

The Effect of Baby Massage on Sleep Quantity in Infants Aged 6-12 Months with Cough and Cold

Wahyu Asih Winda Firdawanti, Agus Purnama Sari, Nurrahmi Umami*

Departmen of Midwifery, Universitas Borneo Tarakan, North Kalimantan, Indonesia

ARTICLE INFORMATION

Received: 12, July, 2024

Revised: 17, December, 2024

Accepted: 20, December, 2024

KEYWORD

Infant massage; Sleep Quantity; Infant 6-12; Cold Cough

CORRESPONDING AUTHOR

Nurrahmi Umami

Departmen of Midwifery, Universitas Borneo Tarakan, North Kalimantan, Indonesia

nurrahmi.umami@borneo.ac.id

+6285242123232

DOI

<https://doi.org/10.36456/embrio.v16i2.9313>

ABSTRACT

Sleep quantity is very important for infant growth and development. If the baby's sleep quantity is poor, it can disturb the baby's physiology and psychology. In infants with cough and cold, the most common problem is sleeping disturbance. One of the non-pharmacological therapies that can be given to coughing and cold babies is baby massage. Baby massage can also cause a decrease in alpha waves and beta waves so that theta waves will increase. According to WHO (World Health Organization) data, 335 infants experience sleep problems. In Indonesia, about 44, 2% of infants experience sleep disturbances in the form of frequent nighttime awakenings. This study aims to determine the effect of baby massage on the quantity of sleep in infants aged 6-12 months with a cold cough in the working area of Karang Rejo Health Centre, Tarakan. This research was quantitative with a quasi-experimental design pre- and post-without control. The population in this study amounted to 124 babies. The sample size was 33 respondents. The result showed the quantity of sleep infants aged 6-12 months with a cold cough before being given a massage intervention, 33 infants (100%) with a bad category, after being given a baby massage intervention, the quantity of sleep of infants aged 6-12 months with a cold cough increased to a good category namely 27 infants (81,8%). Bivariate analysis Wilcoxon test showed p-value= 0,001 (p-value <0,05), which means that there was an effect of giving baby massage on the quantity of sleep of infants aged 6-12 months with a cold cough in the working area of Karang Rejo Health Centre, Tarakan.

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Introduction

Infancy is not only a golden period but also a critical period for babies. This is because babies are very sensitive to their environment, and it is said to be the golden period because the infancy period is very short and cannot be repeated. So, the growth and development of infants need special attention (Agustina et al., 2022). The main factors that affect growth and development, in general, are hereditary factors, including ethnicity, race, and gender, environmental factors, and hormonal factors (Sembiring, 2019). According to Erlina et al., factors that can affect the growth and development of infants include sleep and rest, which need to be considered as quantity and quality. If the quantity and quality of the baby's sleep are good and sufficient, the baby's growth and development can be achieved optimally (Erlina et al., 2023).

Infant sleep quantity is the number of hours a baby needs according to their sleep needs. Newborns spend more time sleeping, an average of 16-17 hours (Erlina et al., 2023). When entering the age of 2 months, babies begin to sleep more at night than during the day. Until 3 months, newborns will

spend their sleep time around 15-17 hours, with a division of 8 hours for daytime and 9 hours for nighttime. As the baby gets older, the sleeping hours also decrease. In infants aged 6 months, their sleep patterns appear similar to adults (Duarba et al., 2024). Based on Indonesian Ministry of Health (2018) According to the Indonesian Ministry of Health (2018), the sleep needs of babies aged 0-1 month are 14-18 hours every day, and when babies are 1-18 months old, their sleep needs are 12-14 hours every day including naps.

Based on WHO (World Health Organization) data, 335 infants experience sleep problems. Around 44.2% of infants in Indonesia experience sleep disturbances, namely frequent nighttime awakenings (Erlina et al., 2023). The quantity of infant sleep is influenced by several factors, including the environment, drugs, fatigue, nutrition, and disease, which often causes a cold cough (Kemenkes RI, 2023).

The prevalence of common cold (cough and cold) in Indonesia is 25%, and doctors diagnose 13.8% of cases. The prevalence of the common cold among infants in North Kalimantan province was 10.16%. (Ministry of Health, 2018a). In 2023, the number of infant visits in Tarakan City due to the common cold was 3,093 visits, and the number of visits at Karang Rejo Health Center was 705 (22.80%). Cough and cold disease in infants and toddlers is estimated to occur 3-6 times per year, this means that an infant and toddler experience cough and cold 3 to 6 times a year. The problem that often arises in cough and cold patients is the ineffectiveness of airway clearance, causing disturbed sleep time (Amin et al., 2020; Widyastutik, 2019).

The results of research conducted by Duarba et al. (2024). after interviews with 18 parents of toddlers stated that their children experienced problems including sleep disturbances, difficulty concentrating, coughing, fussing, decreased appetite, and hyperactivity. The research results of Agustina et al. of 26 infants aged 6-12 months showed that 26 people (42.3%) experienced sleep disturbances.

Infant massage can improve sleep problems by stimulating the baby (Supriatin et al., 2022). Infant massage is one of the complementary therapies in midwifery care services that has many benefits, one of which is to improve the quality of infant sleep (Nainggolan et al., 2022). According to Yanti et al., 2022 Treatment efforts that can be made to prevent pneumonia and overcome complaints such as cough and runny nose symptoms are through medical treatment (conventional) and alternative treatment (traditional) in accordance with the development of science. Baby massages can be done for babies with coughs and colds who experience sleep disturbances because they can improve blood circulation, relieve the airway, and increase the baby's immunity (Umah & Samiasih, 2022).

Previous studies showed a difference between the quantity of infant sleep before and after massage, with a p-value of $0.000 < \alpha = 0,05$. This result can be interpreted as a significant difference in the quantity of infant sleep before and after the baby is given a massage (Barbara A.D Maria, 2020). This study's results align with the research conducted by Istikhomah et al. (2020), which found that baby massage affects the length of sleep of infants aged 3-6 months.

Based on preliminary studies, it is known that in 2023, the highest coverage of infants aged 6-12 months was at Karang Rejo Health Center, which had 664 infants. A total of 392 babies (59.03%) are

known to visit the health center because they have a cold cough. The results of interviews conducted with 10 parents of infants who experienced a cold cough, 8 of them (80%) said that their babies experienced sleep disturbances. Such as sleeping less than 12 hours per day, often waking up and crying during sleep, having difficulty falling back asleep, and being fussy when waking up. In addition, the mothers said they did not know the benefits of infant massage in reducing cough and cold symptoms.

Sleep quantity is the length of sleep time a person needs based on age group (Miyatun & Puspita, 2021; Nailufar et al., 2022). Sleep quantity influences the balance of physiology and psychology. Therefore, every human needs enough sleep to carry out activities properly. (Nailufar et al., 2022). Sleep time for infants aged 0-6 months ranges from 13-15 hours/day. When babies are 6 months old, their sleep patterns begin to resemble those of adults (Duarba et al., 2024). Based on Indonesian Ministry of Health (2018) According to the Indonesian Ministry of Health (2018), the sleep needs of babies aged 0-1 month are 14-18 hours every day, and when babies are 1-18 months old, their sleep needs are 12-14 hours every day including naps.

Cough and cold are viral infections that can attack the upper respiratory tract (nose to throat) and cause symptoms such as nasal discharge, nasal congestion, and cough, sometimes accompanied by fever and headache (Fairus et al., 2021). Coughing cold (Common Cold) in infants is a common health problem affecting their quality of life.

Massage is one of the stimuli that stimulates the development of the structure and function of brain cells, which, if performed on babies regularly and continuously, will achieve optimal development. Infant massage is also a health treatment in the form of touch therapy in specific ways on the body so that the benefits of medicine and therapy can be achieved (Juwita & Nicky, 2019; Supratti et al., 2023).

This study aimed to determine the effect of baby massage on the quantity of sleep in 2024 in infants aged 6-12 months with a cold cough in the Karang Rejo Health Center Working Area, Tarakan City.

Method

The research was conducted in the working area of Karang Rejo Health Center Tarakan City in 2024 with *ethical approval* No.0211/EPK-FISKES UBT/V/2024. The experimental research design used was a quasi experiment pre and post-test without control. The population in this study included babies aged 6-12 months from November 2023 - January 2024, with as many as 124 babies. The number of respondents was 33 respondents. Inclusion criteria are Infants aged 6-12 months who reside in the Karang Rejo Health Center working area. Infants aged 6-12 months with symptoms of cough and cold. The baby's parents are willing to be respondents. Infants do not have congenital abnormalities. Exclusion Criteria Parents are unwilling to be respondents, infants with diseases and are at risk for massage, and infants with fever. The instrument used in this study was an observation sheet. The observation sheet for infant massage consisted of name, gender, weight, date, and time of massage. In contrast, the observation sheet for infant sleep quantity consisted of the length of the infant's daytime and nighttime sleep before and after infant massage.

Result

The characteristics of the respondents in this study are as follows:

Table 1. Frequency distribution of characteristics of infants aged 6-12 months With Cough and Cold in the Working Area of Karang Rejo Health Center

	Characteristics	Frequency	Percentage (%)
Gender	Female	13	39,40%
	Male	20	60,60%
	Total	33	100 %
Age	6 months	2	6,10%
	7 months	4	12,10%
	8 months	3	9,10%
	9 months	3	9,10%
	10 months	7	21,20%
	11 months	3	9,10%
	12 months	11	33,20%
	Total	33	100%
Body Weight	Below the Red Line	2	6,10%
	Normal	31	93,90%
	Total	33	100%

Based on Table 1, it can be seen that the characteristics of the average baby's gender are male, namely as many as 20 babies (60.60%), and the baby's age is mostly at the age of 12 months, 11 babies (33.20%). As for the average baby's weight is normal, as many as 31 babies (93.90%).

Table 2. Frequency Distribution of Characteristics of Infants Aged 6-12 Months with Cough and Cold Based on Massage Time in The Working Area Karang Rejo Health Center

Massage Time	Frequency	Percentage (%)
Morning	15	45,50
Afternoon	18	54,50
Total	33	100

Source: Primary data 2024

Table 2 shows that respondents' characteristics based on massage time are 18 (54.50%) in the afternoon and 15 (45.50%) in the morning.

Table 3. Frequency Distribution of Sleep Quantity of 6-12-month-old Infants with a Cold Cough Before a Massage

Sleep Quantity (Hours)	Frequency	Percentage (%)
8	2	6,10
9	7	21,20
10	14	42,40
11	10	30,30
Total	33	100

Source: Primary data, 2024

Table 3 shows that before the massage, 14 babies (30.30%) had 10 hours of sleep, 10 babies (30.30%) had 11 hours of sleep, seven babies (21.20%) had 9 hours of sleep, and two babies (6.10%) had 8 hours of sleep.

Table 4. Frequency Distribution of Sleep Quantity of 6-12-month-old Infants with a Cold Cough After a Massage

Sleep Quantity (Hours)	Frequency	Percentage (%)
9	1	3,00
10	2	6,10
11	3	9,10
12	11	33,30
13	8	24,20
14	7	21,20

15	1	3,00
Total	33	100

Source: Primary data, 2024

Table 4 shows that infants had a sleep quantity of 12 hours were 11 infants (33.30%), sleep quantity of 13 hours were eight infants (24.20), sleep quantity of 14 hours were seven infants (21.20%), sleep quantity of 11 hours were three infants (9.10%), sleep quantity of 10 hours were two infants (6.10%), sleep quantity of 9 hours was one infant (3.00%) and sleep quantity of 15 hours were one infant (3.00%).

Table 5. Distribution of Infant Massage Effect on Sleep Quantity of 6-12 Months Infants with Cough and Cold in the Working Area of the Working Area Karang Rejo Health Center

Infant Sleep Quantity	Baby Massage			
	Before		After	
	F	%	F	%
Bad	33	100	6	18,2
Good	0	0	27	81,8
Total	33	100	33	100

Source: Primary data, 2024

Table 5 shows that the quantity of infant sleep before massage is 33 infants (100%) with a bad category, and after baby massage, the quantity of sleep 27 infants (81.8%) with a good category.

Table 6. Effect of Infant Massage on Sleep Quantity of 6-12 Months Infants with Cough and Cold in the Working Area of the Working Area Karang Rejo Health Center

Intervention	(N) Negative Ranks	(N) Positive Ranks	Mean Positive Ranks	(N) Ties	p-value
Influence of Infant Massage	0	30	15,50	3	0,001

Source: Uji Wilcoxon

Based on Table 6 with the Wilcoxon test, the statistical test results obtained p-value = 0.001 (p-value <0,05) with mean positive ranks 15.50, which means stating that there is an effect of giving baby massage on the quantity of sleep of infants aged 6-12 months with a cold cough in the Karag Rejo Health Center work area. Based on the value of ties, three respondents did not experience an increase in sleep quantity after being given a baby massage, and seen from the value of positive ranks, 30 respondents experienced an increase in sleep quantity after being given a baby massage.

Discussion

Based on Table 1, it can be seen that the sex characteristics of the baby are mostly male, with 20 babies (60.60%), and female, with as many as 13 babies (39.40%). Gender can affect the kinds of sleep disorders experienced by babies. In general, baby boys are more active than baby girls, which results in activities carried out between baby girls and baby boys tending to be different. This difference in activity will impact baby boys experiencing physical fatigue more often than baby girls and affect the quantity and quality of baby sleep (Nudesti & Sulastri, 2020).

Table 1 shows that the most common age of infants is 12 months old, as many as 11 infants (33.20%). This study was conducted on infants with the age category of 6-12 months. The study's results align with research conducted by Rosalina et al. that most respondents who experienced sleep disturbances were 46 people (31.1%) aged 12 months. This is because babies aged 12 months will start learning to walk. Babies aged 12 months will experience better motor development, their muscles will

get stronger and do more diverse play activities, such as throwing or learning to kick a ball. This change in activity will affect the baby's sleep quantity, and as they get older, the need for sleep time will also decrease.

Based on Table 1, the results of infant weight characteristics were 31 infants (93.90%) with normal categories and two infants (6.10%) with categories below the red line based on the KIA (Maternal and Child Health) book. Body weight influences the quantity of infant sleep. Disturbed sleep patterns can impact a child's nutritional status, affecting body weight. Lack of sleep will cause growth hormones to be disrupted, when the baby does not get enough time to sleep the hormone cortisol will be released. If this happens, the body will store more fat, affecting weight (Budiantoro, 2019).

Table 2 shows that infant massage is mostly done in the afternoon, namely 18 (54.40%), while in the morning, as many as 15 (45.50%). Baby massages can be done anytime, but the recommended time is in the morning, afternoon, or evening. This is in accordance with the results of research conducted by Emilda & Fazdria Silfia (2022) that there is a significant relationship between the timeliness of infant massage and infant sleep needs ($\text{sig } 0.000 < 0,05$). This is also in line with Susilowati (2022), which states that the right baby massage time is in the morning, afternoon, or evening. Before doing the massage, it must be considered that the baby is ready to be massaged. Babies are said to be ready for massage when they baby respond well, are not fussy, have no fever, are not thirsty, are hungry, and are not sleepy.

The quantity of sleep of infants aged 6-12 months with a cold cough before being given a baby massage intervention was 100% (33 respondents) with a poor sleep quantity category. Before massage, the baby's sleep was less than his sleep needs. Based on the recommendations of the Ministry of Health, babies aged 1-18 months need 12-14 hours of sleep/day. The quantity of sleep will affect the growth and development of the baby because 75% of growth hormone will be released while the baby is sleeping. This is in line with research conducted by Istikhomah et al. (2020), which found that 56.25% of babies had poor sleep before the massage was done. Several factors influence this. Factors that affect infant sleep are also closely related to environmental factors, a safe and comfortable environment can accelerate the sleep process. Factors that interfere with sleep quantity include rest, environment, physical, exercise or activity, nutrition, and health problems. (Jihan V. W., Risza C., 2021). A health problem that often arises in infants is a cold cough. A cold cough is a respiratory disorder that can interfere with a baby's sleep. Coughing conditions can be caused by the invasion of external pathogens and deficiency or lack of energy in the spleen and lungs due to the poor constitution of the child's body, while colds can occur due to cold attacks on the surface of the body (Fairus et al., 2021).

Table 5 shows that sleep quantity for 27 babies (81.8%) is good after a massage. Babies fall asleep soundly after massage because massage can stimulate changes in brain waves, alpha and beta waves will decrease while theta waves will increase, this is evident during EEG (Electroencephalography) examination (Wardani et al., 2023). The results of this study are in line with research by Aryani et al. (2022), which showed that the results, before being given baby massage with VCO (Virgin coconut oil) had a poor sleep quantity, namely as many as 11 respondents (68.8%), after being given baby massage

with VCO (Virgin coconut oil) there was an increase in sleep quantity, namely as many as 14 respondents (87.5%) had a good sleep quantity. Baby massage makes babies healthier and less fussy. Baby massages can also make baby muscles stronger, increase immunity, increase weight, reduce pain, and make baby sleep better. Baby massage stimulates motor muscles, improves immunity, and increases white blood cell production, making babies healthier.

Based on table 6, it can be seen that the baby's sleep quantity before the massage was 100% with the classification of poor sleep quantity, after the baby massage 27 babies (81.8%) increased to good sleep quantity. Table 6 shows the Wilcoxon test obtained statistical test results $p\text{-value} = 0.001$ ($\alpha < 0,05$), which means states that H_a is accepted, there is an effect of giving baby massage on the quantity of sleep of infants aged 6-12 months with a cold cough in the Karang Rejo Health Center area. There were 30 respondents who experienced an increase in sleep quantity after being given a baby massage, and 3 respondents who did not experience an increase or decrease in sleep quantity after being given a baby massage. Respondents whose sleep quantity did not increase were due to several factors, including environmental and nutritional factors. The baby's night sleep has increased, but the daytime sleep has decreased. All three respondents live in houses close to the highway, which allows high noise levels during the day, disrupting nap time. During the cough and cold, the three respondents experienced a decrease in appetite, resulting in reduced nutritional intake and decreased sleep quantity. This aligns with the theory that disturbances in infant sleep patterns are influenced by several factors, such as noisy surroundings and food intake (Fajrin et al., 2015).

Infant massage has positive benefits, including increasing the baby's concentration and making the baby sleep soundly. Based on the study results, the quantity of sleep of all respondents after the baby massage has increased. The increased quantity of sleep in infants who were given the massage was due to increased levels of serotonin hormone secretion produced during the massage. Serotonin is the main transmitter substance that releases the melatonin hormone. Melatonin hormone will make babies sleep longer and deeper at night. This is because melatonin is produced more in the dark when less light enters the eyes (Akib & Merina, 2019; Sinaga, 2021).

Conclusion

Based on the study's results, it can be seen that giving baby massage affects the quantity of sleep of infants aged 6-12 months with a cold cough in the Karang Rejo Health Center working area in 2024. It is hoped that this study can be used as a source of reference and can be continued by further researchers using a control group, looking at the effect of baby massage on weight gain, and paying more attention to confounding factors that might affect the results of the study, such as drug consumption, nutritional intake, environmental factors, and baby activities.

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