International Journal of Public Health
Volume. 1 No. 2 June 2024
e-ISSN: 3047-5228; dan p-ISSN: 3047-5236, Hal. 54-63
DOI: https://doi.org/10.62951/ijph.v1i2.28

Home Based Walking Exercise For Nursing Interventions

Huwaina Af'idah
Nursery Study Program, Sekolah Tinggi Ilmu Kesehatan Columbia Asia Medan

Correspondence email : huwaina301286@gmail.com

Abstract , *Chronic Obstructive Pulmonary Disease (COPD) is a lung condition characterized by persistent and typically progressive respiratory symptoms and airflow limitation. This disease is associated with an excessive chronic inflammatory response in the airways and lung parenchyma due to exposure to harmful gases or particles. The objective of this study is to evaluate the changes in oxygen saturation and activity tolerance in COPD patients before and after performing home-based walking exercises, pursed lips breathing, and effective coughing. The research method used a descriptive design in the form of a case report with a nursing process approach. The instruments used included assessment sheets and oximetry to measure oxygen saturation. The study subjects were patients with COPD. The results showed that before the intervention, the patient's (Mrs. E) oxygen saturation was 96%, and she reported difficulty engaging in activities due to fatigue and shortness of breath. After three days of intervention, her oxygen saturation increased to 99%, and she was able to perform outdoor activities without experiencing shortness of breath. In conclusion, home-based walking exercises, pursed lips breathing, and effective coughing can improve oxygen saturation, increase activity tolerance, and reduce dyspnea and fatigue*

Keywords: *COPD, oxygen saturation, breathing exercises, activity tolerance, dyspnea, fatigue, walking exercise, pursed lips breathing, effective cough.*

INTRODUCTION

COPD (Chronic Obstructive Pulmonary Disease) is a non-communicable disease characterized by persistent respiratory symptoms and limited air circulation due to abnormalitiesAlveolar ulcers are caused by exposure to harmful particles or gases(GOLD, 2018). According to the Ministry of Health, (2019) Chronic obstructive pulmonary disease is a lung disease characterized by respiratory symptoms and persistent and limited air circulation progressive, associated with excessive chronic inflammatory response in the airwaysand lung parenchyma due to harmful gases or particles.

The prevalence of COPD in every country is increasing with the highest prevalence at ages >60 years. The lowest prevalence of COPD was in Mexico City, namely 7.8%, and the highestin Montevideo, Uruguay it was 19.7% (GOLD, 2018). According to the results of Basic Health Research (Riskesdas) in 2018, the prevalence of COPD in Indonesia was 3.7%, with the highest prevalence at 10.0% in East Nusa Tenggara province, in Yogyakarta Special Region Province at 3.1% and in North Sumatra province at 3.1%. 2.1% (RI Ministry of Health, 2018).

Chronic obstructive pulmonary disease is a common disease that is a health problem in Indonesia. Risk factors for COPD include cigarette smoke, exposure to dangerous substances, genetics, age, air pollution and sufferers experiencing comorbid diseases. The signs and symptoms of COPD themselves vary from mild to severe, the symptoms that

Received: April 30, 2024; Accepted: June 04, 2024; Published: June 30, 2024 ;
* Huwaina Af'idah , huwaina301286@gmail.com ---

appear are usually chronic cough accompanied or without phlegm that does not go away and shortness of breath (Ministry of Health of the Republic of Indonesia, 2019). COPD sufferers usually complain of symptoms of shortness of breath, coughing, and fatigue in daily activities (WHO, 2023). In the long term, symptoms of shortness of breath can occur during light daily activities such as doing work at home (GOLD, 2017). This causes COPD sufferers to experience increasingly worsening conditions where exacerbations and activity intolerance occur.

Therapeutic management that can be carried out for COPD sufferers includes oxygen therapy, bronchodilators, and physical exercise. Therapy that can be carried out non-pharmacologically is lip breathing exercises which can reduce symptoms of shortness of breath and reduce consumption of chemical drugs (PDPI, 2016). The respiratory therapy technique that can be applied is pursed lips breathing. This exercise can increase the expiratory volume value in 1 second (FEV1), reduce symptoms of shortness of breath, and help increase vital lung capacity (Suryantoro et al., 2017). Apart from that, accompanied byeffective cough or effective cough. Effective coughing techniques can help increase the amount of sputum expelled in COPD patients (Dettasari & Istiqomah, 2022). As well as physical exercise techniques that are easy to do at home, namely home based walking exercise. Walking exercise is recommended to be done gradually, to improve exercise performance (Dewi et al., 2022). Physical exercise walking exercise increases blood circulation, supports blood circulation in the legs and abdominal area, energizes the small blood vessels in the legs to divert blood to blocked channels, and increases fat consumption to reduce low-thickness lipoprotein (LDL) in the blood so that its volume increases. , blood and red blood cells can carry more oxygen to flow throughout the body without obstacles, so that smooth oxygen intake can reduce the side effects of shortness of breath (Flowerenty, 2015). Therapeutic management of breathing exercises and physical exercise for COPD sufferers which is carried out gradually can increase tolerance to exercise, as well as reduce dyspnea and fatigue (Dewi et al., 2022).

Therapeutic management of breathing exercises and physical exercise for COPD sufferers requires family support in its implementation. According to the research results of Dasuki, (2018), family support influences the self-efficacy of COPD patients, where good family support shows good self-efficacy, where COPD patients comply with care and treatment. In line with the research results of Bourbeau & Van Der Palen in Adiana & Putra, (2019) that there is a relationship between supportfamily with COPD patient self-care behavior, including; quit smoking, obedience treatment, coming to health services during exacerbations, bronchial cleansing techniques, breathing exercises, physical activity, nutritional programs, stress

management and environmental control with the aim of maintaining the health of COPD patients. The involvement of family members in the care of COPD patients can really help COPD treatment management run well and avoid recurrence (Paramasivam, 2017). In this case the author is interested in reporting a description of home based walking exercise, pursed lips breathing and effective cough nursing interventions in families with COPD.

RESEARCH METHODS

This research method uses a descriptive design, namely a case report with a nursing process approach, namely focusing on problem assessment and intervention based on cases managed to analysis of case management evaluations.has been carried out as well as documentation (AIPNI, 2022). The aim of this study was to determine changes in oxygen saturation and activity tolerance in COPD patients before and after being given home based walking exercise, pursed lips breathing and effective cough. This research was conducted from January 11 2024, for approximately 6 days where data collection was carried out for 3 days by conducting observations, interviews and physical examinations. Then the intervention was carried out for 3 days, where 1 day had 3 exercises, namely morning, afternoon and evening with a duration of 15 minutes for each exercise where oxygen saturation is measured before and after exercise.

This research involves families in carrying out interventionsto improve the health of COPD patients. This aims to ensure that the family understands the intervention being applied and that the client is under family supervision in its implementation. Second, to make appropriate health action decisions, nurses plan together with the family regarding the interventions that will be carried out. Third, providing support for caring for sick family members, where the family supports medication compliance and management of COPD therapy exercises. Fourth, modify the home environment to be healthy, by opening the windows every morning and no smoking is allowed in the house. The fifth refers to health facilities, where nurses inform families about routine COPD treatment. This study used assessment sheet and oximetry instruments to measure oxygen saturation. The subject of this research is Mr. I's family, namely Mrs. E withthe problem of COPD (chronic obstructive pulmonary disease).

RESULTS AND DISCUSSION

Data from Subject Assessment Results

Based on the data from the study, Mrs. E is 67 years old, female, Mrs. E does not work, it was found that she had a history of passive smoking because in the home environment many workers smoke actively. Ny. When carrying out the assessment, the results of the physical examination showed that blood pressure was 150/90 mmHg, pulse 72x/minute, respiration 20x/minute, temperature 36.6oC, Spo2 96%.Mrs. E said she experienced shortness of breath when she did too much activity. Mrs. E said that now she only does activities at home, such as cooking and cleaning the house, she never leaves the house because she easily gets tired when walking long distances.

The intervention was carried out for 3 days, where nurses provided education using posters to families about COPD including understanding, causes, signs, symptoms, factorsrisks, complications, how to manage COPD therapy, and monitoring signsvital. Nurses and families make plans regarding COPD therapy management to prevent recurrence. The nurse recommends therapeutic management that can be applied to COPD patients, namely home-based walking physical exercises, pursed lips breathing exercises and effective cough in COPD, then the nurse supports the family in medication compliance and management of COPD therapy exercises, supports modifying a healthy home environment, by open the windows every morning and no smoking is allowed in the house, as well as supporting families to carry out regular COPD treatment.

The results of the intervention carried out for 3 days showed an increase in family understanding regarding COPD in accordance with the 5 family tasks according to Bailon & Maglaya (1998), characterized by the family supporting treatment complianceand management of COPD therapy exercises, modifying the environment by opening the windows every morning and no smoking is allowed in the house, as well as routinely taking COPD treatment to the nearest health service.

Table. 1 Changes in Oxygen Saturation Before and After Exercise*Home Based Walking Exercise, Pursed Lips Breathing*And*Effective Cough*

No	Results	SaturationOxygen								
		Day 1			Day 2			Day 3		
		Morning	Afternoon	Afternoon	Morning	Afternoon	Afternoon	Morning	Afternoon	Afternoon
1.	BeforeExercise	95%	96%	96%	96%	96%	96%	97%	97%	98%
2.	After Practice	95%	96%	96%	97%	96%	97%	98%	99%	99%

Based on the table above, the results showed that on the first day before the intervention, the average oxygen saturation of Mrs. %. The client said that on the third day she was able to walk out of the house and did not experience shortness of breath, only occasionally when she felt tired did Mrs. E rest for a moment and walkreturned home.

Based on the research results, it showed that on the first day before carrying out the intervention, Mrs. On the second day before the intervention, Mrs. E's average oxygen saturation was 96%, and after the intervention there was an increase in oxygen saturation.to 97%. Mrs. E said that on the second day she had started to train in controlling her breathing so that she did not get tired easily or get short of breath during activities excessive. On the third day before exercise the average oxygen saturation was 97%, and after the exercise intervention the oxygen saturation increased to an average of 99%. The client said that on the third day he was able to walk out of the house and did not experience any problemsshort of breath, only occasionally when she feels tired does Mrs. E rest for a moment and walk back home.

Mrs. E's oxygen saturation was measured beforeand after carrying out intervention, namely using an oximeter. Oxygen saturation measurements are carried out by first calibrating the oximeter. Then the oximeter is placed on the finger or earlobe, then red and infrared light at certain wavelengths is shined through the tissue, usually most often at the nail bed. The ability of oximetry to detect oxygen saturation based on arterial blood flow. This is because the amount of red and infrared light absorbed fluctuates according to the heart cycle (Ministry of Health, 2022).

Home based walking exercise, pursed lips breathing and effective cough interventions were carried outfor 3 days, where 1 day 3 exercises, namely morning, afternoon and evening with a duration of 15 minutes for each exercise. Starting with the first 5 minutes of warming up first to reduce the risk of injury and muscle stiffness. Then 10 minutes of home based walking exercise, pursed lips breathing and effective coughing which are done at home. According to research results by Satria et al., (2022), pursed lips breathing exercises can be done for 10-30 minutes per session, 2x a day, morning and evening, or 3x a week. Regular breathing can improve respiratory muscle function, maintain lung elasticity, and increase ventilation function. Pursed lips breathing is a breathing exercise carried out in two stages, namely inspiration which is carried out strongly through the nose and expiration which is carried out strongly and lengthwise through the mouth and pursing the lips. If pursed lips breathing is carried out by COPD patients regularly, it will have a positive impact, namely increasing oxygen saturation (Yari et al., 2023). The research results of Tarigan & Juliandi, (2018) stated that before implementing pursed lip breathing, the respondent's oxygen

saturation was 96.72%, after implementing pursed lip breathing the oxygen saturation increased by 1.39 to 98.11%. It can be concluded that pursed lip breathing exercise has an effect on increasing oxygen saturation in COPD sufferers with a value of p = 0.001. (α=0.05). According to the research results of Sulistyanto et al., (2023), there is an influence of pursed lips breathing exercise on respiratory status, where the independent t test shows that the SpO2 and respiratory rate variables are significantly different (p value = 0.019 and 0.028 respectively).

The results of research by Prayoga et al., (2022) showed that oxygen saturation in COPD patients before implementing pursed lips breathing on day 1 was 90%, on day 2 it increased to 92% and on day 3 it reached 93%. Then, after implementing pursed lips breathing, the oxygen saturation of COPD patients on day 1 was 90%, on day 2 there was an increase to 93% and on day 3 after application it became 95%. Pursed lips breathing exercises are combined with effective coughing to help expel sputum in COPD patients. In line with the research results of Dettasari & Istiqomah, (2022) that effective coughing carried out 3 times a day for 3 consecutive days resulted in an average output of 17.6 ml of sputum. This shows that effective coughing techniques can help increase the amount of sputum expelled in COPD patients.

Another therapy that COPD patients can apply is home-based physical exercise

walking exercise, where this exercise can increase activity tolerance, as well as reduce shortness of breath and fatigue. Physical exercise walking exercise improves blood circulation, supports blood circulation in the legs and abdominal area, energizes the vessels small blood vessels in the legs to divert blood to blocked channels, and increase fat consumption in reducing low Thickness Lipoprotein (LDL) in the blood so that its volume increases, blood and red blood cells can carry more oxygen to flow throughout the body without obstacles, so that intake Smooth oxygen can reduce the side effects of shortness of breath (Flowerenty, 2015). According to the research results of Satria et al., (2022), walking exercise can provide significant results in reducing the degree of shortness of breath in COPD. The duration of exercise is 30-45 minutes daily, three times a week. According to the guidelines from ACSM (*American College of Sports Medicine*), it is recommended to do physical activity to reduce the degreedyspnea by doing 1 to 3 exercise sessionswith a time of 8 to 12 repetitions, should be done 2 to 3 times per week for 30 to 60 minutes. According to ASCM, walking exercise in COPD patients can increase oxygen demand, reduce dyspnea and increase physical activity. Exercises can be adjusted to suit the abilities of COPD patients. When doing physical exercise, there is an optimal exchange of oxygen and carbon dioxide so that ventilation can

be adequate and dyspnea is reduced.

Home based physical exercises, walking exercises and pursed lips breathing exercises

accompanied by an effective cough can be done simultaneously or in combination in COPD patients with the aim of increasing activity tolerance, as well as reducing dyspnea and fatigue. According to the research results of Haritsah et al., (2022), giving a combination of home based walking exercise and pursed lip breathing has an effect onincrease capacitylungs of COPD patients obtained p<0.001. In line with the results of Ningsih's research, (2018) combining home based walking exercise and pursed lips breathing can increase the value of forced expiratory volume in one second (FEV1), if done regularly and sustainably. So in this case the family plays a very important role in improving the health of COPD patients. The involvement of family members in the care of COPD patients can really help COPD treatment management run well and avoid recurrence (Paramasivam, 2017).

The results of this study show the success of COPD therapy management thanks to family support. Where families can find out about health problems and can make decisions regarding taking appropriate health actions, familiesable and willing to take care of sick family members, modify the environment to be healthy, and the family supports routine treatment of COPD patients at the nearest health service. Family support is very meaningful in improving the health of patients with COPD. According to research by Agustian et al., (2017), family support is related to the quality of life of COPD patients, where healthy family support has a good quality of life in COPD patients. In line with the research results of Bourbeau & Van Der Palen in Adiana & Putra, (2019) that there is a relationship between family support and self-care behavior of COPD patients, where the self-care abilities of COPD patients include; adherence to treatment, quick access to health services, breathing exercises, physical activity, stress management and environmental control with the aim of maintaining the health of COPD patients. So the involvement of family members can directly affect the quality of life of COPD patients.

CONCLUSION

Before being given the intervention, Mrs. Then after it is given After 3 days of intervention, Mrs. E's oxygen saturation increased to 99% and Mrs. E was able to carry out activities outside the house and did not experience shortness of breath. Home based walking exercises and pursed lips breathing can increase oxygen saturation, increase activity tolerance, and reduce dyspnea and fatigue. ManagementThis exercise therapy requires family support for managementCOPD treatment can go well.

ACKNOWLEDGMENTS

The researcher would like to thank the respondents who were willing to take part in this research. Many thanks to the entire academic community of Padjadjaran University for their guidance and direction so that the research can be completed.

REFERENCE LIST

Adiana, I. N., & Putra, I. A. (2023). The relationship between education level and comorbidities and self-care behavior in chronic obstructive pulmonary disease patients. National Health Research Journal, 72–77.

Agustian, D. M., Andayani, N., & Wahyuniati, N. (2017). The relationship between family support and quality of life in patients with chronic obstructive pulmonary disease at the BLUD Regional Hospital Lung Clinic. Zainoel Abidin Banda Aceh. Medisia Student Scientific Journal, 24–29.

AIPNI. (2022). Guide to scientific work at the final stage of the nursing profession. Jakarta.

Allfazmy, P. W., Warlem, N., & Amran, R. (2022). Risk factors for chronic obstructive pulmonary disease (COPD) at Semen Padang Hospital (SPH). Scientific Journal, 19–23.

Bailon, S. G., & Maglaya, A. (1989). Family health care. Republic of Indonesia Ministry of Health.

Dasuki. (2018). The influence of family support on self-efficacy in COPD patients at the pulmonary polyclinic, North Jakarta City Hospital. Pearl Nurses Journal, 19–23.

Dettasari, A. V., & Istiqomah. (2022). Efforts to apply effective coughing to expel sputum in patients with chronic obstructive pulmonary disease (COPD). Health Journal.

Dewi, R., Siregar, S., Manurung, R., & Bolon, C. M. T. (2022). Community development about diseases and walking exercises for chronic obstructive pulmonary disease (COPD) sufferers in Kolam Village, Percut Sei Tuan District. Scientific Journal of Community Service (Ji-SOMBA), 30–35.

Flowerenty, D. D. (2015). The therapeutic effect of exercise walking on sleep quality of clients with chronic obstructive pulmonary disease (COPD) at home B pulmonary polyspecialist lung disease in Jember Regency. University of Jember.

Global Initiative for Chronic Obstructive Lung Disease (GOLD). (2017). Retrieved November 28, 2023, from https://goldcopd.org/gold-2017-global-strategy-diagnosis-management-prevention-copd/

Global Initiative for Chronic Obstructive Lung Disease (GOLD). (2018). Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. USA: https://www.goldcopd.org

Haritsah, N. F., Windiaston, Y. H., & Noerdjannah. (2022). Differences in the effect of the combination of home-based walking exercise and pursed lip breathing with pranayama exercise on increasing lung capacity in COPD conditions. Indonesian Medical Journal, 439–448.

Matos-Garcia, B. C., Rocco, I. S., Mainorano, L. D., et al. (2016). A home-based walking program improves respiratory endurance in patients with acute myocardial infarction: A randomized controlled trial. Canadian Journal of Cardiology, 33(6), 785–791.

Ministry of Health. (2018). Main results of Riskesdas 2018. Research and Development Agency Health.

Ministry of Health. (2019). National guidelines for medical services for the management of lung disease chronic obstructive. Jakarta: Minister of Health of the Republic of Indonesia.

Ministry of Health. (2022, August 2). Pulse oximetry and its uses. Retrieved from Ministry of Health of the Republic of Indonesia: https://yankes.kemkes.go.id/view_article/843/pulse-oximetry-dan-kegunaannya

Ningsih, A. D., Amin, M., & Bakar, A. (2018). The effect of walking exercise and pursed lips breathing on signs and symptoms of COPD patients: A systematic review. INC, 287–291.

Nurfitriani, & Ariesta, D. M. (2021). Factors that influence the incidence of chronic obstructive pulmonary disease (COPD) in pulmonary polyclinic patients at Meuraxa Hospital. Journal of Science Research (JSR), 458–462.

Paramasivam, K. (2017). Chronic obstructive pulmonary disease (COPD). Denpasar.

PDPI (Indonesian Lung Doctors Association). (2016). COPD (Chronic Obstructive Pulmonary Disease) diagnosis and management. Jakarta: UI-Press.

Prayoga, S. N., Nurhayati, S., & Ludiana. (2022). Application of pursed lips breathing technique with forward leaning position on oxygen saturation of COPD patients in metro cities. Journal of Young Scholars, 285–294.

Sulistyanto, B. A., Rahmawati, D. I., Irnawati, & Kartikasari, D. (2023). The effect of pursed lip breathing (PLB) exercise on respiratory status in chronic obstructive pulmonary disease (COPD) patients. Indonesian Nursing Journal, 1259–1265.

Suryantoro, E., Isworo, A., & Upoyo, A. S. (2017). Differences in the effectiveness of pursed lips breathing and the six minutes walk test on forced expiration. JKP, 99–112.

Tarigan, A. P., & Juliandi. (2018). Pursed lip breathing increases oxygen saturation in patients with grade II chronic obstructive pulmonary disease (COPD). Journal of Indonesian Nursing Online, 39–46.

Tompodung, C. O., Sapulete, I. M., & Pangemanan, D. H. (2022). Overview of oxygen saturation and hemoglobin levels in COVID-19 patients. eBiomedicine, 35–41.

World Health Organization (WHO). (2023, March 16). Chronic obstructive pulmonary disease (COPD). Retrieved November 28, 2023, from https://www.who.int/news-room/fact-sheets/detail/chronic-obstructive-pulmonary-disease-(copd)

Yari, Y., Rohmah, U. N., & Prawitasari, S. (2023). Effect of pursed lips breathing (PLB) on increasing oxygen saturation in chronic obstructive pulmonary disease (COPD) patients: Literature review.