

Research on Nursing Effect of Individualized Nursing Intervention on Critically Ill Patients with Continuous Blood Purification

Daxing Shao*

The Fifth Affiliated Hospital of Sun Yat-sen University, Zhuhai 519000, Guangdong Province, China

*Corresponding author: Daxing Shao, 13972360169@163.com

Copyright: © 2023 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: *Objective:* This paper aims to investigate the value of individualized care for critically ill patients receiving continuous blood purification therapy. *Methods:* 89 cases of critically ill patients who were treated from June 2021 to June 2023 were randomly divided into groups, with individualized care in group A and routine care in group B. The differences in clinical indicators, purification effect, quality of life, and complications of blood purification were compared between the groups. *Results:* Heart rate, respiration, body temperature, and other indicators in group A were better than those in group B, $P < 0.05$. C-reactive protein (CRP), β 2-microglobulin (β 2-MG), blood urea nitrogen (BUN), and phosphorus (P) in group A were lower than those in group B, $P < 0.05$. Group A had higher quality of life than Group B, $P < 0.05$. The complication rate of blood purification in Group A was lower than that in Group B, $P < 0.05$. *Conclusion:* During continuous blood purification in critically ill patients, individualized nursing intervention can enhance the effect of blood purification, improve the physiological indicators of patients, and reduce the complications of blood purification, which is highly effective and feasible.

Keywords: Critically ill patients; Continuous blood purification; Individualized nursing; Nursing value

Online publication: September 22, 2023

1. Introduction

Blood purification is a commonly used dialysis treatment in clinical practice. It belongs to ultrafiltration technology. It can clean up metabolic waste in the body, filter out toxins and inflammatory mediators in patients, stabilize water and electrolyte indicators in patients, promote body metabolism, and maintain normal blood supply in the whole body^[1,2]. In addition, continuous blood purification treatment can also ensure that the nutrients can fully enter the patient's body, thereby enhancing the curative effect. For example, the conventional treatment plan for patients with severe kidney disease is kidney replacement surgery, but due to insufficient kidney resources, high surgical risk, and the influence of immune system diseases after surgery, it cannot be widely applied. Therefore, some scholars suggest continuous blood purification to replace kidney function and simulate the kidney filtration system, thereby improving the quality of life of patients^[3]. However, during the

continuous blood purification period, supplementary nursing intervention is required to ensure the effect of blood purification. The individualized model is used in the care of critically ill patients, by fully analyzing the reasonable needs of critically ill patients and considering the nursing content of each segment, it can enhance the quality of blood purification care ^[4]. In this paper, 89 critically ill patients admitted from June 2021 to June 2023 were used as samples to explore the value of personalized nursing.

2. Materials and methods

2.1. General information

A sample of 89 critically ill patients admitted from June 2021 to June 2023 were randomly divided into groups, with the details shown in **Table 1**. The critically ill patients in group A were compared with those in group B, $P < 0.05$.

Table 1. Data analysis of critically ill patients

Group	No	Gender		Age (years)		Disease duration (years)	
		Male	Female	Range	Average	Range	Average
Group A	45	23 (51.11)	22 (48.89)	23–89	48.11±2.42	1–4	1.62 ± 0.52
Group B	44	24 (54.55)	20 (45.45)	23–90	48.13±2.47	1–3	1.64 ± 0.55
χ^2/t	-	0.1053		0.0386		0.1763	
p	-	0.7456		0.9693		0.8605	

2.2. Inclusion and exclusion criteria

Inclusion criteria:

- (1) Patients whose laboratory and CT examinations are consistent with uremia standards.
- (2) Patients with symptoms of acid-base imbalance and metabolic disorder.
- (3) Patients with informed consent.
- (4) Patients with dialysis time > 3 months.

Exclusion criteria:

- (1) Patients with malignant lesions
- (2) Patients with infection
- (3) Patients who are pregnant
- (4) Patients with mental disorders ^[5].

2.3. Methods

Group A individualized nursing is as follows:

- (1) Training: training is provided for blood purification treatment nurses to ensure that the nurses are clear about the blood purification process, precautions, and nursing standards for each segment.
- (2) Evaluation: blood purification knowledge was evaluated based on patient examination results, disease progress, education programs, etc., patients are patiently guided with concerns about blood purification, critically ill patients are assisted to adjust their mentality, and individualized nursing strategies are comprehensively adjusted based on assessment results, patient needs, and symptom manifestations.
- (3) Monitoring vital signs: the weight, blood and urine volume of critically ill patients are recorded before

and after dialysis, and at the same time patient is checked for symptoms, such as fatigue, palpitation, dizziness, etc., and reported to the doctor immediately if applicable.

- (4) Psychological counseling: responsible nurses should strengthen communication with patients with blood purification, patiently and enthusiastically answer questions from dialyzers, and inform patients of the safety of blood purification treatment and the expected effect after dialysis, so as to enhance the cooperation and compliance of patients, and prolong patient survival as much as possible. In addition, it is also necessary to assist patients to regulate their emotions, improve their physical and mental health as much as possible, and ease their emotions through listening to music, watching videos, and communicating with patients.
- (5) Correcting the bad habits of the patient: encourage the patients to sleep more, avoid overworking, spicy food, and the stimulation of tobacco and alcohol, and eat more food with high dietary fiber and protein. In addition, patients should also be instructed to increase their daily water intake.
- (6) Improving the ward environment: nurses should improve ventilation in the ward, adjust the indoor temperature and humidity, disinfect the ward, and at the same time limit the number of daily visitors, and minimize the risk of cross-infection. Before the actual blood purification process, the patient is led to visit the ward in advance to relieve the patient's nervousness and unfamiliarity, and assisted to adjust the body position during the dialysis. Some blood purification patients are critically ill and have problems with movement, thus ward trolley and wheelchairs can be used to pick up and drop off patients to avoid the risk of falling during transfer.
- (7) Nursing care for complications: nurses should check the blood coagulation indicators and blood routine indicators, evaluate blood purifiers for signs of bleeding, and immediately prepare blood for treatment. They need to observe blood purifiers for asthma and chest tightness, and immediately inject dexamethasone, with the dose controlled at about 5mg, and give oxygen to the patient. Moreover, they should observe the fatigue and hypotension of the blood purifier, and immediately give glucose and vasoactive drugs. They should also monitor the changes in the heart function indicators of the blood purifier, adjust the parameters of the blood purifier, and scientifically set the ultrafiltration volume.

Group B routine care involves adjusting the parameters of the blood purification instrument based on the condition of critically ill patients, spreading the knowledge of blood purification, and completing the blood purification examination.

2.4. Observation indicators

The indicators below are observed in the groups.

- (1) Clinical indicators: detect heart rate, respiration, body temperature, and other indicators of blood purification patients.
- (2) Blood purification effect: detect C-reactive protein (CRP), β 2-microglobulin (β 2-MG), blood urea nitrogen (BUN), phosphorus (P), and other indicators of blood purification patients.
- (3) Quality of life: record the SF-36 scores of patients with blood purification before and after nursing, the higher the score, the higher the quality of life of patients with blood purification.
- (4) Complications: Hypoglycemia, muscle spasms, and catheter-related infections were recorded in blood purification patients.

2.5. Statistical analysis

The data of blood purification patients were processed with SPSS21.0, % records (χ^2 test) count data of blood

purification patients, mean \pm standard deviation (SD) records (*t* test) measurement data of blood purification patients. $P < 0.05$ indicates that there is a statistical difference.

3. Results

3.1. Comparison of clinical indicators of blood purification

Based on **Table 2**, the heart rate, respiration, body temperature, and other indicators in group A were better than those in group B, $P < 0.05$.

Table 2. Comparison of clinical indicators of blood purification (mean \pm SD)

Group	Heart rate (times/min)	Respiration (times/min)	Body temperature (°C)
Group A (n = 45)	80.11 \pm 2.14	21.08 \pm 1.25	36.48 \pm 0.36
Group B (n = 44)	104.36 \pm 3.15	32.89 \pm 2.64	38.11 \pm 0.41
<i>t</i>	42.5667	27.0684	19.9422
<i>P</i>	0.0000	0.0000	0.0000

3.2. Comparison of blood purification effect

As presented in **Table 3**, CRP, β 2-MG, BUN, P, etc. in group A were lower than those in group B, $P < 0.05$.

Table 3. Comparison of blood purification effect (mean \pm SD)

Group	CRP (mg/L)	β 2-MG (mmol/L)	BUN (mmol/L)	P (mmol/L)
Group A (n = 45)	10.39 \pm 1.48	2.91 \pm 0.24	21.84 \pm 0.48	1.59 \pm 0.54
Group B (n = 44)	15.01 \pm 2.06	4.89 \pm 0.43	25.89 \pm 0.59	2.41 \pm 0.66
<i>t</i>	12.1717	26.9015	35.5602	6.4215
<i>P</i>	0.0000	0.0000	0.0000	0.0000

3.3. Comparison of blood purification quality of life

After nursing, the SF-36 score of blood purification patients in group A was higher than that in group B, $P < 0.05$. Before nursing, there was no difference in SF-36 score between blood purification patients in group A and group B, $P > 0.05$. The results are shown in **Table 4**.

Table 4. SF-36 score analysis of patients with blood purification (mean \pm SD)

Group	Physical health (points)		Mental health (points)		Social functions (points)		Physiological functions (points)	
	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Group A (n = 45)	63.25 \pm 2.41	81.36 \pm 3.42	64.11 \pm 2.35	80.43 \pm 3.39	63.49 \pm 2.38	82.44 \pm 3.42	64.11 \pm 2.41	83.15 \pm 3.36
Group B (n = 44)	63.27 \pm 2.39	73.61 \pm 2.79	64.13 \pm 2.33	74.11 \pm 2.84	63.51 \pm 2.43	75.21 \pm 2.57	64.13 \pm 2.43	72.36 \pm 2.61
<i>t</i>	0.0393	11.6991	0.0403	9.5230	0.0392	11.2553	0.0390	16.8927
<i>P</i>	0.9687	0.0000	0.9679	0.0000	0.9688	0.0000	0.9690	0.0000

3.4. Comparison of blood purification complications

According to **Table 5**, the complication rate of blood purification in group A was lower than that in group B, $P < 0.05$.

Table 5. Comparison of complication rates of blood purification (*n*, %)

Group	Hypoglycemia	Muscle cramps	Catheter-associated infection	Incidence rate
Group A (n = 45)	1 (2.22)	0 (0.00)	0 (0.00)	2.22
Group B (n = 44)	3 (6.82)	1 (2.27)	2 (4.55)	13.64
χ^2	-	-	-	3.9997
<i>P</i>	-	-	-	0.0455

4. Discussion

Severe diseases can endanger the lives of patients, such as uremia and severe phosphorus poisoning. In the clinical treatment of the above-mentioned severe diseases, in order to reduce the amount of residual toxic substances and prolong the life span of patients, it is necessary to carry out blood purification therapy on the basis of kidney protection and diuresis [6]. Blood purification can completely remove the macromolecular substances in the blood, restore the cleanliness of the blood, and ensure the normal operation of the body. In addition, blood purification therapy can replace part of the kidney function, remove water and impurities in the blood, and then inhibit the body's toxic reaction, which is suitable for the treatment of critically ill patients. However, most critically ill patients have insufficient knowledge of blood purification treatment, and there is a problem of not cooperating with the purification, thus the purification effect is limited. During the actual blood purification treatment, there is a risk of adverse events, such as an abnormal increase in the content of catecholamines in the patient's body, which limits the promotion of blood purification treatment, thus nursing intervention should be carried out for patients with blood purification treatment [7]. Routine care adjusts the purification strategy based on the characteristics of the disease, which can ensure the orderly progress of the purification operation, but the emphasis on mood swings and changes in physiological state indicators of critically ill patients is limited, resulting in abnormal nutritional indicators after continuous purification, and even secondary stress reactions, hence reducing the efficacy of purification. In recent years, the individualized nursing model has gradually been used in the treatment of blood purification patients. Nursing centers carry out relevant examinations for critically ill patients, and adjust the parameters of the purification equipment on the basis of ensuring the purification effect, which can enhance the efficacy of blood purification [8]. In addition, paying attention to the patient's psychological state during blood purification can meet the needs of emotional care of critically ill patients, relieve patients' resistance and anxiety to blood purification treatment, and shorten the recovery time of the body.

Based on the data analysis in this paper, the heart rate, respiration, body temperature, and other indicators of group A were better than those of group B, $P < 0.05$. It is suggested that the individualized nursing mode used in the nursing of patients with blood purification can enhance patients' cognition, reduce complications, and relieve patients' discomfort. In addition, severe patients have a long course of disease and have limited knowledge of medication and diet during hemodialysis, which can lead to fear and anxiety in patients, thereby reducing patient compliance. Therefore, responsible nurses should focus on patient education, and provide diversified guidance for severe patients on medication, diet, environment, and psychology to meet the needs of patients as much as possible. It is beneficial to enhance the cooperation of patients [9]. The results also showed that CRP, β 2-MG, BUN, P, etc. in group A were lower than those in group B, $P < 0.05$. It is suggested that the individualized nursing mode can improve the effect of blood purification treatment. This may be due to that psychological intervention can enhance the cooperation of patients with blood purification treatment, help to optimize the physical and mental state of patients, and at the same time optimize the nutritional status of the

body, thereby delaying the progression of the disease and enhancing the curative effect. Moreover, the results showed that the SF-36 score of blood purification patients in group A was higher than that in group B, $P < 0.05$, and the complication rate of blood purification in group A was lower than that in group B, $P < 0.05$. It is suggested that individualized care for patients undergoing blood purification therapy can reduce complications during blood purification and enhance the quality of life of patients. During individualized nursing, training the responsible nurses can enhance the standardization of nursing, evaluating the physical and mental state of critically ill patients can fully understand the physical health of critically ill patients, monitoring the vital signs of critically ill patients and carrying out psychological guidance can reduce the psychological burden of blood purification patients, stabilize the inner emotions of patients, and enhance the curative effect. Additionally, reducing the negative emotions of critically ill patients and optimizing the ward environment can enhance the effect of blood purification. Intervention based on the complications of blood purification patients can reduce the complication rate of hemodialysis treatment and protect patients through dialysis safety^[10].

5. Conclusion

In summary, individualized nursing intervention for patients with blood purification therapy can maintain stable vital signs, enhance the efficacy of hemodialysis, and reduce dialysis complications, which has high clinical application value.

Disclosure statement

The author declares no conflict of interest.

References

- [1] Dai X, Deng F, 2020, Application Effect of Individualized Nursing Intervention in Patients with End-Stage Renal Disease Undergoing Blood Purification. *Guangxi Medicine*, 42(13): 1763–1764, 1772.
- [2] Xiang M, Xie R, Liu Q, 2023, The Application Value of Phased Nursing Based on the Changing Law of Compliance Curve in Blood Purification of Patients with End-Stage Renal Disease. *China Medicine Herald*, 20(13): 184–188.
- [3] Mei Z, Zhou L, Lin L, *et al.*, 2023, The Effect of Comprehensive Control Nursing on the Clinical Prognosis and Nutritional Status of Patients with End-Stage Renal Disease Treated with Blood Purification. *China Medical Herald*, 20(3): 160–163.
- [4] Qiu J, Ji T, Hu D, 2023, Application of Three-Dimensional Quality Control Nursing under the Guidance of QCC Activities in Blood Purification Patients with End-Stage Renal Disease. *Qilu Nursing Journal*, 29(5): 143–145.
- [5] Li Y, Yu Z, Wu H, 2023, Application Effect Analysis of Detailed Nursing in Blood Purification Nursing of End-Stage Diabetic Nephropathy. *Diabetes New World*, 26(6): 132–135.
- [6] Yajuan, Pu W, 2023, Effect Analysis of Targeted Nursing Based on Evidence-Based Concept on Blood Purification Patients with End-Stage Renal Disease. *Chinese Community Physician*, 39(1): 90–92.
- [7] Feng X, 2020, Effect of Cognitive Behavioral Nursing Intervention on Self-Efficacy of Patients with Blood Purification. *Laboratory Medicine and Clinic*, 17(4): 528–530.
- [8] Xu F, Li R, Liu F, *et al.*, 2023, Effect of Nursing Intervention Based on Behavior Change Theory on Self-management Behavior and Quality of Life of Blood Purification Patients. *Chinese Contemporary Medicine*, 30(12): 193–196.
- [9] Shen J, Shen W, Yu X, 2023, Effect of Continuous Behavioral Cognitive Intervention on Disease Awareness and

Health Behavior of Patients with Regular Blood Purification. *Laboratory Medicine and Clinic*, 20(1): 122–125.

- [10] Li Y, Fan Z, 2023, Effects of Nursing Intervention Based on Stress System Theory on Arteriovenous Fistula Puncture Pain, Psychological State and Treatment Compliance in Patients with Blood Purification. *Henan Medical Research*, 32(8): 1488–1492.

Publisher's note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.