

The Effect of Personalized Comprehensive Care on the Nursing Care of Severe Pneumonia Patients

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Abstract: *Objective:* To explore the value of receiving personalized comprehensive care for patients with severe pneumonia. *Methods:* 73 patients with severe pneumonia who visited the clinic from February 2020 to February 2023 were included in this study. The patients were randomly grouped into Group A and Group B. Group A received personalized comprehensive care whereas Group B received conventional care. The value of care was compared. *Results:* The duration of mechanical ventilation time, the time taken for fever and dyspnea relief, and the hospitalization time of Group A were shorter than those in Group B ($P < 0.05$). The blood gas indexes such as PaO₂, PaCO₂, and blood pH of Group A were better than those of Group B ($P < 0.05$). The pulmonary function indexes such as peak expiratory flow (PEF), forced vital capacity (FVC), and forced expiratory volume in 1 second (FEV₁) of Group A were better than those of Group B, $P < 0.05$. Moreover, the patients in Group A were generally more satisfied with the care given compared to the patients in Group B ($P < 0.05$). *Conclusion:* Personalized comprehensive care improves blood gas indexes, enhances lung function, accelerates the relief of symptoms, and also enhances patient satisfaction in severe pneumonia patients.

Keywords: Severe pneumonia; Personalized nursing; Comprehensive care

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1. Introduction

Pneumonia is a respiratory disease that becomes life-threatening when it progresses to a severe stage. Under the influence of toxins, hypoxia, CO₂ retention, and other factors, patients with severe pneumonia are very susceptible to irritability, lethargy, coma, dyspnea, and other conditions. Therefore, if they are not diagnosed and treated promptly, they may experience serious complications such as hypoxemia, toxic shock, and even respiratory failure, which can be life-threatening^[1]. Therefore, patients with respiratory failure need to be rescued as early as possible followed by nursing interventions. However, conventional nursing only serves to control and prevent pneumonia complications, neglecting other aspects of patient care, resulting in a poor quality of care^[2]. In recent years, personalized comprehensive nursing has been used in nursing severe pneumonia patients to cater to their diversified needs. This approach improved the prognosis of patients with

pneumonia. In this paper, 73 patients with severe pneumonia who were treated in Hubei Xianning Hospital from February 2020 to February 2023 were used as a sample to explore the value of personalized comprehensive care.

2. Information and methods

2.1. General information

73 patients with severe pneumonia who attended the clinic from February 2020 to February 2023 were used as samples for this study. They were randomly grouped into Group A and Group B. There was no difference in the baseline data of patients with severe pneumonia in Group A and Group B, ($P > 0.05$). The details are shown in **Table 1**.

Table 1. Analysis of data of patients with severe pneumonia

Group	n	Sex (%)		Age (years)		Duration (d)	
		Male	Female	Range	Average	Range	Average
Group A	37	21 (56.76)	16 (43.24)	55–84	70.35 ± 2.42	4–25	15.36 ± 2.43
Group B	36	22 (61.11)	14 (38.89)	56–85	70.38 ± 2.39	4–26	15.39 ± 2.49
χ^2/t	-	0.1429		0.0533		0.0521	
P	-	0.7054		0.9577		0.9586	

2.2. Inclusion and exclusion criteria

Inclusion criteria: (1) no organ dysfunctions, (2) gave informed consent, (3) normal cognitive abilities.

Exclusion criteria: (1) presence of systemic infection, (2) bronchial asthma, (3) presence of substantial lesions of organs.

2.3. Methods

The patients in Group A received personalized comprehensive care. (1) Condition assessment: Upon admission, the patients' medical and treatment histories, allergies, and other information were recorded. Their test results from other institutions were also gathered, and their course of disease and symptoms were understood. In addition, nurses were assigned to the patients according to the ward numbers and they were briefed about their patients' condition. (2) Disease education and symptom management: Some elderly patients with severe pneumonia had poor physical function and severe wheezing and coughing. The emotional state of these patients was addressed and they were taught the right way of coughing out their sputum. For patients who were experiencing recurrent low-grade fever, their families were instructed to take cooling measures, measure their temperatures every hour, and notify the responsible nurses of any abnormalities, which would then be addressed accordingly. Patients with more pus and sputum were instructed to carry out nebulization treatment or assisted sputum suction treatment to clear the secretions and maintain unobstructed breathing. (3) Psychological intervention: Patients with severe pneumonia have poor self-care ability and are often in a state of discomfort, which would affect their compliance with the treatment. It is essential to consider the subjective feelings of pneumonia patients, correct any adverse behaviors, and organize group activities such as games or communal TV programs within the hospital room. These activities aim to shift the patients' focus away from their illness, helping alleviate psychological pressure and enhance overall well-being. In addition, family members

were advised to communicate with the patients and to share successful cases of severe pneumonia treatment to enhance the degree of compliance. (4) Environmental intervention: It is necessary to create an excellent environment for patients with severe pneumonia by opening windows and ventilating the room regularly to ensure that the humidity (55–65%) and temperature (22–26°C) are maintained at the optimum level, and the room should also be well-lit. In addition, the patients' rooms were cleaned with the wet-cleaning method to prevent the dust from stimulating the respiratory tract of the patients. The number of visitors allowed to visit patients was limited, and visiting hours were restricted. Additionally, stringent measures were implemented to enhance the management and disinfection of the rooms, aiming to improve the comfort and safety of patients during their recovery. (5) Dietary intervention: Patients with severe pneumonia may experience loss of appetite due to the medications administered. Despite this, maintaining proper nutrition, especially for elderly patients with specific dietary requirements, is crucial. Therefore, the nursing staff guided the patients in terms of diet after understanding their physical conditions. Additionally, patients were advised to eat smaller, more frequent meals, avoid spicy, cold, and greasy foods, and pay attention to preventing constipation. (6) Oral intervention: Patients with severe pneumonia have weak resistance and are very susceptible to cross-infection, especially those with poor oral hygiene. Poor oral hygiene can create a favorable environment for bacterial colonization, thereby increasing the risk of dysphagia and dysphonia. Therefore, the patients were advised to brush their teeth in the morning and evening and rinse their mouths after eating. (7) Complications prevention and treatment interventions: For hypothermia, the indoor temperature was appropriately adjusted, and blankets were provided to the patients to restore normal body temperature as soon as possible. In cases of convulsions and coma, anticonvulsant drugs were administered promptly, and preparations for resuscitation were made. In instances of cardiac failure, cardiac stimulants, and mannitol were administered according to the doctor's instructions. Patients experiencing respiratory distress received oxygen therapy, and the administration of oxygen was gradually discontinued once their breathing stabilized.

The patients in Group B received conventional care. The temperature and humidity of the patients' rooms were maintained at an optimum level. Adequate measures were taken to ensure proper disinfection and cleaning of the rooms, creating a comfortable environment for the patients. The patients were informed of the diagnosis, treatment, and precautions for severe pneumonia. Furthermore, efforts were made to meet the patients' requirements.

2.4. Observation indicators

- (1) Clinical indicators: The duration of mechanical ventilation, time taken for fever and dyspnea relief, and the duration of hospitalization of each patient were recorded.
- (2) Blood gas indicators: The PaO₂, PaCO₂, and blood pH were measured and recorded.
- (3) Lung function indexes: The peak expiratory flow (PEF), forced vital capacity (FVC), and forced expiratory volume in 1 second (FEV₁) of the patients were measured and recorded.
- (4) Patient satisfaction was assessed using a self-made scale, categorized into three dimensions: >80 points, 40–80 points, and < 40 points.

2.5. Statistical analysis

The patients' data were processed by SPSS 21.0. The count data were analyzed using a χ^2 -test and the measurement data were analyzed by a *t*-test. $P < 0.05$ indicates statistical significance.

3. Results

3.1. Clinical indicators

The duration of mechanical ventilation, time taken for fever and dyspnea relief, and the duration of hospitalization of Group A were shorter than that of Group B ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparison of clinical indicators (mean \pm standard deviation)

Group	Duration of mechanical ventilation (d)	Time taken for fever relief (d)	Time taken for dyspnea relief (d)	Duration of hospitalization (d)
Group A ($n = 37$)	7.82 \pm 1.21	2.01 \pm 0.36	2.01 \pm 0.39	14.41 \pm 1.36
Group B ($n = 36$)	9.01 \pm 1.43	4.22 \pm 0.69	2.88 \pm 0.73	17.68 \pm 2.05
<i>t</i>	3.8421	17.2237	6.3751	8.0518
<i>P</i>	0.0003	0.0000	0.0000	0.0000

3.2. Blood gas analysis indexes

After nursing, the blood gas indexes such as PaO₂, PaCO₂, and blood pH of Group A were better than those of Group B ($P < 0.05$), as shown in **Table 3**.

Table 3. Blood gas analysis indices (mean \pm standard deviation)

Group	PaO ₂ (mmHg)		PaCO ₂ (mmHg)		Blood pH	
	Before care	After care	Before care	After care	Before care	After care
Group A ($n = 37$)	46.11 \pm 2.41	95.32 \pm 3.25	65.72 \pm 3.25	34.31 \pm 1.25	6.71 \pm 0.25	7.39 \pm 0.71
Group B ($n = 36$)	46.17 \pm 2.39	89.43 \pm 3.11	65.71 \pm 3.27	39.25 \pm 2.16	6.73 \pm 0.27	6.98 \pm 0.46
<i>t</i>	0.1068	7.9075	0.0131	12.0001	0.3285	2.9193
<i>P</i>	0.9153	0.0000	0.9896	0.0000	0.7435	0.0047

3.3. Lung function indexes

After care, the PEF, FVC, and FEV₁ of Group A were better than that of Group B ($P < 0.05$), as shown in **Table 4**.

Table 4. Analysis of lung function indices (mean \pm standard deviation)

Group	PEF (L/s)		FVC (L)		FEV ₁ (L)	
	Before care	After care	Before care	After care	Before care	After care
Group A ($n = 37$)	1.82 \pm 0.42	2.91 \pm 0.52	1.81 \pm 0.34	3.02 \pm 0.48	1.32 \pm 0.24	2.25 \pm 0.35
Group B ($n = 36$)	1.84 \pm 0.43	2.31 \pm 0.48	1.83 \pm 0.32	2.39 \pm 0.41	1.35 \pm 0.26	1.80 \pm 0.31
<i>t</i>	0.2010	5.1189	0.2587	6.0222	0.5125	5.8093
<i>P</i>	0.8412	0.0000	0.7966	0.0000	0.6099	0.0000

3.4. Patient satisfaction

Table 5 shows that 97.30% of patients in Group A were satisfied with the care given, which was higher than Group B, which was 83.33% ($P < 0.05$).

Table 5. Comparison of patient satisfaction between the two groups (*n*, %)

Group	Very satisfied	Satisfied	Unsatisfied	Total satisfaction
Group A (<i>n</i> = 37)	27 (72.97)	9 (24.32)	1 (2.70)	97.30
Group B (<i>n</i> = 36)	18 (50.00)	12 (33.33)	6 (16.67)	83.33
χ^2	-	-	-	4.1040
<i>P</i>	-	-	-	0.0428

4. Discussion

Pneumonia can be caused by viruses and bacteria. It is a common clinical inflammatory lesion, with the location of the disease being in the interstitial and alveolar regions of the lungs. Severe pneumonia leads to increased morbidity and mortality rates [3]. The prognosis of patients with severe pneumonia is closely related to dietary habits, living habits, and psychological state, and, it has the characteristics of a high risk of complications and rapid progression, which can treatment compliance. It can become life-threatening if it is not diagnosed and treated in time [4]. In addition, severe pneumonia can damage the patient's immune function and reduce the content of nutrients in the body, especially for elderly patients, which in turn affects their prognosis. Therefore, some scholars suggest the treatment of patients with severe pneumonia should be accompanied by nursing interventions to accelerate the recovery of the patients' physical function and immune system. However, conventional nursing is less systematic and personalized [5]. Moreover, patients with severe pneumonia exhibit numerous risk factors during the onset of the disease. Therefore, thorough nursing assessments should be conducted, and personalized nursing programs should be formulated to stabilize the patient's condition and improve diagnostic and treatment outcomes [6]. In recent years, personalized comprehensive care has been gradually introduced in the care of severe pneumonia patients. This mode of care comes with numerous advantages. With comprehensive personalized nursing, the condition of the patients can be well understood, and the patients will be educated about the disease and the treatment, thus effectively preventing complications. Secondly, comprehensive personalized nursing ensures that the patients' needs are met. Psychological counseling can alleviate their negative emotions, facilitating cooperation with subsequent diagnosis and treatment. Creating aseptic and comfortable wards, along with providing instructions for correct eating, can supplement the nutritional needs of patients with severe pneumonia and enhance their comfort during diagnosis and treatment. Additionally, ensuring proper oral and respiratory care contributes to maintaining smooth breathing [7].

In this study, Group A showed a shorter duration of mechanical ventilation, quicker resolution of fever and dyspnea, and a shorter hospitalization time compared to Group B. This shows that personalized comprehensive nursing can shorten the duration of the illness of patients with severe pneumonia, which helps prevent the progression of the disease. This is because the implementation of personalized integrated nursing strategies, addressing negative emotions, providing tailored services for different patients with severe pneumonia, and promptly correcting erroneous behaviors and misconceptions, all contribute to stimulating patients' self-care ability and shortening the duration of the disease [8]. Furthermore, the blood gas indexes such as PaO₂, PaCO₂, and blood pH of the patients in Group A were better than those in Group B. This shows that personalized comprehensive nursing can improve patients' blood gas indicators. This improvement is attributed to personalized comprehensive nursing, which delivers comprehensive services from multiple perspectives, proactively prevents and manages pneumonia complications, and ensures the maintenance of smooth breathing,

leading to better blood gas indicators ^[9]. Another set of data shows that after nursing, the lung function (PEF, FVC, and FEV₁) of Group A is better than those in Group B, suggesting that personalized comprehensive nursing can enhance the lung function of patients. The rationale behind this is that personalized comprehensive care is designed scientifically with the patients' physical and mental conditions in mind, making the program effective. The last set of data shows that the patient satisfaction of patients with severe pneumonia in Group A (97.30%) was higher than that of Group B (83.33%), which indicates that personalized comprehensive care can improve the satisfaction of patients with severe pneumonia. This is because personalized comprehensive care for patients with severe pneumonia provides the patients with active services. This approach makes clinical care more humane, catering to the diverse needs of different patients and ultimately resulting in higher satisfaction among patients with severe pneumonia ^[10].

5. Conclusion

In conclusion, patients with severe pneumonia who received personalized comprehensive nursing showed better improvement in lung function, blood gas indicators, a shorter duration of symptoms, and high satisfaction. Therefore, this nursing mode should be popularized in clinical practice.

Disclosure statement

The author declares no conflict of interest.

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