

The Effectiveness of the Nesting Method in Increasing Body Weight in Low Birth Weight (LBW) Infants: A Literature Review

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ABSTRAK

Background & Objective: Low Birth Weight (LBW) infants remain a major cause of neonatal morbidity and mortality in Indonesia. LBW infants are vulnerable to physiological stress and increased energy expenditure that hinder growth. The nesting method is a nonpharmacological nursing intervention that maintains the infant's physiological flexed position and potentially supports weight gain. The objective of this study was to analyze the effectiveness of the nesting method in increasing body weight in LBW infants. **Method:** This study used a literature review method with a descriptive-analytic approach. A total of 10 national and international journals were selected using purposive sampling technique based on inclusion and exclusion criteria. Data were obtained from electronic databases Google Scholar, Garuda, and the National Journal Portal, then analyzed using content analysis. **Results:** The results of the review of 10 journals showed that the nesting method is effective in increasing the body weight of LBW infants. Weight gain ranged from a few grams in 3 days to more than 300 grams after 7 days of intervention. Nesting also contributed to physiological stability including oxygen saturation, respiratory rate, heart rate, and body temperature. **Conclusion:** The nesting method has been proven effective as a nonpharmacological nursing intervention in increasing body weight, stabilizing physiological parameters, and improving the comfort of LBW infants, and is recommended to be applied routinely in perinatology rooms and NICU.

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Introduction

Low Birth Weight (LBW) infants are infants born with a body weight of less than 2500 grams regardless of gestational age. LBW remains a neonatal health problem that contributes greatly to the high rate of infant morbidity and mortality, especially due to impaired physiological adaptation, hypothermia, nutritional disorders, and delayed growth and development. In Indonesia, LBW is one of the main causes of neonatal death, thus requiring proper and comprehensive management (Izona et al., 2025).

LBW infants have limitations in maintaining body temperature, have little fat reserve, and have an immature neurological system. These conditions cause infants to easily experience physiological stress and increased energy expenditure, which has an impact on slow weight gain. Therefore, interventions are needed that can provide comfort, maintain physiological position, reduce stress, and help conserve energy in LBW infants. One of the nonpharmacological interventions widely used in perinatology rooms and NICU is the nesting method (Pratiwi et al., 2025).

The nesting method is a nursing action of creating a boundary or support resembling a nest around the infant's body to maintain a physiological flexed position like when in the uterus. This position helps the infant feel more comfortable, reduces excessive movement, improves sleep quality, maintains body temperature, and reduces energy use so that energy can be redirected to growth and weight gain (Pratiwi et al., 2025).

Several studies in Indonesia show that the nesting method has a positive impact on LBW infants. Research conducted by Precila and Anggerainy (2025) showed that the application of nesting intervention and positioning for three days in LBW infants was able to increase body weight and maintain body temperature stability. The nesting intervention is considered effective because it is easy to perform, relatively low-cost, safe, and can be applied continuously by health workers.

By increasing the need for evidence-based practice in neonatal nursing, this literature review is needed to analyze the effectiveness of the nesting method in increasing body weight in LBW infants based on the latest research results.

Objective

The main objective of this study was to identify, analyze, and synthesize research findings regarding the effectiveness of the nesting method in increasing body weight in Low Birth Weight (LBW) infants. This literature review aims to evaluate the nesting method as an evidence-based nursing intervention that is safe, affordable, and easy to apply in perinatology rooms and NICU.

In addition, this study aims to understand the physiological mechanisms of the nesting method in supporting weight gain, including energy conservation, improved sleep quality, maintenance of thermoregulation, and promotion of physiological stability in LBW infants.

Metode

This study used a literature review method with a descriptive-analytic approach aimed at identifying, analyzing, and synthesizing research results related to the effectiveness of the nesting method in increasing body weight in Low Birth Weight

(LBW) infants. The population in this study was all research articles discussing the nesting method intervention in LBW infants. The sampling technique used was purposive sampling based on predetermined inclusion and exclusion criteria. A total of 10 national and international journals were selected as samples, consisting of quasi-experimental, pre-experimental, randomized controlled trial (RCT), and case study designs. Data were obtained through searching electronic databases, including Google Scholar, Garuda, and the National Journal Portal. The keywords used in the search included "BBLR", "bayi berat badan lahir rendah", "nesting", "metode nesting", "peningkatan berat badan", "low birth weight infant", and "neonatal care", combined using boolean operators (AND, OR) to obtain relevant articles. Inclusion criteria included: (1) research articles with the topic of the nesting method in LBW infants, (2) articles published in the 2021–2026 range, (3) using Indonesian or English, (4) available in full text form, and (5) having a complete research structure (abstract, method, results, and discussion). Exclusion criteria included: (1) articles not relevant to the research objective, (2) articles in the form of literature review or systematic review, and (3) articles that did not have full text access. Data collection was carried out through the stages of identification, screening, and full text analysis. The research instrument used was a literature review checklist sheet. Data were presented in the form of tables and descriptive narratives. Data analysis was carried out using content analysis by grouping research results based on the nesting method intervention and outcomes in the form of increased body weight and physiological stability of LBW infants.

Result

This study analyzed 10 selected articles consisting of national and international journals that examined the effectiveness of the nesting method in LBW infants. The characteristics of the studies reviewed are presented in Table 1.

TABLE 1. Results of Literature Review Search on the Nesting Method in LBW Infants

No.	Researcher & Year	Method	Research Results
1	Sarinengsih & Dirgahayu (2021)	Quasi-experimental, 36 LBW infants, nesting + classical music therapy for 3 days	BW increased from 2039g to 2059g; $p=0.00$; equivalent to the KMC method
2	Precila & Anggerainy (2025)	Descriptive case study, 2 LBW infants, 3 days	Case 1: 1850g $\rightarrow$ 1857g; Case 2: 1950g $\rightarrow$ 1955g; body temperature returned to normal
3	Arvina & Sutarno (2022)	Quasi-experimental one group pretest-posttest, 30 LBW infants	Nesting had a significant effect on LBW infant behavior ($p=0.000$); sleep quality and energy conservation increased
4	Muti'ah & Mariyam (2024)	Case study, 2 premature LBW infants, nesting + lighting cycle, 7 days	Subject 1: 1525g $\rightarrow$ 1705g; Subject 2: 1215g $\rightarrow$ 1571g
5	Astuti et al. (2022)	Pre-experimental one group pre-posttest, 318 infants	BW increased from 2975g to 2999g ($p=0.014$); HR, RR, O ₂ saturation improved ($p=0.000$)
6	Ginting et al. (2023)	Quasi-experimental, 14 premature infants in NICU, nesting 5 or 7 days, 30 minutes/day	Oxygen saturation increased from 87.9% to 97.1% ($p=0.00$); pulse rate increased from 112.5 to 132.6 beats/minute ($p=0.00$); no significant effect on body temperature ($p=0.18$)

7	Nina Erlina Yulianti, Depi Lukitasari, and Jahidul Fikri Amrullah (2025)	Case study, 1 LBW infant (34 weeks, 1890g), nesting 3 days	Body weight increased from 1820 grams to 1890 grams after nesting for 3 days (increase of 70 grams). Nesting therapy helps improve and maintain weight growth in LBW infants.
8	Azzahraa et al. (2022)	Quasi-experimental two group, 50 LBW infants (25 nesting vs 25 kangaroo method)	Body temperature increased: 35.876°C → 36.064°C (p=0.005); kangaroo method more effective compared to nesting
9	Sutanto & Utami (2025)	Descriptive case study, 6 premature infants, positioning + nesting	HR decreased, O2 saturation increased, temperature stable; infants appeared calmer with better sleep quality
10	Rohmah et al. (2020)	Quasi-experimental, 14 premature infants in NICU, nesting 5 or 7 days, 30 minutes/day	BW increased: +15.72g (5 days), +28.57g (7 days); p=0.001; O2 saturation and respiratory rate improved

Based on Table 1, most studies used quasi-experimental designs and case studies. The nesting intervention was applied for 3 to 7 days with the main outcomes being changes in body weight and stability of physiological parameters. The results of the literature review show that the nesting method is effective in increasing the body weight of LBW infants in almost all studies reviewed. Weight gain was consistently found after the nesting intervention was given, with most studies reporting statistically significant results ($p < 0.05$). In addition to weight gain, nesting was also proven effective in improving physiological parameters. Several studies reported improvements in oxygen saturation, respiratory rate, heart rate, and body temperature stability after the nesting intervention. These physiological improvements are closely related to reduced energy expenditure and increased comfort of LBW infants. In addition, nesting provides additional benefits in the form of improved sleep quality, reduced excessive motor activity, and increased overall infant comfort. Infants who received nesting appeared calmer and less fussy, which is closely related to their ability to conserve energy for the growth process. The combination of nesting with other interventions such as lighting cycle regulation or music therapy showed greater effectiveness compared to single interventions. Overall, the findings indicate that nesting is an effective nonpharmacological nursing intervention in caring for LBW infants, increasing body weight, physiological stability, and comfort. This method is easy to perform, safe, cost-effective, and can be applied consistently by health workers in perinatology rooms and NICU.

Discussion

This literature review highlights the effectiveness of the nesting method as a nonpharmacological intervention in caring for LBW infants, especially in increasing body weight, physiological stability, and infant comfort. Based on the analysis of 10 selected studies, the findings consistently show that nesting provides significant benefits for LBW and premature infants. One of the main variables reviewed in this study is weight gain. Most of the included studies reported statistically significant weight gain after the nesting intervention.

Rohmah et al. (2020) found a weight gain of 15.72 grams after 5 days and 28.57 grams after 7 days of nesting, indicating a dose-response relationship in which longer intervention duration produces greater weight gain. Sarinengsih and Dirgahayu (2021) also reported a weight gain from 2039 grams to 2059 grams. The largest weight gain

was found by Muti'ah and Mariyam (2024), in which subjects experienced an increase of 180–356 grams after 7 days of nesting intervention combined with lighting cycle regulation.

Physiologically, weight gain in infants who received nesting occurs because the maintained flexed position resembles the intrauterine condition. This position makes infants feel more comfortable, reduces stress, decreases excessive motor activity, and improves sleep quality. This condition causes energy use to become more efficient so that calories obtained from nutrition can be utilized for growth and weight gain processes. The findings of Astuti et al. (2022) in 318 infants confirmed this with a statistically significant weight gain ($p=0.014$), while Yulianti et al. (2025) documented a weight gain from 1820 grams to 1890 grams in only three days of nesting. Another important variable reviewed in this study is physiological stability, including oxygen saturation, body temperature, respiratory rate, and heart rate. Nesting was proven to help maintain thermoregulation and improve oxygenation in several studies. Ginting et al. (2023) found oxygen saturation increased significantly from 87.9% to 97.1% ($p=0.00$), while Sutanto and Utami (2025) documented improvement in hemodynamic stability in all six infants who received nesting with position changes. These physiological improvements indirectly support weight gain by reducing calorie expenditure for thermoregulation and breathing effort. The nesting method has been proven effective consistently across various research designs and durations. The flexibility of the nesting technique – which can be made from rolled towels, blankets, or commercial nesting products – makes it adaptable in various health facilities with different resource availability. However, several studies also show that other interventions such as Kangaroo Mother Care (KMC) may be more effective than nesting for certain outcomes such as body temperature increase (Azzahraa et al., 2022).

This shows that nesting and other neonatal care methods can be used complementarily depending on the infant's condition and available resources. From a physiological perspective, the nesting mechanism involves maintaining the infant's flexed position that mimics the intrauterine environment. This reduces physiological stress, minimizes heat loss through reduced body surface exposure, reduces excessive movement, and encourages deeper sleep. When energy expenditure is reduced, available nutrition can be more effectively channeled for somatic growth including weight gain. Nesting also stimulates the proprioceptive and tactile sensory systems, which play an important role in infant neurological development. Although these findings are promising, several limitations were identified in this review. First, many of the included studies used small sample sizes which may limit generalization of results. Second, intervention duration varied significantly between studies making direct comparison difficult.

Third, several studies used case study or descriptive designs without control groups which may introduce bias and reduce the strength of evidence. However, this study also has several strengths. The inclusion of various research designs provides a comprehensive picture of existing evidence. The review focuses on recent research (2020–2025) to ensure findings are relevant to current clinical practice. Analysis of various outcome variables allows for a holistic understanding of the benefits of nesting. In conclusion, this literature review shows that the nesting method is an effective nonpharmacological nursing intervention for LBW infants. Nesting contributes to increased body weight, stabilization of physiological parameters, and improved infant comfort. Although further research with larger sample sizes and

more rigorous designs is still needed, existing evidence strongly supports the integration of nesting into standard neonatal nursing care as a safe, simple, and cost-effective intervention.

Conclusion

Based on the analysis of 10 research articles, the nesting method has been proven effective as a nonpharmacological intervention in increasing the body weight of LBW infants. Almost all studies showed an increase in body weight after nesting was given, both within 3 days and 7 days. By maintaining the physiological flexed position, it encourages energy conservation, reduces physiological stress, improves sleep quality, and maintains thermoregulation. This allows available nutrition to be directed more effectively for somatic growth, resulting in measurable weight gain. In addition to weight gain, nesting also provides holistic benefits including improved oxygen saturation, stabilization of body temperature and respiratory rate, improved sleep quality, and reduced motor agitation. These outcomes collectively support optimal growth and development of LBW infants. Therefore, the nesting method can be recommended as a nursing intervention that is safe, cost-effective, and easy to apply in perinatology rooms and NICU. However, further research with more rigorous designs, larger sample sizes, and standardized intervention protocols is still needed to strengthen the evidence base. Future studies are also suggested to explore the long-term developmental outcomes of nesting in LBW infants.

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