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Research on the Application of Personalized Nursing in Continuous Renal Replacement Therapy for Renal Failure

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Abstract: *Objective:* To analyze the effect of standardized continuous renal replacement therapy and personalized nursing in patients with renal failure. *Method:* Time period: March 2028–2024.8, sample size: 78 patients with continuous renal replacement therapy for renal failure were admitted to our hospital. The included samples were randomly divided into two groups using odd and even numbers. The control group consisted of 39 patients who received routine nursing care, while the observation group consisted of 39 patients who received personalized nursing care. The various indicators of the two groups were compared. *Result:* In the nursing satisfaction project, the observation group was at a higher level, and there was a significant difference in the actual data between the two groups (97.44%/79.49%), $p < 0.05$. In the renal function index project, the observation group is closer to the normal range, and there is a significant difference in the actual data (BUN, Scr, 24hUP) between the two groups, $p < 0.05$. In the incidence of complications project, the observation group was at a lower level, and there was a significant difference in the actual data between the two groups (2.56%/17.95%), $p < 0.05$.The statistical results showed that the observation group had lower blood pressure changes and edema symptoms, $p < 0.05$.In the research project on psychological resilience indicators, statistical results showed that the observation group had higher scores, $p < 0.05$. *Conclusion:* While implementing standardized continuous renal replacement therapy in patients with renal failure, adopting personalized care has significant advantages, especially in reducing patient complications, stabilizing blood pressure, relieving edema symptoms, and improving renal function. It is worth applying and promoting in clinical practice.
Keywords: Renal failure; Personalized care; Continuous renal replacement therapy; Applied value

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1. Introduction

In clinical practice, renal failure is a serious clinical condition with an increasing prevalence. After the onset of the disease, the patient gradually loses kidney function, leading to an imbalance of toxins and electrolytes in the body[1]. The condition of patients with renal failure is relatively complex, and the choice of treatment method is crucial for controlling their condition. Continuous renal replacement therapy (CRRT) has positive and effective outcomes[2]. Implementing CRRT treatment can not only clear metabolic waste but also eliminate excess fluid, which can help improve its prognosis. It should be noted that the effectiveness of continuous renal replacement therapy in patients is affected by various factors. Therefore, during the actual treatment period, relevant medical personnel need to choose treatment methods reasonably based on individual differences and clinical status of patients, in order to ensure their clinical efficacy[3]. At the same time, adopting personalized care can ensure the smooth implementation of continuous renal replacement therapy and improve

its nursing level. This article selects patients with continuous renal replacement therapy for renal failure (August 2023 to August 2024) for analysis, observes its application value, and reports as follows.

2. Data and methods

2.1. General information

Sample collection time: August 2023 to August 2024, sample size: 78 patients with continuous renal replacement therapy for renal failure were admitted to our hospital. The included samples were randomly divided into two groups based on odd and even numbers. The control group consisted of 39 patients, with 20 male and 19 female patients, respectively. The age range was between 53 and 81 years, with an average of (67.74 ± 6.03) years. According to the etiology, there were a total of 20 cases of severe trauma, 6 cases of severe acute pancreatitis, 8 cases of septic shock, and 5 cases of other conditions. According to gender statistics, the sample size of male renal failure patients and female renal failure patients in the observation group of 39 cases were 22 and 17, respectively, with an age range and average of 55–83 (69.12 ± 6.15) years. According to the etiology, there were a total of 17 cases of severe trauma, 7 cases of severe acute pancreatitis, 9 cases of septic shock, and 6 cases of other conditions. There was no significant difference in the causes, gender, age, and other information between the two groups ($p > 0.05$), indicating comparability in the study.

2.2. Method

The control group received routine nursing, and basic nursing was carried out based on continuous renal replacement therapy for renal failure, involving pre-treatment preparation, cooperation during treatment, and guidance after treatment.

Observation group carries out CRRT and personalized care.

(1) Psychological care

Before conducting CRRT treatment, strengthen emotional communication between nurses and patients, explain the CRRT process and disease knowledge, inform RF symptoms and pathogenic factors, explain CRRT related matters, deepen understanding of CRRT, and reduce their worries and fears. During treatment, inform the recovery status of the condition, introduce auxiliary nursing methods, enhance treatment confidence, and improve the cooperation of CRRT treatment.

(2) Environmental care

During the implementation of CRRT, adjust the environment to improve the comfort of patients, maintain indoor quietness, avoid affecting patients, and ensure the smooth implementation of CRRT. During the actual nursing period, disinfection treatment should be done well, and indoor sterilization treatment should be used. The ward should be cleaned regularly to maintain cleanliness and comprehensively improve physical and mental comfort. Regularly open the windows, ensure proper ventilation, keep the air fresh, and improve air quality. In terms of indoor temperature and humidity, reasonable adjustments should be made based on patient comfort and relevant standards to improve their sleep quality and physical and mental condition.

(3) Vascular access nursing

Nursing staff should choose deep vein catheterization reasonably. In CRRT, aseptic operation is the treatment principle, fully understand the patient's puncture situation, clarify the puncture location, and observe for any abnormal symptoms, especially bleeding and redness at the puncture location. At the same time, nursing staff should pay attention to observing the skin condition during CRRT, especially the skin around the catheter placement, do a good job of cleaning, keep the skin dry, effectively prevent infection, and comprehensively improve its prognosis. After CRRT treatment, rinse the lumen and perform heparin sealing treatment.

(4) Implementing intravenous drip nursing

Nursing staff should pay attention to the hourly intake and output to maintain fluid balance. Strengthen the physical signs of patients during CRRT, including blood pressure, pulse, etc., in patients with renal failure. In CRRT

treatment, vasoactive drugs are used for patients with abnormal blood pressure reduction. While strengthening blood pressure monitoring, timely reporting to the attending physician is necessary to prevent adverse events.

(5) Complications care

In CRRT treatment, the care of the puncture site is crucial. Nursing staff closely observe bleeding symptoms during CRRT, adopt pressure treatment based on the actual situation of renal failure patients, and effectively stop bleeding. Nursing staff should strengthen the detection of various indicators in patients, especially prothrombin time, to ensure the reasonable use of heparin, and adjust the dosage according to actual needs. At the same time, nursing staff evaluate the coagulation risk of renal failure patients during CRRT, pay attention to observing their abnormal symptoms, clarify their skin manifestations, and take care of the puncture site to reduce complications. For high-risk patients with pressure ulcers, air mattresses should be used to comprehensively improve their physical and mental condition.

(6) Implementing dietary care

Evaluating the patient's nutritional status, observing for symptoms of malnutrition, providing nutritional support to the patient, guiding them to consume foods rich in vitamins and proteins, supplementing the body with necessary calories and nutrients, enhancing physical fitness, and improving immunity.

(7) Implementing positional care

Nursing staff provide reasonable guidance on patient positioning, improve their comfort level, and strengthen the control of complications. For patients with vascular occlusion, maintain a supine position with the head of the bed raised appropriately and limbs extended 45 degrees to promote physical and mental recovery.

2.3. Observation indicators

(1) Comparing nursing satisfaction involves three aspects [4].

(2) Compare renal function indicators, including BUN measurement values, Scr measurement values, and 24-hour UP measurement values, and extract peripheral venous blood from patients for testing [5].

(3) Complications.

(4) Comparing blood pressure changes and edema symptoms, the evaluation score range is 0–6 points, and the results show no to severe, with higher scores indicating more severe symptoms.

(5) Psychological resilience index.

2.4. Statistical methods

Using SPSS 27.0 software, the measurement data is ($\bar{x} \pm s$), *t*-test; Count data n (%), chi square test; $p < 0.05$ indicates a significant difference.

3. Results

3.1. Comparison of nursing satisfaction

According to statistical research, there is a significant difference in nursing satisfaction, $p < 0.05$ (see **Table 1**).

Table 1. Satisfaction [n/(%)]

Group	Satisfied	Basically satisfied	Dissatisfied	Satisfaction (%)
Control group (n = 39)	16 (41.03)	15 (38.46)	8 (20.51)	31 (79.49)
Observation group (n = 39)	21 (53.85)	17 (43.59)	1 (2.56)	38 (97.44)
χ^2				6.154
p				0.013

3.2. Comparison of renal function indicators

The statistical research results of renal function indicators show that the observation group is closer to the normal range, and there is a significant difference in the actual data comparison between the two groups, $p < 0.05$ (**Table 2**).

Table 2. Comparison of renal function indicators ($\bar{x} \pm s$)

Group	BUN (mmol/L)		Scr (μmol/L)		24hUP (g/24h)	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Control group (n = 39)	20.36 ± 1.19	17.48 ± 1.41	589.29 ± 24.26	451.12 ± 20.19	5.32 ± 1.41	4.25 ± 1.71
Observation group (n = 39)	20.19 ± 1.24	15.39 ± 1.34	590.17 ± 24.35	325.23 ± 17.56	5.78 ± 1.59	2.38 ± 1.63
t	0.617	6.709	0.159	28.677	1.351	4.943
p	0.538	0.000	0.573	0.000	0.180	0.000

3.3. Comparison of incidence of complications

The statistical research results show that there is a significant difference in the incidence of complications, $p < 0.05$ (**Table 3**).

Table 3. Complications [n/(%)]

Group	Deep vein thrombosis	Elevated blood pressure	Bradycardia	Incidence rate (%)
Control group (n = 39)	2 (5.13)	3 (7.69)	2 (5.13)	7 (17.95)
Observation group (n = 39)	0 (0.00)	1 (2.56)	0 (0.00)	1 (2.56)
χ^2				5.014
p				0.025

3.4. Comparison of blood pressure changes and edema symptoms

The statistical study on blood pressure changes and edema symptoms showed that the observation group was at a lower level, and there was a significant difference in actual data between the two groups, $p < 0.05$ (**Table 4**).

Table 4. Comparison of blood pressure changes and edema symptoms ($\bar{x} \pm s$)

Group	Systolic blood pressure (mmHg)		Diastolic blood pressure (mmHg)		Edema symptoms (score)	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Control group (n = 39)	139.08 ± 12.21	132.45 ± 12.27	121.25 ± 11.41	95.33 ± 5.32	4.97 ± 1.48	2.31 ± 0.67
Observation group (n = 39)	140.12 ± 10.19	125.82 ± 11.18	120.18 ± 10.39	91.71 ± 3.55	4.02 ± 1.32	0.94 ± 0.25
t	0.408	2.494	0.433	3.534	2.991	11.963
p	0.684	0.014	0.666	0.000	0.003	0.000

3.5. Comparison of psychological resilience indicators

The statistical research results of psychological resilience indicators show that the observation group is at a higher level, and there is a significant difference in the actual data of the two words, $p < 0.05$.

Table 5. Comparison of psychological resilience indicators ($\bar{x} \pm s$)

Group	Resilience (Score)	Enduring negative emotions (score)	Actively accepting changes (points)	Control (divided)	Psychological impact (Score)
Control group (n = 39)	80.28 ± 4.31	84.47 ± 2.31	81.28 ± 2.79	81.35 ± 2.19	85.37 ± 2.56
Observation group (n = 39)	92.56 ± 3.76	93.63 ± 2.75	88.61 ± 2.48	89.41 ± 2.58	91.69 ± 2.78
t	13.408	15.927	12.262	14.873	10.443
p	0.000	0.000	0.000	0.000	0.000

4. Discussions

In clinical practice, renal failure has the characteristics of rapid progression, poor prognosis, and relatively high mortality rate [6]. During the treatment process, it is necessary to follow the principle of early detection and early treatment in order to improve the success rate of rescue. Implementing CRRT treatment, actively improving the physical and mental condition of patients, maintaining electrolyte balance, reducing inflammatory reactions, and maintaining a stable body environment are of great significance for their physical and mental recovery [7]. In CRRT, after clarifying the treatment indications, implementing standardized treatment plans, strengthening patient monitoring, setting personalized treatment goals for them, and implementing various procedures, can improve their clinical efficacy. In CRRT treatment, a series of active and effective nursing methods should be used in conjunction with the patient's needs as the starting point to carry out targeted nursing methods, which can reduce complications, ensure sufficient nutrition supply, and promote the improvement of its efficacy and prognosis [8].

Research has found that in the nursing satisfaction program, the observation group is at a higher level, and there is a significant difference in actual data between the two groups (97.44%/79.49%), $p < 0.05$. The reason for this is that personalized nursing is scientific and reasonable, and based on the actual needs of patients, nursing can effectively control the patient's condition. At the same time, implementing this nursing model, providing multi-dimensional nursing methods, maintaining the body's nutritional status, improving its disease resistance and immunity, effectively avoiding serious consequences, can help improve its nursing satisfaction. In the renal function index project, the observation group is closer to the normal range, and there is a significant difference in the actual data (BUN, Scr, 24hUP) between the two groups, $p < 0.05$. To investigate the reasons: adopting personalized nursing, intervening through pipelines, positions, etc., fully understanding the specific nursing needs of patients, developing special nursing methods based on the clinical manifestations of renal failure patients and CRRT treatment needs, strengthening the monitoring of various indicators of the body, and observing their bleeding risk and coagulation status, providing a series of nursing methods to comprehensively improve their prognosis. Systematic nursing methods implemented by nursing staff can promote the improvement of patients' kidney function and have significant practical effects. The differences in complications are significant, $p < 0.05$.

To investigate the reasons: implementing personalized care, assessing the risk of complications, planning various nursing work, actively preventing complications, controlling adverse events, thereby improving nursing effectiveness, and ensuring the safety and effectiveness of continuous renal replacement therapy. In the items of blood pressure changes and edema symptoms, the observation group was at a lower level, and there was a significant difference in the actual data comparison between the two groups, $p < 0.05$. The reason for this is that personalized care is more detailed and comprehensive than routine care, and has significant advantages in controlling patients' blood and edema symptoms. In nursing work, nursing staff strengthen psychological counseling, disease education, nutritional support, posture guidance, etc., maintain the body's nutritional status, maintain good psychological emotions, alleviate patients' edema symptoms, control blood pressure within the normal range, which helps to improve their nursing effectiveness. In the psychological

resilience index project, the observation group is at a higher level, and there is a significant difference in the actual data comparison between the two groups, $p < 0.05$. Root cause: Implementing personalized care to ensure the smooth implementation of CRRT, informing patients of CRRT related knowledge, clarifying the causes and severity of negative emotions, and using this as a basis to strengthen counseling, help kidney failure patients establish treatment confidence, and improve their physical and mental health. In addition, adopting this nursing approach can enhance its auxiliary treatment effect, form a harmonious nurse-patient relationship, and strengthen the patient's CRRT treatment cooperation, which has a promoting effect on the improvement of nursing efficiency and treatment efficiency.

In summary, implementing CRRT and personalized care for patients with renal failure can improve various indicators, reduce their complications, and have high nursing satisfaction, which has great application and promotion value.

About the author

Chen Hong (September 1990-) Female; Han ethnicity; undergraduate college; People from Guanyun, Jiangsu; Research direction of supervisor nurse: nursing of renal failure.

Disclosure statement

The author declares no conflict of interest.

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