



# Self-management among patients with chronic obstructive pulmonary disease in China and its association with sociodemographic and clinical variables



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## ABSTRACT

**Purpose:** This study aimed to examine the status of self-management in patients with COPD and its associations with sociodemographic and clinical variables.

**Methods:** This cross-sectional study included 154 patients with COPD (mean age, 73 years) at four hospitals in Tianjin, China. The COPD Self-Management Scale was used to describe the level of self-management, and its associations with sociodemographic and clinical variables were examined with multiple regression analysis.

**Results:** More than half of the patients with COPD had a low (30%) or moderate (27%) level of self-management. Self-management was rated highest in management of daily life and lowest in information management. Higher physical activity, higher salary, and lower age affected self-management the most positively.

**Conclusion:** The overall burden of COPD in China is greater than that found in other countries. Healthcare professionals need to improve their understanding of the importance of self-management and specifically focus on increased physical activity targeting patients with poor literacy skills.

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## 1. Introduction

Chronic obstructive pulmonary disease (COPD) has an unpredictable and progressive trajectory and affects patients' health status. The World Health Organization has predicted that COPD will become the third leading cause of death by 2030 (WHO). In China, a population based survey showed approximately 8% of people aged >40 years old were affected by COPD, which would mean a COPD patient population of more than 43 million in China, exceeding previous expectations (Zhong et al., 2007). The overall burden of COPD in China is reported to be greater than that found in developed countries (Mannino, Homa, Akinbami, Ford, & Redd, 2002; NICE, 2010).

COPD is an incurable and chronic disease. Therefore, this disease must be managed to prevent its exacerbation and the further deterioration of lung function (Voncken-Brewster et al., 2013). Self-management is regarded as an integral component in COPD care. Self-management is defined as the patients' ability to understand the disease, control their behavior, and maintain a healthy attitude to manage their disease under chronic conditions (Barlow, Wright, Sheasby, Turner, & Hainsworth, 2002).

Despite the fact that self-management abilities have been shown to be important in improving well-being and decreasing health care costs for patients with COPD (Cramm & Nieboer, 2013), research regarding self-management in patients with COPD lags behind considerably compared to other chronic illnesses (Kaptein, Fischer, & Scharloo, 2014).

A recent Cochrane review concluded that self-management interventions in patients with COPD can improve health-related quality of life, reduce hospital admissions, and decrease dyspnea, but showed no difference in exercise capacity (Zwerink et al., 2014). Therefore, it is striking to see self-management not included in the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines for diagnosis and management of patients with COPD (GOLD, 2016).

However, a systematic review of patients with COPD who recently had been discharged from hospital showed that there is insufficient evidence to support self-management for patients with COPD, indicating the need for good quality primary research to identify effective approaches (Majothi et al., 2015). Sociodemographic and clinical factors appear to play a role in the patients' ability to perform self-management. Many studies have demonstrated that smoking, acute exacerbation of symptoms, increased body mass index (BMI), dyspnea, and low exercise capacity are associated with decreased self-management in COPD (Bos-Touwen et al., 2015; Effing et al., 2012; Peytremann-Bridevaux, Staeqer, Bridevaux, Ghali, & Burnand, 2008; Rice et al., 2010; Tashkin et al., 2001). An important component to facilitate self-management support is the understanding of factors which influence the self-management abilities. In China, there is a shortage of

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studies on self-management abilities of patients with COPD. One study in south China showed 88% of patients with COPD reported a moderate or low level of self-management abilities (Zhu, Ye, & Chen, 2012), but according to our knowledge there have been no studies from north China. Additionally, no studies have combined relevant sociodemographic and clinical factors to predict self-management of patients with COPD. Therefore, the aim of this study was to examine the status of self-management in patients with COPD and its associations with sociodemographic and clinical variables.

## 2. Materials and methods

### 2.1. Study design and setting

This is a cross-sectional study conducted at respiratory departments at three general hospitals and one specialized hospital in Tianjin, China.

### 2.2. Participants

Approximately 250 patients with COPD were asked to participate in the study from September 2014 to March 2015. The inclusion criteria were as follows: FEV1/FVC  $\leq$  70%, diagnosis of COPD according to the GOLD (GOLD, 2016), willingness to participate, clear consciousness, and the ability to speak Mandarin. The exclusion criteria were history of other severe pulmonary and/or cardiac disease, and another disorder or progressive disease that seriously influenced daily life. A convenience sample of 178 subjects agreed to participate and were recruited for the study. Of these, 154 participants were included in the study (24 questionnaires were invalid).

Include Fig. 1 here.

Permission to carry out the study was granted by Tianjin Medical University Ethics Committee. The study was conducted in accordance with the Declaration of Helsinki (WMA General Assembly, 1964). All of the patients received verbal and written information about the study and were asked to sign an informed consent document prior to participating.

### 2.3. Data collection

The patients completed the questionnaires at the respiratory department in conjunction with a hospitalization. The questionnaires were handed out by a research assistant, who had previous guidance from

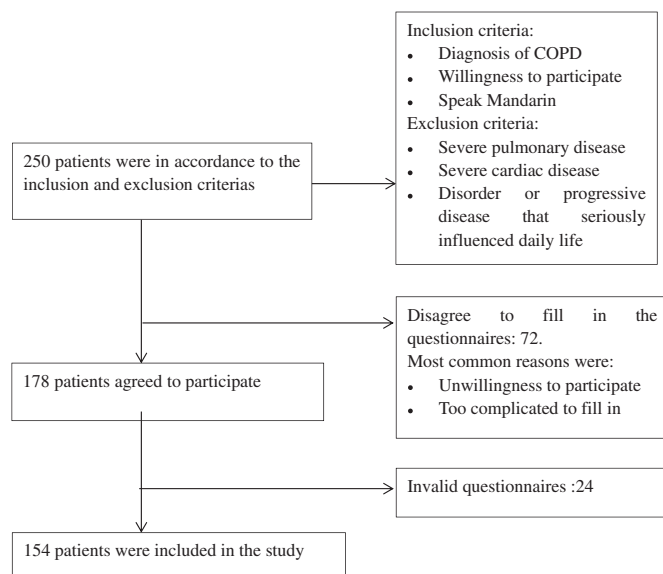


Fig. 1. Flow chart describing how patients were included in the study.

the researchers on how to instruct the participants to complete the questionnaires. Sociodemographic and clinical data were obtained directly from patients and from medical records. The questionnaires took 20–30 minutes to complete.

### 2.4. Measures

#### 2.4.1. COPD self-management scale

The COPD Self-Management Scale (CSMS) was the first scale used to evaluate the self-management status of COPD patients (Zhang et al., 2013). This scale contains 51 items and the response to each item is graded on a five-point scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often, and 5 = always) (Zhang, 2009). The total score ranges from 51 to 255, with the higher the score, the better the self-management level. The CSMS involves five domains: symptom management with eight items (40 points), daily life management with 14 items (70 points), emotion management with 12 items (60 points); information management with eight items (40 points), and self-efficacy with nine items (45 points). A score > 160 points indicates a high level of self-management, that ranging from 144–160 points indicates a moderate level, and that < 144 points indicates a low level (Zhang, 2009). Every domain's standardized score is calculated as each domain score divided by the number of items within the domain in order to compare scores between the domains. The test–retest correlation coefficient, Cronbach's coefficient, and the split-half reliability coefficient of the CSMS for patients with COPD were 0.87, 0.92, and 0.90, respectively (Zhang et al., 2013). In the present study, Cronbach's coefficient value of the CSMS was 0.86.

#### 2.4.2. Sociodemographic and clinical variables

The studied variables included sex, age, living conditions, experience of family support, education level, career, salary, experience of economic burden, smoking status, and BMI. The level of adherence to medication and home oxygen therapy was determined by the questions: “Do you take medicine on time in accordance with prescriptions?” and “Do you use oxygen therapy at home?” The response alternatives were “yes” and “no”. Other independent variables, including grades of COPD and frequency of acute exacerbation in the last year, were obtained from medical records. Functional dyspnea was rated using a modified Medical Research Council dyspnea scale from 0 (not troubled with breathlessness, except with strenuous exercise) to 4 (too breathless to leave the house or breathless when dressing or undressing) (Celli & MacNee, 2004). The level of physical activity (sports activities, walking, exercise, house cleaning) was measured by the question: “How much physical activity do you have per day?” The answering alternatives were never; less than 30 minutes; and more than 30 minutes.

### 2.5. Statistical analysis

Data were analyzed using SPSS for Windows Version 17.0 software (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to illustrate the characteristics of the study participants. Categorical variables are shown as frequencies and percentages, and continuous variables as mean and standard deviation when normally distributed. Spearman's correlation coefficient ( $r$ ) was used for univariate correlation analysis to determine the correlation between independent variables and self-management ability. Further, for development of a final regression model, a stepwise approach was used, choosing variables that had a  $p$  value of < 0.05 in the univariate correlation analysis. The level of statistical significance was set at  $p < 0.05$  and all tests were two-tailed.

## 3. Results

### 3.1. Participants' characteristics

The mean age of the 154 subjects (60% men) was  $72.8 \pm 9.6$  years (range, 46–91 years). Subjects' characteristics are shown in Table 1.

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