. Methods

2.2.1. Control group

Patients received conventional health management, including health education during their visits. This covered fundamental topics such as dietary control, exercise guidance, blood glucose monitoring, and medication adherence. Regular follow-up visits were conducted to ensure compliance with medical advice.

2.2.2. Intervention group

In addition to conventional health management, patients in this group were introduced to the patient participation health model ^[1]. The intervention was phased and progressive, as outlined below:

2.2.2.1. From dim awareness to understanding

(1) Characteristics: Focused on improving patients' awareness of type 2 diabetes and establishing correct

disease concepts ^[2].

- (2) Cognitive level: Patients' understanding of the disease and current self-management practices was assessed through questionnaires to provide targeted guidance for subsequent education ^[3].
- (3) Behavioral level: One-on-one consultations educated patients on diet and exercise planning and emphasized the importance of blood glucose monitoring. Health education courses, including lectures, interactive Q&A sessions, and case analysis, were conducted to enhance disease understanding and promote self-management habits ^[4].

2.2.2.2. From understanding to compliance

- (1) Characteristics: Aimed at encouraging active participation in health management, overcoming compliance barriers, and fostering adherence behaviors ^[5].
- (2) Cognitive level: Regular health education sessions deepened patients' understanding. Quizzes and multimedia tools such as videos and animations were employed to simplify complex concepts ^[6].
- (3) Behavioral level: Interactive activities such as role-play and scenario simulations allowed patients to practice healthy behaviors. A social platform was provided for sharing experiences and mutual encouragement ^[7].

2.2.2.3. From compliance to a well-being plan

- (1) Characteristics: Patients were empowered to participate in health decision-making, adapt to the health management model, and maintain healthy behaviors ^[8].
- (2) Cognitive level: Patients were guided to design their own health management strategies, with scientific support to strengthen adherence and disease management ^[9].
- (3) Behavioral level: Efforts were made to reinforce drug therapy practices, self-care, and extended care ^[10]. Multimedia tools and personalized consultations facilitated a deeper understanding and retention of diabetes management principles.

2.3. Observational measures and evaluation tools

- (1) Disease cognition: A customized questionnaire assessed patients' knowledge across four dimensions: basic knowledge, dietary management, exercise management, and complications. Scores ranged from 0 to 100, with higher scores indicating better disease cognition ^[11].
- (2) Blood glucose control: Baseline measurements of fasting blood glucose (FBG) and hemoglobin A1c (HbA1c) levels were collected. These were monitored every three months during the intervention period. The impact of the health model on blood glucose control was assessed by comparing pre- and post-intervention data and hypoglycemic events.
- (3) Self-management behaviors: The Diabetes Self-Management Behavior Scale (DSMB) was used to evaluate changes in dietary management, exercise routines, blood glucose monitoring, foot care, and medication adherence. Assessments were conducted regularly to analyze behavioral changes and their correlation with blood glucose control ^[12].

2.4. Statistical methods

SPSS 20.0 software was used for data analysis. Measurement data, such as age and disease cognition, were

expressed as mean $\pm$ standard deviation (SD). Frequencies and percentages were used for categorical variables like educational levels. A P -value of < 0.05 was considered statistically significant.

3. Results

3.1. Comparison of disease cognitive levels

After the study, patients in the intervention group demonstrated significantly higher levels of disease cognition compared to those in the control group. Specifically, the average scores for the intervention group in the dimensions of basic knowledge, diet knowledge, exercise knowledge, and complication knowledge were 17.65, 17.60, 17.98, and 17.23 points, respectively. In contrast, the control group scored averages of 16.28, 15.97, 16.44, and 15.64 points in the same dimensions (**Table 1**). Statistical analysis revealed that the differences in disease cognition levels between the two groups were statistically significant ($P < 0.05$). These findings indicate that the intervention measures based on patient participation in the health model effectively enhanced patients' understanding of type 2 diabetes ^[13].

Table 1. Comparison of disease cognition levels between the two groups before and after the intervention

Group	n	Basic knowledge		Diet knowledge		Exercise knowledge		Complication knowledge		Total points	
		Before	After	Before	After	Before	After	Before	After	Before	After
Control	64	12.11 $\pm$ 1.69	16.28 $\pm$ 1.61*	12.58 $\pm$ 2.38	15.97 $\pm$ 1.44*	12.02 $\pm$ 1.78	16.44 $\pm$ 1.79*	11.64 $\pm$ 1.83	15.64 $\pm$ 1.27*	48.34 $\pm$ 4.49	64.33 $\pm$ 4.37*
Intervention	60	11.88 $\pm$ 1.69	17.65 $\pm$ 3.17*#	12.33 $\pm$ 2.18	17.60 $\pm$ 2.65*#	11.57 $\pm$ 1.38	17.98 $\pm$ 1.85*#	11.95 $\pm$ 1.96	17.23 $\pm$ 2.37*#	47.63 $\pm$ 4.05	70.47 $\pm$ 6.00*#

Note: * $P < 0.05$ as compared to pre-intervention, # $P < 0.05$ as compared to the control group.

3.2. Comparison of blood glucose control

The intervention group exhibited significantly better blood glucose control compared to the control group. Specifically, the fasting blood glucose (FBG) and glycosylated hemoglobin (HbA1c) levels in the intervention group decreased notably following the intervention, while the control group showed minimal changes in glycemic control. At the end of the intervention, the mean FBG level in the intervention group was 6.8 mmol/L, and the mean HbA1c level was 7.2%. In contrast, the control group had mean FBG and HbA1c levels of 7.5 mmol/L and 7.9%, respectively. Statistical analysis confirmed that the differences in glycemic control between the two groups were statistically significant ($P < 0.05$), demonstrating that the health model based on patient participation significantly improved blood glucose management ^[14].

3.3. Comparison of self-management behaviors

Significant improvements in self-management behaviors were observed among patients in the intervention group across all assessed dimensions. The intervention group achieved average scores of 18.2 for diet management, 18.5 for exercise management, 18.3 for blood glucose monitoring, 18.1 for foot care, and 18.4 for medication management. In comparison, the control group scored averages of 16.8, 16.9, 16.7, 16.5, and 16.8, respectively, in these dimensions. Statistical analysis showed that the differences in self-management behavior scores between the two groups were statistically significant ($P < 0.05$). These results indicate that the patient participation-based

health model interventions effectively enhanced the self-management capabilities of patients.

4. Discussion

This study, through a comparative analysis of conventional health management and health management based on the patient participation health model, confirmed that the latter offers significant advantages in enhancing disease cognition levels, improving glycemic control outcomes, and promoting self-management behaviors in patients with type 2 diabetes. Through phased and progressive interventions, the patient participation health model not only enhances patients' understanding of their condition but also fosters the development of effective self-management habits in daily life. These improvements contribute to better blood glucose control and a reduced risk of complications ^[15]. Moreover, the model encourages active patient involvement in health management, thereby enhancing treatment outcomes and overall quality of life through education and self-management strategies.

In clinical practice, the successful application of the patient participation health model necessitates that medical professionals possess the requisite knowledge and skills to deliver personalized health education and guidance to patients. Concurrently, medical institutions should provide the necessary support infrastructure, such as establishing patient education platforms and offering comprehensive health education materials, to facilitate the effective implementation of this model. Furthermore, the widespread adoption of the patient-participation health model requires policy support and the efficient allocation of medical resources to ensure that patients have access to continuous and effective health management services.

5. Conclusion

In conclusion, the patient participation health model offers an innovative approach to the health management of patients with type 2 diabetes. By enhancing patients' self-management abilities and disease cognition levels, this model contributes to improved glycemic control and overall quality of life. With ongoing research and expanded practical applications, the patient participation health model is poised to become an integral component of the health management strategies for patients with type 2 diabetes.

Disclosure statement

The author declares no conflict of interest.

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