The Impact of Continuous Nursing Combined with KAP Intervention Guided by the Interactive Achievement Theory on Blood Glucose Control and Healthy Behaviors of Patients with Gestational Diabetes Mellitus

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Abstract: *Objective:* To analyze the nursing effect of implementing continuous nursing combined with knowledge, attitude, and practice (KAP) intervention under the guidance of interactive goal-setting theory for patients with gestational diabetes mellitus (GDM). *Methods:* A total of 68 patients with GDM who were admitted to the hospital between December 2021 and December 2023 were selected and randomly divided into two groups using a random number table. The combined group (34 cases) received continuous nursing combined with KAP intervention under the premise of interactive goal-setting theory, while the conventional group (34 cases) received routine nursing care. Blood glucose control, health behavior scores, and other indicators were compared between the two groups. *Results:* After nursing, the blood glucose level in the combined group was lower than that in the conventional group, and the scores for health behavior and self-management ability were higher than those in the conventional group (*P* < 0.05). *Conclusion*: Combined nursing can improve blood glucose control in patients with GDM, standardize their health behaviors, and cultivate their self-management skills.

Keywords: Interactive goal-setting theory; Continuous nursing; Knowledge, attitude, and practice (KAP) intervention; Gestational diabetes mellitus

1. Introduction

Gestational diabetes mellitus (GDM) is a type of diabetes that first occurs during pregnancy. Currently, patients with GDM undergo standardized examinations in high-risk pregnancy clinics for dynamic assessment of blood

glucose levels and flexible adjustment of treatment plans. However, patient compliance is generally inadequate, and intervention measures are relatively one-sided, which is not conducive to disease prognosis [1, 2]. The Interactive Achievement Theory is a new nursing theory that emphasizes efficient communication and close interaction between nurses and patients. Implementing continuous nursing based on this theory can stimulate patients' initiative and gradually improve their self-management abilities. The Knowledge-Attitude-Behavior (KAB) intervention is an effective means of cultivating healthy behaviors among patients. It provides detailed explanations of disease knowledge, establishes patients' health beliefs, and urges them to develop healthy behaviors, thereby improving the quality of nursing care [3]. Based on this, the study selected 68 patients with GDM to evaluate the effects of implementing continuous nursing and KAB intervention based on the Interactive Achievement Theory.

2. Materials and methods

2.1. General information

Sixty-eight patients with GDM who were admitted to the hospital between December 2021 and December 2023 were selected and randomly divided into two groups using a random number table. The combined group consisted of 34 patients aged between 24 and 34 years, with a mean age of (28.14 ± 2.36) years. The gestational age ranged from 24 to 33 weeks, with a mean of (27.82 ± 2.59) weeks. The conventional group also consisted of 34 patients, aged between 23 and 33 years, with a mean age of (28.28 ± 2.41) years. The gestational age ranged from 23 to 32 weeks, with a mean of (27.93 ± 2.64) weeks. There were no significant differences in the baseline characteristics between the two groups $(P > 0.05)$.

Inclusion criteria: fasting blood glucose (FBG) > 5.1 mmol/L, 1-hour postprandial blood glucose (1hPG) > 10.0 mmol/L, 2-hour postprandial blood glucose (2hPG) > 8.5 mmol/L; age < 35 years; singleton pregnancy; normal consciousness and communication abilities. Exclusion criteria: abnormal heart, liver, and kidney function; history of diabetes; mental illness; major diseases such as malignant tumors; withdrawal from the study.

2.2. Methods

The conventional group received routine nursing care. The nursing staff understood the patients' dietary structure and behavior habits, listed dietary dos and don'ts, and explained the precautions for daily life. Nurse-patient communication was strengthened to assess the psychological characteristics of patients, and their psychological pressure was reduced through language counseling, comforting with body movements, and other methods. Patients were informed of the follow-up time and received individualized guidance regularly through telephone follow-up and other means.

The combined group implemented continuous nursing based on the Interactive Achievement Theory, combined with the Knowledge-Attitude-Behavior (KAB) intervention.

2.2.1. Continuous nursing based on the Interactive Achievement Theory

(1) Formation of a continuous nursing team

The team leader is the head nurse of the obstetrics department, and the team members include specialists and specialized nurses. The team leader is responsible for special training, including nursing concepts, nursing projects, and nursing skills. After the training, the team leader will conduct a unified special assessment to ensure

that all team members pass the assessment.

(2) Development of a nursing plan

Patiently communicate with the patient, and evaluate their dietary habits, occupation type, past medical history, and family environment to comprehensively grasp their personal information. Encourage patients to elaborate on their current nursing expectations, propose nursing suggestions, and invite them to jointly develop a nursing goal list. Among them, short-term goals include disease knowledge and health beliefs; long-term goals include continuous blood glucose control.

(3) Evaluation: Evaluate the patient's nursing goal completion. If the patient effectively completes the nursing goals, provide material and spiritual rewards to guide the patient to continue to consolidate nursing skills. If the patient's nursing goal completion is average, deeply analyze nursing defects, optimize the nursing plan accordingly, and implement the next stage of nursing intervention.

2.2.2. Knowledge-Attitude-Behavior (KAB) intervention

(1) Health education

During hospitalization, distribute educational manuals and explain in detail the essentials of prenatal care and different delivery methods. Adopt a one-on-one education format and provide secondary education on knowledge weaknesses. Play educational videos demonstrating self-monitoring methods for blood glucose, scientific training methods, and popularizing medication usage and dosage. Focus on dietary guidance, informing patients of a low-sugar, low-fat diet, and adjusting the patient's diet structure using the food exchange method to ensure nutritional balance while stimulating appetite. One day before discharge, establish WeChat and QQ groups and reserve patient contact information. Interact in the group every day at around 14:00, encourage patients to ask their own questions, and the group administrator will provide targeted answers. Push educational videos about disease knowledge and nursing content in the group once a week, allowing patients to continuously learn the latest knowledge. Conduct a WeChat follow-up once a week, inquiring about the patient's outpatient care through WeChat text and video chats, with each follow-up lasting 30 minutes. Conduct a telephone follow-up every two weeks, or change to a home visit if the patient's blood glucose level is high. Comprehensively evaluate the patient's current nursing status and provide targeted guidance, with each visit lasting about 60 minutes.

(2) Establishing healthy beliefs

During communication with the patient, observe their facial expressions and tone changes, patiently guide them to express their inner thoughts, and provide psychological counseling with a kind attitude and professional language to improve their negative psychology. Quote successful cases, convey positive energy to patients, and stimulate their health awareness. Advise family members to discuss positive topics with the patient more often to help them establish healthy beliefs.

(3) Behavioral intervention

Correct patients' bad habits in the home environment, require patients to record their medication status daily, such as medication time and dosage, and check in the group once a week. The group administrator evaluates the patient's medication compliance and provides targeted guidance. Daily records of blood glucose monitoring results and exercise time are also submitted to the group administrator to dynamically evaluate the patient's blood glucose control and adjust exercise intensity and frequency based on the patient's exercise tolerance.

2.3. Observation indicators

(1) Blood glucose control: Evaluate levels of FBG, 2hPG, and glycated hemoglobin (HbAlc) before nursing and after 3 months of nursing.

(2) Health behaviors: Administer the Health-Promoting Lifestyle Profile-II during the same time period, which includes nutrition (9 items), health responsibility (9 items), interpersonal relations (9 items), stress management (8 items), physical activity (8 items), and personal goals (9 items). Each item is scored from 1 to 4, with higher scores indicating better performance.

(3) Self-management ability: Administer a self-management ability questionnaire for GDM patients, including beliefs and attitudes (4 items), relevant knowledge (9 items), social support (4 items), and management methods and behaviors (9 items). Each item is scored from 1 to 5, with higher scores indicating better performance.

2.4. Statistical analysis

Data were processed using SPSS 28.0 software. Measurement data were expressed as mean ± standard deviation ($\bar{x} \pm s\bar{x} \pm s$) and compared using the t-test. Count data were expressed as frequency and percentage (n/%) and compared using the chi-square test. Statistical significance was set at $P < 0.05$.

3. Results

3.1. Comparison of blood glucose control between the two groups

After nursing, the blood glucose levels in the combined group were significantly lower, with a statistically significant difference between the groups ($P < 0.05$).

Table 1. Comparison of blood glucose control between the two groups ($\bar{x} \pm s\bar{x} \pm s$)

Grouping	FBG(mmol/L)		2hPG(mmol/L)		HbAlc(%)	
	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Combined group (n = 34)	7.85 ± 1.29	5.31 ± 0.58	14.72 ± 2.68	9.74 ± 1.27	7.20 ± 1.49	5.80 ± 0.77
Conventional group (n = 34)	7.89 ± 1.33	6.01 ± 0.72	14.75 ± 2.71	10.89 ± 1.31	7.24 ± 1.51	6.94 ± 0.79
t	0.126	4.415	0.046	3.675	0.110	6.026
P	0.900	0.000	0.964	0.000	0.913	0.000

3.2. Comparison of health behaviors between the two groups

After nursing, the health behavior scores of the combined group were significantly higher, with a statistically significant difference between the groups ($P < 0.05$).

Table 2. Comparison of health behaviors between the two groups, ($\bar{x} \pm s\bar{x} \pm s$, scores)

Grouping	Nutrition		Health Responsibility		Interpersonal Relationships	
	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Combined group (n = 34)	19.15 ± 2.34	27.24 ± 3.95	18.15 ± 2.97	28.24 ± 3.44	17.10 ± 2.35	30.28 ± 3.74
Conventional group (n = 34)	19.11 ± 2.40	22.41 ± 3.88	18.19 ± 2.90	23.04 ± 3.19	17.14 ± 2.39	26.77 ± 3.45
t	0.070	5.087	0.056	6.463	0.070	4.022
P	0.945	0.000	0.955	0.000	0.945	0.000

Grouping	Stress Coping		Physical Exercise		Personal Goals	
	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Combined group (n = 34)	14.59 ± 2.33	25.69 ± 3.12	14.28 ± 2.61	27.31 ± 3.14	18.33 ± 2.84	27.61 ± 3.41
Conventional group (n = 34)	14.56 ± 2.37	20.71 ± 3.10	14.31 ± 2.70	24.01 ± 3.11	18.27 ± 2.89	23.91 ± 3.50
t	0.053	6.602	0.047	4.354	0.086	4.415
P	0.958	0.000	0.963	0.000	0.931	0.000

3.3. Comparison of self-management ability between the two groups

After nursing, the self-management ability scores of the combined group were higher, with a statistically significant difference between the groups ($P < 0.05$).

Table 3. Comparison of self-management ability between the two groups, ($\bar{x} \pm s\bar{x} \pm s$, scores)

Grouping	Beliefs and Attitudes		Relevant Knowledge		Social Support		Management Methods and Behaviors	
	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Combined group (n = 34)	11.56 ± 2.30	16.08 ± 2.97	30.15 ± 3.05	37.52 ± 3.14	10.61 ± 1.87	15.64 ± 2.08	25.15 ± 3.12	35.99 ± 3.12
Conventional group (n = 34)	11.48 ± 2.43	14.11 ± 2.81	29.77 ± 3.08	33.09 ± 3.10	10.74 ± 1.90	13.17 ± 2.04	25.20 ± 3.18	30.71 ± 3.10
t	0.139	2.809	0.511	5.854	0.284	4.943	0.065	7.000
P	0.890	0.007	0.611	0.000	0.777	0.000	0.948	0.000

4. Discussion

The high-risk factors for GDM include advanced age, multiple pregnancies, and obesity, which can easily lead to adverse pregnancy outcomes such as macrosomia or preeclampsia [4, 5]. Clinical practice has found that the self-management awareness and behaviors of GDM patients at home can directly affect blood glucose control. Therefore, it is necessary to strengthen continuous nursing care for patients and carry out systematic health education. The Interactive Achievement Theory is a new theory of continuous nursing that continuously evaluates the feasibility of nursing processes and optimizes them based on patient feedback, thereby achieving the expected nursing goals [6]. Under the guidance of this theory, continuous nursing care has stronger interactivity, which can

foster a sense of ownership among patients, actively involve them in nursing practices, and fully unleash their nursing potential, enabling them to self-manage in a standardized manner. The Knowledge-Attitude-Behavior intervention can strengthen health knowledge education to improve patients' knowledge mastery. At the same time, cultivating patients' health beliefs and helping them develop healthy behaviors can significantly enhance their confidence in disease control and equip them with nursing abilities [7, 8].

The results showed that the blood glucose control effect in the combined group was better than that in the conventional group after nursing ($P < 0.05$). The reason is that the Interactive Achievement Theory can comprehensively evaluate patients' nursing needs, scientifically develop nursing plans, and improve patients' self-care awareness through orderly and systematic nursing measures, enabling them to actively control their blood glucose. The Knowledge-Attitude-Behavior intervention can use successful cases to enhance patients' self-confidence in disease control, enabling them to effectively implement nursing plans and improve blood glucose control. The scores for healthy behaviors and self-management ability in the combined group were higher than those in the conventional group ($P < 0.05$). This is because the above nursing is carried out in a group format, which allows for a comprehensive understanding of patients' bad habits, dynamic evaluation of their nursing goal completion, and subsequent improvement of nursing measures.

Additionally, this nursing approach can stimulate patients' initiative, enabling them to deeply understand their own condition and actively correct unhealthy behaviors, thereby optimizing their self-management abilities [9]. Furthermore, measures such as WeChat follow-ups and home visits can provide long-term monitoring of patients' blood glucose levels and healthy behaviors, making patients the leaders of nursing practice and facilitating the improvement of their nursing skills. Evidently, the combined nursing approach is highly professional and targeted, fully considering the disease characteristics and nursing difficulties of GDM, continuously identifying and addressing nursing problems, and ultimately elevating patients' knowledge, attitudes, and behaviors [10].

5. Conclusion

In summary, the combination of continuous nursing based on the Interactive Achievement Theory and the Knowledge-Attitude-Behavior intervention has a good effect on blood glucose control for GDM patients. It can assist them in developing healthy behaviors and comprehensively improving their self-management abilities.

Disclosure statement

The authors declare no conflict of interest.

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