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The Effect of Respiratory Care on the Treatment of Asthma Patients

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Abstract: *Objective:* To analyze the intervention effect of respiratory care on asthma patients. *Methods:* 49 asthma patients admitted to the hospital between December 1, 2018 and November 30, 2022 were selected for this study. The patients were divided into Group A (25 cases) and Group B (24 cases). The patients in Group A received respiratory care, while the patients in Group B received routine care, and the nursing effects of both groups were compared. *Results:* Group A demonstrated a better nursing effect compared to Group B; the patients in Group A were generally more satisfied with the care given compared to those of Group B. Furthermore, Group A showed better improvements in respiratory function compared to Group B ($P < 0.05$). Before care, there was no difference in quality-of-life scores between the two groups ($P > 0.05$). After care, Group A's quality of life score was lower than Group B's ($P < 0.05$). *Conclusion:* Respiratory care for asthma patients can improve the quality of care and patient satisfaction. Besides, it also leads to a better improvement in respiratory function and the quality of life of the patients.

Keywords: Respiratory care; Asthma; Nursing effect; Respiratory function; Quality of life

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1. Introduction

Asthma is a common chronic respiratory disease characterized by long-term, chronic airway inflammation and reversible airway obstruction [1]. Asthma attacks can cause symptoms such as narrowing of the airway, coughing, wheezing, and difficulty in breathing, thus reducing the patient's quality of life. Respiratory care is designed for patients with this disease, which serves to improve respiratory function, relieve disease-related symptoms, and reduce the frequency of asthma attacks [2]. Therefore, 49 asthma patients were used as samples to analyze the effect of respiratory care on asthma patients in this study.

2. Materials and methods

2.1. General information

49 asthma patients admitted to the hospital between December 1, 2018 and November 30, 2022were selected

for this study. The patients were divided into Group A (25 cases) and Group B (24 cases). Group A consisted of 13 male patients and 12 female patients, aged 21 to 77 years old, (mean = 48.95 ± 2.17 years); the duration of disease ranged from 9 months to 8 years, (mean = 4.02 ± 0.67 years). Group B consisted of 15 males and 9 females, aged 22 to 79 years old (mean = 49.75 ± 2.23 years); the duration of the disease ranged from 8 months to 9 years, (mean = 4.16 ± 0.81 years). There were no significant differences in the data of both groups ($P > 0.05$).

Inclusion criteria: diagnosed with asthma according to the "Guidelines for the Diagnosis and Treatment of Bronchial Asthma," normal mental state, able to communicate, able to cooperate with the study; gave informed consent to the study. Exclusion criteria: accompanied by liver and kidney damage, presence of mental disorder, complicated with other respiratory diseases.

2.2. Method

Group B underwent routine care: The patients' physical signs were monitored and they were guided on their medications and daily precautions.

Group A underwent respiratory care. (1) Respiratory tract care: The respiratory tract of the patients was observed from time to time and any discomfort was reported immediately. Assess the secretions inside the respiratory tract and provide aerosol treatment if necessary. The correct method of coughing was demonstrated to the patients and their backs were tapped regularly to facilitate phlegm expulsion. (2) Communication with the patients: The medical staff communicated with the patients regularly. The patients' physical and mental conditions were monitored regularly based on the changes in their facial expressions, vital signs, and communication attitude. The patients were guided in expressing their discomfort and provided symptomatic treatment. The patients were informed of their condition and were given assurance so that they complied with the treatment. (3) Posture care: Patients with mild asthma were encouraged to sit upright and keep their backs straight to maximize the chest volume and facilitate smooth breathing. Patients with moderate asthma stayed in a semi-lying position with the headboard elevated by 30° to 45°. Their upper bodies were slightly elevated and were supported using pillows or raised mattresses. Patients with severe asthma were laid on their side and the headboard was raised 20 to 30° to facilitate gas exchange. (4) Oxygen inhalation care: The oxygen inhalation method for each patient was selected according to their condition and individual needs. Examples of inhalation methods include mask and nasal cannula inhalation. The oxygen flow rate was set to be 2–3 L/min for mask oxygen inhalation and 4–6 L/min for nasal cannula oxygen inhalation. The patients' response to oxygen inhalation was observed and abnormalities were addressed immediately. (5) Health education: Before discharge, knowledge manuals were distributed. The manuals explained the causes, symptoms, risk factors, and treatment options for asthma. Dietary precautions were also explained and the patients were informed to avoid irritating foods, eat more fruits and vegetables, and stay away from pollen and other irritants. They were also encouraged to wear a mask to avoid inhaling allergens, use their medications according to prescription, and visit the hospital for check-ups regularly.

2.3. Observation indicators

The nursing effect was regarded as "excellent" if cough, dyspnea, and other related symptoms disappeared, and the patient's bodily functions have recovered; the nursing effect was regarded as "good" if the symptoms improved significantly and the patient's body functions were mostly restored; the nursing effect was regarded as "poor" if there was no improvement in the symptoms or bodily functions. Patient satisfaction was evaluated using a self-made questionnaire, including nursing operations, communication frequency, and service attitude, totaling to 100 points. A score of > 75 points was regarded as "highly satisfied," a score of 45-75 points was

regarded as "satisfied," and a score of 45 was regarded as "dissatisfied." Respiratory function was evaluated by the Dyspnea Rating Scale (MMRC). Level 0 means no dyspnea at rest or abnormal breathing during excessive activities; Level 1 means abnormal breathing when walking on level ground or going uphill; Level 2 means abnormal breathing when walking on level ground and a rest is needed after walking for 90 m; Level 3 means that the patient needs to rest after walking for a few minutes of walking on level ground (less than 90 m); Level 4 means one has abnormal breathing when changing their clothes and are unable to leave home. The patients' quality of life was measured by the Asthma Quality of Life Questionnaire. The items included in this questionnaire were asthma symptoms (score 13 to 21), activity limitations (score 1 to 12), reactions to stimuli (score 27 to 31), overall health (score 32 to 35), and psychological condition (score 22 to 26); the lower the score, the higher the quality of life.

2.4. Statistical analysis

The data were processed by SPSS 28.0 software. The measurement data were compared using a t-test, while the count data were compared using a χ^2-test. Statistical significance was considered when $P < 0.05$.

3. Results

3.1. Nursing effect

Group A had a higher percentage of "excellent" and "good" nursing effect compared to Group B ($P < 0.05$).

Table 1. Comparison of nursing effects between the two groups (*n* [%])

Group	Number of cases	Excellent	Good	Poor	Total efficacy
Group A	25	18(72.00)	6 (24.00)	1 (4.00)	96.00 (24/25)
Group B	24	12 (50.00)	5(20.83)	7(29.17)	70.83 (17/24)
χ^2	-	-	-	-	5.677
P	-	-	-	-	0.017

3.2. Patient satisfaction

The patients in Group A were generally more satisfied with the care given compared to Group B ($P < 0.05$).

Table 2. Comparison of patient satisfaction between the two groups (*n* [%])

Group	Number of cases	Highly satisfied	Satisfied	Dissatisfied	Satisfaction rate
Group A	25	15 (60.00)	8 (32.00)	2 (8.00)	92.00 (23/25)
Group B	24	11(45.83)	5 (20.83)	8 (33.33)	66.67 (16/24)
χ^2	-	-	-	-	4.838
P	-	-	-	-	0.027

3.3. Respiratory function

The proportions of respiratory function Level 0 and Level 1 in Group A were bigger than that in Group B ($P < 0.05$).

Table 3. Comparison of respiratory function between the two groups (*n* [%])

Group	Number of examples	Level 0	Level 1	Level 2	Level 3	Level 4
Group A	25	16 (64.00)	6 (24.00)	2 (8.00)	1 (4.00)	0
Group B	24	8 (33.33)	1 (4.17)	7(29.17)	5 (20.83)	3 (12.50)
χ^2	-	4.608	3.934	3.659	3.229	3.329
P	-	0.032	0.047	0.056	0.072	0.068

3.4. Quality-of-life scores

Before care, there was no difference in quality-of-life scores between both groups ($P > 0.05$). After care, Group A's quality of life score was lower than Group B's ($P < 0.05$).

Table 4. Comparison of quality-of-life scores between the two groups (mean ± standard deviation, min)

Group	Number of examples	Asthma symptoms		Activity limitations		Response to stimuli		Overall health		Psychological condition	
		Before care	After care	Before care	After care	Before care	After care	Before care	After care	Before care	After care
Group A	25	18.32 ± 1.62	14.02 ± 1.30	7.22 ± 1.32	4.02 ± 0.85	30.65 ± 0.44	28.01 ± 1.32	34.22 ± 0.65	32.65 ± 0.44	25.03 ± 0.71	22.05 ± 0.61
Group B	24	18.33 ± 1.41	15.98 ± 1.44	7.19 ± 1.35	5.76 ± 0.98	30.66 ± 0.40	29.87 ± 1.36	34.28 ± 0.54	33.01 ± 0.41	25.02 ± 0.70	23.10 ± 0.69
t	-	0.023	5.005	0.079	6.648	0.083	4.858	0.351	2.960	0.050	5.649
P	-	0.982	0.000	0.938	0.000	0.934	0.000	0.727	0.005	0.961	0.000

4. Discussion

The pathogenesis of asthma involves multiple factors, such as genetics, environment, and immunity [3]. Asthma is characterized by chronic inflammation of the airways. Inflammatory cells detected pathologically include eosinophils, lymphocytes, and soluble inflammatory mediators, such as cytokines and leukotrienes [4-5]. When the airway is inflamed, it becomes overly sensitive to irritants (such as cold air, viral infections, and allergens), which leads to airway contraction and spasms, thereby causing airway obstruction. Long-term inflammatory responses can change the airway mucosal structure, such as smooth muscle hyperplasia, basement membrane thickening, and fibrosis, leading to airway structural remodeling. The symptoms of this disease are periodic asthma symptoms, namely dyspnea, chest tightness, and wheezing [6]. The cough worsens at night or early in the morning and is often accompanied by thick phlegm. Prolonged asthma can lead to complications such as chronic obstructive pulmonary disease, bronchiectasis, and respiratory failure. The disease can be treated with or without medications. The commonly used medications are inhaled short-acting/long-acting β2 receptor agonists and inhaled corticosteroids [7,8]. Non-drug treatments include avoiding allergens, regular exercise, and respiratory rehabilitation training.

Asthma is a chronic disease that is difficult to manage. Therefore, in addition to standardized treatment, systemic nursing intervention is required [9]. Several aspects should be noted in the nursing care of asthma patients. (1) Symptom observation: Nursing staff should observe and record the changes in their patients' symptoms, including the frequency and severity of dyspnea and cough, so that the treatment plan can be adjusted accordingly. (2) Oxygen supply: Ample oxygen supply is crucial during an asthma attack. Nursing staff should check the oxygen supply at any time and reasonably adjust the oxygen flow rate [10]. (3) Breathing and vital capacity exercises: Regular breathing and vital capacity exercises can strengthen the patient's respiratory

muscles and improve lung function, thus reducing dyspnea and asthma attacks. Based on the above nursing points, this study adopts respiratory care, which can dynamically evaluate the patient's respiratory function and carry out targeted nursing measures, thereby accelerating the disease outcome [11].

In this study, Group A demonstrated a better nursing effect, respiratory function, patient satisfaction, and quality of life compared to Group B. This result is attributed to the fact that respiratory care involves continuous monitoring of the respiratory tract. By doing so, respiratory discomfort can be discovered and addressed in time. Besides, constant assessment of respiratory secretions allows proper measures to be taken to clear airway obstructions in time [12]. Good nurse-patient communication helps patients understand their current physiological and psychological state. Furthermore, proper symptomatic treatment and psychological counseling will also improve treatment compliance. The patients can be positioned in different ways to manage their symptoms. For example, sitting upright can help maximize chest volume and facilitate breathing; semi-recumbent and side-lying positions can improve gas exchange and relieve dyspnea and airway spasms [13]. As for oxygen inhalation, the oxygen inhalation method should be selected based on the patient's condition, and the oxygen flow rate should be adjusted from time to time to ensure that the blood oxygen level is within the normal range. Providing patients with detailed health education and explaining life precautions can improve patients' self-care skills and awareness, thus improving their quality of life [14]. Respiratory care is highly individualized and emphasizes meeting each patient's needs and refining each link of the process. Furthermore, asthma patients will get to master respiratory care knowledge such as oxygen inhalation methods, aerosol sprays, and posture management methods. Lastly, the patients will be able to identify asthma attack signs and handle them correctly [15].

5. Conclusion

In summary, respiratory care can be used as a routine care method for asthma patients due to its feasibility and high effectiveness.

Disclosure statement

The author declares no conflict of interest.

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