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Optimized Individualized Nursing Improves Recovery and Reduces Complications in ICU Patients with Severe Pneumonia

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ABSTRACT

Objective: This study evaluates the effectiveness of optimized individualized nursing interventions on clinical outcomes in intensive care unit (ICU) patients with severe pneumonia

Methods: In this randomized controlled trial, 76 patients with severe pneumonia were randomized into a control group and an experimental group. Both groups received routine nursing care. On this basis, the experimental group received optimized individualized nursing. After the nursing intervention, clinical outcomes, respiratory function, coagulation function, Acute Physiology and Chronic Health Evaluation II (APACHE II) score, and St. George's Respiratory Problems Questionnaire (SGRQ) score were assessed, and the complication and mortality rates were counted.

Results: After the intervention, compared with the control group, the experimental group exhibited shorter times of fever reduction, white blood cell count recovery, and off-boarding and ICU stay, higher oxygenation index, lower rapid shallow breathing index, respiratory rate, activated partial thromboplastin time, prothrombin time, fibrinogen, and D-Dimer levels, lower APACHE II scores and SGRQ scores ($p < 0.05$). Additionally, the experimental group possessed a lower complication rate and mortality rate than the control group ($p < 0.05$).

Conclusion: Implementing optimized individualized nursing can significantly enhance recovery and reduce complications in ICU patients with severe pneumonia.

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Application effect; coagulation function; intensive care unit; optimized individualized nursing; respiratory function; severe pneumonia

Introduction

Pneumonia is a frequent infectious ailment that impacts the airways, interstitial tissues, and alveoli. In the absence of prompt and efficient treatment, it can progress to severe pneumonia.[1] Severe pneumonia is a prevalent and critical illness marked by lower respiratory tract infections, associated with high mortality rates, numerous complications, an unfavorable prognosis, and a significant economic impact. Furthermore, it stands as a primary reason for intensive care unit (ICU) admissions and infection-related fatalities worldwide.[2] Even with persistent advancements in treatment approaches over the last few decades, severe pneumonia has persistently been correlated with a substantial mortality rate, spanning from 20% to over 50%.[2] Therefore, it is particularly important to seek effective treatment and clinical nursing for patients with severe pneumonia.

Routine nursing is the traditional nursing approach for elderly patients with severe pneumonia in the ICU. However, as people's nursing needs increase, the shortcomings of this approach have gradually become apparent, such as passive nursing, limited nursing content, lack of targeted nursing measures, and insufficient attention to patients' physical and mental comfort. This makes this nursing model unsuitable for modern clinical use.[3] Nevertheless, with the transformation of the medical model and the updating of nursing concepts, people are increasingly recognizing that each patient is a unique individual with different physiological, psychological, and social needs.[4] Individualized nursing care fully embodies the principle of patient service, prioritizing patient-centeredness. It extends beyond mere technical nursing procedures to encompass all dimensions of a patient's well-being, including their physical, psychological, and spiritual needs, thereby delivering tailored, high-quality nursing services.[5] This nursing mode transcends the traditional one-size-fits-all approach, acknowledging that each

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patient's health condition, personal background, and preferences are pivotal in determining their specific care requirements.[6] Importantly, optimized individualized nursing is a systematic nursing model that can meet patients' clinical needs and focus on their physical and mental comfort. Nursing measures are more scientific and personalized, and nursing is proactive, which can significantly improve patients' prognosis and ensure nursing quality.[3]

Xianpeng Wang et al. state that the implementation of optimized individualized nursing care for patients with severe pneumonia in the ICU can enhance the patients' physiological parameters, minimize the occurrence of complications, enhance their quality of life prognosis, and positively contribute to their rapid recovery.[5] In addition, it has been reported that implementing optimized individualized nursing interventions for elderly patients with severe pneumonia in the ICU can reduce the incidence of complications, promote rapid improvement of symptoms, and enhance nursing quality.[3]

In view of this, traditional nursing mostly involves symptomatic care after the onset of symptoms, and the nursing measures are rough and general, which cannot improve clinical efficacy or promote patient recovery.[7] In contrast, optimized individualized nursing practice pays more attention to patients' individual differences and needs, emphasizes patient-centered care, and focuses on the personalization and comprehensiveness of nursing services. Therefore, this study aims to evaluate the effect of implementing optimized individualized nursing for ICU patients with severe pneumonia, in order to provide useful references for clinical nursing practice.

Materials and methods

Study design

This was a randomized controlled trial aimed at exploring the application effect of optimized individualized nursing in patients with severe pneumonia in the ICU. The study was approved by the Ethics Committee of The First Affiliated Hospital of Fujian Medical University. The trial complied with the Declaration of Helsinki, and the patients or their families agreed to participate in the study and signed informed consent forms. Patients were randomly assigned to either routine nursing care (control group) or optimized individualized nursing care (experimental group).

Participants

A total of 76 eligible patients with severe pneumonia admitted to the ICU of The First Affiliated Hospital of Fujian Medical University from January to December 2023 were recruited (The flowchart is shown in Figure 1).

Participant inclusion criteria included: (1) The patients met the criteria for determining severe pneumonia[8]; (2) the patients were all hospitalized in the ICU of our hospital and those who took the ventilator for mechanical ventilation; (3) the patients were fully conscious upon admission to the ICU and during their stay in the ICU; (4) the patients' clinical data were complete; (5) the study was ratified by the Ethics Committee of the hospital, and the patients or their family members were aware of the study and signed the consent form.

Participant exclusion criteria included: (1) patients with malignant tumors, serious cardiovascular and cerebrovascular diseases, and serious immune system diseases; (2) those with uncontrollable respiratory failure and those with hepatic and renal insufficiency prior to enrollment; (3) those with drug-induced pulmonary diseases; (4) those with psychiatric disorders, ambiguity of consciousness, and communication disorders that made it impossible for them to cooperate with the study; (5) those with combined oral diseases. (6) those in shock or coma; (7) those with a history of ICU admission.

Randomization and masking

Eligible participants were randomized in a 1:1 allocation ratio. The allocation sequence was generated using computer-generated random numbers, and group allocation was placed into sealed opaque envelopes by an independent researcher not involved in the nursing intervention or outcome measurement. Outcome assessment and statistical analysis were conducted by independent researchers who were blinded to the group allocation.

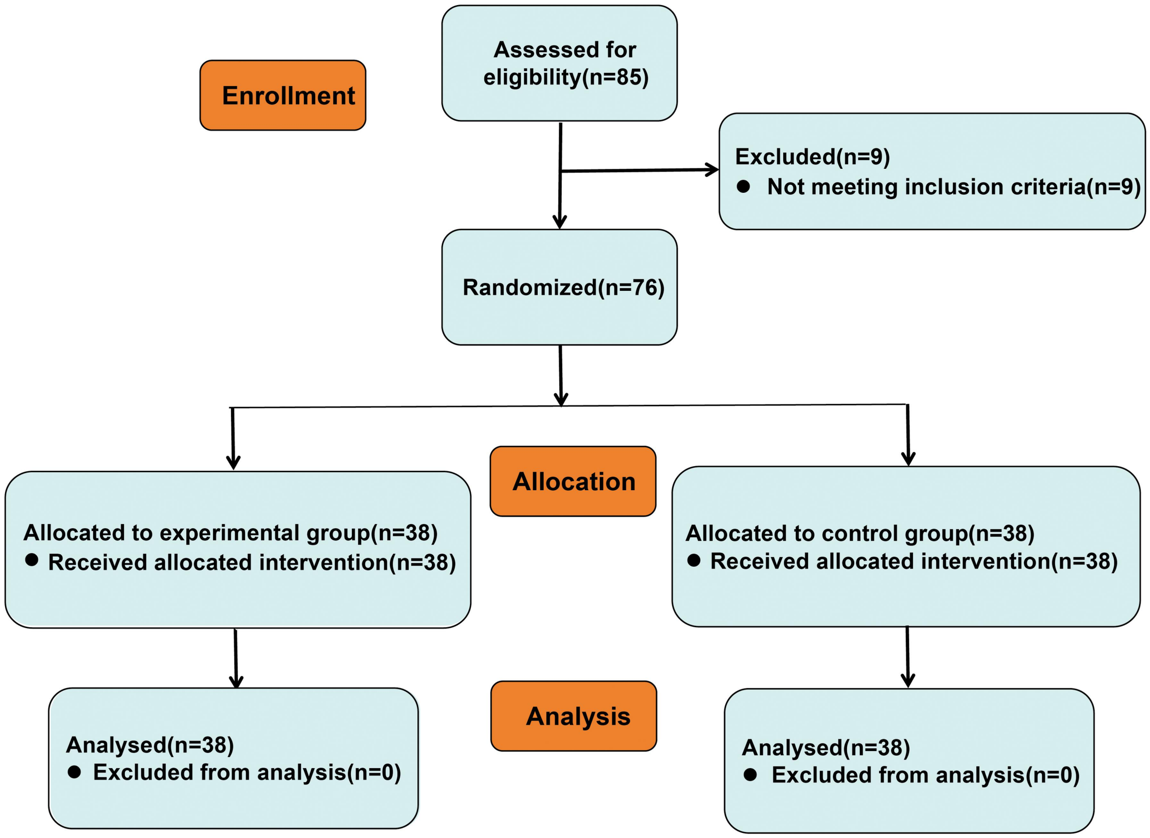

Figure 1. Flowchart of the study.

Interventions

After admission to the ICU, patients in both the control group and the experimental group received treatments such as oxygen inhalation, asthma relief, cough suppression, phlegm reduction, anti-infection therapy, correction of water-electrolyte imbalance, and acid-base imbalance. They also received routine nursing care including ward environment management, body position nursing, medication guidance, sputum drainage nursing, and nutritional support.

The experimental group received optimized individualized nursing on the basis of routine nursing care. The specific nursing methods included (1) Needs assessment: After admission to the ICU, a joint nursing team conducted a one-on-one assessment of the patients, which included multiple aspects such as physical condition, rehabilitation needs, and nursing risks. Based on the comprehensive assessment results, a special plan was formulated to clarify the nursing objectives, such as promoting symptom recovery and shortening ICU stay. (2) Optimization of individual airway, mouth, and nose management: For patients on mechanical ventilation, enhance airway humidification to facilitate sputum discharge. Select appropriate mouth and nose masks based on facial contours, adjust elasticity to minimize facial extrusion, and pad gauze at the nose bridge to prevent pressure ulcers. Monitor all channels during nursing to avoid folding or pressure. Clean patients' mouths and noses with cotton swabs morning and evening, and after meals, using 0.9% sodium chloride for gargling to maintain oral and nasal hygiene. Cushion the neck and back to keep patients flat, thoroughly clean oral and nasal secretions, and use chlorhexidine for oral cleansing three times daily to prevent ventilator-associated pneumonia caused by oral bacteria. (3) Optimization of individual lung nursing: Nursing staff should gently tap patients' backs every 3 hours, using wrist force in an inward, outward, and upward motion from the lower lung lobes, maintaining a gentle pace of 50–100 taps per minute. Flush carbon tubes with sodium chloride solution, rotating sputum collection from bottom to top within 15 seconds. Instruct patients to cough correctly and effectively with appropriate force, and administer pure oxygen before and after sputum aspiration to prevent hypoxemia. For persistent fever, use ethanol wipes to promote cooling; for high fever, first apply physical cooling, then medical intervention. If mouth and lips are dry, use a water-dipped cotton swab for care. (4) Optimization of individual bacterial culture and drug sensitivity testing: To keep track of pathogenic bacteria changes in patients, nursing staff should regularly conduct bacterial cultures of airway secretions and drug sensitivity tests for pathogens. Antibacterial drug selection should be based on patient condition, with usage controlled within 8 days. Adjust drug types according to patient condition to reduce bacterial resistance. (5) Optimization of individual psychological nursing: Nursing staff should enhance communication with patients, fully understanding their condition beforehand, and assess their psychology and emotions through conversation. Communication topics should be tailored based on patients' cultural levels and personality traits, discussing hobbies, occupations, etc., to divert their attention and make them feel cared for. For those with anxiety and depression, soothing music can be played in the ward to stabilize their mood. For patients struggling to express themselves, nursing staff can offer encouragement and support through non-verbal means like eye contact, shoulder pats, or handshakes, informing them of their progress and boosting their confidence. For communicative patients, staff should engage in regular conversations and conduct brief (20-minute) interviews. Establishing trust is crucial to reducing negative emotions. Individualized health education programs should be formulated, detailing disease-related knowledge and emphasizing the importance of a positive mind-set, thereby helping patients view their condition correctly and build confidence in recovery. Family members should be encouraged to provide ample support, especially emotional. (6) Optimization of individual nutritional nursing: Nursing staff should provide enteral nutrition support to ensure normal intestinal function and prevent bacterial displacement from cross-infection. Strict aseptic techniques should be followed when preparing nutritional solutions, which should be refrigerated and allowed to reach approximately 37°C before use, and consumed within 24 hours. Adverse and abdominal symptoms should be monitored post-administration. The tube should be flushed with warm water before nasal feeding, and the patient's head should be elevated by 30° for 30 minutes afterward to prevent aspiration. (7) Optimization of individual rehabilitation nursing: Nursing staff should actively guide patients through rehabilitation training. During bedridden periods, lip-contraction breathing exercises can be introduced, involving closing the mouth, inhaling through the nose, and exhaling slowly with whistling or fish-mouth movements, maintaining an inhalation-to-exhalation ratio of about 3:1. As the patient's condition improves, abdominal breathing exercises can be performed in a sitting position, with the hand on the chest, raising the abdomen during inhalation and pressing it with the hand during exhalation, ensuring the chest remains still. Prolonged bed rest can lead to muscle atrophy, so joint activities and passive limb training should be initiated, gradually transitioning to active training. (8) Optimization of individual complication prevention: ICU patients with severe pneumonia are susceptible to various complications, including multi-organ failure, often manifesting as cardiac insufficiency. Nursing staff should closely monitor and prevent such occurrences, such as administering sedatives and oxygen if the patient appears pale, irritable, with a rapid pulse or cyanotic lips. Sudden liver enlargement (e.g., 1.5 cm in a short period) may indicate heart failure and should be reported immediately for resuscitation. For patients with renal insufficiency, strict monitoring of 24-hour fluid intake and output is essential, with prompt physician notification for treatment. Chills and shivering may suggest sepsis, potentially leading to septic shock, requiring immediate physician notification, rescue efforts, and blood culture specimen collection for examination. (9) Summary of results: Issues were summarized, and discussed, and measures were taken to improve them, after which the results were fed back to the patients and their families.

Outcome measure

(1) Clinical outcomes: the time of fever reduction, the recovery time of white blood cell (WBC) count, the time of off-boarding and

the ICU stay were recorded in both groups. The normal value of adult WBC was (4.0 ~ 10.0) × 10^9/L.

(2) Respiratory function: before and after the intervention, the oxygenation index (OI), rapid shallow breathing index (RSBI) and respiratory rate (RR) of the two groups were monitored and obtained by using a Dräger Evita V300 ventilator (Jumu, Shanghai, China). Among them, OI was obtained by monitoring the inspired oxygen concentration (FiO_2), mean airway pressure, and arterial partial pressure of oxygen (PaO_2) with the formula [$OI = (FiO_2 \times \text{mean airway pressure})/PaO_2$]; and RSBI was obtained by monitoring the RR, tidal volume (Vt), with the formula ($RSBI = RR/Vt$).

(3) Coagulation function: before and after the intervention, venous blood samples were acquired from the two groups of patients using a blood collection needle, and after routine anticoagulation treatment, the blood samples were centrifuged at 2000 ~ 2500 rpm for 10-15 min to separate the plasma, and the supernatant plasma was removed and tested for the levels of activated partial thromboplastin time (APTT), prothrombin time (PT), fibrinogen (FIB), and D-dimer (D-D) by the Mindray automatic blood coagulation instrument C2000-A coagulation analyzer (Jinan lab Medical Equipment Co., Ltd., Shandong, China).

(4) Acute Physiology and Chronic Health Evaluation II (APACHE II) scoring system: before and after the intervention, the severity of the condition of the patients in the two groups was assessed by APACHE II, which included 3 assessment dimensions of age, acute physiology score, and chronic health score, with a total score of 0-71. The higher the score was, the more severe the condition was and the worse the prognosis was.

(5) St. George's Respiratory Problems Questionnaire (SGRQ) score: before and after the intervention, the quality of life of patients in both groups was assessed according to the SGRQ, which included respiratory symptoms, the impact of the disease on daily life, and the ability of the body to move around in 3 items with a total of 50 questions, and a percentage system was adopted, and the higher the score, the poorer the quality of life.

(6) Adverse outcomes: the complication rate and mortality rate during ICU hospitalization in both groups were counted.

Statistical analysis

Statistical analysis was implemented using SPSS 26.0 software. Qualitative data were described by [n (%)] and χ^2 test was performed. Normal distribution quantitative data were described by mean ± standard deviation ($\bar{x} \pm s$) and paired samples t-test and independent samples t-test were utilized. Skewed distribution quantitative data were described by median (quartile spacing) [M (*P*25, *P*75)], and Mann-Whitney U-test or Wilcoxon signed-rank test was adopted. $p < 0.05$ was considered to be a significant difference.

Results

General information

There were 38 patients in each of the experimental group and the control group. There were no statistically significant differences in baseline data such as age, disease duration, gender, comorbidities, and etiology between the two groups ($p > 0.05$) (Table 1), indicating that the groups were comparable.

Clinical outcomes

The time of fever reduction, the recovery time of WBC count, the time of off-boarding and the ICU stay in the experimental group were all shorter in contrast to the control group ($p < 0.05$) (Table 2).

Respiratory function

The differences in respiratory function parameters between the two groups before intervention were not significant ($p > 0.05$). After the intervention, OI increased and RSBI and RR decreased in the experimental group relative to the control group ($p < 0.05$) (Table 3).

Table 1. Comparison of baseline data between the two groups [$\bar{x} \pm s$, M(*P*25, *P*75), n(%)].

Indicator	Experimental group (*n* = 38)	Control group (*n* = 38)	$t/Z/\chi^2$	*P*
Age (years)	58.34 ± 7.43	60.21 ± 6.40	−1.175	0.244[a]
Disease duration (d)	4.00 (4.00, 5.00)	4.00 (4.00, 5.00)	−0.539	0.590[b]
Gender (case)			0.490	0.484[c]
Male	21 (55.26)	24 (63.16)	–	–
Female	17 (44.74)	14 (36.84)	–	–
Comorbidities (case)				
Hypertension	12 (31.58)	16 (42.11)	0.905	0.342[c]
Diabetes	5 (13.16)	9 (23.68)	1.401	0.237[c]
Coronary heart disease	7 (18.42)	4 (10.53)	0.957	0.328[c]
Chronic obstructive pulmonary disease	6 (15.79)	5 (13.16)	0.106	0.744[c]
Cerebral infarction	4 (10.53)	3 (7.89)	0.157	0.692[c]
Cerebral hemorrhage	4 (10.53)	2 (5.26)	0.724	0.395[c]
Etiology			0.259	0.879[c]
Bacterial	25 (65.79)	27 (71.05)		
Fungal	12 (31.58)	10 (26.32)		
Other	1 (2.63)	1 (2.63)		

[a]Uses the independent samples t-test.
[b]Buses the Mann-Whitney U-test.
[c]Cuses the chi-squared (χ2) test.

Table 2. Comparison of clinical outcomes between the two groups [M(*P*25, *P*75)].

Indicator	Experimental group (*n* = 38)	Control group (*n* = 38)	*Z*	*P*
Time of fever reduction	5.00 (3.00, 6.00)	6.50 (4.00, 8.00)	−2.789	0.005[a]
Recovery time of WBC count	6.00 (4.00, 8.00)	8.50 (6.75, 10.00)	−3.404	0.001[a]
Time of off-boarding	7.50 (6.00, 9.25)	11.00 (9.00, 12.00)	−4.841	<0.001[a]
ICU stay	9.00 (7.75, 11.25)	13.00 (10.75, 14.00)	−4.733	<0.001[a]

[a]Uses the independent samples t-test. WBC, white blood cell; ICU, intensive care unit.

Table 3. Comparison of respiratory function indicators and coagulation function indicators between the two groups [$\bar{x} \pm s$, M(*P*25, *P*75)].

Indicators	Time	Experimental group (*n* = 38)	Control group (*n* = 38)	*t/Z*	*P*
OI (mmHg)	Before the intervention	282.61 ± 13.12	280.34 ± 14.23	0.721	0.473[a]
	After the intervention	404.74 ± 11.07[c]	369.76 ± 10.65[c]	14.037	<0.001[a]
RSBI (time/L·min)	Before the intervention	177.87 ± 15.20	180.71 ± 14.39	−0.837	0.405[a]
	After the intervention	111.26 ± 12.10[c]	140.18 ± 11.39[c]	−10.729	<0.001[a]
RR (time/min)	Before the intervention	31.50 (28.00, 34.00)	30.00 (27.75, 33.00)	−0.966	0.334[b]
	After the intervention	20.50 (17.75, 22.00)[d]	24.00 (21.75, 25.25)[c]	−5.142	<0.001[b]
APTT (s)	Before the intervention	36.50 (31.75, 39.25)	35.50 (32.00, 39.00)	−0.115	0.909[b]
	After the intervention	32.00 (27.00, 35.00)[d]	33.50 (30.75, 36.25)[d]	−2.053	0.04[b]
PT (s)	Before the intervention	19.00 (17.00, 21.00)	19.50 (17.00, 21.25)	−0.718	0.473[b]
	After the intervention	15.00 (13.75, 17.00)[d]	17.50 (15.00, 19.00)[d]	−3.116	0.002[b]
FIB (g/L)	Before the intervention	5.61 ± 1.37	5.80 ± 1.28	−0.627	0.533[a]
	After the intervention	3.85 ± 0.92[c]	4.57 ± 1.25[c]	−2.865	0.005[a]
D-D (mg/L)	Before the intervention	8.52 (6.47, 9.92)	8.69 (6.75, 10.01)	−0.348	0.728[b]
	After the intervention	5.65 (3.82, 7.06)[d]	6.95 (4.73, 8.33)[d]	−2.291	0.022[b]

[a]Uses the independent samples t-test.
[b]Uses the Mann-Whitney U-test.
[c]Uses the paired samples t-test.
[d]Uses the Wilcoxon signed-rank test. OI, oxygenation index; RSBI, rapid shallow breathing index; RR, respiratory rate; APTT, activated partial thromboplastin time; PT, prothrombin time; FIB, fibrinogen; D-D, D-dimer.

Coagulation function

The difference in coagulation function parameters before intervention was not significant in both groups ($p > 0.05$). After the intervention, APTT, PT, FIB, and D-D were lower in the experimental group versus the control group ($p < 0.05$) (Table 3).

APACHE II and SGRQ scores

There were no differences in APACHE II and SGRQ scores between the two groups before the intervention ($p > 0.05$). After the intervention, APACHE II and SGRQ scores were lower in the experimental group relative to the control group ($p < 0.05$) (Figure 2).

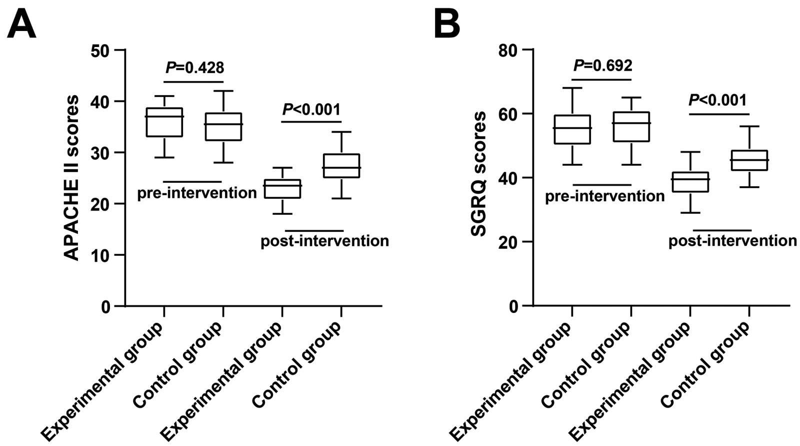

Figure 2. Comparison of APACHE II (A) and SGRQ scores (B) between the two groups. APACHE II, Acute Physiology and Chronic Health Evaluation II; SGRQ, St. George's Respiratory Problems Questionnaire.

Adverse outcomes

The incidence of complications in the experimental group was 7.89%, which was lower than that in the control group (26.31%), and the difference between the groups was significant ($p < 0.05$). There was 1 death in the experimental group and 6 deaths in the control group, with a significant difference in mortality rate between the two groups ($p < 0.05$) (Table 4).

Discussion

Pneumonia remains a chief public health issue and is common in ICUs. Early assessment, diagnosis, and upgrading to proper levels of nursing are crucial for improving survival rates.[9–11] Providing reasonable nursing interventions to patients with severe pneumonia is of great benefit in improving their prognosis. This study combined the actual situation of ICU patients with severe pneumonia to adopt optimized individualized nursing measures, and adjusted the nursing program according to the changes in the condition of patients with severe pneumonia and the monitoring indicators.[12,13]

This study found that after the intervention, compared with the control group (routine nursing), the experimental group (optimized individualized nursing) exhibited shorter times for fever reduction, recovery of WBC count, off-boarding, and ICU stay. This indicates that optimized individualized nursing can improve clinical outcomes in ICU patients with severe pneumonia. Furthermore, compared with the control group, the experimental group showed an increase in OI and decreases in RSBI and RR, as well as lower levels of APTT, PT, FIB, and D-D. This suggests that optimized individualized nursing helps improve patients' respiratory function, reduce respiratory burden, and enhance coagulation function. Additionally, the APACHE II and SGRQ scores in the experimental group were lower than those in the control group after the intervention, indicating that optimized individualized nursing can improve patients' overall health status and quality of life. Notably, the incidence of complications and mortality in the experimental group was lower than those in the control group, suggesting that optimized individualized nursing can reduce the risk of complications and mortality in patients.

Table 4. Comparison of incidence of complications and mortality rate between two groups [n (%)].

Indicator	Experimental group ($n = 38$)	Control group ($n = 38$)	χ^2	P
Incidence of complications	3 (7.89)	10 (26.31)	4.547	0.033[a]
Bronchiectasis	2 (5.26)	5 (13.16)	–	–
Pulmonary edema	0 (0.00)	2 (5.26)	–	–
Septic shock	1 (2.63)	3 (7.89)	–	–
Prognosis mortality	1 (2.63)	6 (15.79)	3.934	0.047[a]

[a]Uses the chi-squared (χ^2) test.

As mentioned earlier, the application of an optimized individualized nursing approach for patients with severe pneumonia in the ICU can effectively elevate their physiological indicators, decrease the likelihood of complications, improve their long-term quality of life outcomes, and greatly facilitate their rapid recovery process.[5] Furthermore, the application of optimized individualized nursing interventions for elderly patients with severe pneumonia in the ICU can effectively promote rapid improvement of symptoms, reduce the incidence of complications, and thereby enhance the quality of nursing care.[3] These research findings fully demonstrate the important role and broad prospects of optimized individualized nursing in the care of ICU patients with severe pneumonia. The results of this study further provide strong evidence for the application of optimized individualized nursing.

Benefiting from the core concept and specific implementation pathways of personalized nursing, optimized individualized nursing has had significant positive effects on ICU patients with severe pneumonia. Firstly, personalized nursing emphasizes patient-centered care, tailoring individualized nursing plans based on patients' specific conditions and needs. In the care of ICU patients with severe pneumonia, this means that nursing staff need to closely monitor patients' condition changes, promptly adjust nursing measures, and meet patients' individualized needs. Secondly, personalized nursing emphasizes the continuity and systematicness of care. During the nursing process for ICU patients with severe pneumonia, nurses need to continuously monitor patients' condition changes, timely adjust nursing plans, and ensure the coherence and effectiveness of nursing measures. Furthermore, personalized nursing also emphasizes the importance of psychological nursing and rehabilitation guidance. ICU patients with severe pneumonia often face enormous psychological pressure and rehabilitation challenges, and nursing staff need to help patients establish a positive mind-set and enhance their rehabilitation confidence through psychological nursing and rehabilitation guidance. Overall, from a mechanistic perspective, optimized individualized nursing significantly improves clinical outcomes, respiratory function, coagulation function, overall health status, and quality of life in ICU patients with severe pneumonia, and reduces the risk of complications and mortality by being patient-centered, emphasizing the continuity and systematicness of care, and highlighting psychological nursing and rehabilitation guidance.

It is worth noting that targeted sedation nursing combined with comprehensive nursing interventions can effectively lower the occurrence of adverse reactions in children with severe pneumonia, alleviate their pain and discomfort, and markedly enhance the level of sedation. This approach holds considerable reference value for the management of pediatric patients with severe pneumonia.[14] Moreover, providing continuous care to children with pneumonia can aid in lessening the severity of the illness, alleviating pain, preventing heart and lung failure, and helping to avert potential medical disputes.[15] Another report states that a comprehensive empowerment-based health intervention throughout the entire course of illness significantly boosts psychological resilience, self-care ability, and overall quality of life in elderly patients with severe pneumonia.[16] These nursing models in these studies all have significant importance for patient rehabilitation to some extent. However, the optimized individualized nursing in this study is more comprehensive, personalized, and targeted, able to formulate individualized nursing plans based on patients' specific conditions and needs, thus better meeting patients' individualized needs and promoting their rehabilitation. This highlights the advantages of optimized individualized nursing.

Conclusion

To sum up, implementing optimized individualized nursing can significantly improve the recovery rate and reduce complications in ICU patients with severe pneumonia. These findings have important clinical significance and provide new ideas and methods for the care of ICU patients with severe pneumonia. Optimized individualized nursing helps improve patients' recovery speed and effectiveness, reduce the risk of complications and mortality, and thereby enhance patients' overall health status and quality of life. In terms of adaptability, optimized individualized nursing is suitable for ICU patients with severe pneumonia of different conditions and age groups, and can be promoted and applied in ICU wards of different medical institutions. Medical institutions can appropriately adjust and improve optimized individualized nursing based on their actual situations and patient needs to better adapt to the local medical environment.

Clinicians can apply optimized individualized nursing based on patients' actual situations. Upon admission, conduct a comprehensive health assessment, including physiological, psychological, and social needs. Secondly, formulate individualized nursing plans based on the assessment results, including condition monitoring, medication administration, nutritional support, respiratory management, etc. Additionally, strengthen condition monitoring and nursing adjustments to provide comprehensive nursing services. Importantly, it is necessary to strengthen the training and education of nursing staff in optimized individualized nursing. On the other hand, attention should be paid to the rational use of resources during the implementation of optimized individualized nursing, such as human resources (experienced and professional medical staff), material resources (advanced medical equipment and instruments, sufficient medical supplies and medications), and information resources (a well-established medical information system).

However, this study also has some limitations. For example, the sample size of this study is limited, and sample size calculation was not performed, which may affect the generalizability of the findings. In addition, due to limited time and energy, the long-term prognosis of severe pneumonia was not traced. In the future, the sample size can be expanded, and long-term follow-up can be conducted to further validate the results of this study.

In summary, this study explored the application effects of optimized individualized nursing in ICU patients with severe pneumonia and found its significant advantages in improving clinical outcomes, respiratory function, coagulation function, overall health status and quality of life, as well as reducing the risk of complications and mortality. These results not only have important clinical significance and practical value but also provide scientific evidence and guidance for nursing practice, promote the development of nursing research, and enhance the image of the nursing profession.

Disclosure statement

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