
Effectiveness of Chest Physiotherapy with Thoracic Expansion Exercise (TEE) in Pneumonia Patients

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Abstract:

Background: Pneumonia is an infectious lung disease that can affect anyone, such as children, adolescents, young adults, and the elderly. One of the appropriate treatments to overcome the problem of pneumonia is physiotherapy using Chest Physiotherapy and Thoracic Expansion Exercises (TEE).

Objective: The aim of this study was to evaluate the effect of chest physiotherapy and thoracic expansion exercise in pneumonia patients

Method and Materials: In this study, a literature review was used to obtain information regarding the effect of Chest Physiotherapy and Thoracic Expansion Exercise (TEE) on patients with pneumonia. A thorough study was conducted on 2 topics: (1) Pneumonia (2) Chest physiotherapy and Thoracic Expansion Exercise (TEE) pneumonia. The inclusion criteria were (1) the sample was a patient suffering from pneumonia (2) in a pneumonia patient the therapeutic modalities were chest physiotherapy and Thoracic Expansion Exercise (TEE). Effective search was deliberately limited to English, with interesting studies in pneumonia patients and published in the last 9 years. Literature research was conducted on the PubMed and Google Scholar electronic databases, for the period between January 2013 and January 2022.

Result: Meta-analysis of 3 articles showed that after the intervention, the P value was very significant.

Conclusion: The provision of physiotherapy interventions in the form of Chest Physiotherapy and Thoracic Expansion Exercise (TEE), can have a significant effect on pneumonia patients.

Keywords: physiotherapy, chest physiotherapy, thoracic expansion exercise, pneumonia

INTRODUCTION

Pneumonia is an acute respiratory infection that is often caused by a virus or bacteria. It can cause mild to life-threatening illness in a person. Pneumonia is considered an inflammation of the lungs caused by a bacterial infection and causes respiratory problems. Pneumonia can affect anyone, such as children, adolescents, young adults, and the elderly. Pneumonia killed more than 808,000 children under 5 years of age in 2017, accounting for 15% of all deaths of children under 5 years of age. People at risk of developing pneumonia also include adults and over the age of 65 and people with pre-existing health problems. (Fadillah, L. et. al. 2018). One of the right treatment to overcome the problem on the problem of pneumonia is by physiotherapy, namely using Chest Physiotherapy and Thoracic Expansion Exercise (TEE).

With this physiotherapy modality, it is hoped that the symptoms of pneumonia can be reduced and the patient can carry out daily activities without any respiratory problems caused by the symptoms of pneumonia. Chest physiotherapy is an airway clearance technique that combines manual percussion of the chest wall by a caregiver, strategic positioning of the patient for mucus drainage, and teaching coughing and breathing techniques. (Fadillah, L. et. al. 2018). Thoracic Expansion Exercise (TEE) is one of many techniques and is very important in conventional chest physiotherapy to increase chest wall mobility and improve respiratory function. Passive or active chest mobilization can help improve chest wall



mobilization, flexibility, and chest capability. This concept increases the length of the intercostal muscles and helps to perform effective muscle contractions.

METHODS

In this study, a literature review was used to obtain information regarding the effect of Chest Physiotherapy and Thoracic Expansion Exercise (TEE) on patients with pneumonia. A thorough study was conducted on 2 topics: (1) Pneumonia (2) Chest physiotherapy and Thoracic Expansion Exercise (TEE) pneumonia. The inclusion criteria were (1) the sample was a patient suffering from pneumonia (2) in a pneumonia patient the therapeutic modalities were chest physiotherapy and Thoracic Expansion Exercise (TEE). Effective search was deliberately limited to English, with interesting studies in pneumonia patients and published in the last 9 years. Literature research was conducted on the PubMed and Google Scholar electronic databases, for the period between January 2013 and January 2022. Keywords were used, in different combinations, including: “physiotherapy”, “chest physiotherapy”, “thoracic expansion exercise”, and “pneumonia”.

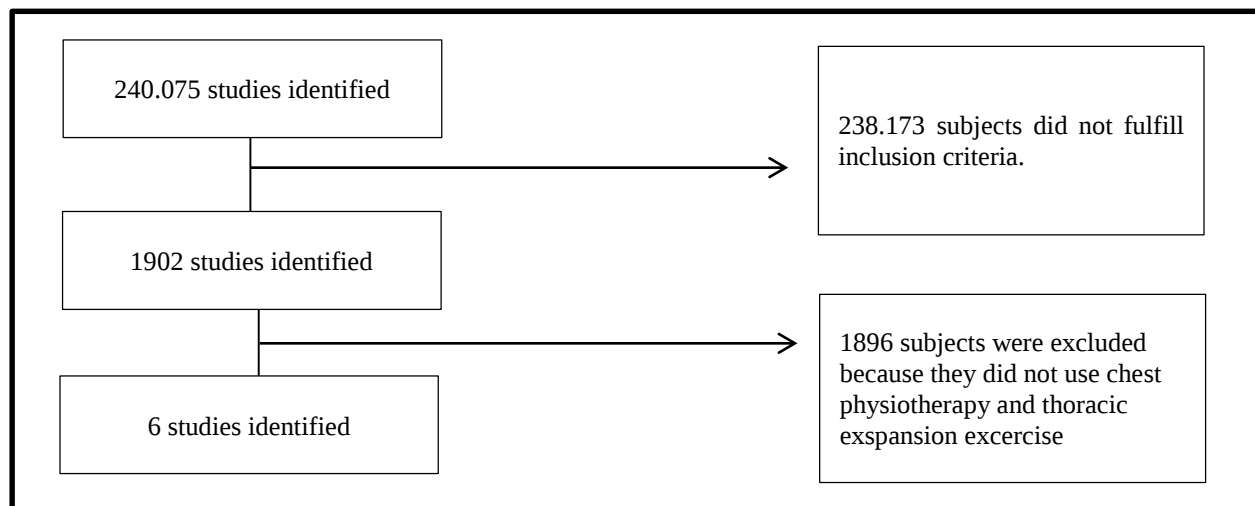


Figure 1. Flowchart of the search and selection of articles during the literature review process.

RESULT

Table 1. Effectiveness of Chest Physiotherapy and Infrared in Pneumonia Patients

First author/ year	Type of study	Sample	Assessment and intervention	Clinical outcome	Significance
Abdelbasset, W. K. M. et. al (2015)	A randomized controlled study was conducted	50 patient	Intervention : The primary measurement was time to clinical resolution. The secondary measurements	There were significant differences in terms of median time to clinical resolution	p=0,012





Bhandakkar, P. A. et. at. (2021)	1 patient	were changes of respiratory rate and arterial oxygen saturation. Thoracic Expansion, Patient was asked to take a deep breath with concentration on controlled and slow inspiration via nose in combination with end inspiring breath for 3 second hold followed by open glottis before passive expiration.	a specific physiotherapy interventions dictated its significance in the line of treatment of pneumonia	p=0,001	
Waseem, M. H. et. al (2021)	A quasi-experimental study was conducted	35 patient	Assessment : the six-minute walk distance Intervention : The chest physiotherapy includes turning, postural drainage, percussion, vibration, deep breathing exercises, coughing, and suctioning were performed on a patient with aspiration pneumonia.	The results of this study show pre-treatment and post-treatment chest congestion, heart rate, and respiratory rate show that the P value is highly significant.	p=0,000

DISCUSSION

In a randomized study explained that chest therapy is an airway clearance technique, which is used to accelerate the clinical course of pneumonia (Abdelbasset, W. et. al. 2018). In this study also explained that patients who have received chest physiotherapy will show real progress and extraordinary effects, such as decreased crackles in the lungs and improved chest tightness. However, in several other studies it was explained that chest physiotherapy was not useful. Then another study explained that chest physiotherapy



is beneficial in patients with pulmonary infections. Clearing the airway by a physiotherapist will help to improve chest efficiency and arterial blood saturation. (Waseem, M. H., et al. 2021). This case explains that physiotherapy is part of the treatment plan for a respiratory condition, can act as a preventative and also shows promising effects. (Bhandakkar, P. A., et al. 2021)

Thoracic Expansion Exercises (TEE) are inspirational exercises to improve chest wall movement. In patients with pneumonia, TEE will increase the mobilization of the thoracic cage during maximal inspiration by pressing on the thorax. (Fadillah, L. et al. 2018). From the research obtained a significant effect on clinical symptoms of pneumonia and plays an important role in improving the patient's functional status. (Bhandakkar et al., 2021)

CONCLUSION

From this study, it can be concluded that the provision of physiotherapy intervention in the form of Chest Physiotherapy and Thoracic Expansion Exercise (TEE), can have a significant effect on pneumonia patients. Such as obtaining maximum re-expansion of the lungs, no difficulty breathing, the lungs are clear of phlegm and function independently.

AUTHOR CONTRIBUTION

David Ahmad Wibowo and Andari are the main researcher who selected the topic, searched and collected the data. Linda Pramusinta analyzed data and reviewed study documents.

ACKNOWLEDGEMENT

We thank the patients who participated and contributed samples to the. It was concluded that chest physical therapy showed significant improvement in pneumonia. The author would like to thank Ethics Review Karachi and Institute of Physiotherapy Committee Rehabilitation Science.

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