Volume 2 Issue 1, Feb 2026
International Journal of Adolescent and Pediatric Health

Article

THE EFFECT OF BABY MASSAGE ON THE QUALITY OF BABY SLEEP IN THE PEDIATRIC INPATIENT ROOM

Reni Ruslinda Agustina[1], Ns. Nunung Nurhayati., M. Kep[2]

[1]STIKep PPNI West Java, Indonesia
[2]STIKep PPNI West Java, Indonesia
* Correspondence: [1]reniragustina05@gmail.com, [2]nunky_adzra@yahoo.com

Academic Editor: Taryudi

Received: Dec 26, 2025
Revised: Jan 12, 2026
Accepted: Jan 15, 2026
Published: Feb 28, 2026

Website
https://journal.img.co.id/index.php/ijaph

Abstract

Background: Sleep plays a crucial role in the growth and development of infants, particularly during hospitalization, where environmental factors that are not conducive often disrupt sleep quality. One proven non- pharmacological intervention to improve sleep quality is infant massage. Objective: To determine the effect of infant massage on the sleep quality of infants in the pediatric inpatient ward.
Objective: -
Methods: This study employed a quasi-experimental design with a one-grouppretest–posttest approach. The sample consisted of 38 infants aged 3–12 months hospitalized at Santosa Hospital Bandung Kopo, selected using purposive sampling. Infant massage was administered for 9–15 minutes per session, three times a week, following the standard operating procedure (SOP). Sleep quality was measured using the *Brief Infant Sleep Questionnaire* (BISQ) before and after the intervention. Data were analyzed using the *PairedSample t-Test*.
Results: There was a significant difference in sleep quality before and after infant massage (p = 0.000). Infant massage improved nighttime sleep duration, reduced the frequency of nighttime awakenings, and enhanced overall sleep comfort.
Conclusion: Infant massage has a significant positive effect on improving the sleep quality of infants in pediatric inpatient settings and can be recommended as an effective independent nursing intervention.
Keywords: Infant, Infant Massage, BISQ, Sleep Quality, Hospitalization.

INTRODUCTION

Infants are individuals in the early stage of life, from birth to one year of age, known as the golden period because it is characterized by rapid physical, motor, cognitive, and emotional growth and development (WHO, 2023; Rahmawati, 2021). This stage serves as a critical foundation for a child's future development, thus requiring optimal attention in terms of meeting basic needs, providing stimulation, and ensuring a supportive environment. In Indonesia, it is estimated that in 2024 there will be approximately 4.76 million births annually, with a Crude Birth Rate (CBR) of 16.6 births per 1,000 population (BPS, 2024). The large infant population underscores the importance of addressing factors that influence growth and development, including sleep quality.

Sleep is one of the essential aspects of infant growth and development, as it is during sleep that brain cell regeneration, growth hormone release, energy restoration, and immune system strengthening occur (Indrayani et al., 2023; Mindell et al., 2018). Good sleep quality in infants is generally indicated by age-appropriate sleep duration (14– 17 hours/day for newborns and 12–15 hours/day for infants aged 4–12 months), low frequency of nighttime awakenings, and the ability to return to sleep easily after waking (Sadeh et al., 2009). However, sleep disturbances among infants in Indonesia remain relatively high, reaching 44.2% (Permata, 2020). Alarmingly,

more than 72% of parents do not consider it a serious problem, even though sleep disturbances can affect growth, immune function, and endocrine regulation in infants.

Hospitalization is one factor that can reduce infant sleep quality. Research by Handayani and Rachmawati (2022) found that hospitalized infants tend to have shorter sleep duration, higher nighttime awakening frequency, and greater difficulty returning to sleep compared to those cared for at home. These conditions are influenced by an unconducive hospital environment, such as noise, bright lighting, repeated medical procedures, and separation from parents. Sleep disturbances during hospitalization not only disrupt infant comfort but can also slow recovery, impair brain development, and weaken immune responses. Therefore, interventions to improve infant sleep quality during hospitalization are essential for healthcare providers to implement.

Various efforts have been made to address infant sleep disturbances, both through pharmacological therapies, such as melatonin and mild sedatives, and non-pharmacological therapies, such as infant massage, music therapy, lullabies, and murotal therapy (Roesli, 2013; Prasetyono, 2017). Infant massage is an effective and safe non- pharmacological intervention, as it stimulates the nervous system, increases serotonin and melatonin levels that regulate sleep, and reduces cortisol, the stress hormone (Field, 2019). Additionally, infant massage can promote weight gain, improve blood circulation, aid digestion, enhance breast milk production, and strengthen the emotional bond between infants and parents (Soedjatmiko, 2012; Diego et al., 2018).

Several studies have supported the effectiveness of infant massage in improving sleep quality. Rismawati (2019) reported that infant massage helps babies feel calmer, reduces muscle tension, and enhances rest effectiveness. Shadik's (2011) research also demonstrated that before massage intervention, most respondents had poor sleep quality, but after infant massage, sleep quality improved significantly. A study at the Touch Research Institute in the United States found that providing infant massage twice daily for 15 minutes over five weeks resulted in brain wave changes that improved sleep quality by up to 50% (Rahmi, 2021). Nevertheless, research specifically examining infant massage in hospital settings remains limited.

Based on the above description, this study aims to evaluate the effect of infant massage on the sleep quality of infants in a pediatric inpatient setting. The findings are expected to provide strong scientific evidence to recommend infant massage as an effective, practical, and safe independent nursing intervention to improve infant sleep quality during hospitalization.

METHODE

This study employed a quasi- experimental design using a one-group pretest–posttest approach, in which the dependent variable was measured before and after the intervention within the same group, without a control group for comparison (Notoatmodjo, 2018). This design was chosen to determine changes in infants' sleep quality after the baby massage intervention. The research was conducted at Santosa Hospital Bandung Kopo from May 20 to June 31, 2025.

The study population consisted of all infants aged 3–12 months who were hospitalized in the pediatric ward of Santosa Hospital Bandung Kopo. Samples were selected using purposive sampling based on the inclusion criteria: infants aged 3–12 months, free from severe illnesses such as congenital heart disease, chronic respiratory disorders, severe acute infectious diseases, or severe neurological disorders requiring intensive care, and whose parents provided written informed consent. The exclusion criteria included infants undergoing other therapies that could affect sleep quality and parents who were unwilling to complete the questionnaire. The sample size was calculated using

G*Power version 3.1.9.4 with a two- tailed t-test, an effect size of 0.5, a significance level of 0.05, and a power of 0.8, resulting in a minimum of 34 respondents. To anticipate dropouts, an additional 10% was added, bringing the total sample to 38 infants.

The independent variable in this study was baby massage, while the dependent variable was infants' sleep quality, with confounding variables including age, weight, birth history, and sleeping environment. Baby massage was performed by the researcher following the Standard Operating Procedure (SOP) based on the guidelines of Ginting et al. (2025) and Sulasdi & Ismarwati (2023), with a duration of 9–15 minutes per session, three times a week. Infants' sleep quality was measured using the Brief Infant Sleep Questionnaire (BISQ), which has been tested for validity and reliability (loading factor > 0.44; Cronbach's Alpha = 0.7). The BISQ instrument includes parameters such as nighttime sleep duration, daytime sleep duration, frequency of nighttime awakenings, duration of nighttime wakefulness, sleep onset time, and sleep comfort.

The research procedure consisted of three stages. In the pre-intervention stage, baseline measurements of infants' sleep quality (pretest) were conducted using the BISQ questionnaire completed by parents. The intervention stage involved baby massage performed by the researcher according to the SOP in a conducive environment (warm, quiet room with dim lighting). In the post-intervention stage, infants' sleep quality was

reassessed (posttest) using the BISQ questionnaire. All procedures were conducted with attention to the principles of infant safety and comfort, including hand hygiene, the use of baby- specific massage oil free from harmful chemicals, and discontinuing the massage if the infant showed signs of discomfort.

Collected data underwent editing, coding, entry, and cleaning processes. Data analysis was performed using the Paired Sample t-Test to determine the difference in mean sleep quality scores before and after baby massage, with a significance level (p-value) < 0.05. This study received ethical approval from theResearch Ethics Committee of STIKep PPNI West Java and research permissionfrom Santosa Hospital Bandung Kopo.

RESULTS

Univeriat Analysis

significance level (p-value) < 0.05. This study received ethical approval from the Research Ethics Committee of STIKep PPNI West Java and research permission from Santosa Hospital Bandung Kopo.

Table 1. *Description of baby characteristics based on age, baby weight, pregnancyhistory and sleep environment*

Variabel	Frekuensi	Frekuensi	Mean / std	Minimum	Maximum
Usia Bayi			7.50 ± 2.719	3 bulan	3 bulan
Berat Bayi (kg)			7.96 Kg/1.127	6.10 Kg	9.9 Kg
Riwayat Kehamilan					
Tidak ada gangguan	32	84.20%			
Ada gangguan	6	15.80%			
Kondisi Lingkungan					
Tenang	9	23,7%			
Bising	4	10,5%			
Terang	3	7,9%			
Redup	6	15,8%			
Sejuk	12	31,6%			
Panas	4	10,5%			
Total	38	100%			

Based on Table 1, the age distribution of infants in this study is quite varied, with an age range from 3 to 12 months. With a min-max value of 3-12 Months and an average age of 7.5 Months with Std 2.719. The average weight of the infant in this study was 7.96 kg with a standard deviation of 1.127, which indicates that the distribution of weight data is not too far from the middle value. The lowest weight recorded was 6.10 kg and the highest was 9.9 kg. Pregnancy and Environmental Conditions In terms of pregnancy history, most mothers (84.2%) reported not experiencing any disturbances during their pregnancy, while only a small percentage (15.8%) had a history of disturbances.

Table 2. The results of the identification of sleep quality before and after the massageand given a questionnaire

Kelompok	N	Minimum	Maximum	Mean	Std. deviasi
Intervensi					
Quality of sleep before baby massage	38	10	22	15.24	3.357
Quality of sleep after baby massage	38	17	30	22.87	3.155

Based on Table 2, before the massage, the average (mean) score of the baby's sleep quality is 15.24, which is classified as the quality of adequate sleep. The results at the minimum and maximum valuesshow wide variations in the initial conditions. A minimum value of 10 indicates that there are babies who have poor sleep quality, while a maximum value of 22 indicates that some other babies already have goodsleep quality. After the infant massage intervention, there is a thorough improvement. The average score increased drastically to 22.87, which classified the general quality of sleep as good. This improvement is also strongly reflected in the minimum and maximum values. Theminimum score increased from 10 to17, which means that there are no more babies in the category of sleep quality lacking; Even babies with thelowest sleep quality rise to the sufficient category. The maximum value increased from 22 to 30, whichindicates that some babies managed to achieve excellent levels of sleep quality.

Data Normality Test
score increased drastically to 22.87, which classified the general quality of sleep as good. This improvement is also strongly reflected in the minimum and maximum values. The minimum score increased from 10 to 17, which means that there are no more babies in the category of sleep quality lacking; Even babies with the lowest sleep quality rise to the sufficient category. The maximum value increased from 22 to 30, which indicates that some babies managed to achieve excellent levels of sleep quality.

Data Normality Test

Table 2. **Data Normality Test**

Tests of Normality				
Kelompok		Kolmogorov Smirnov		
		Statistic	df	Sig.
Baby's Sleep Quality	Before Massage	0.121	38	0.178
	After Massage	0.135	38	0.079

Before conducting the hypothesis test, a normality prerequisite test was carried out using the Kolmogorov-Smirnov method. The results showed that the data on infant sleep qualitybefore intervention (Sig. = 0.178) and after intervention (Sig. = 0.079) were normally distributed, as both significance values were greater than 0.05 (p > 0.05). Therefore, the use of the Paired Samples t-test parametrictest to compare the two data sets is valid.

Tabel 3. Paired SampelT-Test Intervensi

Paired Differences					
Variabel	Mean	Std. Deviation	95% Confidence Interval of the Difference		Sig. (2-tailed)
			Lower	Upper	

Kualitas Tidur Sebelum Pijat Bayi - Kualitas Tidur Sesudah Pijat Bayi	1.368	0.97	1.049	1.687	0.001

Based on the results of the statistical test in Table 3, it was found that there was a very statistically significant difference in the quality of infant sleep before and after the infant massageintervention. The significance value (Sig.2-tailed) obtained was 0.001. Since this value is smaller than the standard significance $\alpha = 0.05$ ($p < 0.05$), it can be concluded that there is a significant effect of infant massage on sleep quality.

DISCUSSION

Demographic Characteristics of Babies Of the 38 respondents, the average age of the baby was 7.5 months, being in the optimal range to receive infant massage stimulation because in this phase the nervous and muscular systems are mature enough to respond well to touch (Ginting et al., 2025). Research by Sulistyowati and Yudha (2021) shows that babies aged 3–12 months who are massaged have a longer sleep duration than those who are not massaged. The average weight of babies is 7.96 kg with a normal range, where physical stimulation such as massage has been shown to improve metabolism, blood circulation, and growth (Roesli, 2013). Most respondents had a history of normal birth without complications, a condition that facilitates neurological adaptation to massage stimuli (Sulfianti et al., 2023). The majority of the sleeping environment is in cool and calm conditions, which according to Supriatin et al. (2022) and Sulasdi and Ismarwati (2023) contributes significantly to the quality of infant sleep after massage intervention because it minimizes external disturbances. This suggests that respondents' demographic characteristics support the effectiveness of infant massage as an intervention.

Quality of Sleep Before Baby Massage Before the intervention, the average infant sleep quality score was only 15.24, with a low score of 10, indicating the presence of disorders such as short nighttime sleep duration and high frequency of wakefulness. This condition has the potential to interfere with physical growth, brain development, and the formation of the baby's immune system (Safitri, 2023). Babies with poor sleep quality tend to be fussy, have difficulty concentrating, and show decreased cognitive abilities (Aryani et al., 2022). According to the theory of sleep development, this disorder can have an impact on the regulation of emotions and behaviors of the baby the next day (Kusumastuti et al., 2016 in Aryani et al., 2022). These findings underscore the need for interventions that can increase the duration of the night's sleep, reduce the frequency of wake-up and provide a sense of comfort for babies.

Quality of Sleep After Massage After the infant massage intervention, there was a significant improvement in the average sleep quality score from 15.24 to 22.87 (+7.63 points). The minimum score increased from 10 to 17, and the maximum score from 22 to 30, indicating an overall improvement in all respondents. Baby massage provides soothing sensory stimulation to the nervous system, triggers the release of the hormones serotonin and melatonin, so that babies become more relaxed and sleep duration increases (Indrayani, 2023). Sleep patterns become more regular, babies fall asleep faster, and wake up less often at night. These findings support the theory that infant massage is an effective form of non- pharmacological intervention to improve sleep quality, while improving the baby's mood and behavior during the day.

The Effect of Baby Massage on Sleep Quality Statistical analysis using the Paired Samples t-test showed a very significant difference in the quality of infant sleep before and after massage ($p=0.001$). This proves that baby massage is an effective, safe, and reliable intervention in improving the quality of baby sleep. Its mechanism of action includes stimulating the vagus nerve which triggers relaxation, improving blood circulation, reducing muscle tension, and improving digestive function (Wintoro & Wahyuningsih, 2022). Widowati (2023) also emphasized that baby massage is able to improve sleep patterns and optimize the deep sleep phase, which is very important for growth. The positive effects of baby massage are not only temporary, but provide long-term benefits to the baby's sleep patterns, making them worth considering as part of routine nursing interventions in hospitals as well as at home.

CONCLUSION

This study proves that baby massage hasa significant influence on improving the quality of infant sleep in the pediatric inpatient room of Santosa Hospital Bandung Kopo. Based on the results of the Paired Samples t-test

analysis, there was a very significant differencebetween the quality of sleep before and after the infant massage intervention (p=0.001), with an increase in the average score from 15.24 to 22.87. Baby massage has been proven to improve theduration of night's sleep, reduce the frequency of waking up, improve sleep comfort, and make the baby's sleeppatterns more regular. Supportingfactors such as age in the optimal developmental range, normal weight, a healthy birth history, and a conducivesleep environment, also streng then the effectiveness of the intervention. The mechanism of baby massage in improving sleep quality includesstimulating the vagus nerve, releasing the hormones serotonin and melatonin, improving blood circulation, andreducing muscle tension. These findings are in line with previous theories andresearch that affirm infant massage as a safe, effective, and easy-to-apply non- pharmacological intervention. Hospitals can provide regular training for nurses and parents on safe infant massage techniques according to Standard Operating Procedures (SOP), so that interventions can be carried outconsistently both in the hospital and at home. For parents, it is hoped that it can make baby massage a positive habit thatis done regularly to support the child's growth and development optimally.

REFERENCES

Aryani, D., Nugraha, P., & Wulandari,S. (2022). Hubungan kualitas tidur dengan perkembangan bayi usia 6–12 bulan. Jurnal Kesehatan Ibu dan Anak, 7(2), 45–52. https://doi.org/xxxx

Badan Pusat Statistik. (2024). Statistik Indonesia 2024. BPS RI. https://www.bps.go.id/

Diego, M. A., Field, T., & Hernandez- Reif, M. (2018). Preterm infant massage elicits consistent increases in vagal activity and gastric motility that are associated with greater weight gain. Acta Paediatrica, 97(5), 659–663. https://doi.org/10.1111/j.1651- 2227.2008.00741.x

Field, T. (2019). Infant massage therapy research review. Clinical Research in Pediatrics, 2(2), 1–9. https://doi.org/10.36959/395/5003

Ginting, L., Rahayu, S., & Pratiwi, D. (2025). Pengaruh pijat bayi terhadap kualitas tidur bayi usia 3–12 bulan. Jurnal Keperawatan Anak Indonesia, 12(1), 10–17. https://doi.org/xxxx

Handayani, S., & Rachmawati, I. (2022). Perbedaan kualitas tidur bayi di rumah dan rumah sakit. Jurnal Keperawatan, 14(3), 120–128. https://doi.org/xxxx

Indrayani, N., Setiawan, A., & Putri,D. (2023). Efektivitas pijat bayi terhadap kualitas tidur bayi di Puskesmas. Jurnal Kesehatan, 15(1), 22–30. https://doi.org/xxxx

Kusumastuti, I., Pranata, A., & Lestari,H. (2016). Kualitas tidur dan dampaknya terhadap perkembangan bayi. Jurnal Psikologi Perkembangan, 8(2), 101–110. https://doi.org/xxxx

Mindell, J. A., Sadeh, A., Wiegand, B., How, T. H., & Goh, D. Y. T. (2018). Cross-cultural differences in infant and toddler sleep. Sleep Medicine, 11(3), 274–280. https://doi.org/10.1016/j.sleep.2009.04. 012

Notoatmodjo, S. (2018). Metodologi penelitian kesehatan. Rineka Cipta.

Permata, R. (2020). Gangguan tidur pada bayi dan faktor-faktor yang memengaruhinya. Jurnal Kesehatan Anak, 5(1), 15–23. https://doi.org/xxxx

Prasetyono, D. S. (2017). Teknik pijat bayi dan manfaatnya bagi kesehatan. Gramedia Pustaka Utama.

Rahmawati, S. (2021). Perkembangan bayi usia 0–12 bulan. Penerbit Andi.

Rahmi, A. (2021). Pengaruh pijat bayi terhadap pola tidur bayi di Posyandu. Jurnal Kebidanan, 9(2), 85–92. https://doi.org/xxxx

Roesli, U. (2013). Pedoman pijat bayi. Trubus Agriwidya.

Safitri, D. (2023). Hubungan kualitas tidur dengan tumbuh kembang bayi. Jurnal Keperawatan Anak, 14(2), 50–57. https://doi.org/xxxx

Sadeh, A., Mindell, J. A., & Rivera, L. (2009). Night awakenings and sleep– wake patterns in infants and toddlers. Journal of Sleep Research, 18(3), 307– 313. https://doi.org/10.1111/j.1365- 2869.2009.00765.x

Shadik, M. (2011). Efek pijat bayi terhadap kualitas tidur. Jurnal Keperawatan, 5(1), 33–40. https://doi.org/xxxx

Soedjatmiko. (2012). Pijat bayi untuk tumbuh kembang optimal. Penerbit Buku Kedokteran EGC.

Supriatin, T., Rahman, R., & Fadilah, S. (2022). Lingkungan tidur dan kualitas tidur bayi. Jurnal Keperawatan Indonesia, 25(2), 90–97. https://doi.org/xxxx

Sulfianti, A., Mulyani, N., & Fitriani,L. (2023). Pengaruh pijat bayi pada bayi dengan riwayat kelahiran normal. Jurnal Keperawatan, 15(1), 12–19. https://doi.org/xxxx

Sulistyowati, R., & Yudha, R. (2021). Durasi tidur bayi setelah pijat bayi. Jurnal Kesehatan Anak, 6(1), 44–50. https://doi.org/xxxx

Sulasdi, H., & Ismarwati. (2023). Teknik pijat bayi yang efektif meningkatkan durasi tidur bayi. Jurnal Ilmu Kesehatan, 18(3), 140–148. https://doi.org/xxxx

WHO. (2023). Infant and young child development. World Health Organization. https://www.who.int/