

The Effect of Health Education Using Clinical Nursing Pathways in Patients with Schizophrenia and Diabetes

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Abstract: *Objective:* To analyze the nursing effect of health education intervention using clinical nursing pathways for patients with schizophrenia and diabetes, and to provide a basis for optimizing nursing intervention strategies for this type of patients.

Methods: 200 cases of schizophrenia and diabetes in our hospital from January 2023 to December 2024 were selected as research samples, and were divided into equal groups using the random number table method, namely the control group ($n = 100$) and the observation group ($n = 100$). The control group received routine health education, and the observation group received health education based on clinical nursing pathways. The intervention period was 8 weeks in both cases. The nursing effects of the two groups were compared. *Results:* After the intervention, the total health knowledge mastery rate of the observation group (92.0%) was significantly higher than that of the control group (75.0%), $P < 0.05$. The FPG, 2hPG and PANSS scores of the observation group were significantly lower than those of the control group ($P < 0.05$). The PSQI score of the observation group was lower than that of the control group ($P < 0.05$). In terms of MCMQ scores, compared with the control group, the observation group had higher scores on the facing dimension and avoidance dimension, and lower scores on the yielding dimension ($P < 0.05$). *Conclusion:* Health education for patients with schizophrenia and diabetes mellitus through the use of clinical nursing pathways can improve the patient's cognitive level of the disease, improve their blood sugar control, mental symptoms, sleep quality and active coping ability. It is a structured and efficient nursing intervention model with clinical application and promotion value.

Keywords: Schizophrenia; Diabetes; Clinical nursing pathway; Health education; Nursing effect; Blood sugar control; Quality of life

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1. Introduction

Schizophrenia is a chronic mental disorder that can cause abnormal manifestations in patients' consciousness, behavior, and perception, and significantly impair the patient's social functions^[1]. Diabetes Mellitus (DM) is a chronic metabolic disease with high incidence in the world. According to the 2023 report of the International Diabetes Federation (IDF), there are more than 570 million patients worldwide, and the prevalence rate in my country is as high as 12.4%^[2]. Management of the condition is particularly complex when schizophrenia and diabetes co-occur. On the one hand, antipsychotic drugs often induce or aggravate metabolic disorders and aggravate the progression of diabetes^[3]. On the other hand, abnormal blood sugar fluctuations can also affect the function of the central nervous system and may induce or worsen psychiatric symptoms. Studies have shown that patients with schizophrenia are 2-3 times more likely to develop diabetes than the

general population^[4]. Such patients often suffer from impaired cognitive function, reduced self-management ability and poor treatment compliance due to the disease itself, which makes the dual control of blood sugar and mental symptoms face severe challenges and seriously affects their quality of life^[5].

Health education is the core part of comprehensive management of chronic diseases, aiming to enhance patients' self-management effectiveness through knowledge transfer and behavioral intervention. The traditional conventional health education model has limitations such as fragmented content, insufficient pertinence, and a single form, and is difficult to meet the complex and special health needs of patients with schizophrenia and diabetes^[6]. Clinical Nursing Pathway (CNP) is a standardized and process-based nursing management model guided by evidence-based medicine, using a timeline as a framework, and integrating multi-dimensional content such as diagnosis, treatment, nursing, nutrition, rehabilitation, health education and discharge planning^[7]. Its core lies in multidisciplinary collaboration to provide patients with continuous, coordinated and individualized care services. Existing studies have confirmed that CNP is effective in single disease management^[8], but there are relatively few studies on its effectiveness in systematically implementing health education in patients with schizophrenia and diabetes. This study aims to explore better nursing intervention programs by comparing the effects of conventional health education and CNP-based health education, and provide a reference for clinical practice. The report is as follows.

2. Materials and methods

2.1. Research objects

200 patients with schizophrenia and diabetes who were hospitalized in our hospital from January 2023 to December 2024 were selected. Use the random number table method to divide them into two groups, with 100 cases in each group. Control group: 58 males and 42 females; age (42.5 ± 8.3) years old; disease duration (8.2 ± 3.1) years old. Observation group: 60 males and 40 females; age (43.2 ± 7.9) years old; disease duration (8.5 ± 2.8) years old. There was no significant difference in parallel comparison of information data between 2 or more groups $P > 0.05$.

Inclusion criteria: (1) Meet the diagnostic criteria for schizophrenia in the International Classification of Diseases (ICD-10) and the diagnostic criteria for diabetes by the World Health Organization (WHO); (2) Aged 18 to 65 years old; (3) Clear consciousness and basic communication skills; (4) The patient or his legal guardian gave informed consent and signed an informed consent form.

Exclusion criteria: (1) Combined with severe heart, liver, and renal failure; (2) Suffering from other serious mental disorders (such as major depressive episode, manic episode of bipolar disorder) that interferes with the assessment; (3) Voluntarily withdrawn or lost to follow-up during the study.

2.2. Intervention methods

Control group: Implement routine health education. The responsible nurse organizes a group health lecture once a week, each time for about 30 minutes. The content covers the basic knowledge of schizophrenia and diabetes, clinical manifestations, treatment principles, drug use precautions, diet and exercise guidance, etc.; disease knowledge brochures are distributed; while the patient is hospitalized, oral health education is given from time to time according to the situation, emphasizing the importance of following medical treatment. The intervention lasted 8 weeks.

Observation group: Implement health education based on CNP. The specific plan is as follows:

- (1) Team formation: Establish a CNP team, including 1 deputy chief physician of the psychiatry department, 1 attending physician of the endocrinology department, 2 psychiatric nurses in charge, 2 diabetes specialist nurses, and 1 nutritionist. The team jointly developed a CNP form, clarified the division of responsibilities, and conducted regular case discussions and professional knowledge training to ensure professionalization and standardization of intervention.
- (2) Path formulation: Based on the patient's disease characteristics, treatment process and clinical experience,

formulate a staged CNP table. Day 1 of admission: Complete the admission assessment and environmental introduction; psychiatrists and endocrinologists will jointly explain the disease definition, etiology, pathophysiology, main hazards and treatment goals to patients and guardians; issue a customized health manual and self-management record card. Days 2 to 20 of hospitalization: Nutritional management: Individualized dietary guidance (calorie calculation, recipe formulation) will be provided by a responsible nurse or nutritionist every day, emphasizing the timing and quantitative principles of diabetic diet. Exercise guidance: Develop an exercise plan based on the patient's physical condition and supervise its execution. Medication management: Psychiatric and diabetes specialist nurses jointly provide medication education, explaining in detail the mechanism of action, usage and dosage, potential adverse reactions and coping strategies of various drugs. Knowledge enhancement: 2 special lectures are held every week. Psychological support: For patients with anxiety, depression and other emotional problems, psychological counselors or trained nurses provide individualized psychological counseling to promote the establishment of a positive treatment attitude. 3 days before discharge: Skills training: guide patients/family members to master the operation of blood glucose meters, self-monitoring methods and frequency of blood glucose; standardize insulin injection techniques, emphasizing aseptic operation. Discharge plan: clearly inform the discharge medication plan, follow-up time and location; formulate a personalized home rehabilitation plan; establish follow-up files, and provide consultation channels such as telephone and WeChat.

(3) Path implementation and feedback: Implement health education strictly in accordance with the CNP table. After each education, the responsible nurse assesses the patient's understanding and mastery through questions, retellings, scenario simulations, etc., and dynamically adjusts the content and methods of subsequent education based on feedback. The intervention period is 8 weeks.

2.3. Observation indicators

- (1) Health knowledge mastery: assessed using a self-designed questionnaire, including basic knowledge of diseases, treatment points, self-management skills (diet, exercise, medication, monitoring), etc., with a full score of 100 points. ≥ 85 is classified as "mastered", 60–84 is classified as "basic mastered", and < 60 is classified as "not mastered". Total mastery rate = (number of mastered cases + basic mastered cases)/total number of cases $\times 100\%$.
- (2) Blood glucose level: Blood samples were collected from patients before and after the pre-pregnancy test to detect fasting blood glucose (FPG) and 2-h postprandial blood glucose (2hPG).
- (3) Assessment of mental symptoms: Use the Positive and Negative Syndrome Scale (PANSS)^[6] to assess mental symptoms. The higher the score, the more serious the patient's mental disorder.
- (4) Sleep quality assessment: Use the Pittsburgh Sleep Quality Index (PSQI)^[7] score. The higher the total score, the worse the sleep quality.
- (5) Coping style assessment: The Medical Coping Style Questionnaire (MCMQ)^[8] is used to assess, including three dimensions: facing (active coping), avoidance (avoiding problems), and yielding (negative acceptance). The score of each dimension reflects the patient's degree of coping tendencies.

2.4. Statistical methods

All the data in this article were analyzed with the help of SPSS 26.0, and the measurement data involved are expressed as follows: mean \pm standard deviation (SD), that is, the mean plus or minus the standard deviation, all are t tests, and the count data are expressed as follows: [n (%)], all are χ^2 tests, and $P < 0.05$ is considered statistically significant.

3. Results

3.1. Comparison of health knowledge mastery between the two groups

After the intervention, the total health knowledge mastery rate of the observation group was higher than that of the control

group, and there was a difference ($P < 0.05$). See **Table 1** for details.

Table 1. Comparison of health knowledge mastery between two groups of patients after intervention [n(%)]

Group	n	Master	Basic mastery	Not mastered	Total mastery (%)
Control group	100	38 (38.0)	37 (37.0)	25 (25.0)	75 (75.0)
Observation group	100	55 (55.0)	37 (37.0)	8 (8.0)	92 (92.0)
χ^2	-	-	-	-	10.488
P	-	-	-	-	0.001

3.2. Comparison of blood glucose levels and PANSS scores between the two groups of patients

Before intervention, there was no statistically significant difference in FPG, 2hPG and PANSS scores between the two groups of patients ($P > 0.05$). After intervention, the FPG, 2hPG and PANSS scores of the observation group were lower than those of the control group, and there were differences ($P < 0.05$). Intra-group comparison showed that all indicators in the two groups were significantly improved after the intervention compared with before the intervention ($P < 0.001$). **Table 2** for details.

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

Group	n	FPG (mmol/L)		2hPG (mmol/L)		PANSS (Score)	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Control group	100	8.5 \pm 1.2	7.8 \pm 1.0	13.2 \pm 2.1	11.8 \pm 1.8	78.5 \pm 8.3	72.3 \pm 7.5
Observation group	100	8.3 \pm 1.1	6.5 \pm 0.8	13.0 \pm 2.0	9.5 \pm 1.2	78.2 \pm 8.1	65.2 \pm 6.8
<i>t</i>	-	1.229	10.151	0.690	10.632	0.259	7.013
P	-	0.221	0.000	0.491	0.000	0.796	0.000

3.3. Comparison of PSQI and MCMQ scores between the two groups of patients

Before the intervention, there was no statistical significance in the scores of PSQI and MCMQ between the two groups of patients ($P > 0.05$). After the intervention, the PSQI score of the observation group was lower than that of the control group; in terms of MCMQ score, the face and avoidance dimensions of the observation group increased, while the yielding dimension decreased significantly ($P < 0.05$). **Table 3** for details.

Table 3. Comparison of PSQI and MCMQ scores between two groups of patients before and after intervention (mean \pm SD)

Group	n	PSQI (points)		MCMQ-face (points)		MCMQ-Avoidance (points)		MCMQ-Yield (Points)	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Control group	100	8.2 \pm 1.5	7.5 \pm 1.3	18.5 \pm 2.3	19.2 \pm 2.1	14.2 \pm 1.8	14.8 \pm 1.6	10.5 \pm 1.2	10.8 \pm 1.0
Observation group	100	8.0 \pm 1.4	6.2 \pm 1.0	18.3 \pm 2.2	22.5 \pm 2.5	14.0 \pm 1.7	16.5 \pm 1.9	10.3 \pm 1.1	8.5 \pm 0.8
<i>t</i>	-	0.975	7.926	0.628	10.107	0.808	6.844	1.229	17.960
P	-	0.331	0.000	0.530	0.000	0.420	0.000	0.221	0.000

4. Discussions

Effective management of patients with schizophrenia and diabetes is the focus and difficulty of current clinical nursing research. This study focuses on the application effect of the structured health education model. The results show that health education based on CNP is significantly better than conventional health education in improving patients' health knowledge level, improving physiological indicators (blood sugar), mental symptoms, sleep quality and promoting positive coping.

The health knowledge mastery rate of patients in the observation group increased significantly (92.0% vs. 75.0%), verifying the advantages of the CNP model in knowledge transfer. CNP systematically plans educational content, clarifies time points, integrates multidisciplinary resources (physicians, nurses, nutritionists, psychologists), and uses diversified educational forms to overcome the shortcomings of fragmentation and lack of depth in conventional education and ensure the comprehensiveness, continuity and individual adaptability of knowledge transfer^[9], thereby effectively improving patients' cognitive level in the management of complex comorbidities. In terms of blood sugar control, the significant improvement in FPG and 2hPG in the observation group was because CNP deeply integrated the core elements of diabetes management (individualized diet prescription, regular exercise prescription, refined medication guidance, standardized blood sugar monitoring and insulin injection skills training) into each stage of the path, and was followed up and supervised by specialist nurses. This integrated and intensive lifestyle intervention and medication management can significantly improve patients' treatment compliance and self-management efficacy^[10,11]. At the same time, the simultaneous improvement of mental symptoms (PANSS score) may be due to the stabilizing effect of optimization of blood sugar control on neurological function on the one hand, and is also closely related to the regular medication guidance, self-identification, and coping strategies of mental symptoms, and targeted psychological counseling emphasized in the CNP path. Together, these interventions promote overall stabilization of the patient's condition. The improvement in sleep quality (PSQI score) and more active coping styles of the patients in the observation group highlighted the value of CNP in paying attention to the psychosocial aspects of patients. Patients with schizophrenia and diabetes often bear a huge disease burden and psychological pressure, and are prone to anxiety and depression, which in turn affects sleep and coping styles. The specialized psychological counseling sessions, coping skills guidance, and positive guidance on disease recognition in the CNP path can help patients relieve negative emotions, establish a more effective stress coping mechanism, and improve their psychological flexibility and self-efficacy^[12], thereby improving sleep quality and overall adaptability.

5. Conclusion

In summary, the health education model based on the clinical nursing path, through its characteristics of standardization, structuring, multidisciplinary collaboration, and individual customization, can effectively improve the disease recognition and self-management ability of patients with schizophrenia and diabetes. It has shown significant advantages in improving blood sugar control, alleviating mental symptoms, optimizing sleep quality, and promoting active coping, and provides clinical nursing intervention programs that are highly operable and effective.

Disclosure statement

The author declares no conflict of interest.

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