



THE EFFECT OF BABY MASSAGE TOWARD SLEEP QUALITY AMONG BABY WITH ACUTE RESPIRATION INFECTION: A QUASI-EXPERIMENTAL STUDY

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ABSTRACT

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Acute Respiratory Infection (ARI) is still a major health problem among children under 5 years old. One of the clinical manifestations besides cough, sore throat, and fever is sleep difficulty. Sleep is essential for children to support growth and development. The supportive management for babies with ARI is the baby massage. However, most parents view that sleep disorder is not a big problem. This study aimed to see the effect of baby massage on sleep quality for infants under 12 months diagnosed with Acute Respiratory Infection (ARI). This research is a quantitative perspective using a quasi-experimental study. Respondents were divided into control and intervention groups, with 60 respondents, 30 control groups and 30 intervention groups. Data was collected before and after the baby massage intervention. Instruments were used: The Brief Infant Sleep Questionnaire (BISQ-R) tool with a total of questions is 19 distributed in 3 subscales consisting of Infant Sleep, Parent Perception, and Parent Behaviour with the r-test retest ($r > .82$) indicating high correlations. Data were analyzed using bivariate calculations. Based on the results, the baby's mean age is 7.77 ± 3.29 and is mostly boys. The independent T-test shows a significant effect in the intervention group before and after a baby massage from 60.50 ± 8.29 to 77.75 ± 9.98 with a p-value of 0.000 ($p < 0.05$). Massaging children in the intervention group twice a day, morning and evening, improves sleep quality among babies with ARI; therefore, a structured operational procedure should be implemented in the children's ward, and pediatric nurses must also be skilled with baby massage.

Keywords:

Infants, Massage, Respiratory infections, Sleep quality

BACKGROUND

The total number of acute respiratory infections (ARI) among children is 1,400 cases per 100,000 children, with the most significant incidence occurring in South Asia (2,500 cases per 100,000 children) (UNICEF, 2023). From current research, the prevalence of ARI reported in developing countries ranged from 20-30% (Murarkar et al., 2021). A high incidence of ARI in Indonesia was reported in Indonesia; one in four infants had an episode of pneumonia in the first year of life associated with Vitamin D deficiency (Oktaria et al., 2021). Based on expert agreements, it was suggested that ARI be described as presumed pneumonia and still one of the primary causes of children's death under 5 years old (WHO, 2023). ARI is a common childhood disease frequently underestimated, along with common colds and coughs. A systematic review found significant reductions in respiratory function in children with a history of pneumonia compared with a healthy population (Collaro et al., 2023)

ARI is a serious health problem in both developing and developed countries. This is due to the high morbidity and mortality due to ARI, especially in neonates (Kementerian Kesehatan, 2018). There are difficulties managing ARI from disease diagnosis caused by hard-to-obtain samples from the lower respiratory tract, and there is no standard method for studying the pathogens that cause pneumonia (Rahayu et al., 2018). Supportive management is needed for caring for patients with pneumonia who experience a variety of clinical manifestations, including cough, difficulty breathing, fever, wheezing, unconsciousness, hypothermia and convulsions (WHO, 2022). One of the underreported symptoms is a sleep disorder that will inhibit children's growth and development. Previous studies mentioned that sleep quality was associated with stress, general health and life satisfaction; therefore, children with adequate sleep will have happier lives than those with more disturbed sleep (Blackwell et al., 2020). Another research described that the severity of respiratory illness would cause sleep-disordered breathing (SDB), sleep quality and sleep efficiency that affected 50% of patients impacted the quality of life (Faverio et al., 2023; Reiter et al., 2022) However, many caregivers think that sleeping is not a big issue. Factors contributing to sleep disorders among children also vary and add more reasons to investigate (Ridolo et al, 2015; Papale et al., 2023).

Baby massage has been found effective in other studies and experienced an increase in sleep

quality after baby massage (Kamalia et al., 2022; Nurmalasari et al., 2017; Tang et al., 2018). However, based on the above studies analyzed age, diseases, massage technique and duration, activity and nutrition strongly influenced infant sleep quality. Therefore, there is a need to explore the effect of baby massage with ARI.

The current intervention is solely focused on a pharmacological approach with little effect and management with less pain, cheaper and practical, which will increase the quality of life of children's sleep (Baker et al., 2023). From the description above, researchers are interested in investigating the effect of baby messages on sleep quality among babies with acute respiratory infection

METHODS

This research is a quasi-experimental study using two groups of pre and post-test designs. The researcher conducted this study in one of the referral hospitals in Indonesia from July-August 2023. At first, the researcher collected 30 respondents in the intervention group and then later in the control group. Respondents were divided into two groups: a control and an intervention group. The subjects of this study were infants aged less than 12 months who were hospitalized and diagnosed with ARI. The inclusion criteria were a baby with a stable hemodynamic condition, fully awake and born without congenital abnormalities, with low birth weight, and a preterm baby. The instruments of this study were a questionnaire of demographic characteristics and The Brief Infant Sleep Questionnaire (BISQ-R) created by Dr. Avi Sadeh, who has been used by more than 150,000 babies and toddlers (Sadeh, 2004). The reliability test with the r-test retest ($r > 0.82$) indicates high correlations.

The instrument's originality is in English, but the Bahasa version is available and used in this study. The total questions number in this questionnaire is 19, distributed in 3 subscales consisting of Infant Sleep (5), Parent Perception (3), and Parent Behaviour (11). The total score is calculated based on the average of 3 subscales with a scale of 0 to 100, indicating that the higher the score, the better or positive sleep quality (Mindell et al., 2019). The intervention starts with carefully considering informed consent, and after the parents' agreement, the baby massage intervention procedure lasts for 15 minutes twice a week. The Health Research Committee STIKep PPNI Jawa Barat No gained the ethical clearance number.III/036/KEPK-SLE/STIKEP/PPNI/JABAR/VI/2023.

The data collection technique used convenience sampling, and the result was analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. A descriptive analysis was used to measure demographic characteristics, and an Independent T-Test was used to measure the difference between the intervention and control group

RESULTS

Table 1 shows the comparison between the control and intervention groups, and it can be seen that there is a statistically significant difference in baby age, mother age, smoking history, and duration of hospitalization. Both the intervention and control have the same gender; the majority of the babies gained exclusive breast milk, and the mother was a housewife and had an ARI history.

Table 2 shows that the description of sleep quality in infants with acute respiratory infections can be seen from average results. In the intervention group, after being given treatment, scores increased from 60.50 (SD=8.29) to 77.75 (SD=9.98).

In Tables 2 and 3, the Average score of children's sleep quality before intervention in the intervention group was 60.52 (SD = 7.27) and increased after using massage therapy with an average score of 69.11 (SD = 11.96) with $p = 0.000$ ($p < \alpha 0.05$), the quality of children's sleep increased significantly after massage was performed on children. In the con-

trol group, the mean score before the control group was 60.57 (SD = 6.24), then the score increased to 60.48 (SD = 6.11) with $p\text{-value} = 0.696$ ($p > \alpha 0.05$), indicating a change in the control group but not significant. There was a statistically significant difference between the intervention and control groups, with a $p\text{-value}$ of 0.000 ($p < 0.05$).

DISCUSSION

In the study, the range of baby age in both groups was 6 to 8 months old, and at this stage age, under 12 years old, ARI commonly will attack, similar to previous research that explains that ARI occurs at ages 7 to 11 months (Caniago et al., 2022). Most babies had exclusive breastfeeding in both groups supported (Wahyuni et al., 2020) explain that breast milk ingredients protect babies from infection, and many children did not receive exclusive breast milk.

Based on the smoking history in the family in the control group, a high proportion was found, and this research is supported by (Aryani et al., 2018), which shows that the percentage of toddlers with ARI is higher for those exposed to cigarette smoke compared to those who were not exposed to tobacco smoke. There is a statistical relationship between the smoking habits of family members living in the same house and the incidence of ARI in young children. Based on the research results, the greater the possi-

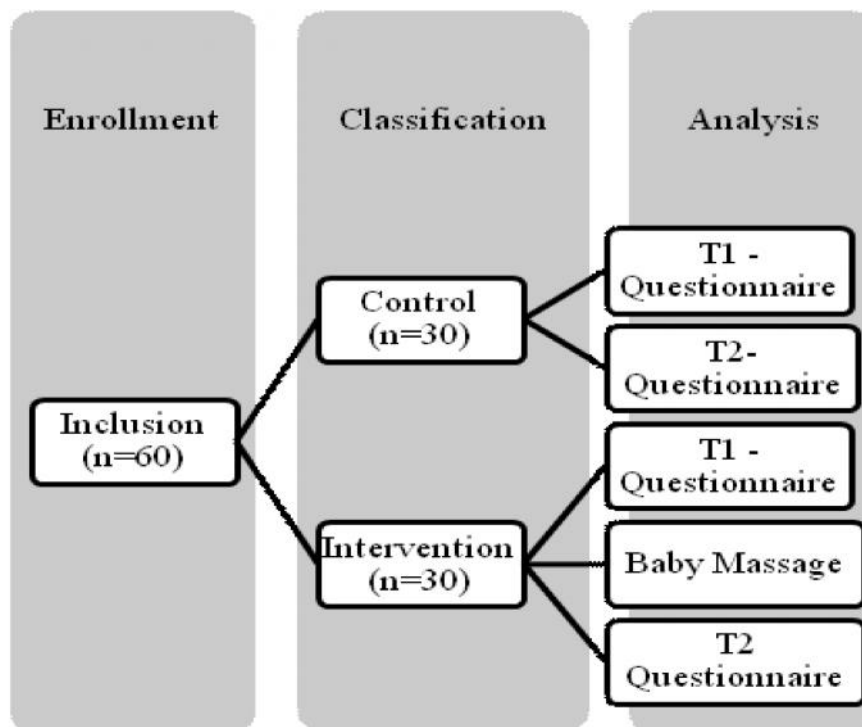


Figure 1. Flowchart Research

Table 1. Demographic Characteristics of Baby and Caregiver

Variables	Control	Intervention	p-value
Baby Age (Mean ± SD)	6.9 ±3.61	8.63±2.72	0.04*
Baby Gender:			1.00
Boys	14 (46.7)	14 (46.7)	
Girl	16 (53.3)	16 (53.3)	
Father Age (Mean +SD)	32.73±6.23	34.17±8.38	0.45
Mother Age (mean +SD)	27.43±5.83	30.87±6.18	0.03*
Exclusive Breast Milk:			0.09
Yes	22 (73.3)	27 (90)	
No	8 (26.7)	3 (10)	
Father Occupation:			0.16
Private Employee	2 (6.7)	10 (30)	
Seller	3 (10)	2 (6.7)	
Entrepreneur	4 (13.3)	6 (26.6)	
Labor	10 (30)	10 (30)	
Farmer	11 (40)	2 (6.7)	
Mother Occupation:			0.22
Housewives	28 (93.7)	29 (96.7)	
Self-Employment	2 (6.7)	1 (3.3)	
Smoking History:			0.00*
Yes	25 (83.3)	0	
No	5 (16.7)	30 (100)	
ARI History:			0.16
Yes	26 (86.7)	29 (96.7)	
No	4 (13.3)	1 (0.3)	
Days Hospitalization (Mean +SD)	1.87±1.04	3.23±1.07	0.00*

* p-value significant at <0.05

Table 2. Sleep Quality among Control and Intervention Group

Variable	CONTROL		INTERVENTION	
	Range	Mean ±SD	Range	Mean ± SD
Total Sleep Quality				
Pre-test	49-73	60.58±6.24	41-79	60.50±8.29
Post-test	49-70	60.48±6.11	54-99	77.75±9.98
Total Infant Sleep (IS)				
Pre-test	121-192	160.93 ± 19.12	103-216	161.22±24.95
Post-test	121-192	160.93±18.85	136-276	207.39±30.33
Total Parent Perception (PP)				
Pre-test	2-5	3.23±0.54	2-3	2.83±0.44
Post-test	2-5	3.21±0.51	2-3	2.83±0.44
Total Parent Behaviour (PB)				
Pre-test	11-23	17.57±2.96	11-22	16.73±1.95
Post-test	11-23	17.30±2.97	16-28	22.81±3.61

Table 3. Effect of Baby Bassage on Quality of Baby Sleep with ARI

Variables	Mean Diff	t	95% CI	p-value
TOTAL SLEEP PRE				
Control	0.07	0.03	-3.71 - (-3.86)	0.69
TOTAL SLEEP POST				
Intervention	-17.26	-8.07	-21.54 - (-12.98)	0.00*

bility that one of the family members smokes, the higher the possibility that ARI will happen. This study found that the family history of ARI in both groups was similar (Lazamidarmi et al., 2021). The incidence of ARI frequently happens among children with infectious diseases.

Results from this study are similar to those (Asnita, 2020), which shows that 80% sleep soundly before the baby massage, and 100% of 10 respondents had poor sleep quality. The results of this research are consistent with previous research (Cahyani et al., 2020). that baby massage is efficacious in improving the quality of baby sleep. Those who did not get a massage had 3.9 times more sleep quality problems than those who got a massage. Post-treatment sleep was consistent with the research (Mutyah & Anggraeni, 2017), which discussed children's quality and sleep quantity in the intervention and control groups. The strength of this research is using a control group to compare interventions and, therefore, gather more information related to factors. However, there is no correlation between factors and limited data regarding ARI symptoms in infants.

CONCLUSION

Based on the results, the improvement of sleep quality among babies under 1 year old after baby massage can be concluded. A structured operational procedure must be delivered for a baby with ARI with difficulty sleeping to enhance treatment and support growth and development. Further studies should explore more factors related to baby massage techniques and their effects on sleep quality.

The limitation of this study is that the sample size is small due to the short time duration of data collection, and also, days of hospitalization for ARI patients range from 3 to 5 days; therefore, researchers have limited time to conduct an intervention.

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