

# Nursing Effect of Pulmonary Rehabilitation in Patients with Chronic Obstructive Pulmonary Disease

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**Abstract:** *Objective:* To study the effect of pulmonary rehabilitation nursing in nursing of patients with chronic obstructive pulmonary disease (COPD). *Methods:* 30 cases of experimental subjects, diagnosed with COPD, were included in the observation group with pulmonary rehabilitation nursing, while the control group received routine nursing, and the data between the groups were compared. *Results:* After nursing, the observation group showed significantly improved lung function, higher nursing satisfaction, 6-minute walking test (6WMT), World Health Organization Quality of Life (WHOQOL-BREF) score, and self-care ability score, compared to the control group, with  $P < 0.05$ , indicating a statistical difference. *Conclusion:* Pulmonary rehabilitation nursing is applied in the nursing of COPD patients with ideal effect.

**Keywords:** Chronic obstructive pulmonary disease; Pulmonary rehabilitation nursing; Nursing effect

**Online publication:** November 16, 2022

## 1. Introduction

Patients with chronic obstructive pulmonary disease (COPD) have a high mortality rate. The clinical mechanism of the disease, related genetics, air pollutants causing it, and many more information are not clear, and there is no cure<sup>[1]</sup>. Lack of understanding of the patient's condition<sup>[2]</sup> will lead to the occurrence of pulmonary heart disease, which is detrimental. Based on this, it is clinically proposed to give the patient effective nursing care<sup>[3]</sup>. In this paper, the effect of pulmonary rehabilitation nursing in the nursing of COPD patients is studied, 30 patients were selected for the following reports.

## 2. Materials and methods

### 2.1. Information

The selection time was from June 2021 to May 2022. 30 COPD patients were grouped by drawing lots. The number of patients in each group was 15. In the observation group, there were 10 males and 5 females, aged 50–70 ( $59.1 \pm 2.5$ ) years old, in the control group, there were 9 males and 6 females, aged 51–69 ( $59.0 \pm 2.4$ ) years old. No significant difference between the data of both groups was shown ( $P > 0.05$ ).

### 2.2. Methods

The control group was given routine nursing care according to the medication and diet of the patients. Patients in the observation group received pulmonary rehabilitation care which are described as follows: (i) Environmental intervention: the patient's ward was kept clean and the indoor temperature and humidity

was adjusted to prevent the patients from catching a cold and aggravating the patient's cough; the risk factors were checked; during the ward round, the window was closed in time if there was dust to avoid causing the patient to cough; visitors were not allowed to use perfume to avoid odor allergies, which can cause patients to cough and sneeze. (ii) Dietary intervention: The patients were instructed to eat vegetables and fruits that relieve cough and moisten the lungs, reduce the intake food that would cause irritation, control the speed when eating, avoid choking, eat regularly, and develop good eating habits <sup>[4]</sup>. (iii) Psychological intervention: The patient's emotions were well understood and timely care was provided; a good relationship was built between nurses and patients, and the patients were encouraged to talk to the nurses about their feelings to avoid long-term accumulation of negative emotions; besides family support was given to patients, effectively relieving their feelings of loneliness <sup>[5]</sup>. (iv) Pulmonary function exercise: pulmonary function exercises for patients include breathing exercises like abdominal breathing, pursed lip breathing, effective expectoration; these breathing exercises were done during physical activities such as walking, Tai Chi, trotting, and many more; these exercises will increase the burden on the patients' lungs; during each exercise interval, abdominal breathing guidance is implemented for patients to effectively improve the lung function of patients <sup>[6]</sup>.

### 2.3. Effect evaluation

Nursing satisfaction: a questionnaire was formulated according to the patient's situation and the data was investigated.

- (1) 6WMT: Data was measured with the 6-minute walk test.
- (2) WHOQOL-BREF score: determined using WHO-QOL-BREF.
- (3) Self-care ability scores: Data were determined using ESCA.

### 2.4. Statistics

In SPSS 25.0 statistical software, in the  $\chi^2$  test, the categorical variables are represented by percentage %, and in the t test, the continuous variables are  $\bar{x}$  represented by  $[\pm s]$ ,  $P < 0.05$ , which is statistically significant.

### 3. Results

Compared to the control group, the observation group showed significantly improved pulmonary function, and higher nursing satisfaction, 6-minute walking test (6WMT), World Health Organization Quality of Life (WHOQOL-BREF) score, and self-care ability score, with  $P < 0.05$ . (Table 1, Table 2, Table 3, and Table 4).

**Table 1.** Comparison of lung function between the two groups

Group	Forced expiratory volume in 1s (%)		Lung capacity (L)		Maximum ventilation (%)	
	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Observation group (n = 15)	39.61 ± 0.61	57.62 ± 5.33	1.84 ± 0.36	3.25 ± 0.61	43.66 ± 3.24	69.66 ± 5.67
Control group (n = 15)	39.57 ± 2.88	41.34 ± 4.36	1.88 ± 0.38	1.92 ± 0.52	43.66 ± 3.22	51.35 ± 4.22
<i>t</i>	0.0526	9.1564	0.2960	6.4263	0.0000	10.0331
<i>P</i>	> 0.05	< 0.05	> 0.05	< 0.05	> 0.05	< 0.05

**Table 2.** Comparison of nursing satisfaction and 6 WMT between the two groups

Group	Nursing satisfaction (%)	Before nursing (m)	After nursing (m)
Observation group (n=15)	14 (93.33)	362.15 ± 47.41	493.17 ± 60.22
Control group (n=15)	9 (60.00)	360.99 ± 51.12	425.72 ± 50.87
$t/\chi^2$	4.6584	0.0644	3.3139
P	< 0.05	> 0.05	< 0.05

**Table 3.** Comparison of WHOQOL-BREF scores between the two groups (points)

Group	Field of social relations		Environment score		Physiological status		Mental status	
	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Observation group (n = 15)	58.88 ± 6.61	80.12 ± 1.68	57.99 ± 5.33	78.33 ± 1.52	58.26 ± 6.07	78.82 ± 1.61	53.33 ± 6.02	77.71 ± 1.25
Control group (n = 15)	58.24 ± 6.01	76.92 ± 1.43	57.54 ± 6.02	75.91 ± 1.35	58.36 ± 5.52	75.28 ± 1.99	54.08 ± 5.44	74.11 ± 1.88
$t$	0.2775	5.6176	0.2168	4.6103	0.0472	5.3562	0.3580	6.1758
P	> 0.05	< 0.05	> 0.05	< 0.05	> 0.05	< 0.05	> 0.05	< 0.05

**Table 4.** Comparison of the scores of self-care ability between the two groups (points)

Group	Self-concept		Self-care responsibility		Self-care ability		Health knowledge level	
	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Observation group (n = 15)	20.96 ± 3.58	27.85 ± 1.02	11.55 ± 5.02	18.72 ± 1.02	17.66 ± 3.15	22.81 ± 1.95	46.12 ± 4.05	67.55 ± 1.32
Control group (n = 15)	20.32 ± 3.51	25.36 ± 1.77	11.92 ± 2.78	15.92 ± 1.57	17.92 ± 4.02	21.14 ± 1.26	46.72 ± 3.88	65.38 ± 1.07
$t$	0.4944	4.7207	0.2497	5.7922	0.1972	2.7859	0.4143	4.9461
P	> 0.05	< 0.05	> 0.05	< 0.05	> 0.05	< 0.05	> 0.05	< 0.05

#### 4. Discussion

In the case of aggravating aging and environmental pollution, clinical COPD patients are more and more common. COPD patients face a decline in lung function, symptoms of dyspnea [7], and decreased muscle endurance. Drug therapy alone cannot achieve the ideal therapeutic effects. Therefore, it is clinically proposed to carry out corresponding nursing interventions for patients to promote the improvement of patients' symptoms, restore the normal lung function of patients, and improve the patient's condition [8].

Clinical practice has confirmed that it is very important for COPD patients to undergo pulmonary rehabilitation nursing. In the past, routine nursing care for COPD patients was not targeted and comprehensive enough to meet the nursing needs of patients [9], the expected nursing effect could not be obtained. Through research, relevant medical personnel carried out pulmonary rehabilitation nursing according to the condition of COPD patients, carried out pulmonary function rehabilitation training for

patients, instructed patients to perform corresponding exercises, applied pulmonary rehabilitation nursing, and improved the pulmonary function of patients. Compared with routine nursing, it is more targeted and can effectively improve the quality of life of patients [10]. The application of pursed lips breathing can decrease the expiratory flow rate, increase the airway resistance [11], and prevent the patient from prematurely closing the small airway during exhalation, which is conducive to gas expulsion, alveolar ventilation and increased ventilation. In this way, the patients' respiratory function and hypoxia state can be improved [12], the symptoms of dyspnea can be relieved, and the lung function can be strengthened. Besides, the application of abdominal breathing can increase the contraction force and contraction frequency of the diaphragm, act as a coordinator, and reduce the patient's airway resistance [13], increase the tidal volume, reduce the functional residual volume, improve alveolar ventilation, thus improving the patient's lung function, and promote the effective recovery of the patient's lungs [14]. Besides several physical exercises can be done to improve the patient's respiratory muscles, physical endurance, reduce the degree of airway obstruction, and prevent the deterioration of the patients' sickness. Moreover, expectoration nursing can help the patient to fully discharge the sputum, strengthen their immunity, and improve their lung function [15]. The application of the aforementioned nursing measures and the comprehensive implementation of pulmonary rehabilitation nursing can further reduce the symptoms of patients and reduce the impact of the patient's disease on their life [16]. Psychological intervention and other kinds of care are given to patients, which can promote the improvement of lung function of patients.

This group of experiments showed that: After nursing, compared to the control group, the observation group had significantly improved lung function, significantly higher nursing satisfaction, significantly increased 6WMT, significantly improved WHOQOL-BREF score, and improved self-care ability score,  $P < 0.05$ .

## 5. Conclusion

In conclusion, the application of pulmonary rehabilitation nursing in the nursing of COPD patients has an ideal effect, and can significantly improve the pulmonary function, nursing satisfaction, 6WMT, WHOQOL-BREF score, and self-care ability of patients, which is worthy of clinical application.

## Disclosure statement

The authors declare no conflict of interest.

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