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The effectiveness of the combination of clapping and common cold massage therapy on breathing frequency and number of staphylococcus bacteria in toddlers with upper respiratory tract infections (ARI)

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The effectiveness of the combination of clapping and common cold massage therapy on breathing frequency and number of staphylococcus bacteria in toddlers with upper respiratory tract infections (ARI)



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ABSTRACT

Introduction: The common cold is an emergency that often occurs in children due to shortness of breath and even death, so attempts are needed to massage the baby so that respiratory failure does not happen. Not only massage but a combination with percussion (clapping) as a physical chest therapy (CPT) helps effectively against breathing difficulties and respiratory infections in toddlers. Thus, this research is aimed to evaluate the effectiveness of clapping and common cold massage combination therapy on breathing frequency and the number of staphylococcus bacteria in toddlers with upper respiratory tract infections (ARI).

Methods: This quantitative research used a quasi-experiment with a pre-test and a post-test with a control group. The population in this study was PKM Sidoarjo, Indonesia. The sample size was 42 people. Sampling was done by consecutive selection. This study was divided into the intervention group, which received massage and clapping therapy, and the control group only received massage therapy. Data analysis was performed using the Wilcoxon Sign Rank statistical test in the SPSS 25.

Results: According to the age category, most respondents in both groups were one (K1: 45.5%; K2: 54.0%). We reported a respiratory rate decrease in the sample after the massage therapy. The reduction in the respiratory rate was 2.50 times, and decrease in *Staphylococcus* bacteria in the sample after getting the massage therapy. The amount of decrease in *Staphylococcus* bacteria rate was 3.50 times. A significant difference in the increase in the respiratory rate was established in the group that had a massage and clapping therapy ($p=0.000$), and the amount of *Staphylococcus* bacteria was found in the group that had a massage and clapping treatment ($p=0.000$). The amount of decrease in *Staphylococcus* bacteria was 10.50 times.

Conclusion: The combination of clapping therapy and cold massage therapy will affect the respiratory frequency and the number of *Staphylococcus* bacteria. So, it is necessary to motivate parents, especially mothers, to do one of the usual cold massage therapy movements.

Keywords: Clapping, common cold massage, upper respiratory tract infections.

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INTRODUCTION

This common cold disease is more common in Indonesia, which has a tropical climate with high rainfall intensity. One of the symptoms of the common cold is a cough and runny nose that easily attacks both children and adults. In children, complaints of sneezing, coughing and runny nose are common at the age of under 6 years. Each child experiences an average of 6 to 8 times each year. The cause of coughs and colds is rhinovirus,

adenovirus, influenza virus, RSV, and coronavirus.¹

Several previous studies have analyzed some of the effects of infant massage. According to a study, babies massaged regularly from birth often gain weight more quickly than others.² Similar research reported that baby massage reduces cortisol levels and increases the quantity of sleep in hospitalized infants due to the stress of being hospitalized.³ In addition, baby massage is also effective in asthmatic children.⁴ Thus, we can conclude that baby

massage has several benefits for babies.

This method had benefits to the circulation and muscle. It is known that the massage technique touches the skin. The sense of it will be sent to the brain, increasing blood circulation. Thus it enhances oxygen circulation. The enhancement of oxygen circulation also increases energy production. Those mechanisms might benefit babies.⁴

Besides baby massage, another chest physiotherapy is also beneficial to the baby's health, namely clapping massage.

Clapping is part of the massage technique often applied to patients with respiratory disorders or accumulation of secretions. Clapping aims to help mobilize secretions into the main bronchi, making them easy to remove. It can become an alternative treatment before the main treatment to help remove inflammatory exudate in the form of phlegm secretion in pneumonia. Researchers will combine clapping and massage therapy to treat the common cold in toddlers. Given the importance of lung function in life, especially for children, because of the large number of secrets that accumulate and colonize and cause an increase in bacteria, it is necessary to have a fast and precise technique, namely a combination of clapping and massage.⁵ Therefore, this study aims to evaluate the effectiveness of the combination of clapping therapy and common cold massage on respiratory frequency and the number of staphylococci in toddlers with upper respiratory tract infections (ARI)

METHODS

Study Design and Sample

This quantitative research used a quasi-experiment with a pre-test and a post-test with a control group. The population in this study was PKM Sidoarjo, Indonesia. The sample size was 42 people. Sampling was done by consecutive selection. The participants involved in this study were children under five years old with colds and coughs with no complications and parents willing to take action. The children that refused to participate in this study or had comorbidity such as congenital disease, tumor or autoimmune were excluded.

Data Collection Procedures

The research ethics committee of the Chakra Brahmanda Lentera Institution approved data collection. No.012/027/V/EC/KEP/Lemb.Candle/2022. This research used Quasy Experimental with pre-test and post-design test with the control group. The population in this study were all pediatric patients at the IKA midwife who complained of coughing and colds and received regular cough massage therapy. The number of respondents in this study was 46, divided into 23 intervention groups and 23 control groups. The intervention group was given massage

and clapping, while the control group only received massage therapy. Collecting data in this study was based on a questionnaire containing demographic data (age, gender, length of illness). The observation sheet contains respiratory frequency values and *Staphylococcus* results. The observation sheet was completed before the action was carried out and filled out for the next 3 days.

Data Analysis

The data will be analyzed univariate and bivariate. Univariate data analysis for characteristics of respondents and bivariate analysis was carried out using Wilcoxon Sign Rank to compare the intervention and control groups.

RESULTS

Table 1 indicates the characteristics of the respondents. According to gender, all subjects were mostly female (72.7%) and the control group (69.3%). According to the age category, most respondents in both groups were one (K1: 45.5%; K2: 54.0%). The nutritional status in the intervention group was mostly normal (81.8%) and in the control group (90.9%). Besides having a normal nutritional status,

almost all respondents had a complete immunization history. It was only 31.8% in the interventional group and 18.1% in the control group with an incomplete immunization history (Table 1).

Table 2 shows the average respiratory rate in the control group. According to this parameter, we reported a respiratory rate decrease in the sample after the massage therapy. The amount of reduction in the respiratory rate was 2.50 times. Meanwhile, there was no significant difference before and after massage in children with a cold and cough ($p=0.46$). In contrast, a significant difference in the increase in the respiratory rate was established in the group that had massage and clapping therapy ($p=0.000$). The amount of decrease in the respiratory rate was 10.50 times.

Table 3 shows the average *Staphylococcus* bacteria in the control group. According to this parameter, we reported decreased *Staphylococcus* bacteria in the sample after the massage therapy. The amount of reduction in *Staphylococcus* bacteria rate was 3.50 times. Meanwhile, there was no significant difference before and after massage in children with a cold and cough ($p=0.14$). In contrast, a significant difference in the amount of *Staphylococcus*

Table 1. Characteristic of respondent

| Respondent Characteristics | Groups | | | |
|----------------------------|--------------------------|----------------|---------------------|----------------|
| | Intervention (K1) (n=22) | | Control (K2) (n=22) | |
| | Frequency (N) | Percentage (%) | Frequency (N) | Percentage (%) |
| Gender | | | | |
| Male | 6 | 27.3 | 7 | 30.8 |
| Female | 16 | 72.7 | 15 | 69.3 |
| Age, years old | | | | |
| 1 | 10 | 45.5 | 2 | 54.0 |
| 2 | 9 | 40.9 | 6 | 27.2 |
| 3 | 2 | 9.1 | 2 | 9.1 |
| 4 | 1 | 4.5 | 2 | 19.2 |
| 5 | 0 | | | |
| Nutritional status | | | | |
| More | 1 | 4.5 | 1 | 4.5 |
| Normal | 18 | 81.8 | 3 | 90.9 |
| Not enough | 3 | 13.6 | 1 | 4.5 |
| House density | | | | |
| Not solid | 18 | 81.8 | 18 | 81.8 |
| Congested | 4 | 18.1 | 4 | 18.1 |
| Immunization | | | | |
| Complete | 15 | 68.2 | 18 | 81.8 |
| Incomplete | 7 | 31.8 | 4 | 18.1 |

Table 2. Respiratory rate (pre and post-test) in the group of clapping and massage therapy and massage therapy. It used a Wilcoxon statistical test

| Group | Respiratory rate (RR) | N | Rank means | Z | P |
|--------------------|---|----|---------------|-------------------------|-------|
| Control Group | Pre-post-test massage therapy | 22 | 2.50 0.00 | - 2,000 ^a | 0.46 |
| Intervention Group | Pre-post-test clapping with massage therapy | 22 | 10.50 0.00 | - 4.472 ^a | 0.000 |

Table 3. Staphylococcus bacteria (pre and post-test) in the clapping group and therapy massage and therapy massage. It used a Wilcoxon statistical test

| Group | Staphylococcus bacteria | N | Rank means | Z | P |
|--------------------|---|----|--------------|-------------|-------|
| Control Group | Pre-post-test massage therapy | 22 | 3.50 .00 | - 2,449a | 0.14 |
| Intervention Group | Pre-post-test clapping with massage therapy | 22 | 10.50 000 | - 4.472a | 0.000 |

bacteria was established in the group that had massage and clapping therapy (p=0.000). The amount of decrease in *Staphylococcus* bacteria was 10.50 times.

DISCUSSION

A cold cough and accumulated secretions characterize upper respiratory tract infection. This excessive fluid accumulation causes coughing symptoms, so at the beginning of the ARI, the prominent symptoms are cough symptoms. The presence of a viral infection predisposes to a secondary bacterial infection. This bacterial infection causes mucus secretions to increase. It leads to symptoms of difficulty in breathing and even shortness of breath and also causes a productive cough, and viral infections can infect the lungs, causing pneumonia. Children who received clapping and massage therapy had a greater improvement in changes in respiratory rate and arterial oxygen saturation. Chest physiotherapy is very helpful for patients who have difficulty removing the sputum. While massage therapy is a form of therapy that uses a systematic touch of tenderness, which is focused on certain body parts, or as a whole, with the aim of healing and relaxation.⁶

Our study found a decrease in the respiratory rate in the sample after getting massage therapy. The amount of reduction in the respiratory rate was 2.50 times. Meanwhile, there was no significant

difference before and after massage in children with a cold and cough (p=0.46). In contrast, a significant difference in the increase in the respiratory rate was established in the group that had massage and clapping therapy (p=0.000). The amount of decrease in the respiratory rate was 10.50 times. Pediatric massage therapy is proven to be very effective for children who have asthma, cough and cold, constipation and abdominal colic or arthritis, and premature babies. Massage therapy also benefits children with special needs, including hyperactivity, depression, autism and cerebral palsy. Baby massage is also an alternative effort to achieve the simplest health status that can be done at home. Baby massage can also cause inner contact between children and parents.⁷

Acute respiratory infections are caused by air pollution, which is transmitted through saliva and sneezing so that respiratory air containing germs or microorganisms is inhaled by healthy people whose respiratory tract infects and causes inflammation. This study found that the inter-house density was 18.1% in the intervention group and 4% in the control group. It is a high potential for transmission in children who do not have antibodies with cross-reactivity that can cause immune complex formation and severe lung disease. Besides being infected by the virus, IRA could happen by a bacterial infection such as *staphylococcus*. Their existence impacts the prognosis of the baby besides considering several

factors.⁸ In this study there was a decrease of *Staphylococcus* bacteria in the sample after the massage therapy. The amount of decrease in *Staphylococcus* bacteria rate was 3.50 times. Meanwhile, there was no significant difference before and after massage in children with a cold and cough (p=0.14). In contrast, a significant difference in the amount of *Staphylococcus* bacteria was established in the group that had massage and clapping therapy (p=0.000). The amount of decrease in *Staphylococcus* bacteria was 10.50 times.

CONCLUSION

Our findings conclude that combining clapping and common cold massage therapy significantly increased the breathing frequency and the number of *staphylococcus* bacteria in toddlers with upper respiratory tract infections (ARI). So there needs to be motivation for parents, especially mothers, to do with one common cold massage therapy movement by patting and vibrating the data and the back to bring mucus into the large channel so that the child will automatically cough and mucus will come out.

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The authors declare that there is no conflict of interest in this study.

DISCLOSURE

Conflict of Interest

None.

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Author Contribution

All of the authors contributed in conducting the research and preparing the manuscript.

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