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Original Article

Difference between routine nursing and humanistic nursing on blood glucose and quality of life in patients with diabetes complicated with hypertension

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Abstract: Objective: To explore the effect of routine nursing and humanistic nursing on patients with diabetes complicated with hypertension. Methods: Sixty-four patients with diabetes complicated with hypertension in our hospital were selected as the research subjects, and the patients were randomly divided into group A and group B with 32 cases in each group. Group B was given routine nursing, while group A was given humanistic nursing based on routine nursing. The fasting blood glucose (FPG), 2 h postprandial blood glucose (2 h PG) and blood pressure before and one month after nursing were tested. The nursing effect and the incidence of complications 3 months after nursing were observed. The 36-Item Short Form Health Survey (SF-36) was applied to evaluate the quality of life of patients after nursing, and the homemade questionnaire was utilized to evaluate the nursing satisfaction of patients. Results: The measured values of FPG, 2 h PG, systolic blood pressure (SBP) and diastole pressure (DBP) in group A and B after nursing were lower than those before treatment ($P<0.001$); the measured values of FPG, 2 h PG, SBP and DBP in group A were lower than those in group B after nursing ($P<0.001$); the nursing efficiency and satisfaction in group A were higher than those in group B ($P<0.05$); and the incidence of complications in group A was lower than that in group B ($P<0.05$); the SF-36 scores of living habits, physical condition, social function and psychological state in group A were higher than those in group B ($P<0.001$). Conclusion: Humanistic nursing intervention for patients with diabetes complicated with hypertension can effectively control the level of blood glucose and blood pressure, improve treatment efficiency and nursing satisfaction, reduce the incidence of complications and improve their quality of life.

Keywords: Diabetes, hypertension, humanistic nursing, quality of life

Introduction

The number of diabetic patients worldwide is about 415 million. It is estimated that the number of diabetic patients will increase to 642 million in the next 25 years. Around 193 million diabetic patients worldwide are still undiagnosed, and untreated chronic diabetes is prone to multiple complications [1]. At present, the specific pathogenesis of diabetes is not clear, and it will cause other diseases due to environment, heredity and other factors [1]. Diabetes combined with hypertension is a common lifelong disease in clinic. It is an important cause of cardio-cerebral vascular disease. If it is not treated in time or treated improperly, it will also be accompanied by a series of complications such as retinopathy, nephropathy, stroke and so on. It has the characteristics of high disability and mortality [2, 3]. The implementation of effective treatment in clinic has a positive effect on blood glucose and blood pressure of patients with diabetes complicated with hypertension, and can effectively reduce the occurrence of microangiopathy, so as to ensure the life quality of patients [4]. Clinical practice showed that patients with diabetes complicated with hypertension need not only to actively implement symptomatic treatment, but also to implement effective and scientific nursing intervention [5].

With the improvement of medical level, patients are not satisfied with disease treatment in clinic. They also hope to enjoy better nursing service when they are treated. The core of human-

istic nursing is to integrate the nursing service concept of humanistic care and patient-center into nursing service. The purpose of humanistic nursing is to provide personalized and diversified service for patients according to their age, gender, living environment and disease condition, so as to promote the physical rehabilitation of patients [6, 7].

In the past, there have been many studies on the nursing of diabetes complicated with hypertension. For example, in the study of Li et al. [8], when patients with diabetes and acute myocardial infarction received intravenous thrombolytic therapy, effective nursing intervention can shorten the treatment time, improve the treatment effect, reduce the incidence of complications and improve the prognosis.

In the study of Aghajani et al. [9], self-care education can improve the quality of life of patients with essential hypertension. However, there are few specific applications of humanistic nursing in patients with diabetes complicated with hypertension. A feasible nursing model is very important for improving the quality of life of patients with essential hypertension and diabetes. The purpose of this study is to provide a feasible nursing model for patients through the intervention of humanistic nursing in patients with diabetes complicated with hypertension.

Materials and methods

General information

Sixty-four patients with diabetes complicated with hypertension in Rizhao People's Hospital were selected as the research subjects, and the patients were randomly divided into group A and group B with 32 cases in each group. Group B was given routine nursing, while group A was given humanistic nursing based on routine nursing. In group A, there were 19 males and 13 females, aged 43-71 years, with an average age of 54.2 ± 5.6 years, a course of 6-17 years and an average course of 8.1 ± 2.6 years. In group B, there were 17 males and 15 females, aged 41-73 years, with an average age of 53.5 ± 4.9 years, a course of 5-16 years and an average course of 7.8 ± 2.3 years. The subjects can understand the situation of this study and sign the informed consent. This study doesn't violate ethics and morality. The project was submitted to the Rizhao People's Hospital Ethics Committee for review and approval before implementation.

Inclusion and exclusion criteria

Inclusion criteria: Meeting the World Health Organization (WHO) diagnostic criteria for diabetes complicated with hypertension [10]; aged 40-75 years old; random blood glucose >11.1 mmol/L, fasting blood glucose (FPG) ≥7.0 mmol/L; systolic blood pressure (SBP) ≥140 mmHg; diastole pressure (DBP) ≥90 mmHg; no antihypertensive drugs were used within 2 weeks. Exclusion criteria: Complicated with severe liver and kidney dysfunction, secondary hypertension, heart failure, bilateral renal artery stenosis, arteriosclerosis obliterans, hematopoietic dysfunction, malignant tumors, endocrine systemic diseases, infectious diseases; cognitive dysfunction or mental disorders; drug contraindications.

Nursing method

Routine nursing: After the patients were admitted to hospital, the patients' information, including family environment and education level, was collected, the health education was carried out, and the cause and treatment of diabetes complicated with hypertension were explained in detail. The vital signs of patients were observed at all times, and patients' medication should be guided and the attentions should be explained. The dosage and frequency of medication should not be increased or decreased, and patients should be instructed to eat reasonably and rest on time to develop good living habits. The oral and skin cleaning and prevention of cross infection should be strengthened. For patients who need to stay in bed for a long time, they should be helped to turn over regularly to prevent pressure sores.

Humanistic nursing: On the basis of routine nursing, the humanistic nursing intervention was performed. Illness monitoring: Nursing staff regularly measured and recorded blood glucose of patients in fasting state and 2 hours after meals. The normal control range of FPG level was 4.4-6.1 mmol/L in fasting state and 4.4-8.0 mmol/L after meals. Blood pressure was measured every morning, noon and night to record the peak period of blood pressure.

The range of blood pressure should be controlled at <130/80 mmHg. If it exceeds the range, the doctor should be notified immediately.

Psychological nursing: Nursing staff should strengthen the communication between patients and their families. According to patients' education level, understanding ability and severity of illness, the treatment methods and nursing attentions should be explained in detail to improve patients' awareness and compliance and prevent patients from psychological burden. The family members should be instructed to encourage and guide patients and help them build up confidence.

Diet nursing: The eating habits of patients should be understood, and a pertinent and reasonable diet plan should be formulated to guide patients to eat more high-fiber, high-calorie and high-protein foods, and correct poor eating habits. Attention should be paid to proper vitamin supplementation and good nutrition supply to improve immunity. Similarly, attention should be also paid to strictly control the intake of sugar, fat, spicy, raw and cold food. Exercise training: According to the patients' condition, an exercise program should be formulated, and the patients should be encouraged to exercise reasonably. The appropriate amount of sweating is the best, such as walking, fast walking, and jogging, to promote the recovery of the disease. During the process, exercise should be strictly controlled to avoid aggravating illness caused by excessive exercise.

Medication nursing: The role, effect and importance of drugs for patients should be explained to improve patients' awareness of medication by the doctor. The daily administration of drugs should be closely monitored. The patients should be instructed to use insulin reasonably and the injection position should be changed frequently to improve the safety of medication.

Test methods

After 8 hours of fasting, 3 mL of venous blood was collected in the morning and placed in the vacuum blood collection tube without anticoagulant. FPG was measured. After collecting fasting blood, 75 g of glucose solution (250 mL) was taken orally and promptly. After 2 hours, 3 mL of venous blood was collected and sent for examination immediately. The samples were detected by the technician within 2 hours.

The accurately verified vertical mercury sphygmomanometer was used to measure blood pressure of patients. The patient rested for 5 minutes, and then fully exposed his right upper arm. The cuff was tied to the patient's right upper arm, about 2.5 cm above the elbow. Stethoscope was used to measure the SBP and DBP of patients at the tied artery. The SBP and DBP of the patients were determined by the vertical height of the convex surface of the mercury column corresponding to the first and disappearing tones of the korotkoff sounds. The blood pressure was measured once every 5 minutes for three consecutive times, and the average of three times was used as the measurement results of SBP and DBP.

Evaluation measures [11]

FPG, 2 h postprandial blood glucose (2 h PG) and blood pressure were observed before and 1 month after nursing. The incidence of complications was observed during nursing, including diabetic microangiopathy, coronary heart disease and nephropathy.

After 3 months of nursing, the nursing effect of the two groups was observed. Markedly effective: blood pressure <130/80 mmHg, FPG and 2 h PG were 4.4-6.1 mmol/L and 4.4-8.0 mmol/L, respectively. Effective: Blood pressure <130/80 mmHg, FPG and 2 h PG were 4.4-7.0 mmol/L and 4.4-10.0 mmol/L, respectively. Ineffective: Blood pressure cannot be controlled within the normal range and the levels of FPG and 2 h PG didn't change. Effective rate = (markedly effective + effective)/number of cases in group ×100%.

The 36-Item Short Form Health Survey (SF-36) [12] was applied to evaluate the quality of life of patients after nursing. There were four aspects, including living habits, physical condition, social function and psychological state. The total score of each dimension was 100 points. Higher SF-36 score indicates better quality of life.

The nursing satisfaction of patients was evaluated by homemade nursing satisfaction questionnaire. Very satisfied total score ≥82 points; satisfied total score 70-80 points; unsatisfac-

Table 1. General data of group A and group B [n (%)] (x ± sd)

Category	Group A (n = 32)	Group B (n = 32)	T/χ^2 value	*P* value
Gender			0.254	0.614
Male	19 (59.38)	17 (53.12)		
Female	13 (40.62)	15 (46.88)		
Age)	54.2 ± 5.6	53.5 ± 4.9	0.532	0.596
Course of Disease (year)	8.1 ± 2.5	7.8 ± 2.3	0.500	0.619
Type of diabetes			0.563	0.453
Type I	14 (43.75)	17 (53.12)		
Type II	18 (56.25)	15 (46.88)		
Hypertension Grading			0.658	0.720
Level I	9 (28.12)	12 (37.50)		
Level II	12 (37.50)	10 (31.25)		
Level III	11 (34.38)	10 (31.25)		
Drinking history			0.591	0.442
Yes	21 (65.62)	18 (56.25)		
No	11 (34.38)	14 (43.75)		
Smoking history			0.568	0.451
Yes	16 (50.00)	13 (40.62)		
No	16 (50.00)	19 (59.38)		
Educational Level			0.347	0.841
Elementary School and below	7 (21.88)	8 (25.00)		
Junior high	16 (50.00)	17 (53.12)		
College or Above	9 (28.12)	7 (21.88)		
Place of Residence			0.080	0.777
City	23 (71.88)	24 (75.00)		
Rural	9 (28.12)	8 (25.00)		
Marital status			0.533	0.766
Unmarried	1 (3.12)	2 (6.25)		
Married	28 (87.50)	28 (87.50)		
Divorced or Widowed	3 (9.38)	2 (6.25)		

tory total score <70 points. Higher total score indicates better nursing satisfaction.

Statistical methods

SPSS 22.0 (EasyBio (Beijing) Technology Co., Ltd.) was used for statistical analysis. The enumeration data were expressed by [n (%)]. Chi-square test was used for comparing the enumeration data between groups. When the theoretical frequency of chi-square test was less than 5, the continuous correction chi-square test was used for the enumeration data. The measurement data were expressed by (mean ± standard deviation). Independent sample t-test was used for comparing the measurement data between groups. Paired t-test was used to compare before and after treatment within groups. P<0.05 indicated the difference was statistically significant.

Results

General data of group A and group B

There was no difference between group A and group B in gender, age, course of disease, type of diabetes, hypertension grading, drinking history, smoking history, educational level, residence and marital status (P>0.05) (**Table 1**).

Changes of blood glucose and blood pressure before and after nursing in group A and B

There was no difference in FPG, 2 h PG, SBP and DBP between group A and group B before nursing (P>0.05); FPG, 2 h PG, SBP and DBP in

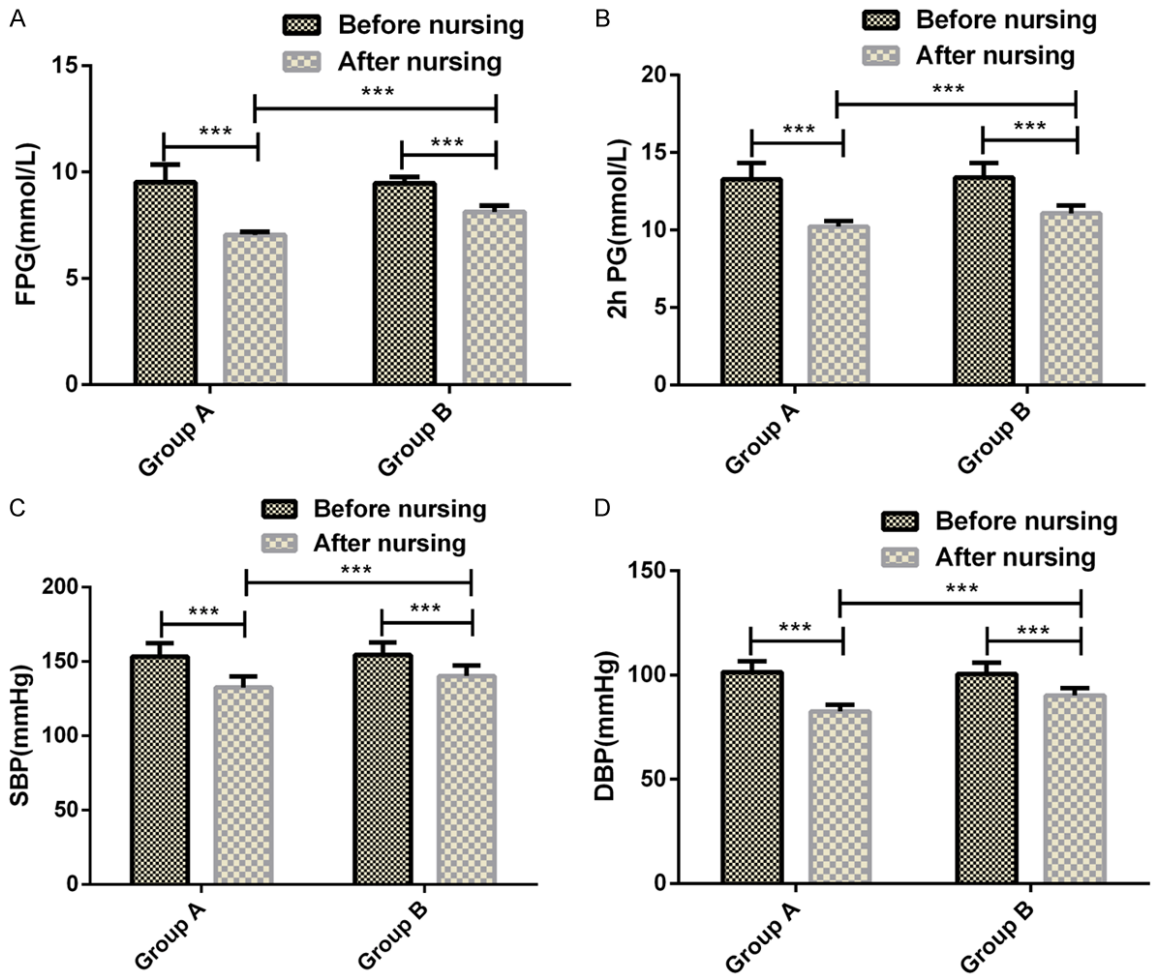

Figure 1. Changes of blood glucose and blood pressure before and after nursing in group A and group B. Comparison of FPG before and after nursing in group A and B (A); Comparison of 2 h PG before and after nursing in group A and B (B); Comparison of SBP before and after nursing in group A and B (C); Comparison of DBP before and after nursing in group A and B (D). Note: ***P<0.001.

Table 2. Comparison of the results of nursing efficiency between group A and group B [n (%)]

Group	n	Markedly effective	Effective	Ineffective	Effective rate (%)
Group A	32	19 (59.38)	11 (34.38)	2 (6.24)	93.76
Group B	32	13 (40.62)	10 (31.25)	9 (28.13)	71.82
χ^2 value	-	-	-	-	5.379
P value	-	-	-	-	0.020

group A and group B after nursing were lower than those before nursing (P<0.001); after nursing, FPG, 2 h PG, SBP and DBP in group A were lower than those in group B (P<0.001) (**Figure 1**).

Nursing effective rate of group A and group B

In group A, 19 cases (59.38%) were markedly effective, 11 cases (34.38%) were effective, 2 cases (6.24%) were ineffective, and the effective rate of nursing was 93.76%. In group B, 13 cases (40.62%) were markedly effective, 10 cases (31.25%) were effective, 9 cases (28.13%) were ineffective, and the effective rate of nursing was 71.82%. The effective rate of nursing in group A was higher than that in group B (P<0.05) (**Table 2**).

Incidence of complications in group A and group B

In group A, there were 1 case (3.12%) of diabetic microangiopathy and 1 case (3.12%) of coronary heart disease, and the incidence of complications was 6.24%; in group B, there

Table 3. The incidence of complications during nursing in group A and group B [n (%)]

Group	n	Diabetic microangiopathy	Coronary heart disease	Nephropathy	Total incidence (%)
Group A	32	1 (3.12)	1 (3.12)	0 (0.00)	6.24
Group B	32	4 (12.50)	3 (9.38)	1 (3.12)	25.00
χ^2 value	-	0.868	0.267	1.016	4.267
P value	-	0.352	0.606	0.314	0.039

Table 4. Comparison of scores of each item of SF-36 scale after nursing in group A and group B (x ± sd)

Category	Group A (n = 32)	Group B (n = 32)	T value	*P* value
Living habit	90.16 ± 6.23	73.25 ± 8.69	8.946	<0.001
Physical Condition	86.29 ± 8.37	70.17 ± 9.58	7.168	<0.001
Social function	88.04 ± 9.06	71.57 ± 8.42	7.533	<0.001
Psychological State	89.05 ± 7.41	72.69 ± 8.19	8.379	<0.001

were 4 cases (12.50%) of diabetic microangiopathy, 3 cases (9.38%) of coronary heart disease, and 1 case (3.12%) of nephropathy, and the incidence of complications was 25.00%. The incidence of complications in group A was lower than that in group B (P<0.05) (**Table 3**).

Quality of life in group A and group B after nursing

The SF-36 scores of living habits, physical condition, social function and psychological state in group A were higher than those in group B (P<0.001) (**Table 4** and **Figure 2**).

Nursing satisfaction in group A and group B

In group A, 24 cases (75.00%) were very satisfied, 5 cases (15.62%) were satisfied, 3 cases (9.38%) were unsatisfied, and the nursing satisfaction was 90.62%. In group B, 18 cases (56.25%) were very satisfied, 4 cases (12.50%) were satisfied, 10 cases (31.25%) were unsatisfied and the nursing satisfaction was 68.75%. The nursing satisfaction of group A was higher than that of group B (P<0.05) (**Table 5**).

Discussions

Diabetes and hypertension are common diseases in middle-aged and elderly people. Most of them are accompanied by diabetes complicated with hypertension [13]. Diabetes combined with hypertension can easily cause many complications, which aggravate the patients' condition. If it is not effectively controlled, it will cause a variety of serious diseases, and then affect the health and safety of patients [14].

With the change of medical model, the traditional nursing model cannot meet the needs of all patients, and some patients have higher requirements for nursing service [16]. The purpose of humanistic nursing is people-oriented, which emphasized that people are the center of nursing work and attention should be paid to human freedom, value and development in the process of implementation. Humanistic nursing mode is personalized, creative, effective and holistic, which can make the patient's personal dignity, life value and privacy respected. It can create a comfortable medical condition to satisfy the psychological, physiological and social aspects of patients [17, 18].

There have been many clinical studies on humanistic nursing in the past. For example, in the study of Jun-Jie et al. [19], the implementation of humanistic nursing and psychological nursing during surgery can adjust the psychology of patients and promote the recovery. In addition, Ba et al. [20] showed that humanistic nursing can improve the treatment compliance of children with type 2 diabetes, and can improve the nursing satisfaction of children's families. Therefore, the application of humanistic nursing in clinical practice has obvious benefits for physical recovery of patients.

Diabetes combined with hypertension generally has a course of many years. As blood glucose and blood pressure are often high or low, the patient's condition is unradical and easy to recurrent. The patients had no correct understanding of their clinical symptoms. Some believe that the disease means terminal disease, and the treatment compliance was poor, so the anxiety, negativity and fear were prone to occur [21]. Therefore, it was necessary to conduct psychological counseling for patients with diabetes complicated with hypertension, to guide patients to develop good living habits,

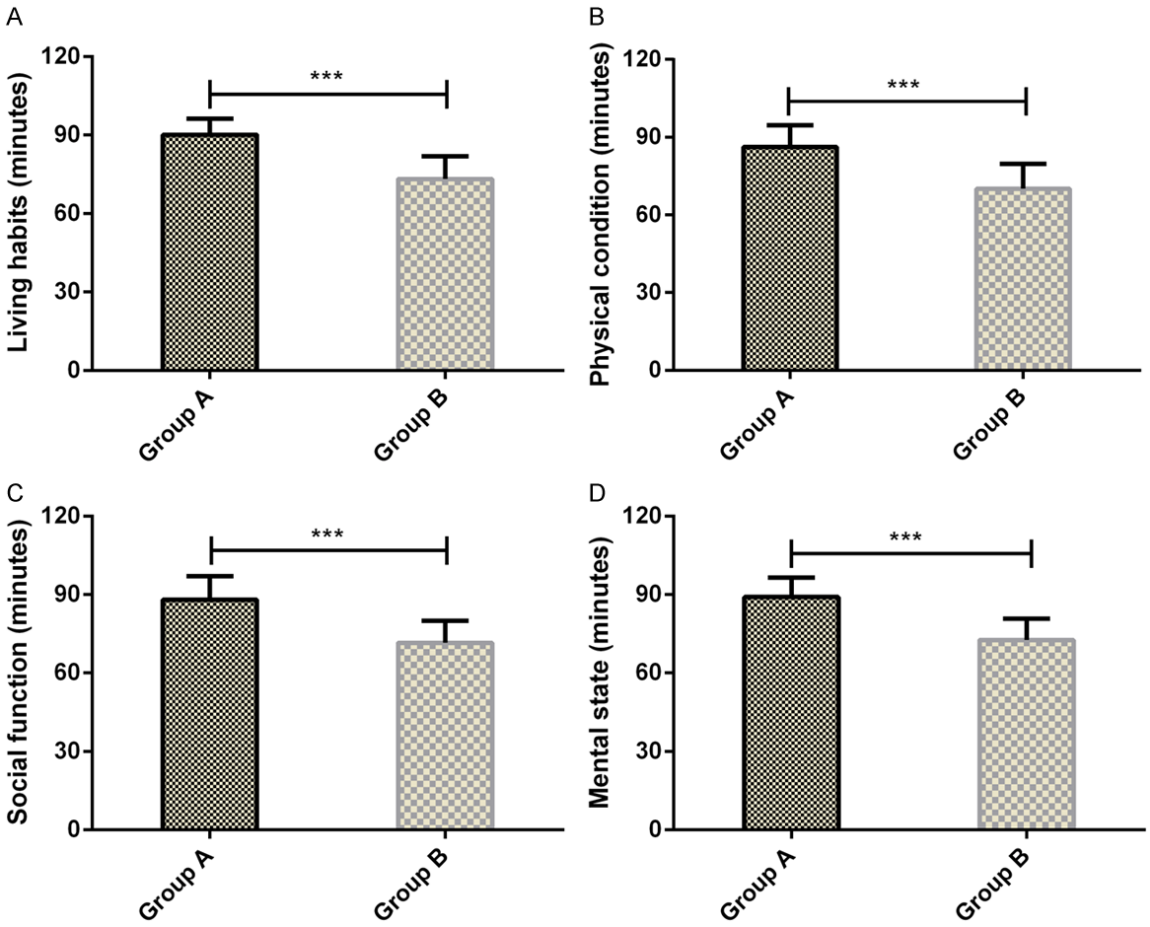

Figure 2. Comparison of quality of life between group A and group B after nursing. The score of living habits in SF-36 in group A and B were compared (A); The score of physical condition in SF-36 in group A and B were compared (B); The score of social function in SF-36 in group A and B were compared (C); The score of psychological state in SF-36 in group A and B were compared (D). Note: ***P<0.001.

Table 5. Comparison of nursing satisfaction results between group A and group B [n (%)]

Group	n	Very satisfied	Satisfaction	Not satisfied	Satisfaction (%)
Group A	32	24 (75.00)	5 (15.62)	3 (9.38)	90.62
Group B	32	18 (56.25)	4 (12.50)	10 (31.25)	68.75
χ^2 value	-	-	-	-	4.730
P value	-	-	-	-	0.030

do moderate daily exercise, control blood glucose and blood pressure, in order to prevent complications [22]. In the study of Bayrak et al. [23], proper nursing activities and regular health education and counseling for patients with hypertension can make patients change their lifestyle and prevent the occurrence of heart disease, stroke and other diseases. This study provided nursing guidance for patients in health education, psychology, diet, exercise, and so on. The results showed that FPG, 2 h PG, SBP and DBP in group A and group B after nursing were lower than those before nursing, and after nursing, FPG, 2 h PG, SBP and DBP in group A were lower than those in group B. The effective rate of nursing in group A was higher than that in group B, indicating that personalized nursing for diabetes combined with hypertension can effectively control blood glucose and blood pressure, and improve the efficiency of treatment. Previous studies have shown that controlling blood glucose and blood pressure in patients with diabetes complicated with hypertension can significantly reduce the risk of

microangiopathy [24]. In this study, the total incidence of complications in group A was significantly lower than that in group B, suggesting that personalized nursing can reduce the incidence of complications in patients with diabetes complicated with hypertension. In the study of Chang et al. [25], through authorized intervention on hypertension of elderly, including lifestyle change education, group discussion and exercise training for 8 weeks, patients reduced sedentary behavior, increased physical activity, improved self-efficacy of physical activity, and increased perceived health. Combined with the results in this study, personalized nursing has obvious benefits for diabetic patients. Personalized nursing is one-to-one pertinent nursing. In the early stage, health education and psychological counseling are carried out to alleviate the patients' poor mood. After that, scientific diet and exercise guidance are given to enhance the patients' immunity and promote the recovery of the patients. The SF-36 was utilized to evaluate the quality of life of patients after nursing. The results showed that the scores of living habits, physical condition, social function and psychological state in group A were higher than those in group B, which indicated that humanistic nursing could improve the quality of life of patients better than routine nursing. It was consistent with the above results. Comprehensive nursing is a multi-faceted and full-scale nursing intervention for patients, while humanistic nursing is a people-oriented and pertinent nursing. The concepts of the two nursing intervention modes are different. The advantages and disadvantages of the two nursing intervention modes in clinical practice need to be considered. Finally, a survey of patients' nursing satisfaction was conducted. The results showed that the nursing satisfaction of group A was higher than that of group B, suggesting that humanistic nursing could improve patients' nursing satisfaction. After nursing intervention, patients' recognition was higher, which provided a strong evidence for the clinical application of humanistic nursing in patients with diabetes complicated with hypertension.

This study confirmed that humanistic nursing intervention model had significant benefits for patients with diabetes complicated with hypertension, but there are still some shortcomings in the study. First, the quality of life of patients before nursing intervention was not investigated. Second, whether personalized nursing is suitable for other chronic diseases in middle-aged and elderly people has not been discussed in depth. These shortcomings need to be further explored in the future to provide further evidences for the conclusions of this study.

In conclusion, humanistic nursing intervention for patients with diabetes complicated with hypertension can effectively control the level of blood glucose and blood pressure, improve treatment efficiency and nursing satisfaction, reduce the incidence of complications and improve their quality of life.

Disclosure of conflict of interest

None.

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