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Research Article

The Effect of Respiratory Rehabilitation Training on the Life Quality of Pneumoconiosis Patients

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Abstract: ***Objective:*** To explore the effect of respiratory rehabilitation training on the quality of life of pneumoconiosis patients. ***Methods:*** 76 pneumoconiosis patients who were treated in our hospital from April 2017 to December 2019 were selected as the research object, and randomly divided into 2 groups according to the order of admission by coin tossing, 38 cases in each group. The control group carried out health knowledge education on the basis of conventional treatment, and the observation group combined with respiratory rehabilitation training on the basis of the control group to compare the quality of life and lung function of the two groups of patients. Results: After 2 months of nursing care, scores of GQOLI-74 scale and pulmonary ventilation function indexes in the observation group were higher than those in the control group, with statistically significant differences (P<0.05). ***Conclusion:*** Respiratory rehabilitation training can improve pulmonary ventilation function of pneumoconiosis patients, improve the quality of life of patients, has good clinical application value.

Keywords: Pneumoconiosis; Respiratory rehabilitation training; Quality of life; Lung function

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Pneumoconiosis is a highly harmful occupational disease, accounting for about 80% of the total incidence of occupational diseases, resulting in shortened working years and reduced life span[1]. Clinically, symptomatic treatments such as anti-infection and improved respiratory function are used to improve the symptoms of patients, but at the current medical level, pneumoconiosis cannot be completely cured[2]. With the change of medical mode, people not only pay attention to the treatment of the disease itself, but also pay more attention to the psychological state and quality of life of patients. Respiratory rehabilitation training, as a non-pharmacological treatment for lung dysfunction diseases, can enhance the patient's respiratory muscle endurance through the control of breathing time and depth, which is conducive to improving the patient's lung function[3]. In this study, the effects of respiratory rehabilitation training on the quality of life of pneumoconiosis patients were discussed as follows.

1 Materials and methods

1.1 Patient data

With the approval of the Medical Ethics Committee of our hospital, 76 cases of pneumoconiosis patients who were treated in our hospital from April 2018 to February 2020 were selected as the research object, and they were randomly divided into 2 groups according to the order of entering the hospital by coin tossing. Each group had 38 patients. The control group consisted of 32 males and 6 females; aged 42-82 years, with an average age of (55.36 ± 2.52) years; pneumoconiosis stage: 25 cases in stage I, 8 cases in

stage II, and 5 cases in stage III. There were 33 males and 5 males in the observation group; aged 41-83 years, with an average age of (55.87 ± 3.44) years; pneumoconiosis stage: 24 cases in stage I, 10 cases in stage II, and 4 cases in stage III. Comparative analysis of the two groups of data, the difference was not statistically significant (P>0.05), there is comparability.

1.2 Inclusion criteria

(1) Inclusion criteria: meet the diagnostic criteria for pneumoconiosis, confirmed by X-ray film and DR chest radiography; the patient is in a stable stage of the disease, and no serious complications have occurred; patients and their families voluntarily signed an informed consent[4]. (2) Exclusion criteria: Those who are in serious condition and need to stay in bed for a long time; Those with severe cardiopulmonary failure; Those with physical dysfunction who cannot complete the study; Those with mental or communication disorders.

1.3 Method

1.3.1 The control group

All patients received symptomatic treatments such as anti-infection, the anti-fibrosis, cough and phlegm. Patients in the control group were given health education on the basis of conventional treatment. Patients were told to pay attention to rest and avoid going to crowded places to reduce the risk of cross-infection. Patients need to pay attention to a temperature change, timely addition of clothing to prevent cold aggravating the condition. Patients are told that a healthy lifestyle can control the development of the disease, and tobacco and alcohol can lead to mucous hyperplasia, increased secretions, bronchial epithelial cilia movement disorders, and decreased airway cleaning ability. Patients and their families are advised to observe personal hygiene and keep their skin clean.

1.3.2 The observation group

On the basis of the above, combined with respiratory rehabilitation training treatment, the methods are as follows: (1) lip contraction breathing training, the patient takes a nasal breath in a sitting position, the lips are closed and contracted to a whistle shape, and slowly exhale for 5 seconds. When exhaling, adjust the shape of the lips to be able to blow the candle flame at 15cm; (2) Diaphragm breathing training, the patient is in a lying position and puts his hands in front of the chest, the abdomen is retracted to the greatest extent when exhaling, and the abdomen is raised to the greatest extent when inhaling, and keep your chest still while breathing; (3)Vertical breathing: the patient gathers his legs and raises his upper arm, exhales when lifting, exhales when lowering, and repeats 10 times; (4) Lunge breathing: adopt alternate stride out punching method, inhale when punching, exhale when closing, repeat 10 times. Each training lasts 15-20min, training 3 times a day.

1.4 Evaluation indicators

(1)Before nursing and after 2 months of nursing, the European QLQ-C30 function scale[5] was used to evaluate the changes in patients' quality of life from five dimensions: emotional function, cognitive function, social function, role function and physical function. 0-100 points for each item, the higher the score is, the better the corresponding function recovers. (2)Pulmonary ventilation function: Before nursing and after 2 months of nursing, the S-980A Ⅱ pulmonary function tester of Cisco Technology was used to detect: forced expiratory volume in 1 second (FEV1), vital capacity (FVC), the ratio of forced expiratory volume in 1 second to the vital capacity (FEV/FVC).

1.5 Statistical methods

SPSS 22.0 software was used for data processing to indicate measurement data with , and t test was used, P<0.05, indicating that the difference was statistically significant.

2 Results

2.1 Comparison of life quality between the two groups

There was no significant difference in GQOLI-74 scores between the two groups before nursing (P>0.05); After 2 months of nursing, the GQOLI-74 scale scores of the observation group were higher than the control group, the difference was statistically significant (P<0.05). The results are shown in Table 1.

Table 1. Comparison of scores of two groups of GQOLI-74 scale ($\bar{x} \pm s$, score)

Time	Groups	Material state of life	The body function	Social function	Psychological function
Before the intervention	The control group (n=38)	26.33±4.06	67.36±8.62	68.69±7.57	60.33±5.75
	The observation group (n=38)	26.45±3.67	66.89±7.76	68.61±8.54	61.08±6.02
	t	0.135	0.250	0.043	0.555
	P	0.893	0.803	0.966	0.580
After the intervention	The control group (n=38)	32.14±5.27[a]	72.14±9.04[a]	76.14±11.43[a]	69.32±6.50[a]
	The control group (n=38)	32.14±5.27[a]	72.14±9.04[a]	76.14±11.43[a]	69.32±6.50[a]
	The observation group (n=38)	41.38±6.36[a]	80.57±10.45[a]	85.46±10.48[a]	80.32±8.64[a]
	t	6.896	3.761	3.705	6.272
	P	0.000	0.000	0.000	0.000

2.2 Comparison of lung ventilation function between the two groups

Before the nursing, there was no statistically significant difference between the two groups of lung function indexes (P>0.05). After 2 months of nursing, the indicators of lung function of the two groups of patients were improved, and the indicators of the observation group were significantly higher than the control group. The difference was statistically significant (P<0.05). The results are shown in Table 2.

Table 2. Comparison of lung function between two groups before and after nursing ($\bar{x} \pm s$)

Time	Group	FVC (L)	FEV_1 (L)	FEV_1/FVC (%)
Before the intervention	The control group (n=38)	2.33±0.30	1.30±0.52	53.57±7.38
	The observation group (n=38)	2.26±0.54	1.29±0.24	54.28±6.40
	t	0.699	0.108	0.448
	P	0.487	0.915	0.655
After the intervention	The control group (n=38)	2.68±0.36[a]	2.32±0.41[a]	60.14±9.81[a]
	The observation group (n=38)	3.31±0.73[a]	2.85±0.47[a]	69.46±10.18[a]
	t	4.771	5.238	4.064
	P	0.000	0.000	0.000

Note: Compared with that before intervention in this group, [a]P<0.05

3 Discussion

Long-term inhalation of productive dust in work activities is the main cause of pneumoconiosis. The retention of a large amount of dust in the lungs will lead to systemic diseases such as pulmonary fibrosis, which will restrict the pulmonary ventilation function of patients and have a serious impact on normal life and work[6]. With the change of medical mode, people not only pay attention to the treatment of the disease itself, but also pay more attention to the psychological state and prognosis of the patients' quality of life. Therefore, nursing intervention plays an increasingly important role in the whole medical system. Because the current medical level is still unable to cure pneumoconiosis, the improvement of pulmonary ventilation function and quality of life through nursing intervention has become a clinical focus[7].

The results of this study showed that after 2 months of nursing, the scores of GQOLI-74 scale and pulmonary ventilation function indexes of patients in the observation group were all higher than those in the control group, indicating that respiratory rehabilitation training could improve pulmonary ventilation function and improve the quality of life of patients with pneumoconiosis. Pneumoconiosis patients suffer from diffuse fibrosis in their lung tissues due to inhalation of large amounts of dust, which impairs lung ventilation. If the disease continues to develop, it will cause serious complications such as decreased immunity, lung infection, emphysema and pneumothorax. At this time, even a common cold or fever will exacerbate the condition and worsen the systemic inflammatory response. Through health education to patients and their families about pneumoconiosis nursing points and matters needing attention, can reduce or avoid patients due to cross-infection, cold, bad lifestyle and other reasons to aggravate the disease. Making patients realize the importance of self-management

is conducive to delay the development of disease and improving the quality of life of patients[8]. Through the scientific and systematic training of the patient's breathing and systemic endurance, the respiratory rehabilitation training can enhance the function of the patient's lung muscles and respiratory muscles, improve the patient's breathing rate and depth, relieve the brain hypoxia, and achieve the purpose of optimizing the patient's respiratory function and pulmonary ventilation function. In addition, respiratory rehabilitation training can help the lungs recover by continuously strengthening the patient's respiratory endurance and enhance the patient's immunity. Xiao Kun[9] and other studies found that through breathing training can significantly improve the patient's quality of life and improve the patient's lung ventilation function, which is consistent with this study. Ma Chaoyan[10] believes that respiratory rehabilitation training can eliminate patients' negative emotions, reduce patients' subjective discomfort, and improve patients' interest in life. However, such studies rarely involve the impact of respiratory rehabilitation training on patients 'lung function. The results of this study confirm that respiratory training can effectively improve patients' lung ventilation indexes. In this study, through lip contraction breathing, diaphragmatic breathing exercise, standing breathing and lung breathing training methods, repeated alternating exercises to essentially improve the patient's lung function and bronchial ventilation. Reducing patients' dependence on drugs is a safer and more effective way to treat pneumoconiosis clinically.

In summary, respiratory rehabilitation training can improve the lung ventilation function of pneumoconiosis patients, improve the quality of life of patients, and has good clinical application value.

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