
Original Articles: Case Study

**CLAPPING, VIBRATING, POSTURAL DRAINAGE, AND EFFECTIVE COUGH AS
MEASURES TO RESOLVE THE PROBLEM OF INEFFECTIVE AIRWAY
CLEARANCE IN PATIENTS WITH BRONCHITIS**

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Abstract

Introduction: Bronchitis is characterized by excessive sputum production due to an infection in the bronchi. In patients with bronchitis, it can cause nursing problems in the form of ineffective airway clearance. Ineffective airway clearance is the inability to clear the airway which is characterized by changes in frequency, pattern, and breath sounds.

Objective: The purpose of this study was to apply nursing care to patients with the application of Clapping, Vibrating, Postural Drainage, and Effective Coughing to overcome ineffective airway clearance in the Azzahra 1 Room, RSI Jemursari Surabaya.

Methods: The design of this research is a case study; the time of research is 13-15 October 2022 in the Azzahra 1 Room, RSI Jemursari Surabaya. The subject used is 1 bronchitis patient (Mr. B) with a nursing diagnosis of ineffective airway clearance. The research was conducted using interviews accompanied by physical examination, observation, and documentation. Nursing care given to patients with a nursing care process approach includes assessment, nursing diagnosis, intervention, implementation, and evaluation.

Results: The results of the case study found that the patient had a cough with phlegm for 2 weeks, chest pain when coughing, increased sputum production, had rhonchi, and the patient was an active smoker. Evaluation of the results of nursing care with effective Clapping, Vibrating, Postural Drainage, and Coughing for 3 days once a day showed decreased rhonchi, decreased sputum production, and patients can cough effectively independently.

Conclusions: Clapping, vibrating, postural drainage and effective coughing can help clear secretions to maintain a patent airway. Nurses are expected to be able to apply effective chest and cough physiotherapy to patients so that optimal action is achieved and the patient performs independently.

INTRODUCTION

Bronchitis is an infectious disease of the respiratory tract that attacks the bronchi. Most patients with acute bronchitis are found with a limited number of complaints, such as coughing, wheezing, sputum, and shortness of breath which are complaints that are found (Marni, 2014). In general, bronchitis is divided into two, namely acute bronchitis and chronic bronchitis. Acute bronchitis usually

occurs due to flu or other infections of the respiratory tract, usually acute bronchitis begins to improve within a few days or a few weeks. Meanwhile, chronic bronchitis is an irritation or inflammation that is located in the airways and must be taken seriously. Often chronic bronchitis is caused by smoking (Joko Suryo, 2010). The phenomenon of patients being treated in the Azzara 1 room is that there are still many patients and their families who do not want to perform chest physiotherapy measures such as clapping, vibrating, postural drainage, and effective coughing independently.

Bronchitis is characterized by excessive mucus production, which can cause an expectorant cough for at least 3 months. In patients with bronchitis, it can cause nursing problems in the form of ineffective airway clearance. Ineffective airway clearance is the inability to clear the airway which is characterized by changes in respiratory frequency, changes in breathing patterns, dyspnea, and additional breath sounds (Ika Kartika et al, 2018)

Based on the World Health Organization (WHO, 2015) at this moment, there are around 64 million people with bronchitis in the world. The main risk factors are smoking, air pollution, dust, and chemicals. The incidence of bronchitis in the State of Indonesia, the prevalence rate of chronic bronchitis is 10,607,561 people from an estimated population of 237,865,523 people (Meneze, 2010). In East Java, it is estimated that up to 41.7% of patients with bronchitis (Tina, Lymbran, 2017). The incidence of bronchitis in Surabaya Lung Hospital in 2014 was 8% and increased in 2015 by 8.3%. Based on a preliminary study in the Azarra 1 room for the last 3 months, there were 24 patients with bronchitis, 14 of whom were sufferers of chronic bronchitis and 10 patients were sufferers of acute bronchitis. Where 100% experience ineffective airway clearance, approximately 50% experience ineffective breathing patterns, and approximately 10% experience impaired gas exchange.

If there is an infection in the bronchi, inflammation will occur which results in vasodilation, congestion, mucosal edema, and bronchospasm. This can cause airflow to become blocked, because of which the mucociliary defense in the lungs increases and is damaged, and tends to be more susceptible to infection. Thickened and excess secretions will interfere with airflow. Bronchial swelling and thick secretions will damage the airway and disrupt gas exchange in the alveoli, especially during expiration. Damage to this can result in decreased alveolar ventilation, acidosis, and hypoxia (Magfiroh, 2021).

To deal with the problem of ineffective airway clearance, the intervention that can be given is airway management by performing chest physiotherapy which aims to remove secretions, improve ventilation, and improve respiratory muscle performance. Chest physiotherapy is a nursing action that is carried out in the form of clapping, vibration, and postural drainage (Ariasti, 2017).

Chest physiotherapy is best done in the morning to reduce secretions that accumulate at night and in the afternoon to reduce coughing at night. The reason for choosing chest physiotherapy is that it is more effective for removing sputum, namely clapping to change the consistency and location of the sputum, vibration to move the sputum, and postural drainage to speed up secretions due to gravity and it is easy to practice by the family at home. So, with these three stages, it is faster to expel sputum. The

chest physiotherapy method is also more effective at improving sleep quality (Fauzi, Nuraeni & Solechan, 2014).

Based on the problems above, the authors are interested in observing the application of breath physiotherapy, postural drainage, and effective coughing in patients with ineffective airway clearance nursing care (bronchitis) in the Azzara 1 room of RSI Jemursari Surabaya.

METHODS

Study Design

This study used descriptive research methods with case studies as the type of research. This case study is a case study conducted by examining the problem through one case consisting of a single unit. The approach used in this research is assessment, nursing diagnosis, planning, implementation, and evaluation (Zelika and Dermawan, 2015).

Settings

The location of this research was carried out at the Azzara 1 room, RSI Jemursari Surabaya. This case study was conducted starting from October 13, 2022, and was carried out for 3 days in providing nursing care.

Research subject

The research subject in this study was Mr. B, who was 26 years old and was treated in the Azzara 1 room, RSI Jemursari Surabaya with a medical diagnosis of bronchitis.

Instruments

Using nursing care sheets using observation and interviews as well as patient medical records.

Data collection

Focus data on assessment through interviews, observation, and physical examination using therapeutic communication techniques, direct observation, and medical records

Data Analysis

The collected research data were synthesized and analyzed. After that, the researcher conducted a descriptive explanation of the study's results.

Ethical Consideration

This study has received approval from the patient, RSI Jemursari Surabaya, and Nahdlatul Ulama University Surabaya.

RESULTS

Focus data on assessment through interviews, observation, and physical examination using therapeutic communication techniques, direct observation, and through medical records in the Azzahra 1 room on October 13 2022 obtained a nursing diagnosis of ineffective airway clearance related to airway hypersecretion characterized by ineffective coughing in patients, excess sputum, rhonchi.

Nursing interventions carried out, namely, airway management focused on the application of chest physiotherapy (clapping, vibrating, postural drainage) and effective coughing.

Implementation with the application of effective chest physiotherapy and coughing is carried out for 3 days, where the action is observation: monitoring breathing patterns (frequency, depth, normal respiratory effort), monitoring breath sounds (obtaining additional breath sounds rhonchi), monitoring sputum (amount, consistency, green color). Therapeutic: maintain airway patency, position semi-fowler or fowler, give warm drinks, perform chest physiotherapy (clapping, vibrating, postural drainage), and effective coughing. Education: teach effective coughing techniques (patients understand and cooperate). Collaboration: collaborate in giving bronchodilators, expectorants (respirable nebule + bisolvone 20 drops 3x1).

DISCUSSION

The study was conducted on October 13, 2022, for Mr. B aged 26, and found data that Mr. B had complained of coughing for 2 weeks, had taken medicine but had not improved, and was accompanied by pain when coughing. In his history, Mr. B has been diagnosed with bronchitis. Compositentis a general condition with GCS 456. Examination results of vital signs BP: 103/70, N: 95x/minute, S: 37.7°C, RR: 20x/minute, SpO₂: 97%. The results of the thorax photo readings obtained the results of the impression of bronchitis.

Bronchitis is inflammation that occurs in the main respiratory tract or bronchi. The bronchus functions as a channel that carries air to the lungs. Bronchitis is characterized by the appearance of cough symptoms that last for one week or more. Bronchitis causes thickening of the bronchi, loss of elasticity in the bronchial tree, changes in mucous membranes, leukocytes (white blood cells), and the formation of a sticky mucopurulent exudate (Shuman, 2013). The cause of bronchitis in Mr. B because previously Mr. B has a history of bronchitis and is an active smoker.

Ineffective airway clearance is the inability to clear secretions or airway obstruction to maintain a patent airway (DPP PPNI, 2016). Airway clearance is a condition where the trachea or lungs are free from sputum with parameters that have not increased respiration, nostril breathing, or respiratory muscle assistance. Airway clearance is a condition in which individuals can cough effectively and no sputum buildup occurs (Mathis, 2018).

Based on the data obtained in the study of Mr. B in the Azzahra 1 room RSI Surabaya Jemursari the patient has a problem in nursing with ineffective airway cleaning related to airway hypersecretion marked by ineffective cough, excess sputum, and rhonchi. According to Muttaqin (2015), chest physiotherapy is a therapy that includes postural drainage, chest percussion and vibration, breathing exercises/breathing retraining, and effective coughing.

The nursing implementation used in this final scientific work is by nursing intervention planning, namely the application of chest physiotherapy (clapping, vibrating, postural drainage) and effective coughing in the Azzahra 1 room RSI Surabaya Jemursari for 3 days, starting on October 13 2022 to

October 15 2022 with 1 time a day, where sputum production goes from increasing on scale (1) to just decreasing to scale (4), effective coughing decreases from scale (1) to increasing to scale (5) so that the problem of ineffective airway clearance can be resolved. This is consistent with research conducted by Rizqiana Dwi, et al (2022) where chest physiotherapy and effective coughing have an effect and are effective in removing secretions and reducing shortness of breath.

Chest physiotherapy is a management for expelling phlegm using postural drainage, vibration, and percussion techniques. The benefit of chest physiotherapy is to make it easier to remove secretions or sputum (Siregar & Aryayuni, 2019).

The implementation of nursing actions for Mr. B is carried out to reduce the risk of further complications by providing non-pharmacological therapy, namely the application of clapping, vibrating, postural drainage, and effective coughing. The effectiveness of chest physiotherapy is chest physiotherapy therapy that is carried out by giving or placing a position according to the postural drainage position to drain secretions in the respiratory tract. Then after postural drainage, do clapping after that vibrating and end with an effective cough.

Evaluation is the final stage of the nursing process based on the application of chest physiotherapy and effective coughing which is carried out once a day for 3 days for Mr. B who experienced ineffective airway clearance due to bronchitis. It can be concluded that the application of chest physiotherapy and effective coughing exercises can be done as one action to overcome the problem of airway clearance is not effective. Evidence of the results was carried out in the study of Mr. B with complaints of coughing up phlegm and chest pain when coughing. After being given pharmacological and non-pharmacological therapy with chest physiotherapy and effective cough exercises routinely once a day for 3 days showed significant progress.

The first evaluation was carried out on October 13, 2022, at 14.00 obtained subjective data: the patient said he coughed up phlegm and had pain when coughing, objective data: the patient's general condition was adequate, the patient appeared to be coughing ineffectively, excess sputum, there were rhonchi sounds. BP: 115/72 mmHg, N: 92 x/minute, S: 37°C, RR: 20 x/minute, SpO2: 99%, A: the problem has not been resolved, P: continued intervention: observe TTV, monitor breathing pattern, sound breath, amount of sputum, perform chest physiotherapy and teach effective cough techniques, collaborate in administering pharmacological therapy, namely giving bronchodilators, expectorants (respirable nebula + bisolvon 20 drops 3x1).

The 2nd evaluation on October 14, 2022, at 14.00, found the patient said the cough had decreased, and chest pain had decreased, objective data: the general condition was adequate, the patient was able to cough effectively, was able to expel phlegm, the sound of rhonchi was reduced. BP: 111/64 mmHg, N: 80 x/minute, S: 36,3°C, RR: 20 x/minute, SpO2: 99%, A: partially resolved problem, P: continued intervention: observe TTV, monitor breathing pattern, breath sounds, amount of sputum, perform chest physiotherapy and teach effective cough techniques, collaborate in providing

pharmacological therapy, namely giving bronchodilators, expectorants (respirable nebula + bisolvon 20 drops 3x1).

The 3rd evaluation on October 15, 2022, at 19.00, obtained subjective data: the patient said the cough had greatly reduced, no chest pain, objective data: general condition was adequate, the patient was able to cough effectively, could cough up phlegm, no crackles were heard. BP: 122/82 mmHg, N: 88 x/minute, S: 36,5°C, RR: 20 x/minute, SpO₂: 99%, A: Problem solved, P: intervention stopped, KRS patient, education to patient and family to continue effective chest physiotherapy and coughing at home until declared cured. Therapy is taken as recommended, control according to schedule, Azithromycin therapy 1x1, N-Acetylcysteine 3x1, Ambroxol 3x1, Vitamin C 1x1.

Based on these data, according to the researchers, the evaluation was carried out for 3 days, after chest physiotherapy and effective coughing. Patients show significant progress, namely sputum production from increasing scale (1) to moderately decreasing to scale (4), effective cough from decreasing scale (1) to increasing scale (5). Mr. B's condition is stable and progress is improving, so the Doctor in Charge of the Patient (DPJP) allows him to go home by continuing chest physiotherapy and effective coughing at home until he is declared cured. Drink therapy as recommended, and control according to schedule.

LIMITATIONS

No limitation.

CONCLUSION

This study analyzed the implementation of nursing care in bronchitis patients diagnosed with "ineffective airway clearance" using chest physiotherapy methods such as clapping, vibrating, postural drainage, and effective coughing techniques. The case study was conducted over three days on a patient at RSI Surabaya Jemursari. The results demonstrated that these interventions successfully reduced sputum production improved the patient's ability to cough effectively, and diminished rhonchi sounds.

The primary conclusion is that chest physiotherapy and effective coughing techniques can help clear secretions to maintain airway patency, ultimately accelerating patient recovery. This highlights the importance of incorporating non-pharmacological approaches into nursing interventions for bronchitis patients. Nurses are encouraged to teach these techniques to patients so they can perform them independently at home for optimal outcomes.

Nurses should prioritize educating patients and their families on the importance of chest physiotherapy techniques such as clapping, vibrating, postural drainage, and effective coughing. This education should emphasize how these techniques can be practiced independently at home to maintain airway clearance and prevent complications. As smoking is a major risk factor for bronchitis and its complications, healthcare facilities should provide

structured smoking cessation programs for patients, particularly active smokers, to improve their respiratory health and overall well-being. Patients who undergo chest physiotherapy should have regular follow-ups to assess their progress, ensure the proper execution of techniques, and modify care plans as needed based on their condition. Healthcare institutions should consider integrating chest physiotherapy into standard treatment protocols for bronchitis and other respiratory conditions involving ineffective airway clearance. While this study demonstrates the effectiveness of these interventions in a single case, additional research involving larger patient samples is recommended to validate and generalize the findings. Encourage collaboration among healthcare professionals, including physicians, nurses, and respiratory therapists, to optimize the implementation of both pharmacological and non-pharmacological therapies for bronchitis patients. Evaluate the applicability of these techniques for pediatric and elderly populations with bronchitis to determine any necessary modifications for age-specific care.

AUTHOR CONTRIBUTION

Authors' contributions: All the authors contributed equally to the study.

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Wahyu Pranoto : None.

Difran Nobel Bistara : None.

Umdatus Soleha : None.

Priyo Mukti Pribadi Winoto : None.

CONFLICT OF INTEREST

The authors declare that there was no conflict of interest.

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REFERENCE

- Agung, R. Septiyanti, “Hubungan Merokok Dan Paparan Polusi Dengan Kejadian Bronkitis,” *Jurnal Media Kesehatan, Volume 9 Nomor 2*, Oktober 2016, hlm 114-203. Politeknik Kesehatan Kementrian Bengkulu, Jurusan Keperawatan.
- Agung, W. Ikrima, R. Muzaroah, E. Fakhrudin, N, S, “Penerapan Fisioterapi Dada (Postural Drainase, Clapping Dan Vibrasi) Efektif Untuk Bersihan Jalan Nafas Pada Anak Usia 6-12 Tahun,” *Intan Husada : Jurna Ilmiah Keperawatan*, Vol. 10 N0 1, Januari 2022.
- Angelina, B. (2016). *Buku Ajar Keperawatan Medikal Bedah. Ed. 5, 101.2. (M. Iskandar, ed) (5th ed)*. EGC Medical.
- Ambarwati, F.R., & Nasution, N. (2015). *Keterampilan Dasar Praktek Klinik*. Yogyakarta: Dua Satria Offset.
- Ariasti. (2017). *Pengaruh Fisioterapi Dada Terhadap Bersihan Jalan Nafas Di Desa Pucung Erimoko Wonogiri*. Kosala JIK 2 (2): 27–34.
- Brunner & Suddarth. (2016). *Buku Ajar Keperawatan Medikal Bedah Edisi 12 volume 1*. Jakarta: EGC.
- Cahya, S. V. (2019). *Asuhan Keperawatan Pada Anak Dengan Bronkitis Dalam Pemenuhan Aman Nyaman*. Stikes Kusuma Husada Surakarta.
- Digital Repository Repository Universitas Jember Jember. *Digital Repository Universitas Jember, September 2019*, 2019–2022.
- Fauzi, I., Nuraeni, A., & Solecha, A. (2014). *Pengaruh Batuk Efektif Dengan Fisioterapi Dada Terhadap Pengeluaran Sputum Pada Balita Dengan ISPA*. Jurnal Kesehatan, I (5), 1-10.
- Global Initiative for Chronic Obstructive Lung Disease, (2017). *Global Strategy for The Diagnosis Management, and Preventive of Chronic Obstructive Pulmonary Disease*. GOLD.
- Ika Kartikk, W. Joyo, M. Mukhammad, Musta'in, “Ketidakefektifan Bersihan Jalan Nafas Pada Tn. M Dengan Bronkitis Kronis di RS Paru Dr. Ario Wirawan Salatiga Tahun 2018,” *Program Studi D3 Keperawatan Universitas Ngudi Waluyo*.
- Ikawati. (2016). *Penyakit Sistem Pernafasan Dan Tatalaksana Terapinya*. Yogyakarta: Bursa Ilmu.
- Luklukaningsih. (2019). *Anatomi Fisiologi dan Fisioterapi*. Yogyakarta: Nuha Medika.
- Magfiroh. (2021). *Studi Literatur: Asuhan Keperawatan Pada Pasien Anak Dengan Bronkitis Dengan Masalah Keperawatan Bersihan Jalan Nafas Tidak Efektif. Tugas Akhir (D3) thesis*, Universitas Muhammadiyah Ponorogo.
- Marni. (2014). *Buku Ajar Keperawatan Pada Anak Dengan Gangguan Pernafasan*. Yogyakarta: Gosyen Publishing.

- Muttaqin, A. (2012). *Buku Ajar Asuhan Keperawatan Klien Dengan Gangguan Sistem Pernafasan*. Jakarta: Salemba Medika.
- Muttaqin, A. (2014). *Asuhan Keperawatan Klien Dengan Gangguan Sistem Pernafasan*. Jakarta: Salemba Medika.
- Muttaqin. (2016). *Asuhan Keperawatan Perioperatif Konsep, Proses dan Aplikasi. Jilid 3*. Jakarta: Salemba Medika.
- N. Nurmayanti, A. Waluyo, W. Jumaiyah, and R. Azzam, “Pengaruh Fisioterapi Dada, Batuk Efektif dan Nebulizer terhadap Peningkatan Saturasi Oksigen dalam Darah pada Pasien PPOK,” *Jurnal Keperawatan Silampari*, vol. 3, no. 1, pp. 362–371, Nov. 2019, doi: 10.31539/jks.v3i1.836.
- Nanda. (2015). *Diagnosis Keperawatan Definisi & Klasifikasi 2015-2017 Edisi 10 Editor T Heather Herdman, Shigemi Kamitsuru*. Jakarta: EGC.
- Ningrum, H.W., Widyastuti, Y., & Enikmawati, A. (2019). Penerapan Fisioterapi Dada Terhadap Ketidakefektifan Bersihan Jalan Nafas Pada Pasien Bronkitis Usia Pra Sekolah. *PROFESI (Profesional Islam) Media Publikasi Penelitian*.
- Nugraha, Y., Ners, M. K. And Wianti, A. (2021). *Konsep Dasar Keperawatan: Buku Lovrinz Publishing. Lovrinz Publishing*.
- Rizqiana, D, A., Indri, H., “Asuhan Keperawatan Bersihan Jalan Nafas Tidak Efektif Pada Pasien Bronkhitis Dengan Fisioterapi Dada Di Ruang Edelweis Atas RSUD Kardinah Kota Tegal,” *Jurnal Inovasi Penelitian*, Vol. 3 No. 3 Agustus 2022.
- Rosyidi, K., & Wulansari, N.D. (2013). *Prosedur Praktik Keperawatan Jilid I*. Jakarta: CV. Trans Info Medika.
- Rusdiantoro, A. (2017). *Asuhan Keperawatan Dengan Bronkitis*. Cendekia Medika.
- Suryo, Joko. (2010). *Penyembuh Gangguan Sistem Pernafasan*. Yogyakarta: B Fisrt (PT. Bintang Pustaka).
- Smeltzer, S. C. & Bare, B. G. (2013). *Buku Ajar Keperawatan Medikal Bedah Brunner & Suddarth. Edisi 8*. Jakarta: EGC.
- Tina, Lymbran, dkk. (2017). Analisis Faktor Resiko Kejadian Penyakit Bronchitis di Wilayah Kerja Puskesmas Mekar. *Preventive Journal*, vol. 2 / No. 1 (2540-8283), 9.
- Utama, Saktya Yudha Ardhi. (2018). *Buku Ajar Keperawatan Medikal Bedah Sistem Respirasi*. Yogyakarta: Depublish.
- Zelika, A. A. & Dermawan, D. (2015) “Kajian Asuhan Keperawatan Jiwa Halusinasi Pendengaran Pada Sdra. D. Di ruang Nakula RSSD Surakarta”. *Profesi (Profesional Islam): Media Publikasi Penelitian*, 12(02).