



Predictors of Self-Efficacy in Patients with Chronic Obstructive Pulmonary Disease

Scholastica Fina Aryu Puspasari
STIKes Panti Rapih Yogyakarta, Indonesia
Email: scholastica_fina@stikespantirapih.ac.id

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Abstract

Chronic obstructive pulmonary disease (COPD) is a growing global health concern with increasing morbidity and mortality. Self-efficacy plays a key role in COPD self-management, influencing patients' ability to control symptoms, perform daily activities, manage emotions, and access health information. Identifying factors that affect self-efficacy is essential to improve patient outcomes and quality of life. This quantitative cross-sectional study involved 100 outpatient COPD patients at Respira Hospital Yogyakarta. Data were collected using the validated Indonesian version of the Chronic Self-Management Scale (CSMS) and analyzed through univariate and multiple linear regression methods. The mean self-efficacy score was 35.83 (SD = 7.609). Regression analysis showed that symptom management, activity management, emotional management, and information management collectively had a significant effect on self-efficacy ($p = 0.001$; $R = 0.582$; $R^2 = 0.339$). Partially, emotional management ($p < 0.001$) and information management ($p = 0.026$) were significant predictors, while symptom management ($p = 0.092$) and activity management ($p = 0.266$) were not. In conclusion, emotional and information management are key predictors of self-efficacy in COPD patients, with emotional management as the most dominant factor. Interventions should prioritize emotional regulation and improving health literacy to enhance self-efficacy and overall quality of life.

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is one of the global health problems characterized by limited airflow that is progressive and not completely reversible (Prasad, 2020). COPD is the main cause of morbidity and mortality in the world, including in Indonesia. The projected number of COPD cases globally will increase by 23% from 2020 to 2050 with a prevalence approaching 600 million (Boers, 2023). The prevalence of COPD in Indonesia is relatively high, namely 4.8 million people or 5.6% (JPNN, 2025). This figure increased almost twice compared to Riskesdas in 2018 of 3.7% (Riskesdas, 2018).

The main complaint of COPD is shortness of breath that is progressive, persistent, and increases with activity (Puspasari, 2019). A decrease in *pulmonary elastic recoil* in COPD patients will lead to an increase in mechanical load on the inspiration muscles and respiratory nerves which can trigger shortening of breathing, exercise intolerance, and restriction of activity. This condition not only has an impact on the patient's physical function, but also affects psychological, social, and overall quality of life aspects by 86.7% (Puspasari, 2025). The successful management of COPD does not only depend on pharmacological interventions, but also on the patient's ability to *self-manage*. One of the important components of *self-management* is *self-efficacy*, which is an individual's belief in his or her ability to manage disease conditions.

Self-efficacy is one of the key factors in the management of COPD because it plays a direct role in determining the patient's ability to *self-manage*. *High self-efficacy* allows patients to be more confident in controlling symptoms, adhering to treatment, and maintaining daily physical activity despite experiencing limited lung function. In contrast, low *self-efficacy* is often associated with increased anxiety, depression, as well as an inability to manage symptoms, which ultimately results in a decrease in the patient's quality of life.

The role of *self-efficacy* is an important target in nursing interventions and comprehensive management of COPD. This statement is supported by the results of Wang (2020) research which shows that patients with high *self-efficacy* have better treatment adherence by up to 1.5–2 times compared to patients with low *self-efficacy*. The results of another study also showed that patients with low *self-efficacy* had a higher risk of experiencing recurrent hospitalization due to the inability to recognize and manage early symptoms of exacerbation (Miravittles et al., 2021), and *that self-efficacy* had a significantly positive correlation with quality of life ($r = 0.45–0.60$), indicating higher *self-efficacy* then the better the patient's quality of life (Liao et al., 2023).

Good self-efficacy in COPD patients is not formed automatically, but is influenced by various factors. Identification of *self-efficacy* predictive factors in COPD patients has a very important role in supporting the success of comprehensive disease management. *Good self-efficacy* allows patients to be able to control symptoms such as shortness of breath, chronic cough, and fatigue through the proper use of medication and the implementation of exacerbation management strategies (Lenferink et al., 2017; Wang et al., 2020). *Self-efficacy* also plays a role in the patient's ability to perform daily activity management, including maintaining appropriate physical activity, regulating rest patterns, and adjusting the intensity of activities so as not to worsen respiratory conditions (Paneroni et al., 2020).

Good self-efficacy is also formed from the ability of COPD sufferers to control emotions, such as anxiety and depression, which often arise due to chronic conditions and physical limitations. This ability to regulate emotions is important because unstable psychological conditions can worsen the perception of symptoms and decrease adherence to therapy (Yang et al., 2021; Zhang et al., 2020). In addition, patients with *good self-efficacy* tend to be more active in seeking information related to their health, both from health workers and other trusted sources, thereby increasing understanding of diseases and strengthening involvement in the treatment process (Li et al., 2022; Chen et al., 2022). *Good self-efficacy* allows patients to be able to control symptoms, maintain appropriate physical activity, manage emotions, and improve health literacy. Independent control of symptoms by COPD sufferers, such as management of shortness of breath, chronic cough, and fatigue through the use of appropriate medications and the implementation of exacerbation management strategies.

Although several previous studies have identified the importance of self-efficacy in COPD management, most studies only focus on the relationship between self-efficacy and clinical outcomes, such as treatment adherence, hospitalization, and quality of life. Limited studies have comprehensively explored the predictive factors influencing self-efficacy among COPD patients, particularly in the Indonesian context and respiratory referral hospitals. Furthermore, there is still insufficient evidence regarding which demographic, physical, psychological, and behavioral factors most strongly contribute to self-efficacy among COPD

patients in Yogyakarta. This condition indicates a clear research gap that needs to be addressed to support the development of targeted nursing interventions.

The novelty of this study lies in its comprehensive analysis of predictive factors affecting self-efficacy among COPD patients at Respira Hospital Yogyakarta, a specialized respiratory referral hospital. This study integrates physical, psychological, activity-related, and health literacy aspects simultaneously to identify the dominant predictors of self-efficacy in COPD patients. The findings are expected to provide more context-specific evidence for Indonesian COPD populations and strengthen the development of nursing-based self-management interventions.

The research was conducted at Respira Hospital Yogyakarta as a referral hospital for respiratory diseases in the Special Region of Yogyakarta. Respiratory Lung Hospital Yogyakarta is tasked with providing comprehensive health services, especially lung and respiratory health. Based on the results of a preliminary study at Respiratory Lung Hospital Yogyakarta, data on the incidence of COPD per year was obtained for 298 people for hospitalization and 27,797 visits for outpatient visits. Based on the background that has been explained, the identification of factors that affect *self-efficacy* in COPD patients at Respira Hospital Yogyakarta is crucial to determine the right intervention, especially in nursing practice. Interventions based on significant predictive factors can help improve patients' ability to control symptoms, carry out daily activities independently, manage emotional states, and improve health literacy.

The objective of this study is to identify and analyze the predictive factors influencing self-efficacy among COPD patients at Respira Hospital Yogyakarta. Specifically, this study aims to examine the contribution of demographic, physical, psychological, activity-related, and health literacy factors toward self-efficacy in COPD patients.

The findings of this study are expected to provide important implications for nursing practice and COPD management programs. Identification of significant predictive factors may assist nurses and healthcare professionals in designing more targeted and individualized interventions to improve self-efficacy among COPD patients. In addition, the study may contribute to the development of evidence-based pulmonary rehabilitation and self-management programs, ultimately improving patients' quality of life and reducing the risk of exacerbation and hospitalization.

RESEARCH METHODS

This study used a quantitative design with a **cross-sectional** approach, which aimed to analyze the predictive factors that affect *self-efficacy* in patients with Chronic Obstructive Pulmonary Disease (COPD). Primary data were taken from questionnaires and interviews. *Self-efficacy* is measured with the CSMS instrument as one of the components in self-management measurement. The instrument consisted of 51 questions consisting of eight questions for symptom management, fourteen questions for daily life management, twelve questions for emotion management, eight questions for information management and nine questions for the self-efficacy component. In this study, self-efficacy was operationalized as the dependent variable, measured using the self-efficacy domain of the COPD Self-Management Scale (CSMS), while demographic, physical, psychological, activity-related, and health literacy characteristics were operationalized as independent variables. Data were processed univariately

to distribute respondent characteristics and multivariate using multiple linear regression analysis to determine the predictive factors of self-efficacy in COPD patients.

The instruments used have been internationally standardized with good validity values. The CSMS that has been translated into Indonesian has also been tested for reliability and validity. The correlation coefficient of the test reached 0.87 and the Cronbach alpha coefficient reached 0.92. The content validity index also shows a value of 0.90. The correlation of CSMS with other scales that measure self-management and self-efficacy of COPD was also significant, with values ranging from 0.61 to 0.82.

The study involved a population of COPD patients undergoing outpatient treatment at the polyclinic of Respira Hospital, Yogyakarta. The sampling technique used in this study was consecutive sampling, in which eligible respondents who met the inclusion criteria during the data collection period were recruited until the required sample size was achieved. Sampling was carried out on one hundred respondents who had agreed to *informed consent* beforehand. Data was collected using a questionnaire containing demographic data and instruments taken from the Indonesian version of the CSMS. Data was collected cross-sectionally, where respondents generally spent 20 minutes filling out questionnaires independently. Ethics permits and research permits were obtained from the ethics team of Respira Hospital Yogyakarta.

RESULTS AND DISCUSSION

Table 1. Distribution of Respondent Characteristics

Features		f	%	
Gender	Male	49	49	
	Women	51	51	
Smoking History	No	62	62	
	Ya	38	28	
Drug Consumption	No	3	3	
	Ya	97	97	
Comorbid Diseases	No	61	61	
	1 komorbid	38	38	
	>1 komorbid	1	1	

Features	Min	Max	Mean	SD
Age (years)	45	90	60,59	9,291
Length of Illness (years)	< 1	20	4,98	4,76

Based on the distribution table of respondent characteristics, it is known that the ratio of respondents is almost balanced between men and women (49%: 51%). Of the smoking history, more than half (62%) of the respondents had no smoking history. Almost all (97%) of respondents took medication and more than half (61%) had no comorbid disease. Based on numerical data, the average age of respondents was 60.59 years (SD = 9.291) with an age range of 45–90 years. Meanwhile, the average length of time to suffer from COPD was 4.98 years (SD = 4.76), with a range of less than 1 year to 20 years.

The results showed that the majority of respondents were elderly with an average age of 60.59 years. This is in line with the characteristics of COPD as a degenerative disease that generally occurs at the age of over 40 years due to long-term exposure to risk factors (GOLD, 2023). Increasing age is also associated with decreased lung function as well as increased susceptibility to chronic diseases, including COPD (Vogelmeier et al., 2017).

The relatively balanced gender distribution between men and women shows that COPD is not only dominated by men, as previous research has shown. This can be caused by increased exposure to risk factors in women, such as indoor air pollution and exposure to biomass smoke (WHO, 2023). These findings are consistent with recent global epidemiological reports showing an increasing prevalence of COPD among women due to environmental and household exposure factors.

An interesting finding in this study is that the majority of respondents have no history of smoking (62%). These findings suggest that the risk factors for COPD are not only limited to smoking habits, but can also be caused by other factors such as air pollution, occupational exposure, and environmental factors (GOLD, 2023). However, the proportion of respondents with a history of smoking remains significant (38%) and is known to be the main risk factor for COPD (Miravittles et al., 2021). Similar findings were also reported by WHO (2023), which emphasized the increasing contribution of non-smoking-related COPD cases globally.

Almost all respondents (97%) took the drug, which showed a fairly good level of therapeutic adherence. Adherence to treatment is an important aspect of the management of COPD to control symptoms and prevent exacerbations (Effing et al., 2016). This adherence is also related to the level of *patient self-efficacy*, where patients with high *self-efficacy* tend to be more adherent to treatment (Wang et al., 2020). According to Bandura's Self-Efficacy Theory, individuals who believe in their capability to manage disease conditions are more likely to perform health-related behaviors consistently, including medication adherence.

Regarding comorbid diseases, most respondents did not have comorbidities (61%), but there were 38% who had one comorbidity. The presence of comorbidities can worsen the patient's clinical condition and affect the ability to self-manage, including *self-efficacy* (Liao et al., 2023). The average length of the respondents' illness was 4.98 years, which indicates that most patients have been living with COPD for a considerable period of time. Long suffering from the disease can affect a patient's experience in managing their disease, ultimately contributing to the formation of *self-efficacy* (Zhang et al., 2020). This finding supports Bandura's concept of mastery experience, where repeated experiences in managing illness over time may strengthen confidence in self-management abilities.

Table 2. Univariate Test Results of Dependent and Independent Variables

	Variabel	Min	Max	Mean	SD
They depend	<i>Self-efficacy</i>	17	87	35.83	7.609
Independent	Symptom Management	17	36	26.04	4.773
	Activity Management	32	68	47.98	6.796
	Emotion Management	31	57	44.85	6.344
	Information Management	16	40	27.23	4.601

Based on table 2, it was obtained that the average value (*mean*) of *self-efficacy* in the respondents was 35.83 with a standard deviation (SD) of 7.609, and a score range between 17 to 87. This shows that there is a considerable variation in the level of *self-efficacy* among respondents. On independent variables, symptom management had an average value of 26.04 (SD = 4.773) with a range of 17–36. Activity management showed the highest average score of 47.98 (SD = 6.796) with a range of 32–68. Meanwhile, emotion management has an average of

44.85 (SD = 6.344) with a range of 31–57, and information management has an average of 27.23 (SD = 4.601) with a range of 16–40.

The results of the study showed that the average *self-efficacy* of COPD patients was in the medium category. This indicates that most patients have sufficient confidence in managing their disease, but it is not optimal. *Self-efficacy* that is not maximized can affect the patient's ability to control symptoms, activities, and adherence to therapy (Zhang et al., 2020). In Bandura's theory, moderate self-efficacy reflects that individuals still experience doubts in performing behaviors needed to manage challenging situations, including chronic illness management.

In the aspect of symptom management, the average value obtained showed that the patient was quite able to control COPD symptoms such as shortness of breath and cough. This ability is important because good symptom management can prevent exacerbations and improve the patient's quality of life (Lenferink et al., 2017; Wang et al., 2020). However, the variation in scores that is still large indicates that not all patients have the same ability to recognize and manage symptoms.

Activity management has the highest average value compared to other variables. This shows that patients are relatively able to adjust their daily activities according to their physical condition. Controlled physical activity is an important part of pulmonary rehabilitation and has been shown to increase the functional capacity and *self-efficacy* of COPD patients (Effing et al., 2016; Paneroni et al., 2020). Similar findings were reported by Paneroni et al. (2020), who found that COPD patients participating in structured activity programs demonstrated better adaptation to physical limitations.

In the aspect of emotion management, a fairly high average score indicates that the patient has a fairly good ability to manage stress, anxiety, and depression. This is important because a stable psychological state can increase patients' motivation to undergo treatment and self-care (Yang et al., 2021; Miravittles et al., 2021). According to Bandura, emotional and physiological states are important determinants of self-efficacy because negative emotions such as fear and anxiety can reduce confidence in performing health behaviors. However, the persistence of score variations indicate the need for psychosocial interventions for patients with low emotion regulation abilities.

Meanwhile, information management showed a fairly good average value, which indicates that the patient has the ability to find and understand information related to his disease. Good health literacy plays an important role in increasing *self-efficacy*, as patients become better able to make informed decisions regarding self-care (Li et al., 2022; Chen et al., 2022). These findings are in accordance with previous studies showing that patients with better access to health information tend to demonstrate stronger disease management confidence.

Table 3. Regression Test Results of All Variables Together

R	R Square	Adjusted R Square	SE
0,582	0,339	0,311	6.316

Based on the results of multiple linear regression analysis, a correlation coefficient value R of 0.582 was obtained. This value shows that there is a **fairly strong relationship** between independent variables (symptom management, activity management, emotion management, and information management) and dependent variables, namely *self-efficacy*. This indicates that

these four variables together have a meaningful relationship with the level of *self-efficacy* of COPD patients.

The value of the determination coefficient (R Square) of 0.339 indicates that **33.9% of the variation in self-efficacy** can be explained by the management variables of symptoms, activities, emotions, and information. Meanwhile, the remaining 66.1% was influenced by other factors not studied in this study, such as social support, education level, psychological condition, and other clinical factors (Zhang et al., 2020; Liao et al., 2023). This finding is relatively similar to previous studies that reported self-efficacy in COPD is multidimensional and influenced by both internal and external factors.

The Adjusted R Square value of 0.311 indicates that after adjusting for the number of independent variables in the model, the model's predictive ability remains at **31.1%**, which means that the regression model has sufficient ability to explain the dependent variables. The Adjusted R Square is important because it provides a more accurate picture of the model's capabilities in the population (Field, 2013).

Furthermore, a **Standard Error of Estimate (SE) value of 6.316** indicates the magnitude of the model's prediction error rate against *the self-efficacy* value. The smaller the SE value, the better the model is at predicting dependent variables. In this study, a relatively moderate SE value showed that the model had a sufficient level of accuracy in predicting *the self-efficacy* of COPD patients.

Based on the value of p, 0.001 is obtained, which is smaller than the significance value set ($\alpha = 0.05$), so it can be concluded that the **regression model is statistically significant**. This means that independent variables consisting of symptom management, activity management, emotion management, and information management together have a significant influence on *self-efficacy* in COPD patients. Thus, the alternative hypothesis (H_a) is accepted and the null hypothesis (H_0) is rejected, suggesting that there is a significant relationship or influence between self-management variables and *self-efficacy*.

Table 4. Regression Test Results for Each Variable

Variabel	t	Sig
Symptom Management	1.704	0.092
Activity Management	1.120	0.266
Emotion Management	4.009	0.000
Information Management	2.261	0.026

Based on the results of the regression test, it was found that emotion management and information management had a $p < 0.05$ so that it was statistically concluded that emotion management and information management had an effect on *self-efficacy*, while symptom and activity management with $p > 0.05$ statistically did not have a statistically significant effect on *self-efficacy*.

The results showed that emotion management was the most dominant variable affecting *self-efficacy*, shown by the highest t-value ($t = 4.009$). This indicates that the patient's ability to manage emotions such as anxiety, stress, and depression greatly determines the level of self-confidence in managing COPD. In theory, emotional states are one of the main sources of *self-efficacy*, where individuals with stable psychological states tend to have higher self-confidence. Previous research has also shown that anxiety and depression are negatively associated with

self-efficacy in COPD patients (Yang et al., 2021). According to Bandura's Self-Efficacy Theory, emotional arousal is one of the four main sources of self-efficacy. Individuals who experience excessive anxiety, fear, or stress tend to perceive themselves as less capable of handling challenges. In COPD patients, chronic dyspnoea, physical limitations, and fear of exacerbation often trigger psychological distress, which directly lowers confidence in self-management abilities.

The dominance of emotion management in this study may also be explained by the chronic nature of COPD. Patients commonly experience recurring symptoms and uncertainty regarding disease progression, which may increase emotional burden over time. When patients are unable to regulate emotions effectively, they may become less motivated to adhere to treatment, avoid physical activity, and withdraw socially. Conversely, patients with good emotional control are more likely to maintain positive coping strategies and confidence in managing their illness. This finding supports previous studies by Yang et al. (2021) and Zhang et al. (2020), which reported that anxiety and depression were strong predictors of lower self-efficacy among COPD patients. Similar findings were also reported by Miravittles et al. (2021), who emphasized that psychological well-being plays a central role in successful COPD self-management.

Information management also had a significant effect on *self-efficacy* ($p = 0.026$). This shows that patients' ability to search, understand, and use health information plays an important role in increasing self-confidence in managing the disease. Good health literacy allows patients to make informed decisions regarding medication and self-care (Li et al., 2022). Information support from health workers has also been proven to increase *the self-efficacy of COPD patients* (Chen et al., 2022). These findings are consistent with Bandura's verbal persuasion concept, where encouragement and education from healthcare providers can strengthen patient confidence in performing self-care behaviors.

Meanwhile, symptom management had no significant effect on *self-efficacy* ($p = 0.092$). This can be due to the possibility that most respondents already have experience in managing symptoms, so the variability is not large enough to significantly affect *self-efficacy*. In addition, other factors such as psychological conditions and social support may be more dominant in influencing *self-efficacy* than the ability to manage symptoms alone (Zhang et al., 2020). Similar non-significant findings were also reported in several chronic disease studies where emotional and cognitive factors contributed more strongly to self-efficacy than physical symptoms.

Similarly, activity management showed no significant effect ($p = 0.266$). This may be due to the relatively homogeneous physical limitations of COPD patients, so that the ability to carry out daily activities does not directly increase self-confidence. In addition, physical activity is more influenced by clinical conditions than psychological aspects (Effing et al., 2016). *These findings differ from several pulmonary rehabilitation studies that found physical activity significantly improved self-efficacy, possibly because the current study involved respondents with varying disease severity and non-interventional conditions.* These results show that psychological factors (emotions) and literacy (information) have a more dominant role in forming *self-efficacy* than physical factors (symptoms and activities). These findings confirm the importance of a holistic approach in nursing interventions, which focus not only on the physical aspects but also on the psychological and educational aspects of the patient.

CONCLUSION

Four aspects of self-management: symptoms, activities, emotions, and information are important components that contribute to the formation of *self-efficacy* in COPD patients. The variables that have a significant effect on the *self-efficacy* of COPD patients are **emotion management and information management**, with emotion management as the most dominant factor. Therefore, nursing interventions need to be focused on improving patients' emotional regulation and health literacy skills. Patients who are able to manage these aspects well tend to have higher *self-efficacy*, which ultimately leads to improved quality of life and reduced risk of exacerbations.

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