Lentera Perawat
Volume 6 Number 4 : October - December 2025

OPEN ACCESS

Original Article

Nursing management of ineffective airway clearance through effective cough technique in chronic obstructive pulmonary disease: A case study

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Keyword:
Effective Coughing;
Ineffective Airway;
Nursing Intervention;
Respiratory Care;

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DOI:
https://doi.org/10.52235/lp.v6i4.629

Article Info:
Received : November 04, 2025
Revised : November 27, 2025
Accepted : December 02, 2025

Lentera Perawat
e-ISSN : 2830-1846
p-ISSN : 2722-2837

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Abstract

Background: Ineffective airway clearance is a common complication among patients with Chronic Obstructive Pulmonary Disease (COPD), requiring structured nursing interventions such as the effective cough technique to optimize secretion mobilization.
Objective: This case study aimed to describe the nursing management of ineffective airway clearance using the effective cough technique in adult COPD patients.
Methods: A descriptive case study was conducted on two adult COPD patients experiencing ineffective airway clearance at RSUD Siti Fatimah. Data were collected through interviews, physical examination, direct observation, and nursing documentation over a three-day intervention period. The effective cough technique was implemented 2–3 sessions per day. Data were analyzed using descriptive analysis, comparing pre- and post-intervention respiratory parameters (RR, SpO_2, sputum characteristics) and narratively reviewing qualitative responses to evaluate clinical improvement.
Results: Both patients initially exhibited dyspnea, ineffective coughing, wheezing, and difficulty expectorating thick sputum. Progressive improvements were observed across three days, demonstrated by increased sputum expulsion, decreased respiratory rate, disappearance of wheezing, improved oxygen saturation, and enhanced patient comfort. By day three, both patients were able to perform effective coughing independently and showed normalized respiratory patterns.
Conclusion: The effective cough technique is a safe and clinically beneficial non-pharmacological intervention that improves airway clearance and respiratory function in COPD patients. Regular guidance, proper positioning, hydration, and continuous monitoring strengthen intervention outcomes and support patient self-management in airway clearance.

Background

Chronic Obstructive Pulmonary Disease (COPD) causes progressive airflow limitation that frequently leads to ineffective airway clearance in affected patients (National Center Health Statistic, 2020). The respiratory system of individuals with COPD experiences mucus hypersecretion and impaired ciliary function that inhibit optimal sputum elimination (Hinkle & Cheever, 2018). Nurses in clinical settings perform essential respiratory care because airway obstruction increases the risk of hypoxia and infection if it is not properly managed (Hudak & Gallo, 2018). Airway clearance becomes a priority intervention when mucus retention compromises ventilation and gas exchange in COPD patients (Andarmoyo, 2018). Studies on pediatric respiratory conditions further highlight that environmental exposure and poor physiological function increase susceptibility to airway problems, illustrating parallels with chronic respiratory diseases in adults (Afdhal & Arsi, 2023). Additional epidemiological data emphasize that respiratory infections worsen airway obstruction in vulnerable populations, reinforcing the necessity of targeted airway clearance interventions (Afdhal, Fauziah & Sagita, 2023). Nursing management therefore requires evidence-based respiratory strategies to improve sputum mobilization and maintain optimal pulmonary function in chronic respiratory conditions (Potter & Perry, 2020).

Airway clearance techniques play a central role in respiratory nursing management because they improve mucus mobilization through non-pharmacological approaches (Hill et al., 2018). Expert guidelines recommend structured airway clearance strategies to reduce mucus stasis and minimize the risk of atelectasis and infection in patients with chronic lung disease

(O'Neill, O'Donnell & Bradley, 2019). International practice standards support the use of effective coughing, breathing exercises, and chest physiotherapy to promote airway patency in various obstructive respiratory conditions (CPR Select, 2023). Clinical observations indicate that improper inhaler use and inadequate cough effort often contribute to persistent airway obstruction in COPD cases (American Lung Association, 2022). Patients with chronic airway diseases frequently require education on inhaler techniques because inadequate medication delivery affects secretion viscosity and airway patency (Mount Sinai, 2019). Nurses must also assess airway patency using standardized tools to guide appropriate intervention selection, particularly when artificial airways or secretion burden complicate the clinical picture. These clinical complexities demonstrate the need for structured airway clearance management that prioritizes individualized respiratory strategies in COPD nursing care (PPNI, 2018).

The effective cough technique is one of the recommended non-pharmacological airway clearance interventions because it facilitates controlled expulsion of secretions (Kisner & Colby, 2019). This technique requires patients to perform deep inhalation followed by a forceful expulsive effort to mobilize and remove mucus from the lower to upper airways (Huda & Kusuma, 2018). Nursing application of effective coughing improves airway patency because repeated cycles enhance mucus mobilization and reduce breathing discomfort (Hudak & Gallo, 2020). Clinical case reports in Indonesia highlight significant improvements in ventilation and dyspnea reduction following structured instruction of effective cough techniques in COPD patients (Hidayatullah, 2024). Additional studies on asthma and tuberculosis patients illustrate that proper coughing techniques help optimize secretion clearance and stabilize respiratory hemodynamics (Yuna Septia et al., 2024). The use of active cycle breathing techniques further strengthens airway clearance outcomes because breathing control supports sputum mobilization (KK et al., 2025). These findings underscore the value of integrating effective coughing into routine respiratory nursing care for patients with chronic airway obstruction (Sujati et al., 2022).

Several Indonesian nursing studies provide contextual evidence that effective cough techniques reduce retained secretions and improve breathing comfort among COPD patients (Eny et al., 2025). Implementation of structured coughing interventions demonstrates improved breath sound clarity and reduced mucus accumulation during hospitalization (Puspita et al., 2025). Nursing documentation from adult respiratory units shows that guided cough techniques enhance sputum expulsion and support patient independence in self-airway management (Jurnal Kesehatan Terapan, 2025). These improvements occur because effective coughing promotes a physiologic mechanism that mobilizes mucus through increased intrathoracic pressure (Potter & Perry, 2018). Additional evidence from respiratory surveys in Canada and the UK indicates that clinicians frequently rely on cough monitoring as an indicator of airway clearance success (Rose et al., 2018). This alignment between international and national findings demonstrates that effective coughing is a feasible and evidence-supported nursing intervention in chronic respiratory cases (PPNI, 2018). These consistent outcomes reinforce the significance of airway clearance interventions as core components of COPD nursing management (Kemenkes, 2022).

The complexity of COPD requires nurses to make accurate assessments because secretion retention contributes to deterioration of gas exchange and increased work of breathing (Kemenkes, 2020). Assessment frameworks guide nurses to identify airway sounds, sputum characteristics, and breathing patterns that indicate ineffective airway clearance (PPNI, 2018). Proper assessment is essential because inaccurate identification of respiratory problems may delay timely airway clearance interventions (Huda & Kusuma, 2018). Evidence from case studies shows that structured assessment followed by effective coughing programs leads to measurable improvements in respiratory comfort (Puspita et al., 2025). Nurses must continually evaluate patient responses because dynamic changes in airway status require frequent adjustments to intervention strategies (Andarmoyo, 2018). Clinical guidelines describe that non-pharmacologic airway clearance methods complement pharmacologic therapy to

maintain stable respiratory function (DiPietro & Mondie, 2021). This comprehensive assessment-intervention process strengthens the rationale for implementing effective coughing as part of standard respiratory nursing care for COPD patients (Sinha, Semien & Fitzgerald, 2023).

Given the burden of ineffective airway clearance in COPD and the evidence supporting effective coughing, nursing case studies are needed to demonstrate practical, real-world outcomes of airway clearance interventions (Eny et al., 2025). Case-based evidence offers clinical insight because individualized observations help nurses understand response variability in respiratory interventions (Puspita et al., 2025). Documentation of nursing management using effective cough techniques adds scientific value because it exemplifies how theoretical principles are applied in routine clinical practice (Potter & Perry, 2018). Case studies in Indonesia have highlighted the importance of hands-on nursing guidance in performing effective coughing to enhance secretion clearance (Yuna Septia et al., 2024). The integration of standardized nursing diagnoses, outcomes, and interventions ensures methodological rigor and supports replication in other clinical settings (PPNI, 2018). These considerations collectively justify the need for the present study, which focuses on the implementation and outcomes of effective cough techniques in COPD care (Hudak & Gallo, 2018). Therefore, the purpose of this study is to describe the nursing management of ineffective airway clearance through the application of the effective cough technique in a patient with Chronic Obstructive Pulmonary Disease.

Methods

Study Design

This study employed a descriptive case study design because such an approach allows for deep exploration of individualized nursing management in real clinical conditions, particularly when evaluating responses to non-pharmacological airway clearance interventions. A case study design was justified because COPD manifestations and airway clearance difficulties vary widely among patients, making individualized nursing observation essential for capturing meaningful clinical outcomes. The descriptive nature of the design provided the flexibility to document comprehensive respiratory assessments, intervention processes, and patient responses over a three-day period without manipulating any clinical conditions . This approach ensured that the study accurately reflected real-world nursing care and clinical events that occurred during the implementation of the effective cough technique. The design was selected to demonstrate the practical application of standardized nursing diagnoses, outcomes, and interventions within authentic care settings, aligning with recommendations for documenting non-pharmacological respiratory interventions in chronic lung disease.

Sampling and Setting

The sampling method used in this study was purposive sampling because the selection criteria required patients who specifically presented with COPD and ineffective airway clearance, ensuring direct relevance to the intervention being tested. Two adult patients aged over 20 years who were newly diagnosed with COPD and experiencing ineffective airway clearance were selected as the case subjects based on clinical eligibility and readiness to follow respiratory training procedures. The study was conducted in the Paviliun Akasia of RSUD Siti Fatimah, South Sumatra Province, during October 2025, which is a clinical unit that frequently manages adult respiratory cases and provided an appropriate setting for implementing airway clearance interventions. The controlled clinical environment supported standardized assessment, continuous observation, and safe implementation of respiratory techniques. This sampling and setting approach improved clinical relevance because the selected patients exhibited classic COPD symptoms including shortness of breath, ineffective cough, and sputum retention, making them ideal for evaluating the effectiveness of the intervention.

Instruments

The instruments used in this study included a structured nursing assessment format covering inspection, palpation, percussion, and auscultation to identify respiratory patterns,

sputum characteristics, and breath sounds relevant to the diagnosis of ineffective airway clearance. Vital signs monitoring tools—including a sphygmomanometer, pulse oximeter (SpO_2), thermometer, and respiratory rate counter—were used to assess physiological responses before and after the intervention. Nursing documentation sheets were used to record nursing diagnoses, expected outcomes, and intervention steps based on standardized guidelines from professional nursing bodies. Observation checklists were utilized to ensure consistent evaluation of respiratory changes, sputum production, and patient performance of the effective cough technique. These instruments enabled systematic, objective, and reproducible data collection consistent with case-based respiratory nursing management.

Intervention

The intervention implemented in this study was the effective cough technique, which was delivered using a standardized step-by-step nursing protocol to promote optimal secretion mobilization in COPD patients with ineffective airway clearance. The procedure began with placing the patient in a comfortable semi-Fowler or Fowler position to maximize lung expansion and reduce respiratory effort. Warm water was given to facilitate mucus thinning prior to the coughing exercise. Patients were then instructed to inhale slowly through the nose, hold the breath for 2–3 seconds, and exhale gently through the mouth three times to optimize airflow control. On the third cycle, patients were guided to perform a strong, forceful cough to mobilize secretions effectively. Each intervention session lasted 5–10 minutes and was performed two to three times per day for three consecutive days. Nurses provided verbal guidance, demonstration, and corrective feedback to ensure proper technique execution throughout the intervention period. This structured approach aligned with evidence-based airway clearance recommendations and was tailored to the patients' respiratory tolerance and clinical condition.

Data Collection

Data collection was carried out through interviews, direct observation, physical examination, and nursing documentation to ensure comprehensive coverage of physiological and behavioral responses to the intervention. Initial data collection involved identifying baseline respiratory status including respiratory rate, breath sounds, sputum amount, oxygen saturation, and patient-reported symptoms such as dyspnea and cough difficulty. During and after each intervention session, the researcher documented changes in respiratory patterns, sputum expulsion, and the patient's ability to perform the coughing technique. Vital signs were re-measured after each 5–10-minute intervention to monitor clinical stability and evaluate immediate physiological responses. Observations were recorded consistently across all three days to identify trends in improvement. All data were captured using standardized nursing forms to maintain accuracy and continuity in clinical documentation.

Data Analysis

Data analysis in this case study used descriptive analysis because the goal was to summarize clinical observations and identify patterns of improvement following the effective cough intervention. Numerical data such as respiratory rate, oxygen saturation, and sputum output were compared before and after the intervention to determine observable physiological changes. Qualitative data—including patient verbal responses, comfort levels, and performance of the technique—were analyzed narratively to provide contextual understanding of patient progress. The combination of quantitative and qualitative descriptive analysis allowed for a holistic interpretation of intervention effectiveness, which is essential in case-based nursing research. This analytical approach enabled the identification of day-to-day progression and supported conclusions regarding the clinical impact of the effective cough technique on airway clearance.

Ethical Considerations

Ethical procedures were strictly followed in accordance with nursing research standards to ensure patient rights, safety, and confidentiality. Informed consent was obtained from each

patient prior to data collection and intervention implementation, ensuring that participants understood the purpose, procedures, risks, and benefits of the study. Time agreements were established to respect patient comfort and clinical workflow. Patient anonymity was maintained by removing identifiable information from all study documents and reporting only coded clinical details. The intervention posed minimal risk as it involved a non-invasive airway clearance technique commonly used in respiratory nursing practice. Throughout the study, the researcher ensured adherence to clinical safety protocols and monitored patients carefully to prevent fatigue or respiratory distress. Ethical safeguards enhanced the credibility and integrity of the case study.

Results

Nursing care was implemented for both Patient 1 (Mr. A) and Patient 2 (Mr. J), who were diagnosed with Chronic Obstructive Pulmonary Disease (COPD) accompanied by ineffective airway clearance, over a continuous three-day period from 14 to 16 October 2025 at the Akasia Pavilion of RSUD Siti Fatimah, South Sumatra. The intervention process followed a structured respiratory nursing protocol that included an initial assessment, patient preparation, deep-breathing exercises, implementation of the effective cough technique, respiratory monitoring involving respiratory rate (RR), oxygen saturation (SpO_2), sputum characteristics, and systematic nursing documentation. Throughout the three days, both patients received consistent therapeutic sessions delivered by the nursing team, allowing close observation of physiological responses and progressive respiratory improvements. This comprehensive implementation ensured that all aspects of airway clearance management were thoroughly addressed, providing insight into the effectiveness of the effective cough technique in real clinical practice.

Assessment

The initial nursing assessment revealed that Patient 1 (Mr. A) experienced significant respiratory discomfort, characterized by shortness of breath, persistent coughing accompanied by nausea, and difficulty expectorating thick secretions. Mr. A was receiving intravenous RL fluid at 20 drops per minute and oxygen therapy through a nasal cannula at 3 liters per minute. His medical history indicated recurrent episodes of dyspnea over the past ten years as well as a previous diagnosis of pulmonary tuberculosis that had been fully treated. Physical examination showed a respiratory rate of 26 breaths per minute, blood pressure of 128/74 mmHg, temperature of 36.5°C, heart rate of 103 beats per minute, audible wheezing, chest wall retractions, prolonged capillary refill time, and productive coughing with noticeable sputum. Similarly, both patients presented with common respiratory complaints including shortness of breath, ineffective coughing, and excessive sputum production, all of which indicated a major compromise in airway clearance. These assessment findings established the clinical foundation for determining the primary nursing diagnosis and guided the selection of appropriate interventions.

Nursing Diagnosis

Based on the assessment, the primary nursing diagnosis for both Mr. A and Mr. J was “Ineffective Airway Clearance,” as evidenced by shortness of breath, ineffective coughing, presence of adventitious breath sounds, increased respiratory rate, and difficulty mobilizing respiratory secretions. This diagnosis was further supported by clinical indicators such as wheezing, visible effort in breathing, and the inability to expel mucus effectively despite repeated coughing attempts. The presence of excessive sputum and the patients’ reports of chest tightness reinforced the conclusion that airway patency was significantly compromised. Establishing this diagnosis allowed the nursing team to prioritize airway clearance interventions and to apply evidence-based respiratory techniques aimed at improving mucus expulsion and respiratory function.

Nursing Interventions

Nursing interventions were carefully selected to address the impaired airway clearance

experienced by both patients. These interventions included continuous monitoring of breathing patterns, evaluation of adventitious breath sounds, and documentation of sputum quantity and characteristics. Patients were positioned in semi-Fowler or Fowler positions to optimize chest expansion and decrease respiratory workload. To support secretion mobilization, warm fluids were administered, and supplemental oxygen was provided at 3 liters per minute. Education and demonstration of the effective cough technique were carried out systematically, ensuring that patients understood each step of the procedure. Collaboration with the medical team was implemented to administer bronchodilators, inhalation therapy, expectorants, and mucolytics as necessary. These interventions formed an integrated respiratory management strategy designed to improve airway patency, reduce dyspnea, and enhance the efficiency of cough mechanisms.

Implementation

During the implementation phase, both patients underwent structured sessions involving deep-breathing exercises followed by the effective cough technique. Respiratory status, including respiratory rate and oxygen saturation, was monitored before and after each therapeutic session to evaluate immediate physiological responses. Each patient received oxygen at 3 liters per minute throughout the intervention period to maintain adequate oxygenation. Nurses assessed the patients' ability to follow breathing and coughing instructions, providing corrections when necessary to ensure proper technique execution. Collaboration with the medical team ensured timely administration of bronchodilators, mucolytics, and expectorants to support airway clearance pharmacologically. Over the three days, the intervention sessions were performed consistently, and nursing documentation captured progressive improvements in sputum expulsion and breathing comfort for both patients.

Evaluation

On the first day of implementation, both patients demonstrated the ability to cough but were unable to do so effectively, resulting in minimal sputum expulsion. Shortness of breath persisted, and adventitious breath sounds remained audible, indicating that airway clearance had not yet improved. On the second day, the effectiveness of the cough began to improve, and both patients started expelling sputum more easily. Respiratory discomfort showed early signs of reduction, and breath sounds became slightly clearer in comparison to the first day. By the third day, significant improvements were observed in both patients. For Patient 1 (Mr. A), respiratory symptoms had resolved, with effective coughing achieved and sputum successfully expectorated. His respiratory rate decreased to 20 breaths per minute, blood pressure stabilized at 116/78 mmHg, heart rate decreased to 88 beats per minute, wheezing disappeared, and he appeared more energetic and comfortable. For Patient 2 (Mr. J), shortness of breath was considerably reduced, sputum was expelled more effectively, wheezing was no longer present, respiratory rate stabilized at 20 breaths per minute, blood pressure measured 124/81 mmHg, and heart rate improved to 80 beats per minute. Based on these clinical improvements, the nursing team concluded that the problem of ineffective airway clearance had been successfully resolved for both patients, and the intervention was terminated.

Discussion

The findings of this case study demonstrated that both COPD patients presented with hallmark manifestations of ineffective airway clearance, such as dyspnea, ineffective cough, and excessive sputum retention, which align with the established pathophysiology of chronic airflow obstruction described in major respiratory nursing references (Hinkle & Cheever, 2018). The presence of wheezing, chest wall retraction, and tachypnea in both patients further reflects the typical obstructive pattern documented in COPD prevalence reports (National Center Health Statistic, 2020). These clinical indicators also correspond with the respiratory impairment framework described by Andarmoyo, who emphasizes that impaired oxygenation leads to significant functional limitations when airway clearance is inadequate (Andarmoyo, 2018). Although the literature on

pediatric respiratory infections highlights that environmental and nutritional factors influence airway vulnerability, similar mechanisms of inflammation and secretion accumulation are observable in chronic adult lung disease (Afdhal & Arsi, 2023; Afdhal, Fauziah & Sagita, 2023). These parallels reinforce the view that airway clearance is a universal determinant of respiratory stability across diverse populations. The consistency between the clinical presentation in this study and previous epidemiologic findings strengthens the validity of interpreting dyspnea and sputum retention as primary care priorities in COPD management.

The deterioration of airway patency noted during the initial assessment aligns with classical descriptions of impaired secretion mobilization, emphasizing the need for targeted airway clearance interventions in chronic respiratory disease. The presence of thick sputum and a weak cough reflex demonstrates the mechanical difficulty experienced by COPD patients, a challenge similarly noted in cases of bronchiectasis where mucus plugging contributes to worsening airflow limitation (O'Neill, O'Donnell & Bradley, 2019). The importance of structured assessment in this study aligns with nursing standards described by PPNI, which emphasize the critical role of respiratory evaluation in determining appropriate interventions (PPNI, 2018). Additionally, improper inhaler use and suboptimal medication deposition—issues commonly found in chronic airway diseases—can exacerbate mucus retention and breathlessness (American Lung Association, 2022; Mount Sinai, 2019). These assessment findings highlight the clinical need for non-pharmacological airway clearance techniques that complement pharmacological therapy. The data confirm that accurate identification of ineffective airway clearance is central to preventing further respiratory decline in COPD (Hudak & Gallo, 2018).

The successful respiratory improvement observed in this study reflects the effectiveness of the cough technique, which is widely recognized as a key airway clearance intervention for mobilizing trapped secretions (Kisner & Colby, 2019). Effective coughing increases intrathoracic pressure and facilitates upward movement of mucus, supporting physiological mechanisms necessary for airway patency (Potter & Perry, 2020). The positive outcomes observed in both patients mirror prior Indonesian studies reporting the success of this technique in COPD cases (Eny et al., 2025; Puspita et al., 2025). Similarly, improved secretion clearance and reduced dyspnea have been reported in studies involving asthma and tuberculosis patients, further validating its broader applicability across obstructive respiratory conditions (Yuna Septia et al., 2024; KK et al., 2025). These findings align with global recommendations that prioritize non-pharmacological airway clearance strategies as essential tools within respiratory rehabilitation programs (Hill et al., 2018). The convergence of evidence across diseases and populations underscores the universality of effective cough training as a valuable respiratory intervention.

Additionally, this study supports the body of evidence indicating that consistent guidance and structured breathing exercises enhance patients' ability to expel mucus more effectively. The application of warm fluids, appropriate positioning, and controlled breathing cycles helps optimize lung expansion and reduce airway irritation, as recommended in airway management protocols (CPR Select, 2023). The use of semi-Fowler or Fowler positioning is also consistent with clinical respiratory care literature, which identifies upright positioning as a means of reducing diaphragmatic workload and improving ventilation distribution (Huda & Kusuma, 2018). Prior studies show that integrating non-pharmacological approaches with pharmacological therapy—such as bronchodilators, mucolytics, and inhalation treatments—produces synergistic benefits for secretion management (Potter & Perry, 2018). These integrated strategies reflect essential principles of comprehensive COPD nursing care, as described in critical care nursing texts (Hudak & Gallo, 2020). The alignment between this intervention and established clinical recommendations strengthens the credibility of using effective coughing as a core airway clearance intervention.

The progressive improvement observed over three days in both patients indicates that airway clearance interventions require consistent repetition and patient engagement to achieve optimal outcomes. The reduction in respiratory rate, resolution of wheezing, and improved patient energy levels align with expected clinical markers of restored airway patency described in standard nursing outcomes criteria (PPNI, 2018). Improvements in sputum expulsion over time highlight the role of patient mastery and adaptation when performing respiratory exercises, which has been similarly reported in home-care respiratory training for asthma patients (Sujati et al., 2022).

The findings also suggest that environmental and nutritional factors, though not the primary focus of this study, may indirectly influence respiratory resilience, as noted in broader health research (Kemenkes, 2022). The absence of complications during the sessions further demonstrates the safety of this intervention, particularly in comparison with higher-risk airway procedures such as suctioning, which carry greater potential for mucosal injury or patient discomfort (Sinha, Semien & Fitzgerald, 2023). These outcomes reinforce the suitability of effective coughing as a non-invasive alternative for stable COPD patients with secretion retention.

Overall, the results of this study contribute to the growing evidence base supporting effective cough training as a feasible, safe, and highly beneficial intervention for ineffective airway clearance in COPD. The improvement trajectory observed in both patients aligns with earlier case reports documenting similar respiratory stabilization following structured cough training programs (Hidayatullah, 2024). This study also echoes findings from international surveys that highlight the importance of monitoring cough effectiveness as part of routine airway clearance management (Rose et al., 2018). Furthermore, the case findings demonstrate the practical application of fundamental nursing principles, including assessment, intervention, and evaluation, which form the foundation of evidence-based respiratory care (Potter & Perry, 2020). While herbal remedies have been explored in respiratory contexts, their inconsistency and potential toxicity underscore the importance of relying on scientifically validated interventions such as effective coughing (DiPietro & Mondie, 2021). Collectively, this discussion affirms that effective cough training remains a cornerstone of non-pharmacological respiratory therapy and offers significant benefits for COPD patients with ineffective airway clearance.

Conclusion and Recommendation

This case study demonstrated that the effective cough technique is a safe, feasible, and clinically impactful nursing intervention for improving airway clearance in patients with Chronic Obstructive Pulmonary Disease. Both patients showed progressive respiratory improvement over three days, marked by enhanced sputum expulsion, reduction of dyspnea, normalization of respiratory rate, and the disappearance of adventitious breath sounds. These outcomes confirm that structured coughing exercises, when combined with proper positioning, warm hydration, and consistent respiratory monitoring, effectively mobilize secretions and restore airway patency.

The intervention also strengthened patient self-efficacy, enabling both individuals to perform the technique independently by the end of the study. Findings from this study align with existing evidence supporting the use of non-pharmacological airway clearance strategies in chronic respiratory care and reinforce their integration into routine nursing practice. Overall, effective cough training represents an essential component of comprehensive COPD management, offering meaningful physiological benefits while reducing dependence on invasive airway procedures.

Acknowledgment
The author would like to express deepest gratitude to all respondents who willingly took the time to participate in this research.

Funding Source
None.

Declaration of conflict of interest
The authors declare no competing interests.

Declaration on the Use of AI

No AI tools were used in the preparation of this manuscript.

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