



Treatment Preference for Patients with Chronic Obstructive Pulmonary Disease: A Review

Agung Rejcky^{1*)},², Erna Rochmawati¹

¹ Master of Nursing Universitas Muhammadiyah Yogyakarta

² RS Paru Respira Yogyakarta

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ABSTRACT

Chronic Obstructive Pulmonary Disease (COPD) is a chronic illness that requires regular treatment to relieve symptoms and reduce the frequency of relapses and the severity of exacerbations. Treatment options for COPD are pharmacological and non-pharmacological therapies, and patients can prefer the type of treatment. The inhaler is one of the options for pharmacological therapy, where there are several types of inhalers, including metered dose inhalers (MDI), soft mist inhalers (SMI) and dry powder inhalers (DPI). To date, there is no synthesis on the patient's preference of treatment for COPD. The review aimed to synthesize available evidence on patients' preferences for COPD treatment. Three databases, which include PubMed, Ebsco, and Scopus, were searched using terms related to "Patient Preference", "Preference Treatment", "Chronic Obstruction Pulmonary Disease", and "Chronic Airway Obstruction Disease". From the three databases, 2,757 articles were obtained and screened from a title with EndNote to remove duplication. The author and the team discuss the abstract and the full text to decide whether it meets the inclusion criteria. A total of 10 articles were included. We found patients prefer dry powder inhalers, spray inhalers, and relaxation by imagining a beautiful place as an option. The results of the literature review show that there are several preferences for COPD therapy; DPI inhalers are preferred because they are easy to use and have a low error rate.

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Kata kunci:

Pilihan terapi
PPOK
terapi PPOK
inhaler bubuk halus

*) corresponding author

Agung Rejcky

School of Master in Nursing at Universitas Muhammadiyah Yogyakarta

IGD RS Paru Respira Yogyakarta, Jl.
Panembahan Senopati no 4 Palbapang
Bantul, Daerah Istimewa Yogyakarta 55713,
telp (0274) 367326

Email: agungnyailham@gmail.com

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ABSTRAK

Penyakit Paru Obstruktif Kronik (PPOK) adalah penyakit kronis yang memerlukan pengobatan secara teratur untuk meredakan gejala, mengurangi frekuensi kekambuhan dan tingkat keparahan eksaserbasi. Pilihan pengobatan untuk PPOK adalah terapi farmakologis dan nonfarmakologis, dan pasien dapat memilih jenis pengobatan. Inhaler merupakan salah satu pilihan terapi farmakologi, dimana terdapat beberapa jenis inhaler diantaranya metered dose inhaler (MDI), soft mist inhaler (SMI) dan dry powder inhaler (DPI). Sampai saat ini, tidak ada sintesis pada preferensi pengobatan pasien dengan COPD. Tinjauan ini bertujuan untuk mensintesis bukti yang tersedia tentang preferensi pasien terhadap pengobatan PPOK. Tiga basis data yang meliputi PubMed, Ebsco, dan Scopus dicari menggunakan istilah-istilah yang terkait dengan "Preferensi Pasien", "Pengobatan Preferensi", "Penyakit Paru Obstruksi Kronis", dan "Penyakit Obstruksi Jalan Napas Kronis". Dari ketiga database tersebut diperoleh 2.757 artikel, dan disaring dari judulnya dengan EndNote untuk menghilangkan duplikasi. Penulis dan tim berdiskusi untuk menentukan abstrak dan teks lengkap untuk memutuskan apakah memenuhi kriteria inklusi. Sebanyak 10 artikel dimasukkan. Kami

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menemukan pasien lebih memilih inhaler bubuk kering (DPI), inhaler semprot (SMI), dan relaksasi dengan membayangkan tempat yang indah sebagai pilihan. Hasil tinjauan pustaka menunjukkan bahwa terdapat beberapa preferensi untuk terapi PPOK yaitu penggunaan inhaler DPI lebih disukai karena mudah digunakan dan memiliki tingkat kesalahan yang rendah.



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INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a lung disease characterized by progressive airflow limitation and associated with an inflammatory response of the lung to noxious or noxious particles or gases (GOLD, 2015). This disease occurs for a long time, accompanied by increased airflow resistance (Padila, 2012). COPD can lead to emergency conditions and even death. Deaths due to COPD are ranked third in the world (Terzikhan et al., 2016). COPD deaths are ranked fourth in Indonesia after cardiovascular disease, cancer, and diabetes mellitus (Kementrian Kesehatan RI, 2017).

Persistent respiratory symptoms and airflow limitation characterize COPD. COPD occurs because of an abnormal airway and alveolus, usually caused by exposure to harmful gases or particles (GOLD, 2017). An unhealthy lifestyle like smoking causes COPD cases (Rosha et al., 2018). The incidence of COPD caused by a smoking lifestyle reached 95% (Oemiati, 2013). In addition to an unhealthy lifestyle, increasing age also affects driving COPD (Safka et al., 2017), of which 29.07% occur in the pre-elderly period (Hariyanti et al., 2013). In the 40–70 year age group in Japan, the prevalence is 10.9% and at the age > 70 years the prevalence increases to 24% (Tan, 2008).

Management of patients with COPD depends on the severity of the occurrence. COPD management aims to reduce the severity, reduce symptoms, improve the body's activities, avoid and provide treatment when an emergency occurs, and avoid death (GOLD, 2015). Several therapeutic options can be used as COPD treatment options: pharmacological therapy (drugs) and non-pharmacological therapy (supportive therapy) (Kementrian Kesehatan RI, 2008). Pharmacological therapy includes administering medications, including bronchodilators. In contrast, non-pharmacological therapy can be pulmonary rehabilitation, such as deep breathing relaxation techniques (Endrian et al., 2016) and inflatable balloon therapy (Tunic et al., 2017).

The use of inhaled bronchodilators has been in great demand because of their ease of use (Schroeder et al., 2020).

The use of inhalation is also chosen because the respiratory tract can directly feel it, and it is more effective because used in small doses so that it is possible to reduce systemic effects. The types of bronchodilators that are often used are nebulizers and inhalers. The use of nebulizers in hospitals because of the need for supervision by health workers, both doctors and nurses, in their use (Tiddens et al., 2014), although it is possible to use a nebulizer at home. At the same time, inhalers are relatively safe and can be used by patients independently outside the hospital. Inhalers consist of several types of preparations, namely metered dose inhalers (MDI), soft mist inhalers (SMI), and dry powder inhalers (DPI) (Gilbert et al., 2018). The simple form and easy use make MDI much preferred, but this type of inhaler is

considered low in drug delivery (Melani et al., 2011), so the effect in reducing COPD complaints is common (Hamdan et al., 2013). SMI is a type of inhaler that contains liquid medicine, which is used by spraying aerosols produced from the device; its use is accessible, so the risk of incorrect use of this type of inhaler is relatively low (Hickey et al., 2019). DPI inhalers are also widely preferred. The form of this inhaler is the same as the MDI and SMI types, namely the similarity in portable use. This type of DPI is available in portable device preparations filled with drugs in the form of chemical powder granules (Kendre, 2016). The use of DPI is relatively easy (Patil et al., 2012). Because this type does not use a stimulant like a spay, it is enough to inhale the DPI type when using it.

Non-pharmacological therapy options are chosen to reduce the symptoms that arise. Usually, the use of non-pharmacological therapy is combined with pharmacological treatment options such as the use of inhalers. Several types of non-pharmacological therapy include pulmonary rehabilitation and relaxation techniques. Breathing and light exercise can do pulmonary rehabilitation and nutrition to increase immunity. Exercise therapy to increase lung capacities, such as light exercise, breathing exercises, and improving nutritional intake, can be a supportive therapy option in patients with stable conditions (Budweiser et al., 2008). The use of relaxation techniques can also be used by patients, especially patients with excellent and harsh conditions.

Given that there are several treatment options for patients with COPD, and they have been carried out for a long time, this literature review was compiled to determine which patients with COPD choose treatment therapy.

METHOD

The study is a review. We follow PRISMA for reporting the findings. The literature review used comprehensive and relevant database search techniques, such as PubMed, Ebsco, and Scopus. The search used terms related to Patient Preference, Preference Treatment, Chronic Obstruction Pulmonary Disease, and Chronic Airway Obstruction Disease. The investigation used additional Boolean phrases AND or OR to make it easier to search for each database. The search results obtained 2,757 articles, and database searches were collected from 2000 to 2021.

Determining the literature to be reviewed was limited by inclusion criteria. Inclusion criteria included articles published from 2000 to 2021, English articles, and patients with COPD aged above or above 40 years.

The results of a database search through Pubmed, Scopus, and Ebsco with keywords found 2,757 research articles, then screening with EndNote was carried out for 322 duplicate reports so that there were 2435 articles remaining. Sixty-

nine articles were selected from the title and abstract screening. In the final stage, the author read the full text and discussion and obtained exclusion criteria which included

the discrepancy between the article's year of publication, the population's age, and the article's topic totalling 30 articles, so that the articles reviewed were ten articles.

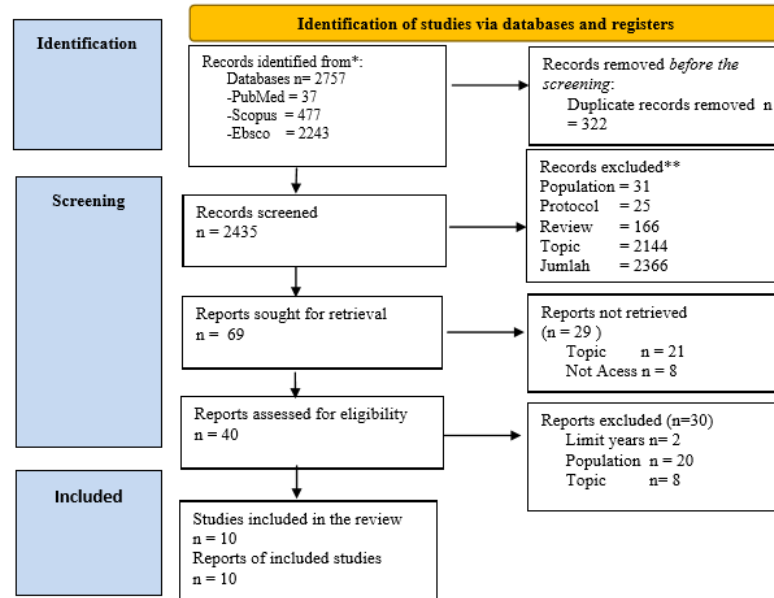


Diagram 1. Prisma Diagram

RESULTS AND DISCUSSION

The ten articles were from several developed countries; three research articles from Japan, two from the USA, one from Netherlands, Italy, and England, and two articles whose research was conducted in more than one country. The type of research in the articles reviewed is not limited to only qualitative or quantitative research. The research design was varied among ten articles reviewed: preference study, open-

label clinical observational study, randomized open-label crossover study, open label-cross over the study, comparative assessment, open-label clinical trial with no randomization, randomized open-label multicentre crossover study, randomized crossover trial investigator and two articles using a cross-sectional survey design. Of the ten articles reviewed, there were 1,701 participants who were patients with COPD over 40 years of age.

Table 1. Extraction Data

No	Author, Year	Country	Design	Participants	Data Collection	Finding
1	Dal Negro et al., 2016	Italy	Preference study	Outpatients with airways amounted to 333 patients consisting of 175 patients with bronchial asthma and 158 patients with COPD). aged 55-58 years.	The Handling Questionnaire	DPI Genuair was preferred by 50% of participants compared to DPI Breezhaler and Handihaler, only 29%.
2	Davis et al., 2017	USA	Cross-sectional survey	503 patients with COPD, aged 40-75 year	PASAPQ, and best-worst scaling (BWS) questions.	Soft mist inhalers were reported to be more satisfactory by some participants. the performance of the inhaler is more important than the comfort of use
3	Hanada et al., 2018	Japan	Open-label clinical observational study	57 patients with COPD, aged 40 years and over, had a history of smoking and, three months before the study, were in stable condition without any exacerbations	Comprised two surveys with quasi-naire	Spray inhaler was preferred by 45.6% compared to DPI, only 17.5%. In the survey two years later, the use of inhaler spray increased to 79.5%
4	Hyland et al., 2016	England	Cross-sectional survey	20 patients with COPD: male seven patients, female 13 patient	Interview	A relaxation technique by thinking of a beautiful place was preferred.

5	Kirby et al., 2015	USA	A randomized, open-label, crossover study	The number of respondents was 287 patients with COPD, with criteria for men and women who were not pregnant; the respondent's age was at least 40 years, smoked or had a history of smoking. Of the 287 patients, 134 were male, and 153 were female	Using the demonstration, preference question versions	More choose Ellipta DPI over Diskus DPI, preferably once a day
6	Komatsu et al., 2018	Japan	Open label-cross over the study	The number of respondents was 150 patients with COPD: 75 male and 75 female. The age of the respondents is between 40-64 years and ≥ 65 years, with a ratio of 1:2	Self-completed questionnaire	ELLIPTA DPI is easier to use and has fewer errors, so many people like it
7	O'Hagan et al., 2018	Brazil, Japan, Italy, Australia	Comparative assessment	The number of respondents was 240 patients with COPD: 107 male respondents and 133 female respondents who were divided equally in Australia, Brazil, Germany, and Japan. They are participants with maintenance inhaler-naive	Instructions given to participants are each to use (IFU), equivalent to a commercial product leaflet.	DPI was preferred over spray inhalers because it is easy to use and learn.
8	Ohno et al., 2018	Japan	An open-label clinical trial with no randomization	The research respondents were 28 patients consisting of 26 male and two female patients with a minimum age of 40 years, smoking one year ten packs of cigarettes, and three months before the study in a stable condition without any exacerbations.	The shortness of breath scale used in this questionnaire uses a modified Medical Research Council (mMRC). Before and after treatment, a COPD (CAT) assessment was performed.	Patients who chose COPD treatment with DPI were more effective, and the effect lasted longer.
9	Palen et al., 2013	Netherlands, Germany	A randomized, open-label, multicentre, crossover study	The number of respondents was 129 patients consisting of 87 male patients and 42 female patients with a minimum age of 40 years.		After two weeks of a trial using DPI Genuair, participants significantly preferred DPI Genuair by 79.1% compared to Handihaler by 20.9%
10	Palen et al., 2013	Netherlands	A randomized crossover trial investigator	129 patient age ≥ 40 years; 87 male patients, 42 female patients	Demonstrated	Diskus DPI (73%) was preferred over Elpenhaler DPI (27%)

The standard therapy recommended by GOLD (2020) includes using a short-acting beta-agonist (SABA), a type of beta-agonist that works quickly so that it can be used in conditions of sudden onset COPD. SABA therapy is available in several kinds of inhalers or nebulizers. In addition, GOLD (2020) also recommends long-acting beta-agonist (LABA) therapy, long-acting muscarinic-agonist (LAMA), and inhaled corticosteroid (ICS). Triple combination therapy is recommended to increase lung function capacity and avoid the risk of exacerbations (Lipson et al., 2017). Several options in self-management education include training in inhalers, training in breathing techniques, and education for early signs of acute exacerbations (Singh et al., 2019). The use of L-shaped inhaler therapy is the most preferred and preferred pharmacological therapy (Chouaid et al., 2019).

Based on the literature obtained, several different preferences regarding COPD therapy were revealed. In general, COPD's therapeutic choices are considered simple, safe, and productive. A soft mist inhaler, better known as a spray inhaler, does not contain propellant and produces fine

fractions or aerosols. In general, its use is enough to be sprayed using a tool in the mouth. Inhaler spray was chosen as a COPD therapy preference because it was more satisfactory. The PASAPQ score showed that most participants were either very satisfied or satisfied. Only 20% of the participants were dissatisfied (Davis et al., 2015). Another article also mentioned that spray inhalers were also a COPD therapy preference. Inhaler spray was preferred by 45.6% compared to DPI, only 17%. In the second survey conducted two years later, inhaler spray increased to 79.5% (Hanada et al., 2015).

However, another article stated that DPI was a preference for COPD therapy. DPI is not the same as a spray inhaler (Ohno et al., 2014) (O'Hagan et al., 2018). If the spray inhaler produces an aerosol when sprayed, then DPI is enough to be inhaled to enter the inhaler drug. DPI is an inhaler containing a dry powder in a capsule with a particular device. Since DPI is a PROFIT, its use is more extended; therefore, the participants preferred DPI because it was more effective and lasted longer (Ohno et al., 2014). DPI was selected over spray

inhalers because they were easy to use and learn (O'Hagan et al., 2018).

The DPI dose varies depending on the single and multi-dose type. Two articles stated that participants preferred single-dose DPI over multi-dose DPI. The ease of calculating the dose, the number of steps required, the size of the inhaler, the convenience of the mouthpiece, and the comfort of opening, were the reasons for participants to prefer single-dose DPI (Yun Kirby et al., 2015) so that there were fewer errors in its use (Komase et al., 2014). In contrast, another article stated that multi-dose DPI was preferred by 50% of participants compared to single-dose DPI, which was only 29% selected (Dal Negro et al., 2016). Multi-dose DPI was chosen because it was user-friendly. After two weeks of a multi-dose trial, participants significantly preferred a multi-dose DPI of 79.1% over a single-dose of 20.9%; $p < 0.0001$ (van der Palen et al., 2013a). Multi-dose DPI (73%) was preferable to single-dose DPI (27%) because it was easier to instruct with fewer inhalation errors. Van der Palen et al. (2013b) also stated that multi-dose DPI (73%) was preferable due to its practicality and association with fewer inhalation errors.

COPD treatment preferences are not limited to pharmacological therapy. Non-pharmacological therapy is also a preference in COPD therapy. 12 out of 20 respondents chose relaxation techniques by imagining a beautiful place compared to other relaxation techniques, namely body relaxation, calculations, repetition of words, positive images, and body movements (Hyland et al., 2016).

LIMITATION OF THE STUDY

This review study uses a limitation of articles published in 2000–2021, with male and female patients with COPD over 40 as the subject. However, there are limitations to the review. We only searched and included literature published in English, which may have caused the exclusion of relevant information from studies reported in languages other than English. In addition, the date and language limitations that we set may affect the generalizability of the research and may have excluded some topics.

CONCLUSIONS AND SUGGESTIONS

The results indicated several COPD therapeutic preferences; DPI inhalers and non-pharmacological. DPI inhalers were preferred because of their simplicity and low error rate. The preferred DPI was DPI with multiple doses. In comparison, the relaxation technique of imagining a beautiful place was a non-pharmacological preference chosen.

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Conflict of Interest Statement

The author declares no conflict with other parties related to this research.

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