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Case Report

Balloon-Blowing Play Therapy During Nursing Care for a Child with Bronchopneumonia and an Ineffective Breathing Pattern: A Single-Patient Case Report

Alucia Ahmadyah[1], Ika Rizki Anggraini[2]

[1]Nursing Study Program, Faculty of Health Science and Pharmacy, University of Muhammadiyah Malang, Indonesia
[2]Department of Nursing, Faculty of Health Science and Pharmacy, University of Muhammadiyah Malang, Indonesia

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Corresponding author

Ika Rizki Anggraini*
Faculty of Health Science and Pharmacy,
University of Muhammadiyah Malang
Jl. Bendungan Sutami No.188, Sumbersari,
Lowokwaru, Malang, East Java
Phone : 87759761290
Email: ikarizki@umm.ac.id

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Abstract

Background: Bronchopneumonia is a common respiratory condition in children and may cause dyspnea, increased work of breathing, and secretion accumulation. *Balloon blowing exercise* is a simple, non-invasive breathing exercise that can be integrated with play activities in children.
Objective: To describe the implementation of nursing care and *balloon blowing exercise* in a child with bronchopneumonia and ineffective breathing pattern, as well as to describe changes in respiratory status during hospitalization.
Methods: This single-patient case report documented balloon-blowing play therapy as an adjunct to comprehensive nursing care for a child with bronchopneumonia and an ineffective breathing pattern. Respiratory status was followed descriptively using respiratory rate, oxygen saturation, and clinical respiratory findings during three days of hospitalization. Respiratory parameters were not measured immediately before and after each exercise session.
Results: During three days of comprehensive nursing and medical care that included balloon-blowing play therapy, the patient's respiratory rate decreased from 32 to 24 breaths/minute and oxygen saturation increased from 94% to 98%. Oxygen supplementation was maintained at 3 L/min during the reported oxygen-saturation assessments. Clinical signs of respiratory distress also improved. Because measurements were not session-specific and concurrent treatments were continued, these changes cannot be attributed specifically to balloon-blowing play therapy.
Conclusion: Balloon-blowing play therapy was feasible and tolerated as an adjunct to comprehensive nursing care in this single pediatric case. Respiratory status improved during hospitalization, but the independent contribution of balloon-blowing therapy cannot be determined because of concurrent medical treatment, continuous oxygen supplementation, and the absence of standardized pre- and post-session measurements.

Keywords: Balloon blowing exercise; bronchopneumonia; child; ineffective breathing pattern; nursing care.

INTRODUCTION

Bronchopneumonia is one of the most common respiratory health problems affecting infants and children (1). It is characterized by inflammation of the lung tissue, particularly around the bronchi and bronchioles, which may be caused by bacterial, viral, or fungal infections.

The inflammatory process may result in tissue edema, increased mucus production, airway narrowing, and alveolar involvement, thereby impairing ventilation and gas exchange (2). These conditions may lead to various clinical manifestations, including cough, fever, increased respiratory rate, dyspnea, chest wall retractions, the use of accessory respiratory muscles, and increased respiratory secretions (3). Such respiratory disturbances may develop into a nursing problem characterized by an ineffective breathing pattern in children.

The epidemiological data discussed here describe pneumonia as a whole because global and national surveillance sources do not consistently report bronchopneumonia as a separate category. UNICEF reports that pneumonia kills more than 700,000 children under five each year, including around 190,000 newborns (4). Global Burden of Disease estimates also indicate a substantial mortality burden among children under five, including in Indonesia (5). Because these estimates derive from different sources and methods, they should not be interpreted as directly interchangeable. In Indonesia, Ministry of Health surveillance data further indicate that childhood pneumonia remains an important public-health concern (6).

In children with bronchopneumonia, increased respiratory secretions and inflammation of the respiratory tract may obstruct airflow and increase the work of breathing (7). Clinical manifestations such as dyspnea, increased respiratory rate, chest wall retractions, nasal flaring, the use of accessory respiratory muscles, and abnormal breath sounds may be observed in these conditions (8). Unmanaged accumulation of respiratory secretions may further impair ventilation and potentially lead to impaired oxygenation (9). Therefore, monitoring respiratory status and maintaining airway patency are important components of nursing care for children with bronchopneumonia (10).

The management of children with bronchopneumonia involves a combination of medical treatment and nursing interventions (11). Medical treatment is provided according to the patient's condition and clinical indications, while nursing interventions may include monitoring respiratory rate and breathing pattern, monitoring oxygen saturation, assessing abnormal breath sounds, positioning to promote lung expansion, airway management, and oxygen administration as indicated (12). In addition to these interventions, breathing exercises may be used as supportive interventions to help optimize respiratory function (13). One relatively simple form of breathing exercise that can be adapted to children's characteristics is the *balloon blowing exercise*, or balloon-blowing exercise (13).

The *balloon blowing exercise* is a breathing exercise performed by inhaling through the nose and exhaling through the mouth to inflate a balloon (14). This activity can be incorporated into play to facilitate children's participation and engagement during the care process (15). Theoretically, balloon blowing involves the regulation of inspiration and expiration as well as the activation of respiratory muscles. Controlled expiration through the mouth may help train breathing patterns, support lung expansion, and optimize ventilation (16). Previous studies have reported changes in respiratory parameters, including increased oxygen saturation and decreased respiratory rate, following breathing exercises or balloon-blowing activities in children (17), (18).

Although balloon blowing has been used as a form of breathing exercise in children with respiratory disorders, its application in children with bronchopneumonia who experience an ineffective breathing pattern warrants further documentation. In addition, changes in children's respiratory conditions may be influenced by various factors, including medical treatment, baseline clinical condition, and disease progression. Therefore, findings from a case report cannot be used to establish a causal relationship but may provide a clinical description of changes in the patient's condition during the provision of nursing care. This intervention should also be considered a supportive therapy rather than a substitute for medical treatment or other primary interventions in the management of bronchopneumonia.

Although balloon-blowing exercises have been described in previous pediatric respiratory studies, documentation of their implementation as part of individualized nursing care for a child with bronchopneumonia and an ineffective breathing pattern remains limited. This case report therefore describes the use of balloon-blowing play therapy as an adjunct to comprehensive nursing care and the accompanying changes in respiratory rate,

oxygen saturation, and clinical respiratory findings.

METHODS

Study Design

This case report employed a single-patient case study approach based on the five stages of the nursing process: assessment, nursing diagnosis, intervention planning, implementation, and evaluation (19), (20). A case study approach was selected to provide an in-depth description of the application of balloon blowing exercise as a supportive nursing intervention in a child with bronchopneumonia. The assessment was conducted through interviews, observations, physical examinations, and medical record reviews. Based on the assessment findings, the nursing diagnosis was established and appropriate interventions were planned according to the patient's condition. The balloon blowing exercise was provided as an adjunct to the ongoing nursing care and medical treatment. Evaluation was conducted by comparing changes in the patient's respiratory status over three days of care based on clinical observations and documented respiratory parameters.

Participants

The participant in this case report was a 3-year-old girl with a medical diagnosis of bronchopneumonia who presented with dyspnea and the nursing problem of an ineffective breathing pattern. The initial assessment was conducted on April 20, 2026. The patient was selected based on clinical characteristics relevant to the focus of the case report, including a medical diagnosis of bronchopneumonia, impaired breathing pattern, increased respiratory rate, cough and dyspnea, intact consciousness, and the ability to follow simple instructions. Written informed consent for publication of the case report and accompanying clinical information was obtained from the patient's parent or legal guardian. All patient identifiers were removed to maintain confidentiality.

Intervention Protocol

The balloon-blowing exercise was administered as a supportive nursing intervention during three days of care. Each session lasted approximately 5–10 minutes and was provided according to the child's tolerance and clinical condition. The activity was incorporated into play to support engagement and was performed under nursing supervision. The available documentation did not provide a complete session-by-session intervention-fidelity record; therefore, the reported dose should be interpreted cautiously.

During the period of care, the patient received treatment according to medical indications, including intravenous fluids, ceftriaxone, ondansetron, nebulized bronchodilator therapy, and continous oxygen saturation values, including the initial value of 94% and the subsequent value of 98%, were obtained thile the patient was receiving oxygen supllementation at 3 L/min. Other nursing interventions were also continued according to the patient's condition, including respiratory status monitoring and positioning. The patient's respiratory parameters were documented throughout the care period, including respiratory rate, oxygen saturation, breathing pattern, use of accessory respiratory muscles, abnormal breath sounds, and secretion status. However, respiratory parameters were not measured using a standardized procedure immediately before and after each balloon blowing exercise session. Therefore, changes in respiratory parameters were used to describe the patient's clinical progression from the first to the third day of care and were not used to determine the direct effects of individual exercise sessions.

Instruments

Oxygen saturation was assessed using a pulse oximeter during routine respiratory monitoring. Measurements were recorded after a stable reading was obtained while the child was at rest. Oxygen flow and the clinical context at the time of measurement were considered when interpreting changes in oxygen saturation. Respiratory assessment also included dyspnea, respiratory rate, chest-wall retractions, use of accessory respiratory muscles, abnormal breath sounds, cough, and respiratory secretions.

Data were collected through interviews with the patient's mother, observations, physical examinations, medical record reviews, and documentation of nursing implementation and evaluation. Changes in respiratory status were analyzed by comparing the patient's condition on the first, second, and third days of care. Although respiratory rate and oxygen saturation

were documented throughout the care period, these parameters were not specifically measured immediately before and after each balloon blowing exercise session. Accordingly, the observed changes were interpreted as part of the patient's overall clinical progression during comprehensive nursing care and were not used to conclude the independent effectiveness of the balloon blowing exercise.

Data Collection Procedure

Data were collected from the initial assessment on the first day through the evaluation on the third day of care. Data collection involved interviews with the patient's mother, observation of the clinical condition, physical examinations, monitoring of vital signs and oxygen saturation, and review of medical and nursing documentation. The respiratory parameters monitored included respiratory rate, oxygen saturation, breathing pattern, dyspnea, chest wall retractions, use of accessory respiratory muscles, abnormal breath sounds, cough, and secretion characteristics. Respiratory parameters were recorded as part of routine clinical monitoring rather than as standarized pre- and post-session measurements. Therefore, the recorderd values represent the patient's respiratory status during the overall course of care rather than the immediate response to individual balloon-blowing sessions.

Data Analysis

Data were analyzed descriptively by comparing changes in the patient's condition from the first to the third day of care. Numerical data, including respiratory rate and oxygen saturation, were presented as daily values, whereas clinical findings such as dyspnea, chest wall retractions, use of accessory respiratory muscles, abnormal breath sounds, cough, and respiratory secretions were described narratively. Changes in respiratory status were subsequently presented in a daily progress table to illustrate the patient's clinical changes throughout the nursing care period. No inferential statistical analysis was performed because the case report involved only one patient. The observed changes were not interpreted as independent effects of the balloon blowing exercise because the patient simultaneously received medical treatment and other nursing interventions.

Ethical Considerations

Patient confidentiality was maintained by excluding the patient's name, address, medical record number, and other potentially identifying information. Consent from the patient's parent or legal guardian was obtained before the use of anonymized clinical data for scientific reporting. The balloon blowing exercise was a non-invasive intervention and was performed while considering the patient's clinical condition and tolerance. The exercise was discontinued if the patient showed fatigue, discomfort, increased dyspnea, or other clinical signs requiring cessation of the activity. This case report described the nursing care provided during the patient's treatment and did not involve any intervention intended to replace medical therapy. The status of formal ethical approval or review was determined according to the policies of the institution where the case report was conducted. When a case report involves medical record data and is intended for scientific publication, the applicable institutional and journal requirements regarding ethical approval and/or case report consent should be fulfilled.

RESULTS

The initial assessment revealed signs of respiratory impairment, including dyspnea, a respiratory rate of 32 breaths/minute, chest wall retractions, nasal flaring, use of accessory respiratory muscles, respiratory secretions, and rhonchi. These findings provided the basis for identifying nursing problems related to respiratory function.

Nursing Diagnoses

Based on the assessment findings, three nursing diagnoses were identified: ineffective breathing pattern, ineffective airway clearance, and nausea. The nursing diagnoses, supporting data, and expected outcomes are presented in Table 2.

Implementation and Evaluation

Nursing care was provided for three days and incorporated airway management interventions and the balloon blowing exercise. The patient's clinical progress during the care period is presented in Table 3.

Over the three-day period of nursing care, the patient's respiratory status showed clinical improvement. On the first day, the patient had a

respiratory rate of 32 breaths/minute and an oxygen saturation of 94%, accompanied by dyspnea, rapid and shallow breathing, nasal flaring, chest wall retractions, use of accessory respiratory muscles, rhonchi, and abundant, thick respiratory secretions.

The SpO_2 measurements were obtained while the patient was receiving continuous oxygen supplementation via nasal cannula at 3 L/min.

The available documentation recorded three supervised balloon-blowing sessions during the care period, each lasting approximately 5–10 minutes. The child tolerated the observed sessions, and no adverse events were documented. Because intervention fidelity and adverse events were not monitored using a standardized session-level form, these findings support observed tolerability rather than established safety.

Overall, the child's respiratory status improved during the three-day care period. These changes occurred alongside antibiotic therapy, nebulized bronchodilator therapy, continuous oxygen supplementation, positioning, respiratory monitoring, and airway management; therefore, the clinical improvement cannot be attributed specifically to balloon-blowing play therapy.

Furthermore, respiratory rate and oxygen saturation were not specifically measured immediately before and after each balloon blowing exercise session. Therefore, the findings of this case report cannot be used to determine the effectiveness of the balloon blowing exercise or establish a causal relationship between the exercise and changes in the patient's respiratory status. The findings are more appropriately interpreted as a description of the patient's clinical progression while receiving comprehensive nursing care.

Table 1. Patient Characteristics and Initial Assessment Findings

Variable	Findings
Initials	An. F
Age and sex	3 years, female
Medical diagnosis	Bronchopneumonia with dyspnea
Medical history	Fever and cough for two weeks before hospital admission; previously received treatment at a primary healthcare facility without improvement
Chief complaints	Dyspnea and approximately five episodes of vomiting
Vital signs at initial assessment	Pulse rate: 120 beats/minute; temperature: 36.1°C; respiratory rate: 32 breaths/minute; patient appeared weak
Respiratory examination	Nasal flaring (+), respiratory secretions (+), chest wall retractions (+), rhonchi (+), use of accessory respiratory muscles
Supporting examinations	Leukocyte count: 15,480/µL; hemoglobin: 12.9 g/dL
Medical treatment	Intravenous fluids, ceftriaxone, ondansetron, nebulized bronchodilator therapy, and continous oxygen via nasal cannula at 3 L/min

Table 2. Nursing Diagnoses, Supporting Data, and Expected Outcomes in a Child with Bronchopneumonia

Nursing diagnosis	Supporting data	Expected outcomes
Ineffective breathing pattern related to impaired breathing effort	Dyspnea, increased respiratory rate, chest wall retractions (+)	Improved breathing pattern and decreased use of accessory respiratory muscles
Ineffective airway clearance related to airway hypersecretion	Cough, respiratory secretions (+), rhonchi (+), nasal flaring (+)	Improved airway clearance and ability to expectorate secretions
Nausea related to gastric irritation	Approximately five episodes of vomiting, dry mucous membranes, decreased skin turgor	Reduced nausea/vomiting and adequate fluid and nutritional intake

Table 3. Changes in the Patient's Respiratory Status During Three Days of Care

Day	Respiratory parameters	Observed condition	Nursing evaluation
Day 1	RR: 32 breaths/minute; SpO_2: 94%	Rapid and shallow breathing, dyspnea, nasal flaring (+), chest wall retractions (+), use of accessory respiratory muscles (+), rhonchi (+), abundant and thick secretions, ineffective cough	Ineffective breathing pattern and ineffective airway clearance remained unresolved. Airway management, respiratory status monitoring, and balloon blowing exercise were continued according to the patient's tolerance.
Day 2	RR: 28 breaths/minute; SpO_2: 96%	Breathing pattern became more regular; chest wall retractions and use of accessory respiratory muscles decreased; rhonchi decreased; secretions decreased and became less viscous; cough became more effective	Nursing problems were partially resolved. Balloon blowing exercice: 3 sessions completed; tolerated with nursing supervision; no adverse events documented.
Day 3	RR: 24 breaths/minute; SpO_2: 98%	Regular breathing pattern; chest wall retractions (-), use of accessory respiratory muscles (-), nasal flaring (-), rhonchi (-), minimal secretions, more effective cough; patient appeared more comfortable	Respiratory problems showed improvement. Interventions were continued as needed according to the patient's clinical condition.

DISCUSSION

The findings of this case report showed that the child with bronchopneumonia experienced respiratory impairment characterized by dyspnea, an increased respiratory rate, chest wall retractions, nasal flaring, the use of accessory respiratory muscles, respiratory secretions, and rhonchi. These findings indicated increased work of breathing and impaired airway clearance, which may occur as a result of inflammation in the respiratory tract. Inflammation may increase secretion production, cause airway narrowing, and impair ventilation, thereby increasing the work of breathing (23).

At the initial assessment, the patient had a respiratory rate of 32 breaths/minute and an oxygen saturation of 94%, with signs of increased work of breathing and impaired airway clearance. Oxygen saturation was measured while the patient was receiving continuous oxygen supplementation via nasal cannula at 3 L/min, which was maintained during the reported observation period. Over three days, respiratory rate decreased to 28 and then 24 breaths/minute, while oxygen saturation increased to 96% and then 98%. Chest-wall retractions, use of accessory respiratory muscles, nasal flaring, rhonchi, and respiratory secretions also decreased, while cough effectiveness improved. These findings describe the patient's overall clinical progression during comprehensive care.

The observed changes can be discussed in relation to previous studies of blowing-based breathing exercises; however, the available evidence is indirect. Febriyanti et al. reported changes in respiratory rate and oxygen saturation following pursed-lip breathing in thress children with pneumonia (24). Similarly, a quasi-experimental study involving 60 children with lower respiratory trect infections reported improvements in respiratory rate and

oxygen saturation following balloon-blowing exercises (25). Dafris et al. also reported changes in respiratory rate and oxygen saturation following pursed-lip breathing using a pinwheel as a blowing medium in children with pneumonia (26). These studies differed form the present case in terms of respiratory diagnosis, intervention technique, exercise protocol, study design, sample size, and concurrent treatment. In particular, pursed-lip breathing and balloon blowing are not physiologically identical because balloon blowing involves expiratory resistance generated by the balloon. Acute bronchopneumonia also has a different pathophysiological context from asthma, chronic obstructive pulmonary disease, or other respiratory conditions. Therefore, these studies provide contextual support for the use of controlled expiratory activities but should not be interpreted as direct evidence that balloon blowing improves respiratory status in children with acute bronchopneumonia.

Physiologically, balloon blowing involves inhalation followed by controlled expiration against resistance. Controlled expiration may plausibly influence breathing pattern and expiratory muscle activity (26,27). However, pulmonary mechanics were not measured in this case; therefore, any proposed physiological mechanism remains theoretical rather than demonstrated. The observed reduction in secretions, rhonchi, and work of breathing occurred during comprehensive nursing and medical care and cannot be attributed specifically to balloon blowing.

The use of the *balloon blowing exercise* also has advantages in pediatric nursing because it can be incorporated into play activities (25). A 3-year-old child may be more likely to participate in activities that are concrete, simple, and enjoyable. Blowing a balloon can make breathing exercises feel like play, thereby facilitating the child's engagement during the intervention (16). In this case, the patient was able to follow instructions and perform the exercise with nursing assistance. This approach is consistent with the principle of *atraumatic care*, which emphasizes the provision of care that considers the child's comfort, abilities, and developmental characteristics during hospitalization (28).

The nurse plays an important role in supervising the exercise and assessing the child's tolerance according to the child's clinical condition (29). The nurse provided a demonstration, used simple instructions, offered encouragement, and monitored the patient's response during the exercise. In young children with acute respiratory illness, balloon-blowing activities require consideration of potential fatigue, increased work of breathing, choking or aspiration if the balloon ruptures, latex sensitivity, and infection-control requirements. The exercise should be discontinued if the child develops fatigue, increated dyspnea, discomfort, oxygen desaturation, or other clinical signs indicating intolerance. Parental involvement may also help create a supportive play environment that facilitates the child's participation during the exercise (30). In this case, the patient tolerated the observed exercise sessions without documented adverse events; however, systematic adverse-event monitoring was not performed. Therefore, the present case supports the feasibility and observed tolerability of the activity rather than establishing its safety.

Overall, the implementation of the balloon blowing exercise during three days of nursing care was tolerated by the patient, who was able to participate with nursing assistance. The observed respiratory changes occurred during comprehensive nursing and medical care, including continuous oxygen supplementation, nebulized bronchodilator therapy, antibiotic treatment, positioning, respiratory monitoring, and airway management. The increase in oxygen saturation from 94% to 98% should be interpreted in the context of continuous oxygen supplementation at 3 L/min and therefore cannot be attributed specifically to the balloon-blowing exercise. Similarly, the observed reduction in respiratory rate and improvement in respiratory findings cannot be separated from the effects of concurrent treatments and the natural clinical course. Previous studies of blowing-based exercises provide contextual rather than direct evidence because they involved different diagnoses, techniques, protocols, and study designs. In nursing practice, balloon-blowing play therapy may therefore be considered as an adjunctive activity for selected young children who are clinically able to participate, with emphasis on feasibility, tolerance, direct supervision, and integration with standard medical and nursing care. Further studies using standardized pre- and post-intervention measurements and appropriate control conditions are needed to evaluate its independent effects.

Nursing Implications

The balloon blowing exercise may be considered a supportive activity within nursing care for children with respiratory problems, particularly when the child is able to follow simple instructions. Nurses can incorporate the exercise into play therapy to facilitate the child's participation. The intervention should be adapted to the child's tolerance and performed alongside respiratory monitoring and appropriate medical treatment. Parental education may include the purpose and procedure of the exercise, the importance of adequate fluid intake as recommended, adherence to prescribed treatment, and recognition of warning signs of respiratory distress.

Limitations

The main limitation of this case report was the inability to determine the independent effect of the balloon blowing exercise because the patient received concurrent medical and nursing interventions. Respiratory rate and oxygen saturation were not measured immediately before and after each exercise session. Furthermore, oxygen saturation measurements were obtained while the patient was receiving continuous supplemental oxygen at 3 L/min, which may have confounded the observed increase in Spo2 during the care period. The intervention dose and fidelity were also not quantified using standardized session-level measurements, limiting the ability to determine the consistency of exercise delivery across the three days. Therefore, the observed respiratory changes cannot be directly attributed to the balloon blowing exercise and are more appropriately interpreted as part of the patient's clinical progression during comprehensive nursing care. These limitations support interpreting the case primarily in terms of the feasibility and observed tolerability of the intervention rather than its effectiveness.

CONCLUSION

The implementation of balloon-blowing play therapy as an adjunct to comprehensive nursing care was tolerated during the observed sessions in a 3-year-old child with bronchopneumonia and an ineffective breathing pattern. Over three days, respiratory rate decreased from 32 to 24 breaths/minute and oxygen saturation increased from 94% to 98% while continuous oxygen supplementation at 3 L/min was maintained. Other respiratory findings also improved. However, these changes occurred during concurrent oxygen therapy, nebulized bronchodilator therapy, antibiotic treatment, positioning, airway management, and routine nursing care. Accordingly, this case supports the feasibility and observed tolerability of the play-based intervention but does not establish its independent effectiveness.

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CONFLICT OF INTEREST

The authors declare that there were no financial, personal, or professional conflicts of interest that could have influenced the preparation of this article.

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