

Effect of continuous nursing on nursing quality and patient quality of life and satisfaction among children with pneumonia

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Abstract

Objective: In this study, we aimed to explore the effect of continuous nursing care on children with pneumonia, including patient survival and quality of life.

Methods: We included 90 children with pneumonia who were admitted to our hospital from May 2017 to June 20, 2017. We established two patient groups (45 children per group); the routine group received general care and the continuous group received continuous nursing care. We observed the correlation among nursing effectiveness, clinical symptom improvement, quality of life, satisfaction, and complications.

Results: Our results showed that effectiveness in the continuous care group was 95.55%, significantly higher than that in the routine group (75.55%). Duration of hypothermia (1.75 ± 0.65 days), time to cough remission (4.24 ± 1.12 days), time to rale remission (4.15 ± 0.89 days), and time to remission of shortness of breath (2.65 ± 0.65 days) in the continuous group was shorter than those in the routine group. The incidence of total complications in the continuous group was 8.89%, which was significantly lower than that in the routine group (26.67%). The continuous care group showed greater improvement after intervention.

Conclusion: Continuous care in children with pneumonia can help to reduce illness severity, pain, heart and lung failure, and serve to avoid medical disputes.

Keywords

Pneumonia, continuous care, effectiveness, patient satisfaction, complications, nursing

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Introduction

Pneumonia is a common clinical disease. Children have weaker defenses against external bacteria and viruses entering the body. Infection with these can lead to a series of common clinical symptoms such as increased temperature and dyspnea.¹ Because of incomplete development and narrow lumen of the organs in children with pneumonia, inappropriate treatment could aggravate their condition and even increase the risk of death.² Research has shown that many causes of pneumonia are related to poor nutrition and seasonal alternation.³ Studies conducted using big data have found that approximately 350,000 children die of pneumonia each year in China.³ Nursing practice must keep pace with societal development to improve the condition of children with pneumonia.³ Continuous nursing is a new scientifically based model in nursing. By designing a series of nursing programs, patients can receive nursing care in different locations.⁴ Continuous nursing in the hospital can strengthen treatment effectiveness and reduce the occurrence of complications.⁵ Continuous nursing is a part of the entire nursing scheme. From the perspective of patients, correct guidance is given with respect to specific items, treatment methods, and prevention methods in pneumonia management. This allows patients to increase their self-management ability, exercise appropriately, and control their illness to achieve optimal outcomes. Continuous nursing has gained widespread attention in the medical community.⁶ However, there is little research on continuous nursing in China. In this paper, we discuss the effect of continuous nursing on nursing quality and the quality of life and satisfaction of children with pneumonia.

Methods

From May 2017 to June 2019, we recruited children with pneumonia in our hospital.

This study was approved by the ethics committee of the study hospital. Informed consent was provided by children's guardians.

Inclusion and exclusion criteria

Inclusion criteria were in line with the diagnostic criteria for pneumonia in children.⁷ We included children with fever and other signs, and detection of lung shadow on X-ray. The exclusion criteria were children who were not compliant with treatment, those with cognitive and organ diseases, and those with incomplete clinical data, as shown in Figure 1.

Routine group

Children in the routine care group underwent the following: (1) the inpatient wards were kept clean and ventilated at all times; (2) children's demographic and clinical characteristics were recorded; (3) children had sufficient rest and the level of their daily activities was maintained stable.

Continuous care group

Humanized nursing focuses on the long-term care of children. Similar to the routine group, patients in the continuous care group received daily care for a certain period. The specific nursing care provided in the continuous group is as follows.

1. Health education: Full-time care nurses conducted health education on disease prevention and treatment for the family members of children with pneumonia. Nurses explained the causes, clinical features, examination items, and complications using different means, such as posters and lectures, so that children's family members could understand the treatment and how to control deterioration of the patient.
2. Dietary guidance: Nurses explained to family members that children with

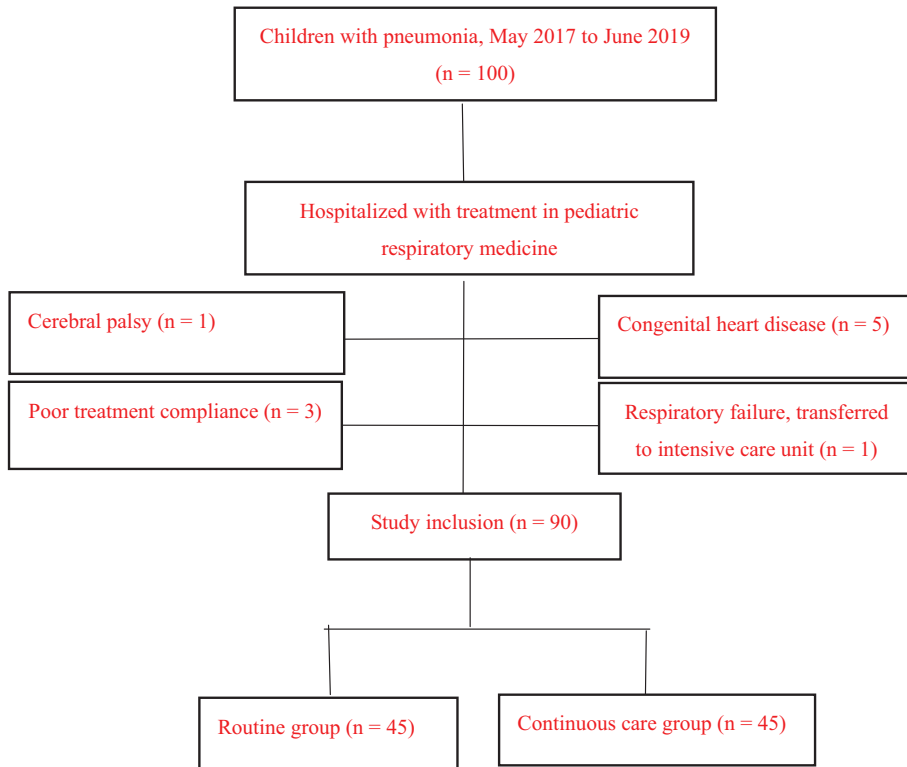


Figure 1. Flow chart of selection for children with pneumonia.

pneumonia and fever should be given the proper amounts of drinking water and that good eating habits should be established, mainly including protein, vegetables, and vitamins, so as to ensure adequate nutrition. Nurses explained that it is necessary to prevent breathing difficulties caused by excessive eating, mainly by consuming smaller but more frequent meals and by eating slowly and in an upright position, so as to reduce the possibility of choking.

3. Respiratory tract care: Nurses explained that checking for secretions in the child's throat should be done frequently. The correct method of sputum discharge was explained to the child and their parents; the parents were taught how to gently pat the child's back and how to use atomization to promote expectoration.

4. Psychological guidance: Explanations of precautions for children with pneumonia were provided to the families, to reduce the occurrence of prolonged illness owing to living conditions or emotional instability caused by physical discomfort in the child. Nursing staff together with parents provided care to help in establishing a good mental and emotional state and to encourage treatment.

5. Discharge nursing guidance: When the children met the conditions for discharge, nurses ensured that each child's family understood the disease and precautions, how to maintain good eating habits and supplement protein, and how to help improve the child's bodily functioning. Nurses explained that attention should be given to ensure the child receives sufficient rest, that the environmental

conditions and indoor air flow should be monitored, as well as outdoor conditions, and that crowds should be avoided in cooler weather, to help reduce reinfection.

6. Discharge sleep guidance: Nurses explained that to avoid unhealthy sleep habits among children that could affect their recovery, sleep intervention measures, such as playing relaxing music to patients before going to sleep, can help children to develop good sleep habits.
7. Targeted telephone follow-up: After discharge, the children's family members were contacted weekly by telephone. Adverse reactions were intervened professionally and detailed records were kept during each follow-up call.

Observation indexes

Clinical effectiveness

According to the curative effect standard for the evaluation of children's pneumonia,⁸ a significant effect refers to the relief of all clinical symptoms and X-ray examination shows no inflammation. Effective indicates that all the above clinical conditions are partially achieved, and X-ray examination shows a partial reduction of inflammation. Ineffective indicates that the above clinical conditions show no change or are aggravated. The total effective rate is calculated as follows: markedly effective + effective / $n \times 100\%$. The reliability is 0.780 to 0.886 and the validity is 0.408 to 0.763.

Other measures

We recorded the time to relief of clinical symptoms (including fever or dyspnea) among patients in the routine group and continuous group after nursing care was recorded.

Before and after receiving nursing care, children in both the routine and the continuous group were assessed regarding their

quality of life. Items addressed psychological, physiological, and other aspects, with 4 points in total for each item; 1 to 4 points respectively indicated excellent, good, neutral, and poor. The higher the score, the worse the quality of life. Symptom checklist-90 (SCL-90)⁸ was used for completion of the self-assessment questionnaire by children and their families. The higher the score, the more serious the symptom. The reliability of the SCL-90 is 0.851 to 0.869 and the validity is 0.173 to 0.589.

To assess satisfaction with nursing, all patients and their families used a self-designed satisfaction scale⁷, including six factors with a total of 6 points, as follows: 0 to 2 indicates dissatisfied, 3 points basically satisfied, and 4 points satisfied. The degree of satisfaction was determined using the equation $\text{satisfaction} + \text{basic satisfaction} / \text{number of patients} \times 100\%$. The reliability was 0.701 to 0.844, and the validity was 0.628.

We analyzed complications in the routine group and the continuous group during the nursing care period, including sepsis, pneumothorax, and heart failure.

Statistical analysis

We used IBM SPSS 22.0 software to analyze the correlation between the routine group and the continuous group (IBM Corp., Armonk, NY, USA). The results were calculated using the χ^2 or *t*-test, and $P < 0.05$ indicated statistical significance.

Results

General patient information

From May 2017 to June 2019, 90 children with pneumonia in our hospital were included in the study. We divided participants into two groups with 45 children in each group, the routine care group (25 boys and 20 girls, age 5.46 ± 1.21 years) and the

continuous care group (23 boys and 22 girls, age 5.72 ± 1.15 years). The general characteristics of the two groups were comparable, as shown in Table 1.

Clinical effectiveness

Effectiveness in the group that received continuous care was 95.55%, significantly higher than that in the routine group (75.55%). The difference between the two groups was significant ($\chi^2=4.094$, $P < 0.05$), as shown in Table 2.

Time to symptom relief

The duration of hypothermia (1.75 ± 0.65 days), time to cough remission (4.24 ± 1.12 days), time to rale remission (4.15 ± 0.89 days), and time to remission of shortness of breath (2.65 ± 0.65 days) in the continuous group were significantly shorter than those in the routine group: hypothermia duration (2.85 ± 0.95 days), cough remission (5.95 ± 1.85 days), rale remission (5.68 ± 1.25 days), and shortness of breath remission (3.45 ± 0.75 days); ($P < 0.05$), as shown in Table 3.

Table 1. General patient information.

Group	Sex (n)		Age (years)	Temperature (°C)	Disease course (days)
	Male	Female			
Routine group	25	20	5.46 ± 1.21	39.5 ± 0.40	2.95 ± 1.40
Continuous group	23	22	5.72 ± 1.15	39.4 ± 0.50	2.90 ± 1.50
χ^2/t	0.179		1.045	1.048	0.164
P	0.672		0.299	0.298	0.871

Table 2. Clinical effectiveness, n (%).

Group	N	Markedly effective	Effective	Ineffective	Effective rate
Routine group	45	24 (53.33)	10 (22.22)	11 (24.44)	34 (75.55)
Continuous group	45	31 (68.69)	12 (26.67)	2 (4.44)	42 (95.55)*
χ^2/t		1.934	0.405	10.15	4.094
P		0.164	0.245	0.002	0.043

*Compared with routine group, $P < 0.05$.

N, number.

Table 3. Comparison of times to symptom relief ($\bar{X} \pm S$).

Group	N	Hypothermia duration (days)	Time to cough relief (days)	Time to lung rale remission (days)	Time to relief, shortness of breath (days)
Routine group	45	2.85 ± 0.95	5.95 ± 1.85	5.68 ± 1.25	3.45 ± 0.75
Continuous group	45	$1.75 \pm 0.65^*$	$4.24 \pm 1.12^*$	$4.15 \pm 0.89^*$	$2.65 \pm 0.65^*$
t		6.410	5.304	6.689	5.407
P		<0.001	<0.001	<0.001	<0.001

*Compared with routine group, $P < 0.05$.

N, number.

Quality of life

Prior to receiving nursing care, the difference in quality of life between the routine group and continuous group was small and non-significant. After receiving nursing care, the two groups showed improvement, compared with before nursing ($P < 0.05$). The improvement in the continuous group was better than that in the routine group ($P < 0.05$), as shown in Table 4.

Nursing satisfaction

The degree of patient satisfaction with nursing care in the routine group and continuous group was 41 (91.11%) and 33 (73.33%), respectively. The degree of satisfaction in the continuous group was higher than that of that in the routine group ($P < 0.05$), as shown in Table 5.

Complications

The incidence of total complications in the continuous group was 8.89%, which was

significantly lower than that in the routine group (26.67%). The difference between the two groups was significant ($P < 0.05$), as shown in Table 6.

Discussion

Pneumonia is a respiratory disease that can be associated with mild or severe symptoms. When the disease progresses rapidly and is not controlled in a timely manner, it can be accompanied by complications such as heart failure, and respiratory failure. The incidence of pneumonia in children is high, seasonal, and rises with large changes in the weather. Some studies have pointed out that when external bacteria, such as *Mycoplasma*, invade the body, they often induce asthma; therefore, timely treatment and care to prevent complications are of great importance in the treatment of children with pneumonia.⁹

The study findings showed that the effectiveness rate of nursing in the continuous group was higher than that in the

Table 4. Comparison of quality of life between groups ($\bar{X} \pm S$).

Group	N	Before nursing care	After nursing care	t	P
Routine group	45	116.56 ± 12.04	110.13 ± 10.32 [#]	2.72	0.008
Continuous group	45	117.09 ± 12.11	65.89 ± 6.23 ^{*#}	25.22	<0.001
t		0.208	24.62		
P		0.835	<0.001		

*Compared with routine group, # Compared with pre-nursing; $P < 0.05$.

N, number.

Table 5. Comparison of satisfaction with nursing care, n (%).

Group	N	Satisfied	Basically satisfied	Dissatisfied	Degree of satisfaction [#]
Routine group	45	15 (33.33)	18 (40.00)	12 (26.67)	33 (73.33)
Continuous group	45	22 (48.89)	19 (42.22)	4 (8.89)	41 (91.11)*
χ^2					3.993
P					0.046

*Compared with routine group, $P < 0.05$.

The degree of satisfaction was determined using the equation satisfaction + basic satisfaction/number of patients × 100%.
N, number.

Table 6. Comparison of complications between groups, n (%).

Group	N	Respiratory		Heart failure	Hypoxic encephalopathy	Toxic shock	Total incidence rate
		Emphysema	Pneumothorax				
Routine group	45	3 (6.67)	1 (2.22)	2 (4.00)	2 (4.00)	1 (2.22)	12 (26.67)
Continuous group	45	1 (2.22)	0 (0.00)	1 (2.22)	1 (2.22)	0 (0.00)	4 (8.89)*
χ^2							8.890
P							0.003

*Compared with routine group, $P < 0.05$.

N, number.

conventional group, and the time to improvement in clinical hypothermia, cough, shortness of breath, and rales in the continuous group was shorter than that in the conventional group. These findings suggested that continuous nursing can improve clinical effectiveness and treatment efficiency in children with pneumonia. The development of this nursing model has changed over time as the traditional nursing model has largely not met the physical and psychological needs of patients. Humanized nursing is a scientific nursing model encompassing the entire process of patient care provided by nurses with a humanistic quality, which involves more practical and humanized behavioral norms. We believe that humanized or continuous nursing can improve patients' eating habits including increasing their intake of protein, increase their body condition, and relieve anxiety and other emotions among children with pneumonia and their families. Using psychological interventions, families can better understand the disease and precautions to be taken in pneumonia prevention, adopt the correct expectoration method, and speed improvement of the condition, as reported in other studies.^{10,11} Continuous nursing has been introduced gradually in recent years as an intervention to improve the lifestyle and condition of children in the hospital and after discharge, as well as to improve nursing methods and concepts with children at the center, which is suitable

for clinical application under the changing predictive model.¹² Some authors have found that by providing continuous nursing for 3- to 5-year-old children with pneumonia, the rate of clinical improvement in patients was increased, the time to discharge of patients was accelerated, and many adverse events caused by incomplete treatment were reduced via out-of-hospital guidance.^{13,14}

In this study, we found that patient quality of life, satisfaction with nursing, and improvement of complications in the continuous group were better than those in the routine group. This shows that continuous nursing can improve quality of life in children from multiple perspectives. Life quality is a recognized health state, and children with pneumonia can have increased psychological pressure owing to restlessness and anxiety caused by pain.¹⁵ Long¹⁶ found that continuous nursing can help with improving children's mood, communicating the treatment plan to children's families, and improving children's immune function and living conditions through diet and proper exercise, which is consistent with previous research results.^{17,18} Continuous nursing can serve to meet the needs of patients, improve the overall level of nursing, improve patient satisfaction, promote more effective nursing work, and promote improvement of the doctor-patient relationship. Kirolos et al.¹⁹ found that continuous nursing can improve nursing

satisfaction among children with pneumonia as well as avoid medical disputes. The continuous nursing process is ongoing once the child leaves the hospital, urging children and families to adhere to nursing guidance and to carry out rehabilitation training, which has a good effect on patients' growth and development and improvement in their immune function while reducing the occurrence of complications; this is similar to research conducted by Huang et al.²⁰

There are some limitations in this paper. We did not consider whether differences among children were owing to symptom resolution, whether these differences would be affected by closer nursing supervision, and we did not carry out statistical calculation of the sample size. Thus, the results may not be representative. Future research is needed to provide a more favorable experimental basis for clinical research.

To sum up, continuous nursing helps children with pneumonia to improve their health, reduce pain, avoid medical disputes, and reduce heart, muscular, or lung failure.


Declaration of conflicting interest

The authors declare that there is no conflict of interest.

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