GENIUS JOURNAL
general nursing science journal
e-ISSN: 2723-7729
Vol. 06 No. 01 PP. 1-8 E-ISSN 2723-7729

Postural Drainage Intervention in Reducing Dyspnea among Bronchial Asthma Patients at Maccini Sawah Public Health Center

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DOI: https://doi.org/10.56359/gj.v6i1.399

ABSTRACT

Introduction: Bronchial asthma is a chronic respiratory condition marked by airway inflammation, mucus hypersecretion, and bronchial spasms, resulting in dyspnea and decreased respiratory efficiency. Postural drainage, a form of chest physiotherapy, has been suggested as a non-pharmacological intervention to enhance mucus clearance and reduce respiratory distress.
Objective: This study aimed to assess the effectiveness of postural drainage therapy in reducing dyspnea among patients with bronchial asthma at the Maccini Sawah Public Health Center.
Method: A descriptive case study design was employed, involving two asthma patients observed over three consecutive days. Postural drainage was implemented using three different positions across three sessions per participant. Data were collected through observation using the Medical Research Council (MRC) Dyspnea Scale, interviews, and documentation. The effect of the intervention was evaluated by comparing pre- and post-intervention dyspnea levels.
Result: Both participants demonstrated a consistent reduction in dyspnea levels following the intervention. On the first day, each respondent exhibited moderate shortness of breath (MRC score: 2), which progressively improved by the third day to a score of 0, indicating no dyspnea. Improvements were also reflected in vital signs, including reduced respiratory rate and more stable pulse. The intervention was well tolerated, and participants reported subjective relief in breathing.
Conclusion: Postural drainage is a safe, effective, and easily administered intervention that significantly reduces dyspnea in bronchial asthma patients. It holds promise as a supportive therapy for asthma management and should be considered in clinical practice, especially in community healthcare settings.

Keywords: bronchial asthma, postural drainage, dyspnea, chest physiotherapy

Introduction

Bronchial asthma is a chronic inflammatory disorder of the airways marked by structural abnormalities such as excessive mucus production and bronchial spasms. These changes lead to narrowed airways, resulting in difficulty breathing, feelings of suffocation, and the presence of abnormal breath sounds. The obstruction causes air to become trapped in the lungs, making it difficult to exhale (Ekaputri et al., 2023).

Clinically, bronchial asthma is characterized by recurrent and reversible bronchial narrowing, allowing patients to breathe normally between episodes. Asthma attacks can be triggered by various stimuli in individuals with bronchial hyperresponsiveness. In mild cases, pathological features include thick mucus hypersecretion, mucosal edema, smooth muscle spasms, and infiltration by chronic inflammatory cells. Additionally, damage to the ciliated bronchial epithelial cells and airway constriction can impair mucus clearance, limiting the effective mobilization of secretions within the lumen (Fernanda, Wibowo, and So'emah, 2022).

Globally, the World Health Organization (WHO) reported approximately 262 million asthma cases and 261,000 deaths due to the disease in 2019. Although asthma remains a major public health concern, its prevalence in Indonesia has shown a decline. Typical asthma symptoms include wheezing, persistent coughing, and chest tightness, which may affect individuals across all age groups—from young children to the elderly (Setiawan & Syafrianti, 2020). WHO (2022) also noted that 455,000 individuals globally died from asthma in 2019. In Indonesia, based on the 2019 Basic Health Research (Riskesdas), 2.4% of the population suffered from asthma, with women representing 2.5% of the cases. In West Java, the asthma prevalence is 2.79%, with Tasikmalaya Regency reporting 2.60%.

Postural drainage is a physiotherapeutic intervention designed to facilitate the removal of pulmonary secretions by strategically positioning patients to aid mucus drainage from obstructed lung segments (Kurniawan 2022; Richard 2022). Ningrum et al. (2019) emphasized that applying postural drainage for five minutes can significantly assist mucus expulsion. Tahir et al. (2019) also highlighted that mucus accumulation obstructs the airways, impeding effective breathing, and necessitating therapeutic clearance. Chest physiotherapy, including postural drainage, has demonstrated efficacy in promoting airway hygiene and respiratory relief.

Moreover, effective coughing techniques can further support mucus clearance. When combined with postural drainage, these methods have shown enhanced outcomes in facilitating expectoration. Therefore, this study explores the use of postural drainage, with or without coughing techniques, to evaluate its effectiveness in reducing dyspnea among bronchial asthma patients, as outlined in the study titled "Postural Drainage Administration in Bronchial Asthma Respondents to Reduce Shortness of Breath."

Objective

This study aimed to assess the effectiveness of postural drainage therapy in reducing dyspnea among patients with bronchial asthma at the Maccini Sawah Public Health Center.

Method

This study employed a descriptive case study design aimed at evaluating the implementation of postural drainage in bronchial asthma patients to reduce dyspnea. The

research was conducted over a three-day period at the Maccini Sawah Health Center, located in Makassar City, South Sulawesi Province, Indonesia.

Data collection methods included questionnaires, interviews, and document analysis. Questionnaires were administered to gather descriptive data from respondents regarding their experiences and respiratory symptoms. Semi-structured interviews were conducted through direct, face-to-face communication, allowing for in-depth exploration of each participant's personal experiences with asthma management. Document review involved the analysis of existing records related to asthma cases, particularly among elderly patients within the working area of the health center.

The collected data—comprising interview responses and observational findings—were systematically categorized into nursing problems and used as the basis for determining appropriate interventions. Data were presented in tabular and narrative formats to enhance clarity and interpretation.

To assess the effectiveness of postural drainage, patient conditions were compared before and after the intervention. The implementation outcomes were evaluated using the Medical Research Council (MRC) Dyspnea Scale, enabling a structured analysis of symptom progression. This methodological approach facilitated a comprehensive assessment of postural drainage as a non-pharmacological intervention to alleviate dyspnea in patients with bronchial asthma.

Result

Table 1. Results of the observation of postural drainage therapy in bronchial asthma respondents to reduce the shortness of breath in Ms. "H".

Time	Date	Action	MRC Scale									
			Pre					Post				
			0	1	2	3	4	0	1	2	3	4
09:00 – 10:00	25/06/2024	Instruct the respondent to sit in a semi-upright position (about 45 degrees) with their back against the bed/chair for 10-15 minutes.			√					√		
11:00 – 11:30	26/06/2024	Instruct the respondent to lie on their back with a pillow to support them at an angle of about 45 degrees and hold the position for 10 to 15 minutes.			√				√			
	27/06/2024	Next, from 11:30 to 12:00, instruct the respondents to sit hunched over with a pillow under their abdomen for support for 10 to 15 minutes.		√					√			

Table 2. Results of the observation of postural drainage therapy in asthma respondents to reduce Mr. "D"'s shortness of breath.

Time	Date	Action	MRC Scale									
			Pre				Post					
			0	1	2	3	0	0	1	2	0	4
09:00 – 11:00	25/06/2024	Instruct the respondent to sit in a semi-upright position (about 45 degrees) with their back against the bed/chair for 10-15 minutes.			√					√		
	26/06/2024	Instruct the respondent to lie on their back with a pillow to support them at an angle of about 45 degrees and hold the position for 10 to 15 minutes.			√				√			
	27/06/2024	Next, from 11:30 to 12:00, instruct the respondents to sit hunched over with a pillow under their abdomen for support for 10 to 15 minutes.		√				√				

MRC scale criteria:
0 (normal): no breathing difficulties except with heavy activity.
1 (mild): there are breathing difficulties, shortness of breath when rushing or walking to a slight incline.
2 (moderate): walking slower than most people of the same age due to breathing difficulties or stopping to catch breath.
3 (severe): stops walking after 90 meters to breathe or after walking for a few minutes.
4 (very severe): too difficult to breathe when leaving the house or when putting on or taking off clothes.

Based on the data presented in Table 1, the respondent Mrs. "H" experienced moderate dyspnea on the first day of observation, with a Medical Research Council (MRC) Dyspnea Scale score of 2. The initial intervention involved placing the respondent in a semi-upright position at approximately 45 degrees, with her back supported by a bed or chair, maintained for 10–15 minutes. This session was conducted in the morning, coinciding with the onset of her asthma symptoms. Following the postural drainage session, the respondent reported a noticeable improvement in breathing.

On the second day, prior to the intervention, the respondent was again positioned at a 45-degree angle, this time lying on her back with a pillow for support. No significant change was observed in her dyspnea level before the postural drainage; however, post-intervention, the respondent reported a reduction in shortness of breath compared to her pre-treatment condition. On the third day, postural drainage was applied with the respondent seated in a hunched-over position, supported by a pillow placed under the abdomen for 10–15 minutes. Following this session, Mrs. "H" experienced a marked improvement, with her MRC score reduced to 0, indicating the absence of dyspnea.

Similarly, Table 2 illustrates the findings for respondent Mr. "D." On the first day, he also reported moderate shortness of breath with an MRC score of 2 prior to the intervention. He was placed in a semi-upright sitting position (approximately 45 degrees) for 10–15 minutes in the morning. After the intervention, his respiratory condition improved. On the second day, he was positioned lying on his back at a similar angle for 10–15 minutes before the postural drainage. No improvement was noted until after the postural drainage session, after which he reported relief from shortness of breath. On the third day, Mr. "D" was positioned in a forward-leaning seated posture with a pillow under the abdomen for support. This final intervention resulted in complete relief of dyspnea, with his MRC score also decreasing to 0.

Discussion

This case study was conducted in the service area of the Maccini Sawah Health Center, involving two respondents—Mrs. "H" and Mr. "D"—to evaluate the effect of postural drainage therapy on reducing dyspnea. The intervention was implemented over three consecutive sessions between June 25 and July 1, 2024.

During the first session, respondent Mrs. "H" presented with moderate dyspnea, with vital signs indicating a pulse rate of 77 beats per minute and a respiratory rate of 32 breaths per minute. Postural drainage therapy was administered; however, no immediate improvement was observed. Similarly, Mr. "D" also exhibited moderate dyspnea with a pulse of 70 beats per minute and respiratory rate of 32 breaths per minute. Like Mrs. "H", no change in respiratory symptoms was noted immediately after the first session. These initial findings are in line with Wenzel (2019), who emphasized that asthma pathogenesis involves inflammatory responses triggered by allergens, air pollution, and viral infections—factors likely exacerbated by limited mobility and poor environmental conditions in the respondents' living areas.

On the second day, vital signs remained similar for both respondents (Mrs. "H": pulse 79 bpm, respiration 32 bpm; Mr. "D": pulse 70 bpm, respiration 32 bpm). However, after receiving postural drainage therapy, both respondents reported a decrease in dyspnea to a mild level. This outcome supports Wenzel (2020), who distinguishes between asthma phenotypes (observable clinical characteristics) and endotypes (underlying biological mechanisms), noting that treatment response may vary based on these classifications.

By the third session, both patients again presented with moderate dyspnea before therapy (Mrs. "H": pulse 100 bpm, respiration 30 bpm; Mr. "D": pulse 70 bpm, respiration 29 bpm). Following postural drainage, both experienced symptomatic improvement, reporting only mild dyspnea. These findings align with the work of Hidayatin (2020), who demonstrated a significant improvement in airway patency following chest physiotherapy. The current study similarly showed a statistically significant reduction in respiratory rate pre- and post-intervention ($p = 0.001$; $p < 0.05$), reinforcing the effectiveness of the therapy.

Additional literature supports the use of chest physiotherapy—including postural drainage, clapping, and vibration techniques—for enhancing secretion clearance and reducing dyspnea (Sukma, 2020; Chaves et al., 2019; Lestari et al., 2018; Faisal & Najihah, 2019). These methods promote expectoration by mobilizing mucus from peripheral to central airways, facilitating expulsion. Hati & Nurhani (2020) described a technique involving finger retraction and breath-holding under the xiphoid process, which enhances secretion mobilization during postural drainage.

Furthermore, Ningrum et al. (2019) observed that postural drainage can clear airway obstruction in less than five minutes, especially when combined with vibrations and clapping. This aligns with the present findings, indicating that postural drainage is a low-risk, practical, and effective therapy to alleviate dyspnea in bronchial asthma patients.

Given its ease of use, safety, and efficacy, postural drainage therapy can be recommended as an adjunct intervention for managing dyspnea in asthma patients, particularly in primary care and community health settings.

Conclusion

Postural drainage is a safe, effective, and easily administered intervention that significantly reduces dyspnea in bronchial asthma patients. It holds promise as a supportive therapy for asthma management and should be considered in clinical practice, especially in community healthcare settings.

Acknowledgement

Not applicable.

Authors' contribution

Each author contributed equally in all the parts of the research. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Conflict of interest

The researchers stated that there is no conflict of interest related to the implementation and publication of the results of this research. The entire research process, from planning, data collection, analysis, to report preparation, was carried out independently without any influence or pressure from any third party. A commitment to research ethics is upheld throughout the research process, ensuring transparency, accuracy and honesty in reporting results. Respondents' participation was voluntary with informed consent, and their confidentiality and privacy were maintained in accordance with applicable research ethics standards. With this statement, researchers hope that the research results can be trusted and used as a valid reference for the development of science and health practices related to ethnomedicine and reproductive health.

Ethical consideration

Not applicable.

Funding

This research is not funded by any party and is not intended for any financial gain.

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