Review

The Effectiveness of Chest Physiotherapy Education in Handling Acute Respiratory Infections in Toddlers on Mother's Knowledge

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ABSTRACT

Background: *Acute respiratory tract infection is one of the respiratory disorders that children in Indonesia often suffer. Acute respiratory tract infection is the infection that most often causes death and disease worldwide. This study aims to determine the effectiveness of health education about chest physiotherapy in the treatment of acute respiratory tract infections in toddlers on the level of maternal knowledge at Early Childhood Education Darusallam Kalibaru.*

Methods: *This quantitative study uses a pre-experimental approach with a one-group pre-post test design. The sampling technique employed is total sampling, with a sample size of 50 respondents. The instrument used for data collection is a questionnaire, and the data analysis is performed using the Wilcoxon signed-rank test.*

Results: *The results showed that maternal knowledge was less than 30 (60%) after being given health education. The level of maternal knowledge was good at 31 (62%). The Wilcoxon test obtained a p-value of 0.000<0.05, so there was a significant influence on the level of maternal knowledge before and after the provision of safety education.*

Conclusion: *This study is expected to be informative for mothers as one of the techniques for handling acute respiratory tract infections in toddlers. Future research should assess the long-term impact of health education on chest physiotherapy in managing acute respiratory infections in toddlers.*

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Introduction

Acute respiratory tract infection is an upper and lower respiratory tract infection caused by bacteria, viruses, and fungi. This disease often attacks children, especially toddlers, because the body's resistance (immunology) in toddlers is still weak. This is because toddlers have a weak immune system and are susceptible to various diseases. This disease is usually transmitted through droplets, but contact with contaminated surfaces or hands can also result in contracting this disease (Delikhoon et al., 2021).

The World Health Organization (2020) said that acute respiratory infections are the most common infections that cause death and illness worldwide. About four million

people die each year from acute respiratory infections, with 98 percent of all deaths from acute respiratory infections being lower (Grangier et al., 2024). Mortality rates among infants, toddlers, and older people are notably high in low- and middle-income countries. The mortality rate for acute respiratory infections in children under five is 40 per 1,000 live births, which accounts for approximately 15-20% of all live births. Data from the East Java Health Office reports that 45,041 children under five in the region have experienced acute respiratory tract infections caused by airborne bacteria and viruses. Additionally, statistical data from the Banyuwangi Health Office indicate 1,962 acute respiratory infections among city residents in August 2023, with 671 cases occurring in children under five.

Intrinsic and extrinsic factors influence the incidence of acute respiratory tract infections. Intrinsic factors that can affect the incidence of acute respiratory tract infections include age, gender, diet, low birth weight, immunity, breastfeeding, and vitamin A consumption. Children with respiratory diseases often have more mucus in their lungs, which builds up and thickens, making it difficult to excrete. Patients with this disease have difficulty breathing and disruption of gas exchange in the lungs due to unsmooth sputum production caused by ineffective airways. As a result, they will experience symptoms such as cyanosis, fatigue, apathy, and weakness. Furthermore, the narrowing will cause adhesion in the airways (Triana, 2019).

The treatment of acute respiratory tract infections in children consists of pharmacotherapy and non-pharmacotherapy. Non-pharmacotherapy treatment, namely the work of nurses as nursing assistants and extension workers, is essential. Nurses educate families about inadequate health problems, especially respiratory hygiene, which involves rapid breathing and secretion buildup, and they can provide chest physiotherapy treatment to reduce the respiratory rate. Chest physiotherapy can improve children's respiratory health with problems with the airways and sputum excretion, which can be done independently or in combination (Hairat, 2024).

Methods

Methods should be structured, including:

Study Design

This quantitative research method uses a quasy experiment design with a pretest-posttest design approach.

Sample/Participants

The sampling technique used in this study is total sampling. Namely, the sample of this study is 50 mothers.

Instrument

The instrument used in this study was a questionnaire, with the independent variable being health education and the dependent variable being the level of knowledge. Data analysis was conducted using the Wilcoxon test.

Intervention

Education on Chest Physiotherapy in the Treatment of Acute Respiratory Infections.

Data Collection

The research was conducted at the Darusallam Kalibaru Early Childhood Education School in April – June 2024. The steps in collecting data in this research are as follows:

1. Administration stage

   The research was carried out after the supervisor obtained permission to conduct research and was declared to have passed the Ethics Review by the

Research Ethics Committee (KEPK) of STIKES Banyuwangi. After that, the researcher coordinated with the party at the Darusallam Kalibaru Early Childhood Education School.

2. Implementation stage

Afterward, the researcher met with the client to introduce himself and explain the procedure and benefits of providing Education on Chest Physiotherapy in the Treatment of Acute Respiratory Infections. The stages in data collection are as follows:

a. Respondents who have been explained and are willing to participate in the research will sign an Informed Consent.
b. Respondents give intervention in education on chest physiotherapy in treating acute respiratory infections.
c. Each respondent was measured for Knowledge Level before and after the intervention was given.

Data Analysis

In this study, the Wilcoxon test was employed to assess whether there was a significant difference in the outcomes after administering the treatment.

Ethical consideration

This research was carried out after obtaining permission or approval from the ethics commission No: 139/03/KEPK-STIKESBWI/Vll/2024.

Results

Table 1. Distribution of Respondents by Age

Age	Frequency	Presented (%)
21-25	10	20%
26-30	29	58%
30-35	11	22%
Total	**50**	**100%**

This study found that the research respondents had an age range of 26-30 years. The most significant number of respondents was at the age of 26-30 years, which was 29 people (58%).

Table 2. Distribution of Respondents Based on Education

Education	Frequency	Presented (%)
Primary school	2	4%
Junior High School	14	28%
High School	27	54%
Diploma 3	4	8%
Sarjana	3	6%
Total	**50**	**100%**

Table 2 shows that the distribution of participants based on education is high school 27 respondents (54%) and elementary school 2 respondents (4%).

Table 3. Distribution of respondents by occupation

Work	Frequency	Presented (%)
Self employed	7	14%
Now	8	16%
Laborer	3	6%
Housewives	32	64%
Total	**50**	**100%**

Results of Table 3. It is known that the distribution of participants based on work, Housewives 32 respondents (64%) and Labor 3 respondents (6%).

Table 4. The level of knowledge of mothers before being given health education

Level of Knowledge	Frequency	Presented (%)
Less	30	60%
Enough	17	34%
Good	2	4%
Total	**50**	**100%**

The results in Table 4. show the frequency distribution of the knowledge level of mothers with children under five at

Early Childhood Education Darusallam Kalibaru Banyuwangi before receiving health education about chest physiotherapy using the presentation method. It was found that most mothers had a knowledge level of less than 30, accounting for 60%.

Table 5. The level of knowledge of mothers after being given health education

Level of Knowledge	Frequency	Presented (%)
Less	2	4%
Enough	17	34%
Good	31	62%
Total	**50**	**100%**

The results are in Table 5. show the frequency distribution of the knowledge level of mothers with children under five at Early Childhood Education Darusallam Kalibaru Banyuwangi after receiving health education about chest physiotherapy through the presentation method. It was found that most of the mothers had a good level of knowledge, with 31 individuals (62%) demonstrating a high level of understanding.

Table 6. Wilcoxon Test on the Effectiveness of Health Education on Chest Physiotherapy with Presentation Method on Mother's Knowledge Level

Pre Test-Post Test		N	*Sig, (2 tailed)*
Presentation	*Negative Ranks*	0	0,000
	Positive Ranks	48	
	Ties	2	
	Total	**50**	

Discussion

Before receiving health education about chest physiotherapy, most mothers with children under five at Early Childhood Education School Darusallam Kalibaru Banyuwangi had a low level of knowledge. Specifically, 30 respondents, or 60%, demonstrated an insufficient understanding of chest physiotherapy and its benefits in managing acute respiratory tract infections in toddlers. This highlights the need for educational interventions to improve awareness and knowledge among mothers, which can ultimately contribute to better health outcomes for their children. Knowledge results from human curiosity to learn through specific tools and strategies (Darsini et al., 2019). Factors that can affect the level of knowledge of mothers on external factors include age.

Meanwhile, internal factors are education and employment (Saputra et al., 2023). Due to a lack of education, they tend to seek information passively. This is because they are unaware of the importance of information and do not understand it. In line with the research of (Saputra et al., 2023b), a person's low level of health knowledge can also be caused by a lack of information about health education that causes a person's lack of knowledge level.

The level of education significantly influences an individual's knowledge, and this was evident in the pre-test results, where most mothers demonstrated a lower level of expertise. This lack of awareness can be attributed to limited access to health-related information and resources. This may hinder their understanding of essential topics like chest physiotherapy and its role in managing toddler respiratory infections. Improved access to educational resources and information could help address this gap in knowledge and support better health practices.

After receiving health education about chest physiotherapy through the presentation method, the knowledge level of mothers with children under five at PAUD Darusallam Kalibaru Banyuwangi improved, with 31 respondents (62%) demonstrating a good understanding of the

topic. This indicates the effectiveness of the health education intervention in increasing maternal knowledge about chest physiotherapy and its role in managing respiratory health in toddlers.

Health education is carried out to help an individual control and improve his health independently by affecting, or enabling and strengthening decisions or actions by a value and goal to be planned (Sianipar et al., 2022) By getting health education, it can change a person's knowledge and society in taking actions related to health (Kriestian Sugih Budiarto et al., 2023) The success of increasing knowledge about the provision of health education can be influenced by age, in general, age affects the level of knowledge (Nurtanti & Azam, 2022).

In line with the research conducted by (Chania et al., 2020), the results of this study show that most of the respondents have a high school education, which also impacts educational factors that affect their knowledge. The respondents have enough education to understand and expand their knowledge about health education. The increase in knowledge can be affected by age and education. Because the higher a person's education level, the ability to grasp and understand in gaining knowledge. In the research conducted, there was a significant increase in maternal knowledge after being given education supported by the age of the respondents who had entered adulthood and the education of the respondents, which could affect the increase in knowledge.

Knowledge is the outcome of human curiosity and the learning process, facilitated by using various tools, methods, and strategies (Ariyadi et al., 2024). Factors that can affect the level of knowledge of mothers on external factors include age. Meanwhile, internal factors are education and employment (Al-Tamimi et al., 2022). Due to a lack of education, they tend to seek information passively. This is because they are unaware of the importance of information and do not understand it. According to the research of (Budiarto et al., 2023), a person's limited knowledge about health can be attributed to a lack of access to health education, which results in an overall deficiency in their knowledge level.

In the researcher's view, a person's level of education plays a significant role in determining their knowledge. It was found that most mothers had a low level of knowledge in the pre-test results. This could be due to a lack of health information and the fact that many mothers had never received counseling or health education on chest physiotherapy techniques.

Health education is carried out to help an individual control and improve his health independently by affecting, enabling, and strengthening decisions or actions by a value and goal (Delikhoon et al., 2021; Triana, 2019). Health education can change a person's knowledge and society's ability to take health-related actions (Budiarto et al., 2023). The success of increasing knowledge about the provision of health education can be influenced by age; in general, age affects the level of knowledge (Jansen et al., 2023). In line with the research conducted by (Chania & Andhini, 2020), the results of this study show that most of the respondents have a high school education, which also impacts educational factors that affect their knowledge. The respondents have enough education to understand and expand their knowledge about health education.

The increase in knowledge can be influenced by factors such as age and education. Generally, the higher a person's education level, the better their ability to comprehend and retain new information. In the research conducted, there was a significant increase in maternal knowledge after receiving education. The respondents'

age likely supported this improvement. They had reached adulthood, and their educational background enhanced their understanding (Rahmawati et al., 2023).

In the opinion of (Alfarizi et al., 2024) said that the use of the audio-visual presentation method increases knowledge. It is more efficient and effective because it is a tool to communicate writing with attractive images that can be read at any time and stored for the long term. Audiovisual media dramatically facilitates the learning process and effective message delivery. Verbal messages can increase people's willingness to receive and remember messages. For this reason, audiovisual media is increasingly used in counseling and can improve knowledge (Kriestian Sugih Budiarto et al., 2023).

The results of this study indicate that health education has a positive impact on the level of maternal knowledge. Mothers had limited knowledge before receiving health education, but their knowledge significantly increased following the education. One of the media that can support the improvement of mothers' knowledge is the audiovisual presentation method. Audiovisual media is a tool that can help mothers learn more about health education because presentations with audiovisual methods present material, sounds, and images that can be seen to increase mothers' knowledge more effectively.

Conclusion

Health education about chest physiotherapy in treating acute respiratory tract infections in toddlers effectively increases maternal knowledge at Early Childhood Education Darusallam Kalibaru. This intervention has significantly improved mothers' understanding of chest physiotherapy, highlighting its role in managing respiratory health in young children. Future research should explore the long-term impact of health education on chest physiotherapy in managing acute respiratory infections in toddlers across regions with more extensive and diverse populations.

Authors Contributions

The manuscript benefited from the collaborative efforts of the authors, with one member contributing to study design and data collection, another member providing expertise in data analysis and interpretation, and a third member contributing to manuscript writing and editing. All authors have reviewed and approved the final manuscript version.

Conflicts of Interest

No conflicts of interest.

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