

The Effect of Public Health Nursing Intervention on Patients with Diabetes and Hypertension on Improving Blood Pressure and Blood Sugar

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Abstract: *Objective:* To explore the effect of public health nursing intervention on improving blood pressure and blood glucose indicators in patients with diabetes and hypertension. *Methods:* 50 patients with diabetes and hypertension admitted to our center in 2024 were selected and divided into a public health nursing group and a routine nursing group with 25 patients in each group using the random number table method. The routine nursing group adopted basic disease management nursing methods, while the public health nursing group implemented targeted public health nursing intervention under the premise of routine nursing. The changes in blood pressure indicators and blood sugar indicators of the two groups of patients before and after the intervention were compared. *Results:* After the intervention, the systolic blood pressure and diastolic blood pressure levels of the public health care group were lower than those of the routine care group. Fasting blood sugar and 2-hour postprandial blood sugar levels were also lower than those of the routine care group. All differences were statistically significant ($P < 0.05$). *Conclusion:* Public health nursing intervention can effectively improve the blood pressure and blood sugar control of patients with diabetes and hypertension, and has the value of clinical promotion and application.

Keywords: diabetes; hypertension; public health; nursing intervention; blood pressure level; blood sugar level

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1. Introduction

Diabetes and hypertension are common clinical chronic comorbidities that have a long course and are difficult to control. The stable control of patients' blood pressure and blood sugar indicators is directly related to the risk of target organ damage and the speed of disease progression^[1]. In the current chronic disease management work carried out by the Centers for Disease Control and Prevention, the routine nursing model mostly focuses on basic disease monitoring and lacks systematic attention to the cultivation of patients' health management capabilities and lifestyle intervention. It is difficult to fully mobilize the enthusiasm of patients to actively participate in disease control. As a result, most patients have problems such as irregular medication and unreasonable diet structure, which results in unsatisfactory blood pressure and blood sugar control effects. Public health nursing intervention emphasizes comprehensive and systematic nursing guidance from the perspective of group health management combined with the actual situation of individual patients, covering

health education, lifestyle intervention, medication supervision and other aspects. It may have a positive contribution to improving the effectiveness of disease control in patients with diabetes and hypertension [2-3]. In recent years, with the continuous advancement of chronic disease prevention and control, people's demand for public health nursing services has also continued to increase. The traditional nursing model has been unable to meet the work needs of the Centers for Disease Control and Prevention's chronic disease management. Exploring more efficient nursing intervention models has become an urgent problem to be solved. Based on this situation, this study specifically explores the clinical effectiveness of public health nursing intervention in patients with diabetes and hypertension and its impact on blood pressure and blood sugar indicators.

2. Materials and methods

2.1. General information

Fifty patients with diabetes and hypertension admitted to our center from January 2024 to December 2024 were selected as research subjects and divided into two groups using the random number table method. The public health nursing group included 25 patients, 14 men and 11 men respectively, with an average age ranging from 45 to 78 years old (61.25 ± 5.32) years old. The routine care group included 25 patients, 13 men and 12 men respectively, with an average age ranging from 46 to 79 years old (61.78 ± 5.26) years old. The basic information of the two groups of patients was comparable $P > 0.05$.

Inclusion criteria: (1) meet the diagnostic criteria for diabetes and hypertension; (2) have clear consciousness and can cooperate to complete nursing intervention; (3) voluntarily join this study. Exclusion criteria: (1) Combined with severe cardiorenal dysfunction; (2) Presence of mental illness; (3) Combined with malignant tumors.

2.2. Method

The routine nursing team implements basic nursing measures for diabetes combined with hypertension, including monitoring blood pressure, blood sugar and other indicators, implementing medication guidance in accordance with doctor's orders, and carrying out simple disease knowledge publicity.

The public health nursing team implements targeted public health nursing intervention on the basis of routine care. The specific contents are as follows: (1) Health assessment and file establishment stage (initial 1 to 2 weeks of intervention): A special nursing team led by medical staff with more than 5 years of experience in chronic disease management is established to comprehensively assess the severity of the disease, past medical history, medication status, and living habits through questionnaires combined with face-to-face communication. Combining the assessment results with the level of health awareness and family support, an exclusive health file is established for each patient and a highly targeted personalized public health care plan is formulated. At the same time, the core points, implementation process and expected results of the nursing intervention are explained in detail to the patients and their families, and various questions raised by them are patiently answered to establish a good nurse-patient trust relationship, lay the foundation for the smooth progress of follow-up care work, and enhance the patient's initial willingness to cooperate. (2) Systemic intervention stage (intervention from the 3rd week to the 6th month): Carry out all-round intervention strictly in accordance with the personalized care plan. First, strengthen health education work, popularize the pathogenesis and harm of diabetes combined with hypertension and the importance of blood pressure and blood sugar control to patients through issuing health manuals, organizing small health lectures, one-on-one interpretation, etc., focusing on explaining the rules. In terms of dietary intervention, a personalized diet plan is developed based on the patient's weight, blood sugar and blood pressure levels and eating habits, and the patient is guided to reduce the intake of high-sugar and high-salt foods, increase the intake of vegetables and high-quality protein, and teach the patient how to calculate food calories and diet matching methods; in terms of exercise intervention, it is based on the patient's age and physical condition. The situation recommends appropriate exercise methods such as brisk walking and Tai Chi. It is recommended to exercise 3 to 5 times a week for 30 to 40 minutes each time. It is also recommended that patients pay attention to monitoring blood pressure and blood

sugar during exercise to avoid sports injuries. In terms of medication supervision, a daily medication reminder mechanism is established to urge patients to take medication on time and in the right amount through phone calls, WeChat, etc., and regularly check the dosage. Drug status: Timely discovery and correction of irregularities in medication use, explaining the mechanism of action and common adverse reactions of drugs so that patients know the need for standardized medication; regular guidance on blood pressure and blood glucose monitoring, teaching patients the correct use of blood pressure monitors and blood glucose meters and mastering home monitoring methods, and requiring patients to prepare monitoring records and submit them to the nursing team every week for timely adjustment of the care plan.(3) Consolidation and strengthening stage (7th to 12th month of intervention): In-depth explanation of the importance of long-term adherence to a healthy lifestyle and standardized medication for disease control through real case analysis, strengthening patients' awareness of health management; guiding family members to actively participate in nursing supervision, and teaching family members to assist patients in monitoring their condition, reminding them to take medication and adjust their diet The organization's method is to conduct follow-up visits once a month to understand the patient's blood pressure and blood sugar control, improvement in living habits and medication compliance through phone calls or door-to-door follow-up visits, promptly discover and solve emerging problems and adjust care plans based on existing problems, and continue to encourage patients to persist in self-health management to help them develop long-term and stable health management habits.

2.3. Observation indicators

Compare the changes in blood pressure indicators (including systolic blood pressure, diastolic blood pressure) and blood sugar indicators (including fasting blood sugar and 2-hour postprandial blood sugar) between the two groups of patients before and after the intervention.

2.4. Statistical methods

SPSS26.0 was used to analyze the data. The t test was used for the measurement data and the χ^2 test was used for the count data. $P < 0.05$ means the difference is very obvious.

3. Results

3.1. Comparison of blood pressure indicators between the two groups before and after intervention

After the intervention, the systolic blood pressure and diastolic blood pressure levels of the public health care group were lower than those of the routine care group ($P < 0.05$). See **Table 1** for details.

Table 1. Comparison of blood pressure indicators between the two groups before and after intervention ($\bar{x} \pm s$, mmHg)

Group	systolic blood pressure		diastolic blood pressure	
	Before intervention	After intervention	Before intervention	After intervention
Routine care group (n=25)	156.32±10.25	142.56±8.74	98.65±6.32	90.34±5.21
Public Health Nursing Team (n=25)	155.89±10.31	130.24±7.86	97.98±6.28	82.15±4.98
<i>t</i>	0.148	5.241	0.438	5.682
<i>P</i>	0.883	0.000	0.664	0.000

3.2. Comparison of blood glucose indicators between the two groups before and after intervention

After the intervention, the fasting blood glucose and 2-hour postprandial blood glucose levels of the public health care

group were lower than those of the routine care group ($P<0.05$). See **Table 2** for details.

Table 2. Comparison of blood glucose indicators between the two groups before and after intervention ($\bar{x} \pm S$, mmol/L)

Group	Fasting blood glucose		Blood sugar 2 hours after meal	
	Before intervention	After intervention	Before intervention	After intervention
Routine care group (n=25)	9.87±1.56	8.23±1.24	13.56±2.15	11.34±1.87
Public Health Nursing Team (n=25)	9.78±1.62	6.54±1.03	13.42±2.21	9.21±1.56
<i>t</i>	0.200	5.242	0.227	4.373
<i>P</i>	0.842	0.000	0.821	0.000

4. Discussions

Diabetes combined with hypertension is a typical chronic comorbidity with complex and interactive pathogenesis. Poor long-term control of blood pressure and blood sugar indicators will greatly increase the risk of serious complications such as cardiovascular and cerebrovascular diseases, kidney damage, and pose a serious threat to the life safety of patients. As the core institution for chronic disease prevention and control, the Centers for Disease Control and Prevention's nursing intervention work is directly related to the patient's disease control effectiveness and health management level^[4]. In the management of diabetes combined with hypertension, the conventional nursing model focuses more on basic indicator monitoring and simple medication guidance, and lacks systematic intervention in key influencing factors such as patients' health cognition and lifestyle, which makes it difficult for patients to develop independent health management capabilities and results in unsatisfactory blood pressure and blood sugar control effects. Public health nursing intervention breaks through the limitations of traditional nursing. It builds a comprehensive nursing intervention system from the overall perspective of public health management and combines the actual conditions of individual patients to help patients improve their health management capabilities and achieve stable control of blood pressure and blood sugar through health education, lifestyle intervention, medication supervision and other measures^[5].

The results of this study show that after the intervention, the systolic blood pressure and diastolic blood pressure levels of the public health care group were lower than those of the routine care group. This result shows that public health nursing intervention can effectively improve the blood pressure control of patients with diabetes and hypertension. The analyzed reason is that in the initial stage of implementation of this nursing intervention model, exclusive health files are established through comprehensive assessment of patient conditions, so that nursing measures are more in line with the actual needs of patients and avoid the blindness of unified care^[6]; the strengthened health education in the system intervention stage makes patients fully aware of the importance of blood pressure control and the adverse effects of non-standard lifestyles on blood pressure, and then proactively cooperate with nursing intervention; personalized dietary intervention Reducing the intake of high-salt foods reduces the triggers of elevated blood pressure, and at the same time, moderate exercise intervention enhances the patient's cardiovascular function, improves blood vessel elasticity, and helps lower blood pressure; the establishment of a medication supervision mechanism effectively avoids missed doses and wrong doses of medication, and ensures the therapeutic effect of antihypertensive drugs; regular blood pressure monitoring guidance allows patients to grasp changes in their own blood pressure in a timely manner, allowing the nursing team to promptly adjust the nursing plan to improve the pertinence of the intervention^[7].

In terms of blood sugar control, the fasting blood sugar and 2-hour postprandial blood sugar levels of the public health care group after the intervention were lower than those of the routine care group. This result fully demonstrates that public health nursing intervention also has a positive effect on blood sugar control in patients with diabetes and hypertension.

Blood sugar control in patients with diabetes and hypertension is closely related to diet and medication standardization. Public health nursing intervention guides patients to reduce the intake of high-sugar and high-fat foods and rationally mix meals by formulating personalized diet plans to effectively control total caloric intake and reduce blood sugar fluctuations while ensuring balanced nutrition. Moderate exercise intervention can improve patients' insulin sensitivity and promote glucose uptake, and utilization to help lower blood sugar levels; carrying out medication supervision can ensure the standardized use of anti-diabetic drugs and avoid blood sugar out of control caused by irregular medication; health education allows patients to know the importance of blood sugar monitoring, and actively cooperate to complete home blood sugar monitoring, providing accurate basis for the optimization of nursing plans^[8].

Judging from the core connotation of public health nursing intervention, the all-round and systematic intervention concept it advocates is highly consistent with the work goals of chronic disease management of the Centers for Disease Control and Prevention. This nursing model not only focuses on the patient's disease itself, but also focuses on cultivating the patient's health management capabilities. Through health education, patients can transform from passively receiving care to actively participating in health management. This change can effectively improve the continuity and effectiveness of nursing intervention. Even after the nursing intervention ends, patients can continue to maintain stable control of blood pressure and blood sugar by relying on their own health management knowledge and skills. Compared with the conventional nursing model, public health nursing intervention emphasizes the participation of family members. By guiding family members to assist in nursing supervision, a synergy of health management at the family level is formed to further consolidate the effectiveness of nursing care. The participation of family members can promptly detect and correct problems in patients' lifestyle, medication, etc., and at the same time provide patients with emotional support, reduce their negative emotions caused by the disease, and improve care compliance.

In summary, applying public health nursing intervention to patients with diabetes and hypertension can effectively improve their blood pressure and blood sugar control conditions, enhance patients' health management capabilities, and play a positive role in reducing the risk of complications and improving patients' health status. This nursing model meets the needs of the Centers for Disease Control and Prevention for chronic disease management. It has the advantages of simple operation and strong feasibility, and is worthy of promotion and application in CDCs at all levels. In subsequent clinical practice, the content and methods of nursing intervention can be further enriched, and information methods such as health management APPs can be combined to improve the convenience and effectiveness of nursing intervention and provide patients with better public health nursing services.

Disclosure statement

The author declares no conflict of interest.

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