Original Article
Effects of comprehensive nursing on negative emotion and prognosis of patients with sepsis

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Abstract: Objective: To explore the effect of comprehensive nursing on negative emotion and prognosis of patients with sepsis. Methods: As a prospective study, 104 patients with sepsis were randomized into the observation group (n=52) and the control group (n=52). The patients in the control group underwent routine nursing, whereas the patients in the observation group underwent comprehensive nursing care in addition to routine nursing. The level of negative emotions, patients' prognosis, quality of life (QOL), Acute Physiology and Chronic Health Evaluation (APACHE) II score, clinical indicators, and patient satisfaction with nursing were compared between the two groups. Results: Compared with the control group, the observation group had lower Self-Rating Anxiety Scale score, Self-Rating Depression Scale score, and APACHE II score (all P<0.001). The scores of physical functioning, general health perceptions, social role functioning, emotional role functioning, and mental health of the observation group were all higher than those of the control group (all P<0.01). The duration of mechanical ventilation, hospitalization expenses, and the length of stay in the Intensive Care Unit (ICU) in the observation group were lower than those in the control group (all P<0.01). Moreover, the observation group had a lower total incidence of shock, multiple organ dysfunction syndrome, and death and higher patient satisfaction with the nursing care than the control group (all P<0.05). Conclusion: Comprehensive nursing care can alleviate anxiety and depression in patients with sepsis and can improve the prognosis and QOL of patients. Also, it can shorten the length of stay in the ICU, lower treatment costs, and improve patient satisfaction; all of which can be recommended for clinical application.

Keywords: Comprehensive nursing, sepsis, negative emotion, prognosis

Introduction

Sepsis is an organ dysfunction syndrome due to the disturbance of a normal human response to infection [1]. The disease can be induced by various types of trauma or infection, such as pneumonia, digestive disorders, urinary disorders, and bacteremia. Moreover, young age, advanced age, immune system damage, diabetes, liver cirrhosis, long-term ICU stay, trauma, invasive treatment, and long-term usage of glucocorticoids are also inducing factors for sepsis [2, 3]. It has been reported that there are more than 19 million septic patients worldwide, and the fatality rate is over 25%, reaching 6 million deaths. Moreover, among the surviving patients, about 3 million have cognitive impairment, which seriously threatens the health and quality of life (QOL) of the patients [4, 5]. At

present, sepsis treatment mainly includes etiological treatment (early lesion removal and use of antibiotics), supportive treatment (early circulatory resuscitation, mechanical ventilation, and metabolic support, etc.), and immunomodulatory therapy [6].

Since septic patients can have recurrent infections, and patients and their families often lack sufficent knowledge about this disease, patients and their families are likely to have negative emotions in the process of treatment, and the QOL and prognosis of patients are often poor [7]. Thus, alleviating the anxiety and depression in patients and improving the prognosis of sepsis has become the focus of nursing care for septic patients. Routine nursing includes health education, electrocardiogram monitoring, close observation of pa-

tients' heart rate, blood pressure, and other vital signs, obtaining venous access, and nutritional support. However, in routine nursing care, little attention is paid to patients' emotional status [8].

In comprehensive nursing, all aspects of nursing, such as specifying nurses' responsibilities, establishing a nursing plan, filling out nursing forms, health education, nursing quality control, are all conducted according to the nursing procedures to ensure a good level and quality of nursing service [9]. So far, there has been no report about the effects of comprehensive nursing mode on the negative emotion and prognosis of patients with sepsis. Therefore, we aimed to explore the effects of comprehensive nursing care on negative emotion and the prognosis of patients with sepsis. We also explored the effects of this nursing intervention on the QOL, APACHE II score, clinical indicators, and satisfaction rate of patients, in order to provide guidance for the application of comprehensive nursing care clinically.

Materials and methods

Participants

One hundred and four patients with sepsis admitted to our hospital from December 5, 2018 to February 28, 2020 were chosen for this prospective study. The patients were randomized into the observation group (n=52) and the control group (n=52). The study was approved by the Ethics Committee of our hospital.

Inclusion criteria: 1) patients who had severe sepsis; 2) patients with normal cognitive function; 3) patients who agreed to participate in the study and signed the informed consent [10].

Exclusion criteria: 1) patients who were complicated with severe heart, liver, or kidney disorders; 2) patients with a history of mental illness; 3) patients with cognitive impairment; 4) patients who had allergic reactions to the therapeutic drugs.

Methods

The patients in the control group received routine treatment and nursing [11]. Routine nursing included health education, electrocardiogram monitoring, close observation of the

heart rate, blood pressure, and other vital signs of patients, deep venous catheterization, obtaining venous access, and nutrition support for patients.

The patients in the observation group were given comprehensive nursing care in addition to routine nursing [9]. The comprehensive nursing care included the following measures: 1) A nursing team that consisted of one attending physician, one nurse manager, two nurse leaders, and two charge nurses. The team first searched the literature to collect good nursing experience for sepsis and then developed a scientific and reasonable nursing plan based on the actual condition of our patients. Next, the team members received training and were required to implement nursing according to the training plan to ensure homogeneity in nursing management. 2) Psychological nursing was provided to the patients. We offered health education to the patients and their families to help them have a better understanding of the disease and encourage the patients and their families to cooperate with treatment and to have confidence in overcoming the disease. Meanwhile, we paid close attention to the patients' emotions. If patients showed signs of anxiety and depression, a targeted psychological intervention was immediately carried out for them. 3) We strengthened the management of catheters, infusion tubes, drainage tubes, ventilator tubes and central venous catheters to keep them clean and prevent reverse flow. 4) We offered dietary intervention to guide the patients to eat appropriately, avoid high-fat and spicy food, and avoid smoking and alcohol. 5) We performed a strict aseptic operation. Hand hygiene and invasive operations strictly followed the principle of aseptic operations.

Outcome measures

After the implementation of nursing care, the nursing effects were compared between the two groups.

Anxiety levels in the two groups: The anxiety level of the patients in the two groups was evaluated according to the Self-Rating Anxiety Scale (SAS) [12]. The system consisted of 20 items, with 1-4 points for each item. A SAS score ≥50 indicated the presence of anxiety, and the degree of anxiety increased with the score.

Table 1. Comparison of baseline data between the two groups (n, x̄ ± sd)

Baseline data	Observation group (n=52)	Control group (n=52)	χ^2/t	P
Age (year)	52.4±8.1	49.6±7.8	1.790	0.076
Gender			0.161	0.689
Male	30	32		
Female	22	20		
SOFA (score)	20.05±4.11	21.08±4.28	1.252	0.214
Comorbidity (cases)				
Coronary disease	16	15	0.051	0.830
Diabetes	15	17	0.185	0.670
Hypertension	22	20	0.160	0.689
Renal insufficiency	17	14	0.411	0.520
Cerebral hemorrhage	1	1	0.000	1.000
Hepatopathy	2	1	0.340	0.558
Malignant tumor	8	7	0.081	0.780
COPD	9	8	0.078	0.790
Infection site (cases)				
Abdomen	51	50	0.340	0.558
Lung	3	4	0.152	0.695
Urinary system	1	1	0.000	1.000
Central nervous system	1	1	0.000	1.000

Note: SOFA: Sequential Organ Failure Assessment; COPD: chronic obstructive pulmonary disease.

Depression levels in the two groups: The depression level of the patients in the two groups was evaluated according to the Self-Rating Depression Scale (SDS). The classification were as follows: 53-62 points = mild depression; 63-72 points = moderate depression; >72 points = major depression. The degree of depression increased with the score [13].

Patients' quality of life in the two groups: The QOL of the patients was assessed according to the Medical Outcome Study Short Form-36 (MOS SF-36). The scale included five dimensions: physical functioning, general health perceptions, social role functioning, emotional role functioning, and mental health. The total score of each dimension was 100, and a higher score indicated better QOL [14].

APACHE ll score in the two groups: APACHE ll consisted of acute physiology score, age, and chronic health evaluation score, with a total score of 71 points. A higher score indicated a more severe conditions [15].

Clinical markers: The duration of mechanical ventilation, hospitalization expenses, and length of ICU stay were compared between the two groups.

Incidence of poor prognosis: The incidence of shock, multiple organ dysfunction syndrome (MODS), and death was compared between the two groups. If more than one of these issues occurred in one patient, they were all included in the total incidence of poor prognosis. Total incidence rate of poor prognosis = total incidence of poor prognosis/total cases ×100% [16].

Patient satisfaction with the nursing: The patients were asked to complete the hosptial-made satisfaction survey upon discharged. The validity coefficient was 0.795 and the reliability coefficient was 0.882. The results were divided into satisfaction (90-100 points), basic satisfaction (60-89 points), and dissatisfaction (<60 points). Satisfaction rate = sum cases of (satisfaction + basic satisfaction)/ total cases ×100%.

Statistical analysis

SPSS 20.0 was applied for data analysis. Enumeration data are presented as number or percentage and were determined by the chi-square test. Measurement data in accordance with a normal distribution were presented as mean ± standard deviation. Independent t-test was performed for comparison between groups. The rank-sum test was used to compare the composition of rank data. P<0.05 indicated a statistically significant difference.

Results

Baseline data in the two groups

No significant differences were found in the age, gender, Sequential Organ Failure Assessment (SOFA) score, comorbidity, and infection site between the two groups (all P>0.05), indicating that the two groups were comparable. See **Table 1**.

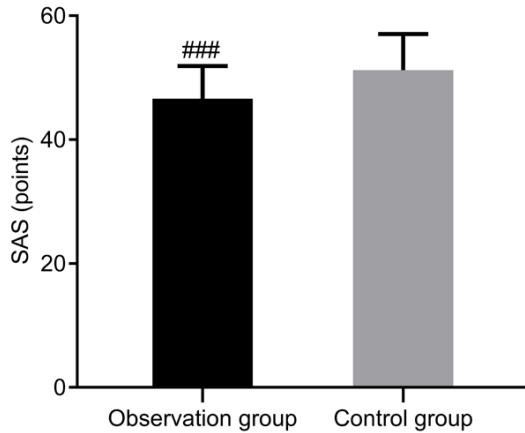**Figure 1.** Comparison of SAS score between the two groups. Compared with the control group, ###P<0.001. SAS: Self-Rating Anxiety Scale.

Figure 2. Comparison of SDS score between the two groups. Compared with the control group, ###P<0.001. SDS: Self-Rating Depression Scale.

Anxiety levels in the two groups

The SAS score of the observation group was lower than that of the control group (P<0.001). See **Figure 1**.

Depression levels in the two groups

The SDS score of the observation group was much lower than that of the control group (P<0.001). See **Figure 2**.

Patients' QOL in the two groups

Compared with the control group, the scores of physical functioning, general health perceptions, social role functioning, emotional role functioning, and mental health in the observation group were all much higher (all P<0.01). See **Table 2**.

APACHE II score in the two groups

The observation group had a much lower APACHE II score than the control group after the nursing intervention (P<0.001). See **Table 3**.

Clinical markers in the two groups

The observation group had shorter duration of mechanical ventilation and ICU stay and lower hospitalization costs than the control group (all P<0.01). See **Table 4**.

Prognosis of patients in the two groups

The observation group had a lower total incidence rate of poor prognosis than the control group (P<0.05). See **Table 5**.
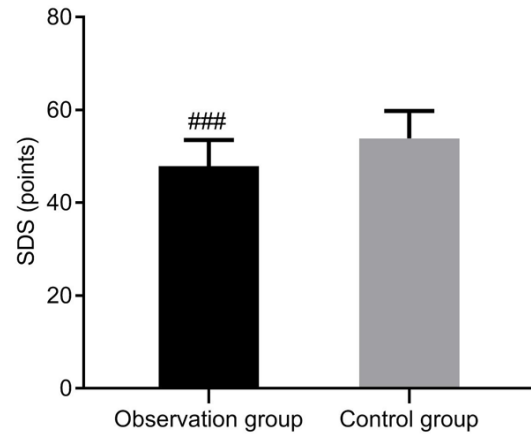
Patient satisfaction with the nursing in the two groups

Patients in the observation group had higher satisfaction with the nursing care than the control group (P<0.05). See **Table 6**.

Discussion

Comprehensive nursing has now been widely applied in the clinical nursing of patients undergoing surgery or patients with chronic diseases or reproductive system diseases and it has achieved positive results [17-22]. In our present study, we applied comprehensive nursing for patients with sepsis to observe its effect on the negative emotions and prognosis of patients.

Studies have shown that due to patients' lack of knowledge about sepsis, poor self-care ability, and the fact that recurrent infection can often take place, patients are likely to have negative emotions, and the QOL and prognosis of patients are often poor [23-25]. In this study, compared with the patients who received routine nursing, the SAS and SDS scores of the patients who received comprehensive nursing were lower, indicating that comprehensive nursing care can reduce the anxiety and depression of the patients. This result may be due to the fact that professional psychological counseling was offered to the patients in the comprehensive nursing group to alleviate the negative emotions of patients.

Luo et al. pointed out that APACHE II was an important marker to evaluate the severity and

Table 2. Comparison of MOS SF-36 scores between the two groups ($\overline{x} \pm sd$)

MOS SF-36 score	Observation group (n=52)	Control group (n=52)	t	P
Physical functioning	78.52±10.21	65.89±9.20	6.627	0.000
General health perceptions	91.24±10.32	85.23±12.12	2.723	0.008
Social role functioning	72.78±11.48	65.31±10.34	3.487	0.001
Emotional role functioning	63.89±9.02	55.85±7.24	5.013	0.000
Mental health	68.47±10.14	57.14±7.25	6.627	0.000

Note: MOS SF-36: Medical Outcome Study Short Form-36.

Table 3. Comparison of APACHE II score between the two groups ($\overline{x} \pm sd$)

APACHE II score	Observation group (n=52)	Control group (n=52)	t	P
Before the nursing intervention	41.53±5.30	41.62±5.20	0.087	0.931
After the nursing intervention	22.62±2.21	25.50±1.26	8.164	0.000

Note: APACHE II: Acute Physiology and Chronic Health Evaluation II.

Table 4. Clinical markers of the patients in two groups

	Duration of mechanical ventilation (h)	Hospitalization expenses (CNY)	ICU stay (d)
Observation group (n=52)	55.55±41.18	76609.53±35421.30	7.4±5.7
Control group (n=52)	81.55±40.25	97410.53±38142.14	13.5±5.6
t	3.256	2.882	5.505
P	0.002	0.005	0.000

Note: ICU: Intensive Care Unit.

Table 5. Total incidence of poor prognosis of patients in two groups (n (%))

Groups	Shock	MODS	Death	Total incidence of poor prognosis
Observation group (n=52)	2 (3.85)	2 (3.85)	1 (1.92)	5 (9.62)
Control group (n=52)	5 (9.62)	4 (7.69)	5 (9.62)	14 (26.92)
χ^2				5.223
P				0.022

Note: MODS: Multiple organ dysfunction syndrome.

drome (MODS) or septic shock [27]. Compared with the patients who received routine nursing, the incidence of shock, MODS and death of the patients receiving comprehensive nursing had lower incidences, indicating that the comprehensive nursing mode can improve the prognosis of patients with sepsis. Also, the patients receiving comprehensive nursing had shorter duration of mechanical ventilation and ICU stay and lower hospitalization expenses than the control group, showing that comprehensive nursing can speed up the hospital bed turnover rate and reduce the financial burden of patients.

Studies have reported that sepsis survivors often have lower QOL than the general population [28]. In this study, compared with the patients receiving routine nursing, the scores of each dimension in MOS SF-36 of the patients receiving comprehensive nursing were higher, indicating that comprehensive nursing can improve the QOL of patients with sepsis. This result may be related to the fact that comprehensive nursing can reduce the severity of sepsis and incidence of complications, thus improving the quality of life of patients.

prognosis of sepsis [26]. The results in our study showed that the observation group had a lower APACHE II score than the control group, indicating that the comprehensive nursing mode can prevent the aggravation of sepsis. The excessive inflammatory mediators in sepsis can damage the kidney, lung, and other organs, and patients with sepsis can be complicated with multiple organ dysfunction syn-

The patient satisfaction with the nursing care during hospitalization was also compared between the two groups. The results showed that the patients receiving comprehensive nursing had higher satisfaction than the control group, which may be due to the fact that comprehensive nursing can reduce anxiety and depression, improve clinical prognosis and QOL of patients, and provide patients with a better

Table 6. Comparison of patient satisfaction with the nursing between the two groups (n, %)

	Satisfaction	Basic satisfaction	Dissatisfaction	Satisfaction rate
Observation group (n=52)	24 (46.15)	24 (46.15)	4 (7.70)	48 (92.31)
Control group (n=52)	20 (38.46)	20 (38.46)	12 (23.08)	40 (76.92)
U/χ^2		1.333		4.732
P		0.183		0.029

experience during hospitalization. However, there were still some shortcomings in this study. The study was a single-center study with a short follow-up period and a small sample size. Besides, the anxiety and depression levels and QOL of patients were not observed after discharge. Therefore, studies with a longer follow-up period and a larger sample size need to be carried out in the future for verification.

In conclusion, comprehensive nursing care can effectively alleviate anxiety and depression in patients with sepsis and can improve the prognosis and QOL of patients. It can also shorten the length of stay in the ICU, lower treatment costs, and improve patient satisfaction with nursing, and as such it can be recommended for clinical application.

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Disclosure of conflict of interest

None.

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