# Evaluation of the Effect of the "General Practitioner-Specialist" Combination in the Community Management of Chronic Obstructive Pulmonary Disease

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*Abstract: The research objective of this article is to explore the effectiveness evaluation of the combination of general and specialized departments in the management of chronic obstructive pulmonary disease (COPD) in the community. The research method of this article is as follows:80 patients with COPD in stable stage who signed a family doctor from July to December, 2022 were randomly divided into general management group (control group) and full-time management group (observation group). The general management group implemented the routine chronic disease management mode of general medical follow-up. The full-time management group implements the joint management of chronic obstructive pulmonary disease by general practitioners and specialties. Six months after the implementation of different management modes, the lung function index, dyspnea degree and symptom score, anxiety and depression score, the number of acute attacks and patient satisfaction were compared between the two groups. After 6 months of intervention, there were no lost cases in both groups. The improvement of lung function, dyspnea degree and symptom score, anxiety and depression score and patient satisfaction in the observation group were better than those in the control group, and there was no significant difference in the number of acute attacks between the two groups. The combination of full-time and full-time management of COPD is effective and can be further promoted.*

*Keywords: General practitioner, Respiratory physician, Chronic obstructive pulmonary disease, Management mode*

## 1. Introduction

Chronic obstructive pulmonary disease (COPD), abbreviated as COPD, is a common respiratory system disease [1] and a widely prevalent disease [2]. Patients with chronic obstructive pulmonary disease not only have respiratory symptoms, but also involve the cardiovascular system [3], may also experience venous thromboembolism [4], and may also develop anxiety and depression. Therefore, we should pay more attention to the prevention and treatment of chronic obstructive pulmonary disease [5-6]. However, literature review studies have found that chronic obstructive pulmonary disease (COPD) has not been included in the national basic public health service projects [7], lacking policy support and community management guidelines for COPD. In terms of COPD prevention and control, the clinical diagnosis and treatment capabilities of general practitioners are also relatively lagging behind [8-10]. Our research team conducted an analysis of the effectiveness of joint management of chronic obstructive pulmonary disease (COPD) in general and specialized departments, and the summary is as follows.

## 2. Object and Method

### 2.1. Research Object

80 stable phase patients with chronic obstructive pulmonary disease (COPD) who signed with family doctors from July to December 2022 were selected as the research subjects. According to the Global Initiative for Chronic Obstructive Pulmonary Disease (2023) [11], the severity of the patient's condition was comprehensively evaluated based on their symptoms, acute exacerbation risk, and changes in lung function. The patients were divided into three groups: A, B, and E. Three groups of patients were randomly divided into a control group (implementing a conventional chronic disease management model of general practice nursing follow-up) and the observation group (implementing joint management of chronic obstructive pulmonary disease with general and specialized departments). Inclusion criteria: COPD stable patients. Exclusion criteria: (1) Acute exacerbation of COPD; (2) Bronchial asthma, bronchiectasis, etc; (3) Severe physical illness; (4) Individuals with cognitive and speech impairments. (5) Refuse to conduct relevant indicator tests or questionnaire responses. There was no statistically significant difference in general information between the two groups (see Table 1). This study meets ethical requirements and obtained informed consent from the research subjects.

### 2.2. Method

#### 2.2.1. Establish a Comprehensive COPD Management Team

The core consists of general practitioners and respiratory physicians from top tier hospitals, responsible for the diagnosis, evaluation, medication guidance, follow-up plans, and referral work of COPD patients. There is one community general practitione, two nurses, one responsible for health education for COPD patients, and one responsible for inputting medical records and data.

#### 2.2.2. Intervention Implementation

Control group: Control group: The control group is managed according to routine treatment and follow-up, including general follow-up and key follow-up. (1) General follow-up: once every 2 months for patients in Group A and Group B, and once every 1 month for patients in Group E. The content includes: 1) understanding the patient's basic condition, including urgency, exercise tolerance, weight, diet, etc; 2) Drug application status (compliance and adverse reactions); 3) Pay attention to lung rales, edema, heart rate, and rhythm during physical examination. (2) Key follow-up: Once every three months, except for general follow-up content, lung function testing is conducted for patients every three months to observe changes in the condition and refer them if necessary.

Observation group: On the basis of the control group, implement a fully specialized joint management model. General practitioners and respiratory specialists from top tier hospitals jointly develop personalized treatment and health management plans based on each patient's condition.

### 2.3. Effect Evaluation

After 6 months of intervention, compare the lung function indicators, degree and symptoms of breathing difficulties, anxiety and depression scores, number of acute attacks, and patient satisfaction between the two groups of patients.

#### 2.3.1. Evaluation of Lung Function Indicators

Our research team mainly measured the ratio of forced expiratory volume (FEV1) to forced vital capacity (FVC) in the first second after inhaling bronchodilators (FEV1/FVC), and the percentage of FEV1 to expected value (FEV1/expected value).

#### 2.3.2. Assessment of Respiratory Distress and Symptoms

The modified version of the British Medical Research Council Respiratory Questionnaire (mMRC) was used to evaluate the degree of respiratory distress in patients. The respiratory distress index of mMRC was divided into 0-4 levels, corresponding to 0-4 points. Use the Chronic Obstructive Pulmonary Disease (COPD) Self Assessment Test (CAT) questionnaire score to evaluate the patient's respiratory distress symptoms. The CAT questionnaire consists of 8 questions, with each question scoring 0-5 points based on gradually worsening symptoms, resulting in a total score of 0-40 points.

### 2.3.3. Anxiety and Depression Scores

Use the Self Rating Depression Scale (PHQ-9) and the Self Rating Generalized Anxiety Scale (GAD-7) to score the depression and anxiety levels of patients.

### 2.3.4. Assessment of the Number of Acute Exacerbations

Count the number of acute exacerbations of COPD in two groups of patients within six months.

### 2.3.5. Satisfaction Comparison

The self-made COPD patient satisfaction scale (including clinical symptoms, work and life abilities, treatment effectiveness, treatment convenience, overall efficacy, etc.) was used to evaluate the satisfaction rate. The satisfaction rate was (number of very satisfied cases+number of satisfied cases)/total number of cases x 100%.

### 2.4. Statistical Processing

Use SPSS 27.0 software for analysis. Quantitative data that conform to a normal distribution are represented by $(x \pm s)$, independent sample t-tests are used for comparison between two groups, paired data t-tests are used for comparison before and after treatment, qualitative data is described by frequency and percentage, and chi square tests are used for comparison between groups. The difference is statistically significant with $P<0.05$.

## 3. Results

### 3.1. General Information of Two Groups of Patients

There was no significant difference in gender, age, disease course, and smoking history between the two groups of patients (p>0.05), as shown in Table 1.

*Table 1: Comparison of General Information between Two Groups of Patients*

| Basic information | Observation group | Control group | $t/\chi^2$ | $P$ |
|---|---|---|---|---|
| Number of cases | 40 | 40 | | |
| Age (years) | 61.31±12.68 | 61.95±11.55 | 0.170 | 0.866 |
| Gender | | | | |
| Male | 20(50%) | 21(52.5%) | 0.050 | 0.823 |
| Female | 20(50%) | 19(47.5%) | | |
| Disease course (year) | 9.25±4.02 | 9.84±3.98 | 0.660 | 0.511 |
| Smoking history | | | | |
| Yes | 27 | 25 | 0.220 | 0.639 |
| No | 13 | 15 | | |

### 3.2. Evaluation of lung function indicators

*Table 2: Comparison of lung function indicators between two groups of patients before and after management (x ± s)*

| Group | Number of cases | FEV$_1$/FVC(%) | | FEV$_1$%pred(%) | |
|---|---|---|---|---|---|
| | | Before management | After management | Before management | After management |
| Control group | 40 | 58.97±7.05 | 58.83±8.46* | 61.72±8.34 | 62.44±7.15* |
| Observation group | 40 | 59.33±6.95 | 62.57±4.10# | 63.73±8.55 | 68.20±8.97# |
| t | | 0.227 | 2.516 | 1.062 | 3.176 |
| $P$ | | 0.821 | 0.014 | 0.292 | 0.002 |

Note: *: Compared with before management in the same group, t=0.078, 0.342, P>0.05. #: Compared with before management in the same group, t=2.438, 2.184, P>0.05.

After a 6-month intervention, lung function index analysis was conducted on two groups of patients. It was found that before management, there was no statistically significant difference in FEV 1/FVC and FEV1% estimated values between the two groups (P>0.05). After six months of management, the

FEV1/FVC and FEV1% estimated values in the observation group were higher than those in the control group, and the difference was statistically significant (P<0.05). After six months of management, there was no significant statistical difference (P>0.05) in the predicted FEV1/FVC and FEV1% values between the control group and the observation group compared to before treatment in the same group, as shown in Table 2.

### 3.3. Assessment of Respiratory Distress and Symptoms

Before management, there was no statistically significant difference in mMRC and CAT scores between the two groups of patients (P>0.05). After management, the mMRC and CAT scores of the observation group were significantly lower than those of the control group (P<0.05), indicating a significant improvement in the degree and symptoms of respiratory distress in the observation group. The mMRC and CAT scores of the control group and observation group were also statistically significant (P<0.001) compared to before treatment in the same group, as shown in Table 3.

*Table 3: Comparison of mMRC and CAT scores between two groups of patients before and after management (x ± s)*

| Group | Number of cases | mMRCscores | | CAT scores | |
|---|---|---|---|---|---|
| | | Before management | After management | Before management | After management |
| Control group | 40 | 2.33±0.57 | 1.83±0.45*** | 19.88±5.52 | 18.75±6.35*** |
| Observation group | 40 | 2.43±0.60 | 1.39±0.54### | 19.23±7.11 | 14.18±5.68### |
| t | | 0.767 | 3.940 | 0.457 | 3.395 |
| p | | 0.446 | 0.000 | 0.649 | 0.001 |

Note: ***: Compared with before management in the same group, t=4.416, 3.883, P<0.01. ##: Compared with before management in the same group, t=7.953, 3.603, P<0.01.

### 3.4. Evaluation of Depression and Anxiety Scale

Before management, there was no statistically significant difference in the depression and anxiety scores between the two groups of patients (P>0.05). After management, the depression and anxiety scores of the observation group were significantly lower than those of the control group (P<0.05). The depression and anxiety scores of the two groups were also statistically significant (P<0.05) compared to before management in the same group, as shown in Table 4.

*Table 4: Comparison of PHQ-9 and GAD-7 scores between two groups of patients before and after management (x ± s)*

| Group | Number of cases | PHQ-9scores | | GAD-7scores | |
|---|---|---|---|---|---|
| | | Before management | After management | Before management | After management |
| Control group | 40 | 13.13±5.83 | 11.10±4.79** | 5.13±2.24 | 4.00±2.00** |
| Observation group | 40 | 12.38±5.54 | 8.03±5.72### | 5.23±2.12 | 3.05±1.80### |
| t | | 0.590 | 2.607 | 0.205 | 2.235 |
| p | | 0.557 | 0.011 | 0.838 | 0.028 |

Note: **: Compared with before management in the same group, t=2.191, 2.555, P<0.05. ##: Compared with before management in the same group, t=3.316, 5.064, P<0.01.

### 3.5. Assessment of Acute Exacerbation Frequency

After six months of management, the control group had 15 acute exacerbations within six months, while the observation group had 11 acute exacerbations within six months, $\chi^2$ value is 0.9117, with no statistically significant difference (P>0.05).

### 3.6. Satisfaction Questionnaire

After six months of management, the satisfaction rate of patients in the observation group was 97.50%, significantly higher than 80.00% of patients in the control group, with a statistically significant

difference (P<0.05), as shown in Table 5.

*Table 5: Comparison of patient satisfaction between two groups*

| Group | Satisfied | Dissatisfied | $\chi^2$ | $P$ |
|---|---|---|---|---|
| Control group | 32 | 8 | 4.507 | 0.034 |
| Observation group | 39 | 1 | | |

## 4. Discussion

Chronic obstructive pulmonary disease is characterized by sustained development of airflow restriction [12-13]. COPD has not received enough attention from patients, doctors and the government [14]. Moreover, in the process of diagnosing and treating stable patients with chronic obstructive pulmonary disease (COPD) in community health service centers, there are often problems such as unclear and inadequate drug and non drug management, and poor referral [15]. The joint management of general and specialized departments can make up for the shortcomings of patients in community diagnosis and treatment.

Our research team used a combination of general practitioners and specialist physicians to manage chronic obstructive pulmonary disease (COPD), and evaluated the management effectiveness through lung function indicators, respiratory symptom assessment, anxiety and depression scale assessment, satisfaction assessment, and other aspects. The lung function evaluation results indicate that there is no difference in lung function indicators between the two groups before and after treatment, and there is no significant difference in lung function indicators between patients in the same group before and after treatment. It is possible that there may be pathological and physiological changes that are characteristic of chronic obstructive pulmonary disease (COPD): persistent airflow limitation leading to pulmonary ventilation dysfunction, which is an irreversible airway obstruction. Therefore, the improvement in lung function indicators in the same group is not significant, and it may also be due to our short intervention time insufficient efforts in health education are related to the situation. However, the lung function of the observation group improved compared to the control group after treatment, which is consistent with the results of respiratory symptom assessment. This may be due to the role of respiratory doctors in tertiary hospitals (see analysis below).

In terms of respiratory symptom assessment, it can be seen that after management, the respiratory distress index and CAT score of both groups of patients improved, which is similar to the results of a study conducted by Xu Dandan et al. [16]. Our research team analyzed the reasons why COPD is difficult to control, symptoms are easy to worsen, lung function indicators are not easy to improve, and patients are exposed to smoke for a long time, do not pay attention to protection during seasonal changes, and lack standardized and appropriate respiratory rehabilitation exercise guidance The lack of standardized oxygen therapy and irregular inhalation of drugs are closely related behaviors. The two groups of management mentors are both community general practitioners and nurses who are familiar with patients and have more contact with them. Patients are very receptive to their opinions, and during follow-up, they are more likely to persuade patients to develop good behavior habits and improve respiratory symptoms. Therefore, there was a significant improvement in respiratory symptoms before and after intervention in both groups of patients, and at the same time, there was a significant improvement in respiratory symptoms in the observation group compared to the control group. This may be related to respiratory doctors in tertiary hospitals, as tertiary hospitals are teaching hospitals with teachers who have been teaching students and continuing education for many years. They have an advantage in knowledge reserves. We have conducted in-depth research on chronic obstructive pulmonary disease (COPD) with rich experience. We can provide health education to this group of patients through many vivid clinical cases, including complications of COPD, precautions for drug use, non drug respiratory rehabilitation, muscle training, nutritional support, psychotherapy, and education. Patients have good compliance, and in the management process, we have guidance from respiratory and general practitioners in top tier hospitals. The professional level of community medical care has also greatly improved. Community medical care has achieved close contact with higher-level hospitals, and patients' lung function indicators, activity ability, especially respiratory symptoms, will naturally improve significantly.

This study also conducted an evaluation of the Anxiety and Depression Scale. The results showed that through a comprehensive and collaborative management model, not only can the condition of COPD patients be improved, but also anxiety and depression can be improved, enhancing their emotional value.

Our research team evaluated and compared the number of acute exacerbations in two groups of patients within six months of management, and found no statistically significant difference in the average number of acute exacerbations between the two groups. The analysis may be related to the six-month period of this study (April 2023 to September 2023), during which there were no significant temperature fluctuations, or to the shorter study period. In terms of satisfaction evaluation, the satisfaction rate of the observation group patients was 97.50%, which was higher than the 80.00% of the control group patients. Our research team analyzed that this may be related to the improvement of community medical staff's awareness, diagnosis, treatment, and management capabilities of chronic obstructive pulmonary disease (COPD) through the joint management model of full specialization. This has homogenized the knowledge of community medical staff in the prevention and treatment of COPD with that of doctors in tertiary hospitals.

In summary, adopting a fully specialized joint management model for stable chronic obstructive pulmonary disease patients can help improve their lung function indicators, respiratory symptoms, anxiety and depression, increase patient satisfaction, and is worthy of promotion and application.

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