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Research Article

# Nursing Implementation Case Study: Health Education on Self-care Management of Asthma Patients During the COVID-19 Pandemic in Indonesia

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**Abstract.**
Asthma is an incurable disease and is considered a risk factor for the morbidity of COVID-19. Self-care management is highly recommended as routine maintenance therapy, especially during the pandemic. This study aims to describe the nursing implementation related to health education about self-care management of asthma patients during the pandemic in Indonesia. This study used an exploratory case study method using the nursing process approach. The data were obtained using purposive sampling. The data were collected in various ways, such as interviews, physical assessments, and environmental observation. The nursing problems identified were ineffective breathing patterns and non-compliance. After implementing nursing through health education on self-care management, it was found that the development of the situation had improved. Nursing implementation through health education on self-care management in asthma patients can be applied to optimize asthma symptom control, reduce the risk of asthma exacerbations, and reduce the side effects of treatment, especially during the COVID-19 pandemic.

**Keywords:** implementation of nursing, health education, self-care management, asthma, COVID-19

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## 1. Introduction

COVID-19 has become a pandemic in the world. The clinical picture of COVID-19 and asthma cases have something in common. The SARS-CoV-2 virus will make symptoms worse and cause other complications [1]. Asthma is considered a risk factor for the morbidity of COVID-19, and this may result from the SARS-CoV-2 virus, like other respiratory viruses, as a trigger for asthma exacerbations [2]. Asthma patients should be cautious in taking their medication to contribute to reasonable disease control [3]. Self-care management of patients with asthma is recommended as routine maintenance therapy, especially during the COVID-19 pandemic [3].

Well-controlled asthma is the best intervention to treat mild SARS-COV2 infection. The consumption of inhaled corticosteroids can help control inflammatory disease in asthmatic patients. Under no circumstances should a drug prescribed by a doctor be discontinued on the assumption that it can damage the immune system [2]. Respiratory symptoms in asthma patients include wheezing, dyspnea, and coughing, which vary from time to time with varying intensity [4]. The prevalence of asthma is still a problem in health care in the community through loss of productivity due to asthma, which can interfere with activities and impose a disturbance or burden on the family system [5]. World Health Organization (2011) estimates that about 15 million Disability-Adjusted Life Years (DALYs) die from asthma. Deaths due to asthma occur around 250,000 worldwide [6]. During 2008, 57 million deaths were recorded globally, of which 36 million were caused by non-communicable diseases (PTM). Deaths from non-communicable diseases are projected to increase by 15% globally between 2010 and 2020. The most significant increases have occurred in the East Mediterranean and Southeast Asian countries, where they are expected to increase by more than 20%. The Hospital Information System data results for 2015 - 2017 also show that the highest prevalence of asthma is in the 45-64 year age group, with a prevalence rate ranging from 26.7-31.3% [7].

During the pandemic, the prevalence of COVID-19 among asthma patients was 9%. Forty-five percent (45%) of patients with COVID-19 received non-invasive respiratory support through a non-rebreathing mask [8]. As of April 28, 2020, the number of confirmed COVID-19 cases surpassed 2.9 million worldwide, and the death toll from the disease reached 200,000. In Sweden, diagnosed cases of COVID-19 exceeded 18,000, and related deaths reached 2,200 as of the same date. Asthma and diabetes are considered to be at high risk of developing severe COVID-19 symptoms, which require hospitalization [9].

Asthma control can be done through health education with self-care management [10]. Asthma education by health care professionals is the key to achieving asthma's effective self-care management [11]. Higher the family's role in self-management, the lower the recurrence rate of asthma [12]. Family of patients with asthma plays a vital role in preventing and controlling the disease so that it does not recur or worsen through self-management [13]. The purpose of this research is to provide the ambition of the nursing implementation related to health education on self-care management in asthma patients during the COVID-19 pandemic.

## 2. Patient information

A patient named Mrs. S, 46 years old, who lives in Sukun, Malang, Indonesia, has migrated with her family and opened a food stall in front of her house. Her level of education is elementary school. Currently, she lives with her husband (Mr. S) and two daughters (Ms. A and Ms. F). She has had asthma for four years. She was diagnosed with asthma after a three-weeks perdurable cough. Her child accompanied her to a public health center to have her health checked. Then, the health center referred her to a hospital in Malang for further treatment. She underwent bronchodilator therapy in the hospital, then used an inhaler (Symbicort) and other asthma medications under the doctor's prescription. During the examination, Mrs. S weighed 59 kg, was 145 cm tall, had 100/60 mmHg blood pressure, 71x/min pulse rate, and 23x/min respiration rate.

The client said that she never had her health checked for two years and no longer consumed inhalers and medicine due to boredom. She used to take medication and have a medical check-up once in two weeks to a month. She informed me that her condition worsened only when exposed to pollutants or in cold weather. She felt tight and then consumed warm water and rested to overcome it. She also felt anxious to return to the hospital for control during the current COVID-19 pandemic.

## 3. Method

### 3.1. Research Design

This case study uses an exploratory case study method. The population of this study was asthma sufferers who are under treatment at home. The sample of this study, a case of home-treated asthma, was obtained with purposive sampling. The inclusion criteria comprise an asthma patient who lives with family at home, can communicate well, read and write correctly, and is willing to be assessed and intervened by the researcher. Meanwhile, the exclusion criteria comprise an asthma patient with severe complications, treated at a hospital, and tested or whose family member tested positive for COVID-19 by the local health service.

### 3.2. Instrument

The instrument used for data collection is Friedman's family nursing assessment – a family assessment model integrating system theory, family development theory, and

functional-structural theory as the main theories based on models and family assessment tools. [14]. The data were collected through interviews, observation, and physical examination. The nursing implementation used is adopted from the Indonesian Nursing Diagnostic Standards (IDHS), the Indonesian Nursing Intervention Standards (SIKI), and the Indonesian Nursing Outcomes Standards (SLKI) (Figure 1).

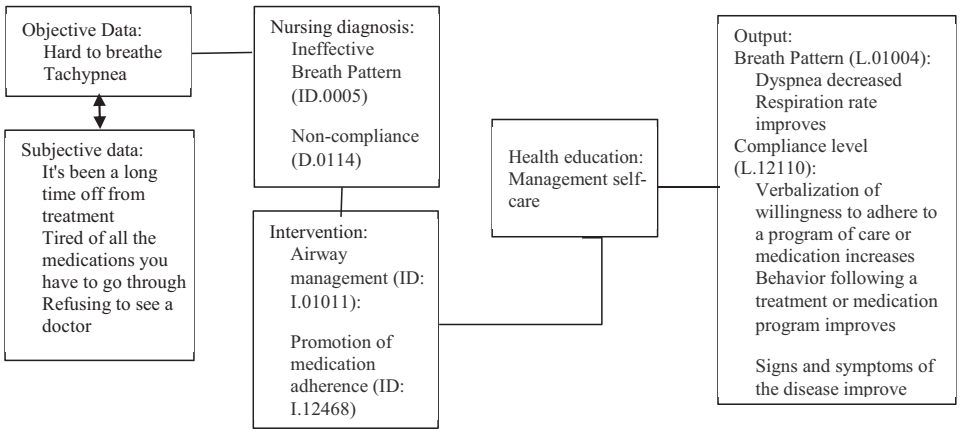


**Figure** 1: Implementation Model of Health education management self-care for asthma patients during the Covid-19 pandemic.

Nursing implementation in health education about self-care management in Asthma patients includes airway management and health promotion, and medication adherence (Table 1).

## 4. Results

### 4.1. Ineffective Breathing Pattern

Significant data indicate ineffective breathing patterns. Mrs. S informed that she suffers from shortness of breath (dyspnea) and dry cough, especially at night, and is exposed to smoke and pollutants. Meanwhile, the client's objective data showed that she has prolonged expiration, with abnormal breathing patterns (tachypnea) with a respiratory rate of 23x/min. In general, an ineffective breathing pattern is a condition in which the ventilation or ventilation of inspiratory and expiratory air is inadequate. For minor data, objective data show that Mrs. S's vital capacity decreased with a weak pulse of 71x / minute.

Table 1: Implementation of Health Education About Self Care Management in Asthma Patients.

| Session | Method | Theme | Content | Duration (minutes) |
|---|---|---|---|---|
| 1 | Face-to-face education on self-care managemer | Airway Manage-ment in asthma Patients | Opening (asking the patient's current state and complaint) Monitoring the client's breathing pattern (frequency, depth, breadth effort) and additional breath sound (wheezing) Educating the patient about asthma symp-toms and complementary therapies to treat shortness of breath, such as: Lying in semi-fowler position during rest or sleep Drinking warm water Encouraging regular consump-tion of medicines and inhalers under doctor's prescription Question and answer | 20 |
| | | | | |
| | | | | |
| 2 | Face-to-face education on self-care managemer | Health Promotion and Treatment Adherence | Providing information regarding asthma (understanding, signs, symptoms, risk factors, complications, etc.) Motivating the patient to continue and adhere to the treatment Involving the family as the supervision of taking medication Advising the patient to avoid triggers of asthma recurrence in the home environment Explaining how to treat asthma to the patient's family Describing the necessary diets and food prohibition Providing information regarding the application of a healthy and clean lifestyle during the COVID-19 pandemic Question and answer | 25 |

### 4.2. Disobedience

Based on the subjective data, the subject's non-compliance was shown when she refused to go to the doctor, even though her child had always reminded her and was willing to take care of the medication. She never had her health checked for two years and worried about returning to the hospital for control during the current COVID-19 pandemic. When she felt tight, she consumed warm water and rested to overcome it. Meanwhile, based on the objective data, she neither took medication nor regularly controlled her health. The essential data show that she suffered from dyspnea, coughing, and wheezing.

## 5. Discussion

## 5.1. Ineffective Breath Pattern

Ineffective breathing patterns become the primary nursing diagnosis in patients with asthma. Asthma is an inflammatory disease of the respiratory tract with characteristics such as inflammation of the airways, narrowing airway smooth muscle, mucus production, and edema, causing airway obstruction and air trapping. Its clinical symptoms are coughing, wheezing, and dyspnea with various degrees, severities, and frequencies [15]. Factors causing asthma are heredity, allergies, infections, environmental factors, and other factors from inside the body. The problem of ineffective breathing patterns in asthma patients will be characterized by inadequate ventilation caused by airway narrowing [16].

According to C. Gautier and D. Charpin (2017), this nursing diagnosis is a significant problem since the most important basic human need is oxygen, where ineffective breathing patterns will interfere with oxygen exchange that enters and leaves the lungs [11]. A decrease in lung expansion without breathing makes the respiratory rate abnormal, which causes ineffective breathing patterns. Interventions given are managing the airway by monitoring breath patterns and additional breath sounds, recommending resting or lying down in a semi-fowler position, consuming warm water when the difficulty recurs and regularly using an inhaler under a doctor's prescription.

## 5.2. Disobedient

The problem of non-adherence occurs due to the lifelong treatment of asthma patients. According to Hinchageri et al., the factors affecting non-adherence in asthma patients are the lack of patients understanding of medication, the lack of patients knowledge of inhaler use techniques, and patients' disregard for consuming medicine [17]. Meanwhile, non-compliance refers to the behavior of individuals and caregivers who disobey the treatment plan or agreement with the health workers, which results in ineffective treatment [18]. Non-adherence to therapy or medication may cause adverse effects, one of which is the uncontrolled and frequent recurrence of asthma [19]. Self-care management is critical to increasing patients' compliance with asthma treatment [20].

Therefore, asthma can be overcome by educating the patients regarding the disease and demanding their compliance and discipline in consuming drugs and visiting health services. One of the seven management components is providing long-term treatment with collaborative action with other health teams such as administering drugs, inhalation,

breathing massage, and prescribing treatment for acute attacks with regular control and maintaining a healthy lifestyle [21].

## 5.3. The Effectiveness of Self-Management Care for Asthma Patients During the COVID-19 Pandemic

Self-care management in asthma patients aims to alleviate daily asthma attacks. Successful asthma control requires commitment from health workers and patients to create a sustainable asthma management plan, including diagnosing and choosing the right medication, identifying and avoiding the causes of an asthma attack, educating patients and families about asthma management, and monitoring and modifying asthma treatment during the COVID-19 pandemic.

Based on the evaluation results of assessment and monitoring, the patient's behavior regarding self-care management of asthma is in a suitable category. The patient is well aware of asthma, including its signs, symptoms, causes of recurrence, and complications. In terms of education, patients know how to handle dyspnea. Patient informed that her dyspnea lessened after she lied in a semi-fowler position and consumed warm water.

In terms of controlling environmental factors, the patient wore a mask when she went outside and avoided pollutants that can trigger her asthma. Patient also washed her hands with soap regularly and maintained a healthy lifestyle to prevent exposure to the COVID-19 virus. Meanwhile, in terms of pharmacological therapy, the patient understands how to handle and treat asthma and use the inhaler correctly. Patient also said that she would go to the hospital as soon as the pandemic ends for recovery. Patient promised to comply with the treatment.

## 5.4. Recommended Advanced Intervention Therapy

Non-pharmacological asthma treatment can be carried out by providing proper therapy to prevent and treat recurrences. The therapy can be done at home by doing effective coughing techniques and chest physiotherapy to remove excess mucus secretion. It will create a sense of comfort because the phlegm or secretions are reduced, and so the patient can breathe easily [22]. Moreover, relaxation exercises such as yoga help the patient improve blood circulation, relax, and recover from an asthma attack. It is recommended as a non-pharmacological adjunct method to increase the treatment efficiency of in-home nursing practice [23].

## 6. Conclusion

The problems of self-care management in asthma patients during the COVID-19 pandemic are ineffective breathing patterns and non-compliance. These problems are the results of inadequate self-care management. It is essential to implement self-care management for asthma patients during the COVID-19 pandemic. It helps the patient and family extend the knowledge regarding assessment, monitoring, education, environmental factors, and pharmacological therapy regarding the disease. The patient and her family's awareness in identifying and avoiding the causes of asthma proves that self-care asthma management during the COVID-19 pandemic is effective.

## Author contribution

All authors contributed to the study's conception and design. Material preparation, data collection, and analysis were performed by Yoyok Bekti Prasetyo, and Adellia Putri. The first draft of the manuscript was written by Yoyok Bekti Prasetyo and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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