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## **Self-care Management to Prevent Exacerbation for Patients with Chronic Obstructive Pulmonary Disease (COPD): A Systematic Review**

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### **Article info**

#### **Article history:**

Received; July 15th, 2019

Revised: July 31st, 2019

Accepted: August 20th, 2019

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#### **DOI:**

10.35654/ijnhs.v3i3.228

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**Abstract.** COPD is currently the number four cause of death in the world but is projected to be the third leading cause of death in 2020. The causes of recurrence are essential to be studied, but prevention of recurrence is preferred in implementing prevention of recurrence in COPD patients. A systematic review of studies on the prevention of recurrence and the use of technology across the lifespan. The databases, Pubmed, Scopus, Elsevier, scholar, were systematically selected in this study. The authors independently rated the reporting of the qualitative studies included. Thematic synthesis was used to analyze the data. The search identified 330 papers. Eighteen research papers met the study inclusion criteria. The review revealed that self-management is an essential factor in reducing the recurrence of COPD sufferers. Alternative models of pulmonary rehabilitation are needed to improve equitable access and outcomes associated with patients. Telerehabilitation using information technology can achieve an equivalent increase in results compared to traditional pulmonary rehabilitation. It is efficient and cost-effective to rehabilitate; the proposed telerehabilitation model is designed to be applied appropriately into clinical practice. It takes a willingness and ability to carry out the prevention of recurrence of COPD sufferers. Knowledge and mastery of information technology are expected to improve the prevention of recurrence of COPD sufferers

**Keyword:** self-care management, exacerbation, chronic obstructive pulmonary disease, a systematic review



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## **INTRODUCTION**

Chronic obstructive pulmonary disease (COPD) is one of the leading causes of chronic morbidity, loss of quality of life, and high mortality rates (1). An essential aspect of preventing recurrence is the independent aspect of the patient (2). The recurrence rate of

COPD patients should be suppressed, but the fact is that the number of relapsed patients returning to the hospital after being hospitalized is increasing.

The Global Burden of Disease Study reports the prevalence of 251 million cases of COPD globally in 2016. Globally, it is estimated that 3.17 million deaths were caused by disease in 2015 (3). COPD is reported to have an estimated disease burden of 210 million people worldwide. Globally COPD is the fourth leading cause of death (5.1%) in 2004 and is projected to occupy the third position (8.6%) by 2030, COPD is a significant cause of chronic morbidity; it was ranked 11th in 2002 and is projected to rise to seventh place in 2030. The prevalence of COPD in adults ranges from 0.2% in Japan and 37% in the USA. The Burden of Obstructive Lung Disease (BOLD) group recently reported a global average COPD prevalence of 10.1% with wide variations in participating countries (4).

The causes of recurrence are essential to study, but repetition is preferred in carrying out the prevention of recurrence of COPD patients. Self-care is a crucial element to improve self-ability and reduce the consequences of chronic diseases. Patients who are more active in maintaining and enhancing their abilities have a better quality of life and can receive and develop support from health workers (1). The concept of self-management appears as a core element in self-care as a dynamic and sustained process of self-regulation in chronic health conditions (1). This development is built on the needs of sufferers for social support, the desire to share, and the emotional union of the patient is expected to help improve the self-management ability of COPD sufferers (5).

## **OBJECTIVE**

The objective of this systematic review is to Develop self-care management as a nursing intervention for patients with COPD to preventing to determine the development of prevention of recurrence of COPD sufferers.

## **METHOD**

The research design was a systematic review with a quantitative approach specially formulated to examine a relevant quantitative study with a comprehensive analysis. Its objective was developed based on the PICO (Patient, Intervention, Comparison, and Outcome) framework (6). This systematic reporting structure using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis)(7).

The systematic review uses the inclusion and exclusion criteria, focusing on quantitative and mixed-method studies—a method using partly quantitative analysis. The feasibility analysis to represent this study is to choose sources that use the English language for the abstract as a language requirement. The publication date is limited to the current ten years, starting from 2008 to 2018. The inclusion group criterion comprises COPD patients with exacerbation, while the exclusion criterion is COPD Patients with other diseases.

The systematic search is based on the PICO electronic data framework and is carried out with the PICO framework (6). The first step is to search for electronic Pubmed, Scopus, Elsevier, scholar, were systematically searched to identify critical articles and keywords matching to 1. COPD, 2. Self Care, 3. Telenurse, 4. exacerbation, 5. Nursing Intervention. The keywords then searched for citations and full articles, including the titles, abstracts, texts, and references that contain the chosen terms. The second step is to translate the keywords to English to search for relevant articles in the electronic database. The third is to filter the result using the PICO framework to decide which articles need to have a further review according to the topic. The complete search strategy is limited in the latest ten years' period.

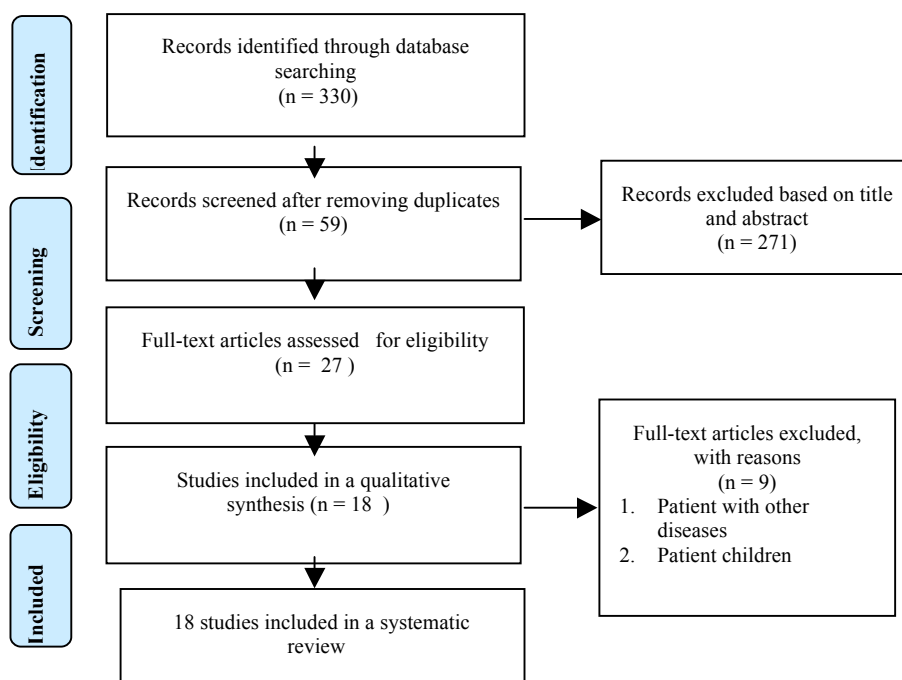
The valuation of the articles' quality implements a quantitative study tool called CASP (Critical Appraisal Skills Program). There are ten different questions used to consider the quantitative study's result, validity, and usage (8).

CASP is an evaluating instrument used to measure the quality and utility of research (9). Ten questions in CASP contain "yes", "no", and "not now" answer options for each question. Every document scored independently by three reviewers (by initial of YD, TS, and EF). The score obtained by one reviewer will then be combined with the others into a single file. If there is a different opinion among the reviewers, it must be finished in the next discussion session. The score allocation is on a scale of 10 for each article. It is viewed based on how many "yes" can an article obtain. The articles with more than 7 "yes" are regarded as very good articles. The objective of this quality review is not to differentiate one article's quality to another, but the high-quality review systematically and based on the standard processes of the available topic.

## RESULTS

### *The study selection*

The search identified 330 papers, with 59 duplicates and 271 kinds of literature deleted in the first roll due to incompatibility between the articles' title and the feasibility criterion that had been set, the final result consisted of eighteen research papers met the study inclusion criteria about self-management as an essential factor in reducing recurrence of COPD sufferers



**Figure 1.** Flow Diagram

### *The characteristic of the study*

The 86 chosen studies, based on 2008-2018 reviews, were carried out in different places. The quantitative method used in the studies covered mixed methods study, randomized controlled trial, quasi-experimental, uncontrolled random group experimental,

cross-sectional descriptive and comparative design, cross-sectional study, retrospective analysis of archived data, and quasi-randomized.

### ***The synthesis results***

The literature research process had identified 18 journals defining that self-management is an essential factor in reducing the recurrence of COPD sufferers. Alternative models of pulmonary rehabilitation are needed to improve equitable access and outcomes associated with patients.

#### *1. Self-management*

Chronic obstructive pulmonary disease (COPD) is one of the leading causes of chronic morbidity, loss of quality of life, and high mortality rates (1). An essential aspect of preventing recurrence is the independent aspect of the patient (2). Self-care is a key element to improve self-ability and reduce the consequences of chronic diseases. Patients who are more active in maintaining and enhancing their abilities have a better quality of life and can receive and develop support from health workers (1).

#### *2. Exacerbation*

Globally, the burden of COPD is projected to increase in the coming decades because it continues to be exposed to risk factors for COPD and aging of the population (10). Chronic obstructive pulmonary disease (COPD) is a life-threatening lung disease that causes shortness of breath (initially with exertion) and predisposes to exacerbations and severe illness (11). More than 90% of COPD deaths occur in low and middle-low countries.

#### *3. Development of self-care management as a nursing intervention for a patient with COPD to preventing exacerbation*

Management prevention of recurrence prevention has not yet fulfilled the client's needs in increasing patient independence in preventing recurrence. The model of developing an increase in client independence in preventing recurrence is carried out based on developments in the era and local culture. The growth that is mostly done now is using telehealth or telenursing. The results of the study show that telehealth real-time is an innovative approach that is feasible at home with the outcome of increased social support and decreased dyspnea (3)

## **DISCUSSION**

This systematic review is formulated to explore the development of self-care management as a nursing intervention for COPD patients to prevent exacerbation. Eighteen articles have been identified to discuss the issue containing corresponding objectives with this study. The design of the study that is used in the studies covers the quantitative approach.

The result of the studies shows that self-management is an essential factor in reducing the recurrence of COPD sufferers. Alternative models of pulmonary rehabilitation are needed to improve equitable access and outcomes associated with patients.

Tele-rehabilitation using information technology can achieve an equivalent increase in results compared to traditional pulmonary rehabilitation. It is efficacious and cost-effective to rehabilitate; the proposed a Tele-rehabilitation model is designed to be applied appropriately into clinical practice. It takes a willingness and ability to carry out the prevention of recurrence of COPD sufferers. COPD Self-Management Behavior Scale, symptom management, daily life management, emotional management, and information management were all positively correlated to the disease knowledge of COPD (12).

This review study has some limitations regarding the search strategy implemented in a broad context in the early stage. First, the result of this systematic review is based on

secondary findings from the previous studies. The previous studies were not explored thematically, which could result in the existence of some factors that have not been mentioned before. Second, this study focused on intervention done in patients who have taken exacerbation. It limits the recorded data. Yet, this study is designed to acquire specific data in the context of exacerbation, which can be used to patients with the prevention of recurrence was carried out when the patient is in control. Strategies have not been carried out to prevent COPD recurrence through patient independence. Limitations of research: self-care is a condition that depends on each person. it takes a strong will from each person to improve their ability to prevent a recurrence

## CONCLUSION AND PRACTICAL IMPLICATION

This systematic review is aimed to explore the intervention of the development of self-care management as a nursing intervention for patients with COPD to preventing exacerbation. The results show that self-management is an essential factor in reducing the recurrence of COPD sufferers. Alternative models of pulmonary rehabilitation are needed to improve equitable access and outcomes associated with patients. The limitations of the study include the small sample size, the short intervention duration, and the unavailable try-out from a different region. There needs to be a further study of the development of self-care management as a nursing intervention for COPD patients to prevent exacerbation.

Alternative models of pulmonary rehabilitation are needed to improve equitable access and outcomes associated with patients. Telerehabilitation using information technology can achieve an equivalent increase in results compared to traditional pulmonary rehabilitation. It is efficacious and cost-effective to rehabilitate; the proposed telerehabilitation model is designed to be applied appropriately into clinical practice. it takes a willingness and ability to carry out prevention of recurrence of COPD sufferers

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Table 1. Data extraction

No	Title, Author, Years	Research Design	Sample	Variable	Result
1	Information and communication technology use in asthmatic patients (13)	Cross-sectional	673 patient	Education, Information Technology	Social media as appropriate for certain types of patients
2	Real-Time Telehealth for COPD Self-Management Using Skype™ (3)	A randomized control study design with repeated measures	22 respondent	Social support and assessment of dyspnea	Telehealth real-time is an innovative approach that is feasible at home due to increased social support and decreased dyspnea.
3	Community-based physiotherapeutic exercise in COPD self-management (14)	A randomized controlled trial	153 respondent	Behavior modification; COPD; Exercise; Physiotherapy; Self-management	There were no differences found in other CRQ components, anxiety and depression scores and free fat period
4	Nursing clinical practice changes to improve self-management in chronic obstructive pulmonary disease (15)	Observation	53 nurse 99 Patient	nursing clinical practice healthcare model, the organization of healthcare the documentation of a support decision-making process	self-management development skills it is necessary to change effective nursing clinical practice. This study has demonstrated the relevance of a portfolio of techniques and tools to help patients adopt healthy behavior.
5	Patient participation during and after a self-management programme in primary healthcare (16)	Observation	36 patients	Person-centered care Patient participation Self-management programme	Patients describe equality in personal interactions, opportunities for sharing and discussion, and willingness to share and learn to facilitate patient participation in self-management programs. Consequently, patient engagement is promoted by a match between individual personal characteristics and the context
6	An intervention for pulmonary rehabilitators to develop a social identity for patients attending exercise rehabilitation (5)	a pilot randomized control trial protocol	two pulmonary rehabilitation center in the UK	COPD, Group intervention, Identity, Quality of life	The first study to adopt a social identity approach to develop rehabilitated management group interventions for COPD patients attending pulmonary rehabilitation
7	Telerehabilitation versus traditional center-based pulmonary rehabilitation for people with chronic	Protocol for a randomized controlled trial	two pulmonary rehabilitation center in the Melbourne	Exercise training Chronic Respiratory Questionnaire – dyspnea domain (CRQ-D).	Alternative models of pulmonary rehabilitation are needed to improve equitable access and outcomes associated with patients. This trial will determine

No	Title, Author, Years	Research Design	Sample	Variable	Result
	respiratory disease (17)			work rate test, physical activity and quality of life	whether Telerehabilitation can achieve an equivalent increase in results compared to traditional center-based pulmonary rehabilitation. The proposed telerehabilitation model is designed to be quickly applied to clinical practice if it is efficacious and cost-effective.
8	Home-Based Physical Activity Coaching, Physical Activity, and Healthcare Utilization in COPD: COPD-SMART Secondary Outcomes (18)	secondary outcome analysis of the Activation of Self-Management of Obstructive Lung Research	325 respondent	Secondary outcomes of physical activity and healthcare utilization	viable and generalizable home-based training interventions can reduce sedentary behavior and increase physical activity levels. This intervention can minimize the use of health services related to lung disease in those with severe COPD.
9	self-management behaviors to reduce exacerbation impact in COPD patients: a Delphi study (19)	a Delphi study	17 self-care management	Stable phase behavior Symptom phase Recovery phase	Future research should focus on developing more comprehensive patient interventions that support patients in self-management behaviors associated with exacerbations.
10	Pulmonary rehabilitation in patients with an acute exacerbation of the chronic obstructive pulmonary disease (10)	Article review	20 randomized controlled trials comparing pulmonary rehabilitation after exacerbation of COPD versus conventional care	Acute exacerbation; chronic obstructive pulmonary disease; exercise; rehabilitation;	Overall, the evidence supports moderate to significant effects on the quality of life-related to health and exercise capacity. However, there was substantial heterogeneity throughout the study
11	Barriers and facilitators to self-management of chronic obstructive pulmonary disease: views of patients and healthcare professionals (20)	Qualitative systematic review	31 studies	Self-management Knowledge and communication	Psychosocial needs of patients must be prioritized with treatment and exacerbation management
12	Effect of Self	quasi-	36	Self Management	Self-management education

No	Title, Author, Years	Research Design	Sample	Variable	Result
	Management Education on Empowerment of Patients with Chronic Obstructive Pulmonary Disease (COPD) at RSUD Wangaya Denpasar (21)	experiment pre-test and post-test control group design	respondent	Education,	is effective in increasing the empowerment of COPD patients but has not been effective in reducing COPD symptoms.
13	Factors influencing self-management in chronic obstructive pulmonary disease (22)	integrative review	integrative review using prospective research questions	Self-management	Collaborative care is needed between patients and health care providers to facilitate patients in management who are confident about their condition
14	Home-based pulmonary rehabilitation for people with COPD: A qualitative study reporting the patient perspective (23)	qualitative study	13 patients with chronic obstructive pulmonary disease (COPD) who undergo home-based pulmonary rehabilitation (HBPR)	Home-based pulmonary rehabilitation	Participants appreciate the flexibility and convenience of the program. Participants also highlighted the importance of social support received, both from physiotherapists by telephone and from family and friends who encouraged their participation.
15	Original Research Evaluation of the National Health Service (NHS) Direct Pilot Telehealth Program: Cost-Effectiveness Analysis (24)	Remote Monitoring	321 patients PCTs	Cost-Effectiveness	There are significant differences in the results of two PCTs
16	Promoting chronic disease management in persons with complex social needs (25)	A qualitative descriptive study	37 participant	Chronic disease management, health equity, social determinants of health, COPD, qualitative research	The ability of participants to manage chronic disease was profoundly influenced by contextual and personal factors, such as poverty, disability, personal attitudes and beliefs (including shame, mistrust, and hopelessness), and barriers inherent in the organization of the healthcare system
17	Patient perceived impact of nurse-led self-management interventions for COPD	A systematic review of qualitative research	six electronic databases-defined keywords	Chronic obstructive pulmonary disease Disease management	When provided with adequate knowledge and support, patients gained self-confidence, and their coping behavior increased. Social

No	Title, Author, Years	Research Design	Sample	Variable	Result
(26)			were used to identify qualitative or mixed methods English-language studies published in any year	Nurse-led clinics Self-care	and psychological support were identified as critical aspects of self-management interventions that patients found to improve their sense of well-being
18	Disease knowledge and self-management behavior of COPD patients in China (12)	A systematic review of qualitative research	360 COPD patients	knowledge and self-management behavior	COPD Self-Management Behavior Scale, symptom management, daily life management, emotional management, and information management were all positively correlated to the disease knowledge of COPD.