

Infant Massage on the Growth and Development of Premature Infants: A Literature Review

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ABSTRACT

Background & Objective: Premature infants are infants born before 37 weeks of gestation and are at high risk of experiencing growth disorders and developmental delays due to organ system immaturity. One of the nonpharmacological nursing interventions widely used to support the growth and development of premature infants is infant massage. The objective of this study was to analyze the effectiveness of infant massage on the growth and development of premature infants through a literature review. **Method:** This study used a literature review method with a descriptive-analytic approach. A total of 15 national and international articles were selected according to inclusion and exclusion criteria through searches in the Google Scholar, PubMed, and ScienceDirect databases. Data were analyzed descriptively based on relevant research results regarding the effectiveness of infant massage in premature infants. **Results:** The results of the review showed that infant massage is effective in improving the growth and development of premature infants. Most studies reported a significant increase in body weight, improved sleep quality, increased oxygen saturation, better motor and neurological development, increased bonding attachment between mother and infant, and reduced length of stay in the NICU. Several studies also showed that infant massage helps improve digestive function through vagus nerve stimulation so that nutrient absorption becomes more optimal. **Conclusion:** Infant massage has been proven effective as a nonpharmacological nursing intervention that supports the growth and development of premature infants through increased body weight, sleep quality, physiological stability, motor

development, and the emotional relationship between mother and infant. Therefore, infant massage is recommended as part of routine care for premature infants both in perinatology rooms, NICU, and at home with assistance from health workers.

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Introduction

Premature birth remains one of the main health problems in the world. Every year it is estimated that more than 15 million babies are born prematurely, or about one in ten live births. Premature infants have a higher risk of experiencing morbidity and mortality as well as long-term growth and developmental disorders due to immaturity of the body's organ systems. Therefore, effective early care is needed to support the growth and development of premature infants.

One of the nonpharmacological interventions widely used is infant massage. This therapy is a form of tactile stimulation carried out in a structured manner through touch on the infant's skin. Various studies show that infant massage can provide benefits for premature infants, such as increasing body weight, improving neurological and cognitive development, strengthening the immune system, and shortening the length of hospitalization. This mechanism is thought to be related to increased vagus nerve activity which can improve gastric motility and nutrient absorption for infant growth.

In addition to affecting growth, massage therapy is also reported to be able to increase oxygen saturation and strengthen the bond between mother and premature infant. The results of a systematic review and meta-analysis conducted by Zhang et al. (2023) showed that massage therapy significantly increased oxygen saturation and the mother-infant relationship in the premature infant group (Weerakul et al., 2025).

Objective

The main objective of this study was to identify, analyze, and synthesize research results regarding the effectiveness of infant massage on the growth and development of premature infants. This literature review aims to evaluate infant massage as an evidence-based nursing intervention that is safe, easy to perform, economical, and effective in supporting the growth and development of premature infants in perinatology rooms, NICU, and at home with assistance from health workers.

In addition, this study aims to understand the physiological mechanisms of infant massage in supporting the growth and development of premature infants, including increased body weight through vagus nerve stimulation and optimization of nutrient absorption, improved sleep quality, physiological stability such as oxygen saturation, and motor and neurological development, while strengthening bonding attachment between mother and premature infant.

Method

The method used in writing this literature review was by searching scientific articles both international and national, from the Google Scholar, PubMed, and ScienceDirect databases. The journal search process from each database was carried out in the same way, namely starting by entering keywords in the search column, then being directed to journal links with appropriate keywords.

Result

The results of the analysis showed that most studies reported the benefits of infant massage on increased body weight, sleep quality, motor development, physiological stability, and bonding attachment between mother and premature infant. A summary of the results of the journal analysis used in this literature review is presented in Table 1.

TABLE 1. Results of the analysis

No	Article Title / Research Journal	Author / Year	Research Method	Research Results
1.	Efektivitas Sentuhan Pijat Bayi sebagai Pendekatan Holistik Terhadap Peningkatan Berat Badan Bayi Prematur	Diah Oktaviana, Diah Andriani, Irawati Indrianingrum / 2026	Quasi Experiment with One Group Pretest-Posttest Design.	The results showed that giving baby massage for 15-20 minutes every day for 5 consecutive days was effective in increasing the body weight of premature infants. Of the 30 premature infants studied, 28 infants (93.3%) experienced an increase in body weight, while 2 infants (6.7%) experienced a decrease in body weight. The average infant body weight increased from 2421.83 grams before the intervention to 2502.07 grams after the intervention. The results of the analysis using the Wilcoxon Signed Rank Test obtained a p-value = 0.000 ($p < 0.05$), which indicates that baby massage has a significant effect on increasing the body weight of premature infants. Thus, baby massage can be used as nonpharmacological therapy to support the growth of premature infants. (Diah Oktaviana, Diah Andriani 2026)
2.	Pengaruh Pijat Bayi dengan Tumbuh Kembang Bayi	Yunri Merida dan Fatya Nurul Hanifa / 2021	Pre-Experimental Design with Intact Group Comparison	The study showed that in the group given baby massage, 15 infants (58.3%) experienced improved growth and development, while 10 infants (41.6%) did not experience improvement. In the group without baby massage, only 10 infants (45.8%) experienced improved growth and development and 15 infants (54.1%) did not experience improvement. The Chi-Square test results showed a p-value < 0.0001 , so it can be concluded that

				there is a significant effect of baby massage on infant growth and development. Baby massage provides stimulation to nerves, improves blood circulation, strengthens muscles, and helps
3.	Efektifitas Pijat Bayi terhadap Perubahan Kualitas Tidur dan Berat Badan pada Bayi Lahir Prematur di Klinik Pratama Mitra Subang	Jusmawati, Dewi Ayu Widiastuti, Linda Selviyana / 2025	Pre-experimental with One Group Pretest-Posttest Design.	The results showed that baby massage was effective in improving sleep quality and body weight of premature infants. Before the intervention, most infants had fairly good sleep quality (66.7%), while after baby massage the majority had good sleep quality (76.7%). In addition, the average infant body weight increased from 6230 grams to 6530 grams with an average increase of 300 grams. The statistical test results showed a value of $p=0.000$ on both sleep quality and body weight, which means there is a significant effect of baby massage on improving sleep quality and increasing the body weight of premature infants.
4.	Penerapan Pijat Bayi Terhadap Kualitas Tidur pada Bayi Usia 0-6 Bulan di Wilayah Kerja Puskesmas Pucangsawit Kota Surakarta	Sevi Lestiya Rini Handayani dan Maryatun / 2024	Descriptive method with case study approach.	The results showed an increase in sleep quality in both respondents after being given baby massage. In By. S, the BISQ score increased from 7 to 15 (an increase of 8 points), while in By. A, the BISQ score increased from 6 to 13 (an increase of 7 points). Before the intervention both infants experienced mild sleep quality disturbances, while after the intervention sleep quality changed to good. Baby massage performed routinely has been proven to help infants sleep longer, more soundly, reduce the frequency of waking at night, and improve overall sleep quality. (Lestiya, Handayani, and Maryatun 2024)

5.	Pengaruh Pijat Bayi terhadap Kualitas Tidur Bayi di Rumah Sehat Nabila Gemolong	Dinar Cahyaningsih dan Kamidah / 2024	Pre-experimental method with One Group Pretest-Posttest design	The results showed that baby massage affects the sleep quality of infants aged 3-12 months. Before being given baby massage, all respondents (100%) had poor sleep quality. After baby massage was performed, most infants (83.3%) experienced improved sleep quality to good. The Wilcoxon test results showed a p-value = 0.000 (<0.05), which means baby massage is effective in improving infant sleep quality. In addition, infants became calmer, rarely woke at night, and had more optimal sleep time. (Cahyaningsih et al. 2024)
6.	Pengaruh Pijat Bayi terhadap Kenaikan Berat Badan pada Bayi Prematur di RSUD Sidikalang	Heriaty Berutu, Rugun Togianur Lingga, dan Wiwik Dwi Arianti / 2023	Quantitative correlational with One Group Pre-Test and Post-Test Design	
7.	The Effects of Infant Massage Therapy on Preterm Neonatal Outcomes: A Clinical Trial	Jiranun Weerakul, Yasinee Apiraknapanon, Mathayan Sanjaiban, Suneera Intasen, Supattra Tipsuwan, dan Mattana Bhumipraphat / 2025	Prospective Randomized Controlled Trial (RCT)	in the massage group compared to 68.5 days in the control group ($p = 0.01$). The researchers concluded that infant massage therapy is effective in increasing weight gain, accelerating the achievement of full nutrition, and reducing the length of care for premature infants with very low birth weight. (Weerakul et al. 2025)
8.	Effects of Infant Touch on Growth-Related Indexes of Preterm Infants	Man Guo, Qiuying Du, Qingqing Yang, Huichan Yang, dan Hongbin Zhu / 2025	Retrospective study	The results showed that at 60 days of age, premature infants who received touch therapy had higher body weight (4.878 kg vs 4.639 kg; $p=0.001$) and greater body length (53.467 cm vs 52.067 cm; $p=0.036$) compared to the control group. In addition, motor,

				visual, language, and emotional development were also significantly better ($p < 0.05$). From the sleep aspect, the frequency of waking at night (2.47 vs 3.16 times; $p < 0.001$) and crying duration (2.72 vs 3.62 minutes; $p < 0.001$) were lower in the intervention group. However, no significant differences were found in head circumference, hearing, and sleep duration ($p > 0.05$). The researchers concluded that infant touch therapy is effective in improving physical growth, behavioral development, and sleep quality of premature infants. (Article et al. 2025)
9.	Baby Massage Terhadap Peningkatan Berat Badan Pada Bayi Prematur	Happy Marthalena Simanungkalit dan Arias Vini / 2022	Quantitative method with quasi experiment design	The results showed that the average body weight of premature infants increased after baby massage. In the intervention group the average body weight after treatment reached 2500 grams, while in the control group it was 2024 grams. The statistical test results showed p value = 0.002 (< 0.05) so there is a significant effect of baby massage on increasing the body weight of premature infants. (happy marthalena simanungkalit 2022)
10.	Effect of Massage With Verbal Contact by Mothers of Premature Infants on Maternal Attachment and Infant's Motor Performance: A Randomized	Ava Monfared, Malek Amini, Jamileh Abolghasemi, Ali Mazouri, dan Zahra Darabi Boroujeni / 2026	Randomized Controlled Trial (RCT) with single-blind method	The results showed that baby massage combined with maternal verbal contact provided a significant increase in maternal attachment and motor performance of premature infants compared to the control group. Maternal attachment scores increased significantly with $p = 0.001$ and motor performance increased with $p = 0.009$. However, this intervention did not provide a significant increase in body weight in premature

				infants with $p = 0.720$. The study concluded that baby massage with verbal contact is a safe, economical, and effective intervention to improve mother-infant relationships and motor development, but has not been
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Based on Table 1, most studies used quasi-experimental, pre-experimental, randomized controlled trial (RCT), case study, systematic review, scoping review, and literature review designs. The infant massage intervention was applied with varying durations, generally for 5–15 days or carried out routinely according to the protocol of each study. The main outcomes assessed included increased body weight, sleep quality, motor development, physiological stability, bonding attachment, and length of stay in the NICU. The results of the literature review show that infant massage is effective in supporting the growth and development of premature infants in most of the studies reviewed. Weight gain was found consistently after infant massage was given, with most studies reporting statistically significant results ($p < 0.05$).

In addition to increasing body weight, infant massage is also proven to provide benefits for the physiological stability of premature infants. Several studies reported increased oxygen saturation, optimization of digestive function through vagus nerve stimulation, improved sleep quality, and improvement of motor and neurological development after the intervention was carried out. These physiological improvements contribute to increasing the infant's ability to absorb nutrients, reducing physiological stress, and supporting optimal growth processes.

In addition, infant massage provides additional benefits in the form of improved sleep quality, reduced frequency of infants waking at night, increased bonding attachment between mother and infant, and accelerating the achievement of full feeding in premature infants treated in the NICU. Infants who received infant massage appeared calmer, more comfortable, and showed better behavioral development compared to the control group. Several studies also showed that infant massage combined with maternal verbal contact provided greater benefits for motor development and mother-infant emotional relationships compared to massage alone.

Discussion

This literature review highlights the effectiveness of infant massage as a nonpharmacological intervention in supporting the growth and development of premature infants. Based on the analysis of 15 selected studies, the findings consistently show that infant massage provides significant benefits for increased body weight, sleep quality, motor development, physiological stability, and bonding attachment between mother and premature infant.

In addition to physiological benefits, infant massage also provides a positive impact on sleep quality, motor development, and bonding attachment. Studies show that infants who receive baby massage have better sleep quality, longer sleep time, fewer frequency of waking at night, and appear calmer compared to before the intervention. Research by Monfared et al. (2026) also showed that baby massage combined with maternal verbal contact significantly increased bonding attachment and motor development of premature infants, although it did not provide a significant increase in body weight. These findings indicate that infant massage not only plays a role in physical aspects, but also provides psychological and neurobehavioral development benefits for premature infants.

Infant massage has been proven effective in various research designs, from quasi experiment, pre-experimental, randomized controlled trial (RCT), case study,

systematic review, to literature review. The variation in research methods shows that the benefits of infant massage can be applied to various conditions of premature infants both in perinatology rooms, NICU, and after the infant is discharged home with assistance from health workers and parents. The massage technique is relatively simple, safe, economical, and easy to learn, making this intervention worthy of being applied as part of routine care for premature infants.

However, several limitations were still found in this literature review. Some studies used relatively small sample sizes, thus limiting the generalization of research results. In addition, the duration and frequency of infant massage administration differed in each study, making direct comparison difficult. Several studies also used pre-experimental designs or case studies without control groups so that the level of strength of evidence was lower compared to experimental studies with randomized designs.

On the other hand, this literature review has several advantages because it combines national and international research results with various research designs so that it provides a comprehensive picture of the effectiveness of infant massage in premature infants. In addition to evaluating weight gain, this review also discusses various other outcomes such as sleep quality, physiological stability, motor development, and the emotional relationship between mother and infant, thus providing a more thorough understanding of the benefits of infant massage in neonatal nursing practice.

Overall, this literature review shows that infant massage is a nonpharmacological nursing intervention that is effective in supporting the growth and development of premature infants. Infant massage contributes to increased body weight, improved sleep quality, stabilization of physiological parameters, increased motor development, and strengthening bonding attachment between mother and infant. Although further research is still needed with stronger designs and larger sample sizes, the available evidence supports the application of infant massage as part of neonatal nursing care because it is a safe, simple, economical, and easy-to-apply intervention in perinatology rooms, NICU, and at home with assistance from health workers.

Conclusion

Based on the analysis of 15 research articles, infant massage is an effective nonpharmacological intervention to support the growth and development of premature infants, particularly by increasing body weight, improving sleep quality, motor development, and physiological stability. Infant massage also provides additional benefits, including improved oxygen saturation, faster achievement of full feeding, reduced NICU length of stay, and strengthened mother-infant bonding. Therefore, infant massage can be recommended as a safe, simple, economical, and effective nursing intervention, although further research with stronger designs and standardized protocols is needed.

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