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Effect of High-Quality Nursing in Early Continuous Renal Replacement Therapy for Patients With Acute Respiratory Distress Syndrome

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Abstract

Objective: The objective of the study is to analyze the effect of high-quality nursing applied to patients with acute respiratory distress syndrome (ARDS) undergoing early continuous renal replacement therapy (CRRT). **Methods**: A total of 102 ARDS patients receiving early CRRT treated in our hospital from January 2023 to June 2025 were randomly divided into the control group and the observation group, with 51 cases in each group. The control group received traditional nursing, while the observation group received high-quality nursing on the basis of traditional nursing. Patient satisfaction, psychological status and quality of life were compared between the two groups. **Results**: The observation group showed significantly better patient satisfaction, psychological status and quality of life than the control group (P<0.05). **Conclusion**: High-quality nursing for ARDS patients undergoing early CRRT can effectively eliminate adverse psychological impacts and enhance patients' confidence, which is worthy of clinical promotion and application.

Keywords: high-quality nursing, acute respiratory distress syndrome, early continuous renal replacement therapy, quality of life

1. Introduction

Acute respiratory distress syndrome (ARDS) is a common critical clinical condition, and the efficacy of its treatment methods is of great clinical significance. In this context, early continuous renal replacement therapy (CRRT) has been regarded as a key treatment strategy. This therapy can effectively remove inflammatory mediators and endotoxins from the body, block the exacerbation of inflammatory responses, and thereby control and improve ARDS. Numerous studies have confirmed that active and effective nursing interventions can significantly improve the clinical efficacy of early CRRT in ARDS patients (Pan, Wang, & Chen, 2024; Zhao, & Tang, 2024). Professional nursing interventions can not only promote the overall recovery of patients, but also reduce the risk of complications and improve patients' quality of life. However, studies on the application value of high-quality nursing interventions in early CRRT are relatively scarce, providing new ideas for future nursing practice (Zhao, Liu, & Jiang, 2023). Therefore, this study aimed to explore the specific application and effect of high-quality nursing interventions in ARDS patients receiving early CRRT, so as to provide a reference for clinical nursing work and contribute to relevant research fields. It is expected to promote the wide clinical application of CRRT and provide a reference for the treatment of patients with similar diseases. The details are reported as follows.

2. Materials and Methods

2.1 Baseline Data

From January 2023 to June 2025, 102 ARDS patients receiving early CRRT in our hospital were enrolled and divided into two groups by the random number table method. In the control group, the patients aged 45-81 years, with an average age of (63.84±4.51) years. In the observation group, the patients aged 46-83 years, with an average age of (64.97±5.01) years. There was no significant difference in general baseline data between the two groups (P>0.05), indicating comparability. This study was approved by the Ethics Committee of our hospital.

Inclusion criteria: All patients met the diagnostic criteria for ARDS formulated by the Respiratory Branch of the Chinese Medical Association, with hospital stay >24 hours. Exclusion criteria: patients with poor compliance,

inability to cooperate with treatment, or mental disorders.

2.2 Nursing Methods

2.2.1 Control Group

The control group received traditional nursing. Nurses provided detailed oral health education according to patients' conditions to help patients understand the significance, function, purpose and precautions of CRRT treatment. Electrocardiographic monitoring was performed to real-time monitor vital signs such as heart rate and rhythm to support clinical decision-making. CRRT treatment was strictly implemented in accordance with medical orders to ensure treatment safety and effectiveness. In addition, routine psychological counseling was provided for patients with obvious psychological disorders through regular communication and assistance to relieve psychological pressure and help patients maintain a positive attitude towards treatment.

2.2.2 Observation Group

On the basis of traditional nursing, the observation group received standardized high-quality nursing interventions, with specific measures as follows:

(1) Maintenance of hemodynamic stability

Extracorporeal circulation during CRRT may cause hemodynamic instability. Within 1 hour after the start of CRRT, dynamic monitoring of blood pressure and central venous pressure was performed. The blood pump flow rate and ultrafiltration volume were adjusted according to patients' real-time conditions. Timely blood volume supplementation and vasoactive drug administration were conducted to prevent shock and maintain stable hemodynamics.

(2) Maintenance of internal environment stability

Patients suffered from electrolyte disorders (such as elevated lactic acid, serum potassium and serum sodium) and acid-base imbalance caused by primary diseases and secondary renal dysfunction. During CRRT treatment, blood gas, blood glucose and electrolyte indicators were detected every 2 to 4 hours. Intravenous infusion was performed when necessary to maintain water-electrolyte balance and acid-base homeostasis.

(3) Bleeding prevention

Due to abnormal coagulation function and bleeding tendency in patients, close observation was conducted on the color of drainage fluid and feces, as well as oozing of gums, oronasal mucosa and wounds. Activated clotting time was dynamically monitored and recorded to realize early detection and intervention of bleeding complications.

(4) Venous access nursing

The limb with CRRT catheter was placed in a functional position to avoid reduced blood flow velocity, catheter blockage or detachment. Appropriate limb restriction was performed to ensure unobstructed vascular access. After CRRT treatment, the catheter was flushed with 20 mL normal saline and sealed with heparin to prevent thrombus blockage.

(5) Individualized nutritional support

Personalized nutritional support was provided according to patients' physical conditions. The enteral nutrition procedure was strictly followed to ensure matching feeding volume and intestinal tolerance. Parenteral nutrition was supplemented for patients with poor intestinal tolerance or insufficient nutritional intake.

(6) Aseptic management and health education

Hand hygiene management was strengthened, and strict aseptic operation was implemented throughout the treatment process. Targeted health education was carried out to improve patients' self-management awareness.

(7) Psychological nursing

In-depth communication was conducted to grasp the psychological needs of patients and their families, and timely psychological support and guidance were provided. Trusted nurse-patient relationships were established to relieve patients' negative emotions such as tension, anxiety and depression, which may adversely affect treatment efficacy. For patients with severe psychological disorders, psychological tests were performed to identify the causes of negative emotions, targeted psychological intervention and positive encouragement were provided, and regular follow-up of psychological status was conducted to maintain a positive treatment attitude.

2.3 Observation Indicators

(1) Quality of life: The 74-item General Quality of Life Inventory (GQOL-74) was adopted to evaluate patients' quality of life from four dimensions: material life, physical function, psychological function and social function. Higher scores indicated better quality of life.

(2) Nursing satisfaction: A self-designed satisfaction questionnaire was used for evaluation. Scores of 98-100 points indicated very satisfied, 79-97 points indicated satisfied, and 0-59 points indicated dissatisfied.

(3) Psychological status: The Self-rating Depression Scale (SDS) and Self-rating Anxiety Scale (SAS) were used to assess patients' depression and anxiety levels respectively. Higher scores indicated worse psychological status.

2.4 Statistical Analysis

SPSS 23.0 statistical software was used for data analysis. Measurement data were expressed as mean ± standard deviation ($\overline{x} \pm s$) and analyzed by t-test; count data were expressed as percentage (%) and analyzed by chi-square test. A *P* value of less than 0.05 was considered statistically significant.

3. Results

3.1 Comparison of Quality of Life Scores

After nursing, the scores of material life, physical function, social function and psychological function in the observation group were significantly higher than those in the control group ($P<0.05$). See Table 1 and Table 2.

Table 1. Comparison of quality of life scores before and after nursing ($\bar{x} \pm s$)

Group	Number of cases	Material life		Physical function	
		Before nursing	After nursing	Before nursing	After nursing
Control group	51	70.82±3.22	90.34±2.23	67.21±3.54	89.93±3.03
Observation group	51	70.82±3.22	91.34±2.12	67.37±2.23	91.83±2.53
t value	-	0.1459	3.9465	0.4012	3.3693
P value	-	0.8843	0.0002	0.6892	0.0011

Table 2. Comparison of social function and psychological function between the two groups ($\bar{x} \pm s$)

Group	Number of cases	Social function		Psychological function	
		Before nursing	After nursing	Before nursing	After nursing
Control group	49	69.55±3.26	89.63±3.57	69.29±2.87	89.16±4.01
Observation group	49	69.36±2.58	91.42±3.18	69.27±3.32	91.57±3.43
t value	-	0.3199	2.6208	0.1973	3.1327
P value	-	0.7497	0.0102	0.8440	0.0211

3.2 Comparison of Nursing Satisfaction

The total nursing satisfaction rate of the observation group was significantly higher than that of the control group ($P<0.05$). See Table 3.

Table 3. Comparison of nursing satisfaction between the two groups (%)

Group	Number of cases	Very satisfied	Satisfied	Dissatisfied	Total satisfaction rate
Observation group	51	32 (65.31%)	15 (30.61%)	2 (4.08%)	47 (95.52%)
Control group	51	25 (51.02%)	15 (30.61%)	9 (18.37%)	40 (81.52%)
χ value	-	-	-	-	5.0142
P value	-	-	-	-	0.0532

3.3 Comparison of Psychological Status

Before nursing, there were no significant differences in SAS and SDS scores between the two groups ($P>0.05$). After nursing, the SAS and SDS scores of both groups decreased significantly, and the observation group had lower scores than the control group ($P<0.05$). See Table 4.

Table 4. Comparison of SAS and SDS scores before and after nursing ($\bar{x} \pm s$)

Group	Number of cases	SAS score		SDS score	
		Before nursing	After nursing	Before nursing	After nursing
Control group	49	62.24±3.34	33.81±4.57	63.42±2.56	34.26±2.03
Observation group	49	63.44±3.42	31.42±3.18	66.59±2.21	32.67±3.53
t value	-	0.2324	3.0313	0.3452	2.4337
P value	-	0.5674	0.0023	0.7176	0.1251

4. Discussion

ARDS is a pathophysiological process caused by cascade reactions of multiple inflammatory factors, and eliminating a single inflammatory factor cannot fundamentally solve the pathogenesis of ARDS. CRRT is an advanced clinical medical technology that treats renal failure through continuous hemodialysis and hemofiltration to remove metabolic wastes and excess water from the body and restore renal function (Guo, & Lu, 2023; Zhao, Yu, & Wang, 2023).

CRRT can non-specifically remove various inflammatory factors and has a definite therapeutic effect on ARDS (Wang, & Wang, 2023). This study aimed to improve the negative emotions and treatment compliance of ARDS patients undergoing early CRRT, so as to enhance treatment efficacy and reduce complications. The results showed that there was no significant difference in baseline SAS and SDS scores between the two groups before nursing ($P>0.05$), indicating comparable baseline psychological status. After treatment, the SAS and SDS scores of all patients decreased, which may be related to the improvement of patients' physical conditions (Feng, & Wang, 2023; Chao, 2023).

Compared with traditional nursing, high-quality nursing significantly reduced patients' anxiety and depression levels. This fully proves that high-quality nursing can effectively improve patients' mental health and relieve negative emotions (Xue, & Zhao, 2023; Zhai, Huo, & Zheng, 2023). Centering on patients, high-quality nursing strengthens psychological communication and guidance for patients and their families, alleviates the adverse effects of negative emotions on disease recovery, and helps patients maintain a positive treatment attitude. As an active and effective nursing strategy, high-quality nursing ensures the smooth implementation of CRRT treatment. Continuous nursing optimization and improvement are key measures to improve nursing quality.

In conclusion, high-quality nursing has a significant clinical effect on ARDS patients receiving early CRRT, which can effectively improve patients' psychological status, quality of life and nursing satisfaction, and is worthy of wide clinical application.

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