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Analysis of the Effectiveness of Continuous Nursing Interventions in Elderly Patients with COPD in the Stable Phase and Frailty

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Abstract: *Objective:* To evaluate the effectiveness of continuous nursing interventions in elderly patients with COPD in the stable phase and frailty. *Methods:* Sixty elderly patients with COPD in the stable phase and frailty, treated between January 2024 and August 2024, were selected as the study subjects. Patients were randomly divided into two groups (30 each) using a drawing method. Patients who drew a black token were assigned to the intervention group and received continuous nursing interventions, while those who drew a red token were assigned to the nursing group and received standard nursing care. The quality of care between the groups was compared. *Results:* Pulmonary function indicators in the intervention group were significantly better than those in the nursing group ($P < 0.05$). Immune function in the intervention group was also significantly higher than in the nursing group ($P < 0.05$). Before the intervention, there was no significant difference in self-care ability between the two groups ($P > 0.05$). However, post-intervention, both groups showed improved self-care abilities, with the intervention group scoring significantly higher than the nursing group ($P < 0.05$). Similarly, before the intervention, there was no significant difference in quality-of-life scores ($P > 0.05$), but post-intervention, both groups exhibited increased scores, with the intervention group outperforming the nursing group significantly ($P < 0.05$). *Conclusion:* Continuous nursing interventions significantly improve outcomes in elderly patients with COPD in the stable phase and frailty, warranting broader implementation.

Keywords: Continuous nursing; Stable COPD; Elderly patients; Pulmonary function; Immune function

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1. Introduction

Chronic obstructive pulmonary disease (COPD) is a preventable and treatable respiratory disease, predominantly affecting the elderly. With worsening environmental pollution, its clinical prevalence has been rising. Patients in the acute phase typically require hospitalization, but they are discharged upon reaching the stable phase. To further improve the prognosis of elderly patients with stable COPD and frailty, implementing continuous nursing interventions is essential. Recent reports [1,2] confirm that continuous nursing interventions can significantly improve pulmonary function, enhance immunity, and strengthen self-care ability and quality of life in such patients. To validate these findings, this study selected 60 elderly patients with stable COPD and frailty treated between January and August 2024, divided them into intervention and nursing groups, and compared the quality of care provided.

2. Materials and methods

2.1. Basic information

Sixty elderly patients with COPD in the stable phase and frailty, treated between January 2024 and August 2024, were selected as the experimental observation subjects. Using a random draw method, patients were divided into two groups of 30 each. Those drawing black token were included in the intervention group and received continuous nursing interventions, while those drawing red token were included in the nursing group and received routine nursing care. The intervention group consisted of patients aged 60–78 years, with an average age of 69.39 ± 0.67 years, including 17 males and 13 females. The nursing group included patients aged 62–80 years, with an average age of 70.14 ± 0.83 years, consisting of 16 males and 14 females. There were no significant differences in age or gender between the two groups ($P > 0.05$), indicating comparability.

Inclusion criteria: (1) Ethical approval for the experiment was obtained; (2) Patients met the diagnostic criteria for COPD confirmed by ultrasound [3]; (3) Patients understood the experimental content and agreed to participate.

Exclusion criteria: (1) Patients with mental disorders; (2) Patients with immune diseases; (3) Patients with heart, liver, or kidney dysfunction; (4) Patients with impaired consciousness [4].

2.2. Methods

The nursing group implemented basic nursing measures: Patients were provided with a high-nutrition, high-vitamin, high-protein, and easily digestible diet, including eggs, fish, and lean meat, with frequent small meals to ensure adequate caloric intake. Fresh fruits and vegetables such as apples, oranges, cabbage, and tomatoes were emphasized, while spicy, indigestible, and greasy foods like chili, raw onions, glutinous rice, and fatty meat were minimized. Smoking and alcohol were prohibited to prevent increased phlegm and worsening cough symptoms. Patients were guided in the proper use of bronchodilators and informed about the importance of adhering to medication. They were advised to exercise regularly to enhance immunity, maintain personal hygiene (e.g., rinsing the mouth after meals), ventilate rooms daily for fresh air, and take precautions during significant temperature changes.

The intervention group implemented continuous nursing measures: Building on the nursing group's measures, additional continuous nursing interventions were implemented: (1) Medication guidance: Patients were guided to use corticosteroids, antibiotics, and inhalers based on symptoms such as cough, sputum, and wheezing, in line with medical advice. (2) Smoking cessation encouragement: Personalized smoking cessation plans were developed, and patients signed agreements for gradual cessation. Successful quitters were invited to share experiences, and families were encouraged to supervise. (3) Rehabilitation interventions: Patients were taught limb exercises and

given nursing plans upon discharge, encouraging activities like walking and stair climbing, with a recommended schedule of twice daily for 30 minutes each. Follow-ups were conducted via home visits or phone calls. (4) Home oxygen therapy: Patients were advised to inhale oxygen before exercise, meals, and at night, with a daily limit of 4 hours. Oxygen flow rates were maintained at 1.0–2.5 mL/min, using nasal cannulas or masks as appropriate. (5) Psychological support: To address anxiety, depression, or other negative emotions, staff closely monitored patients' mental states, communicated with families, and encouraged support and understanding to foster a positive mindset during treatment. (6) Respiratory interventions: (i) Long breathing: Patients were guided to stand straight, relax muscles, inhale through the nose, and exhale through the mouth. A ratio of 3:1 was maintained for inhalation to exhalation, with a breathing frequency of 16 times per minute, avoiding dizziness. (ii) Chest breathing: Patients were instructed to keep an upright posture with arms crossed on the chest. During exhalation, arms were raised slowly, expanding the chest before inhaling. (iii) Walking breathing: Patients were guided to take two steps per breath initially, increasing to five steps per breath with 30-second intervals. Training duration and intensity were tailored to individual conditions, following a gradual progression principle.

2.3. Evaluation criteria

(1) Lung function indicators such as FVC (forced vital capacity), FEV1 (forced expiratory volume in one second), and PEF (peak expiratory flow) were analyzed [5].

(2) Through blood tests, CD3, CD4, CD8, and CD4/CD8 ratios were analyzed [6].

(3) The ESCA Self-Care Ability Measurement Scale was used for evaluation, which includes levels of health knowledge, self-care skills, self-concept, and self-care responsibility. The scale is scored on levels 1–4, with a total score range of 0–172 points. Higher scores indicate stronger self-care ability [7].

(4) The SF-36 scoring scale was used for assessment, covering four aspects. Scores range from 0–100, with higher scores closer to 100 indicating better quality of life, demonstrating a positive correlation [7].

2.4. Statistical methods

SPSS22.0 software was used for analysis. Measurement data were expressed as mean ± standard deviation (SD) and tested using the *t*-test. Count data were expressed as percentages and tested using the chi-square test. A *P*-value < 0.05 was considered statistically significant.

3. Results

3.1. Comparison of lung function indicators between groups

The lung function indicators in the intervention group were significantly better than those in the nursing group ($P < 0.05$). **Table 1** shows the details.

Table 1. Comparison of lung function indicators between groups (mean ± SD)

Group	FVC (L)	FEV1 (L)	PEF (L/s)
Intervention group ($n = 30$)	2.56 ± 0.75	1.57 ± 0.53	4.79 ± 0.74
Nursing group ($n = 30$)	1.34 ± 0.46	1.33 ± 0.28	2.24 ± 0.72
t value	7.206	6.382	11.505
P value	< 0.05	< 0.05	< 0.05

3.2. Comparison of immune function between groups

The immune function in the intervention group was significantly higher than that in the nursing group ($P < 0.05$). **Table 2** presents the results.

Table 2. Comparison of immune function between groups (mean ± SD, scores)

Group	CD3	CD4	CD8	CD4/CD8
Intervention group ($n = 30$)	66.37 ± 2.47	47.56 ± 3.33	27.36 ± 1.35	1.47 ± 0.46
Nursing group ($n = 30$)	62.28 ± 2.38	11.27 ± 2.25	30.17 ± 1.37	1.62 ± 0.13
t value	8.635	38.056	14.352	4.163
P value	< 0.05	< 0.05	< 0.05	< 0.05

3.3. Comparison of self-care abilities between groups

Before the intervention, the self-care abilities of the groups were relatively similar, with no statistically significant difference ($P > 0.05$). After the intervention, both groups showed improvement in self-care abilities. However, the intervention group demonstrated significantly better self-care abilities compared to the control group ($P < 0.05$). The details are shown in **Table 3**.

Table 3. Comparison of self-care abilities between groups (mean ± SD)

Group	Health knowledge level		Self-concept		Sense of responsibility for self-care		Self-care skills	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Intervention group ($n = 30$)	22.52 ± 1.37	34.55 ± 1.48	10.68 ± 1.29	23.58 ± 6.39	12.13 ± 1.15	16.27 ± 1.28	14.76 ± 1.45	21.59 ± 1.53
Nursing group ($n = 30$)	22.62 ± 1.16	28.73 ± 1.35	10.94 ± 1.43	15.26 ± 6.17	11.12 ± 1.17	15.19 ± 1.19	14.74 ± 1.24	19.27 ± 1.36
t value	1.776	5.047	0.127	10.164	1.048	5.264	0.826	6.472
P value	0.282	0.000	0.841	0.000	0.295	0.000	0.425	0.000

3.4. Comparison of quality of life between groups

Before the intervention, the quality-of-life scores between the groups were relatively close and showed no statistical significance ($P > 0.05$). After the intervention, the quality-of-life scores increased in both groups, with the intervention group scoring higher than the nursing group (**Table 4**). The difference between the groups was statistically significant ($P < 0.05$).

Table 4. Comparison of quality of life between groups (mean ± SD, scores)

Group	Vitality		Mental health		Physiological function		Overall health	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Intervention group (n = 30)	78.47 ± 3.85	95.44 ± 3.52	77.26 ± 3.72	92.47 ± 3.28	78.68 ± 3.35	93.54 ± 3.27	76.36 ± 3.17	93.47 ± 3.28
Nursing group (n = 30)	77.45 ± 3.32	86.25 ± 4.15	78.45 ± 3.71	86.56 ± 4.23	77.29 ± 3.26	87.17 ± 4.15	77.47 ± 3.65	87.42 ± 4.73
t value	0.413	6.154	0.564	8.246	0.445	7.124	0.334	7.057
P value	> 0.05	< 0.05	> 0.05	< 0.05	> 0.05	< 0.05	> 0.05	< 0.05

4. Discussion

The clinical prevalence and mortality rate of COPD are relatively high. Due to its slow progressive development, COPD significantly impacts patients' work capacity and quality of life. Although symptoms may alleviate during the stable phase following an acute exacerbation, lung function continues to deteriorate. Reduced immune function and exposure to various harmful substances exacerbate the disease, leading to recurrent episodes and potentially triggering a range of cardiopulmonary complications. The goal of stable-phase treatment is to prevent acute exacerbations of COPD, enhance daily living capabilities, accelerate lung function recovery, and prevent further decline in lung function [8,9].

Continuous nursing care, as a modern nursing approach, ensures systematic intervention for patients outside the hospital. This involves medication guidance, home oxygen therapy, psychological support, rehabilitation interventions, respiratory therapy, and encouragement to quit smoking. These measures help patients adopt healthy eating habits, safely use medications, promote early recovery of physical functions, and achieve self-care, thereby improving nursing outcomes and significantly enhancing patients' quality of life. Experimental results indicate that the intervention group had more favorable lung function indicators than the nursing group and demonstrated higher immune function. Before the intervention, self-care abilities were comparable between groups; after the intervention, both groups showed improvement, with the intervention group exhibiting superior self-care abilities. Similarly, while quality-of-life scores were similar initially, post-intervention scores improved in both groups, with the intervention group achieving higher scores. These findings align with previous research [10-12], adding representativeness to the study.

5. Conclusion

In conclusion, continuous nursing interventions in elderly COPD patients during the stable phase of frailty effectively improve their condition, enhance quality of life and lung function, and merit broader implementation.

Disclosure statement

The authors declare no conflict of interest.

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