

Literature Review: The Efficacy of Kangaroo Mother Care (KMC) On Weight Gain in Low Birth Weight (LBW) Infants

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Article Info	Abstract
Article History Submitted, 2026-05-11 Accepted, 2026-05-20 Published, 2026-06-30	Low Birth Weight (LBW) infants represent a highly vulnerable group with elevated mortality rates due to physiological immaturity, particularly regarding thermoregulation stability. Deficient fat reserves render these infants susceptible to rapid heat loss, forcing the body to expend excessive energy merely for survival, which subsequently hinders weight gain. Kangaroo Mother Care (KMC) serves as a critical intervention that utilizes maternal body heat to stabilize infant temperature. By achieving normothermia, nutritional energy can be maximized for cellular growth, leading to faster and more optimal weight gain compared to conventional care. This literature review aims to comprehensively evaluate the efficacy of KMC implementation in stimulating accelerated weight gain among LBW infants. The primary focus is to identify the extent to which skin-to-skin contact interventions provide significant clinical contributions to physical stability and neonatal growth. A comprehensive literature review was conducted on eight scientific articles published between 2022 and 2025. Data were extracted from credible national and international databases using strict inclusion criteria. The evaluation process involved analyzing intervention duration parameters and comparing clinical outcomes across studies to produce a valid data synthesis. Synthesis of the literature confirms that consistent KMC implementation significantly impacts daily weight gain positively. Key findings indicate that long-duration interventions (at least 8 hours per day) result in superior growth outcomes compared to short-duration care. Furthermore, this method is clinically proven to enhance the success of exclusive breastfeeding, which acts as a primary determinant in meeting nutritional needs and increasing infant body mass. The conclusion of this study was kangaroo Mother Care is a highly effective, safe, and cost-efficient intervention strategy for optimizing the physical recovery of LBW infants. In addition to its benefits for weight growth, this method has clinical significance in reducing the duration of hospitalization, making it strongly recommended for integration as a standard in neonatal nursing care.
Keywords: Kangaroo Mother Care, low birth weight, weight gain, thermorelutation	

Introduction

The phenomenon of Low Birth Weight (LBW) remains a significant global medical challenge due to the associated high risks of neonatal morbidity and mortality. The primary issue faced by infants weighing less than 2,500 grams is organ immaturity, particularly an underdeveloped thermoregulation system. A high surface-area-to-mass ratio, coupled with thin subcutaneous fat layers, makes LBW infants extremely vulnerable to hypothermia. Physiologically, this cold stress forces the infant to allocate limited energy reserves solely to maintain core body temperature, thereby inhibiting optimal growth and weight gain processes. (Bueno-Pérez, 2025) (Gong, 2025)

Physiologically, this vulnerability creates a severe barrier to development. When exposed to cold stress, the infant is forced to allocate its highly limited energy reserves solely to maintain core body temperature. Consequently, this compensatory mechanism severely

inhibits optimal growth and weight gain processes, which are critical for the infant's survival and long-term health (Bueno-Pérez, 2025). Overcoming this barrier requires continuous thermal support to ensure that nutritional intake is directed toward cellular growth rather than mere survival thermogenesis.

In an effort to overcome these physiological and growth barriers, Kangaroo Mother Care (KMC) has emerged as an essential and strategic non-pharmacological intervention. Unlike static conventional incubator care, KMC facilitates highly effective conductive heat transfer through continuous skin-to-skin contact between the mother and the infant (Lintungsari, 2024). Prior research indicates that the resulting thermal stability creates a conducive environment for the infant to remain in an anabolic state, where nutritional intake can be fully focused on body mass increase and organ maturation (Purnama S, 2023). Thus, consistent KMC implementation acts as both a protective thermal shield and a crucial growth stimulant for preterm infants (Rafiq, 2023).

Despite the widely acknowledged benefits of KMC, a comprehensive synthesis of the most recent clinical data is necessary to address existing research gaps. Previous studies have heavily explored the general advantages of KMC, yet there remains a critical need to systematically isolate and evaluate the specific impact of intervention duration on daily weight gain metrics (Gong, 2025). Furthermore, identifying the precise threshold at which KMC provides a statistically significant advantage over conventional incubators across various care settings requires updated scrutiny. Consolidating these recent findings is vital for reinforcing and standardizing clinical nursing guidelines.

Therefore, the primary objective of this literature review is to examine the efficacy of Kangaroo Mother Care (KMC) in increasing weight gain among Low Birth Weight (LBW) infants. By systematically evaluating recent scientific articles published between 2022 and 2025, this study contributes an updated, evidence-based synthesis that highlights the quantitative impact of KMC duration on neonatal physical stability. The novelty of this review lies in its targeted analysis of recent multi-center and local clinical data to establish optimal duration protocols, ultimately providing strong recommendations for integrating KMC as a cost-effective standard in neonatal nursing care. The primary objective of this literature review is to examine the efficacy of Kangaroo Mother Care (KMC) in increasing weight gain among Low Birth Weight (LBW) infants.

Methods

The article search procedure for this review was conducted systematically and followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure methodological rigor. The search strategy utilized specific keywords combine with: "Kangaroo Mother Care" AND "Weight Gain" AND "LBW". Identification of data sources focused on high-repute journal portals, including BMC Pediatrics, PubMed, and national literature via the Jurnal Keperawatan Indonesia. Selection was based on strict inclusion criteria: (1) studies on preterm or LBW infants; (2) KMC as the intervention; (3) weight gain as the measured outcome; and (4) publication between 2022 and 2025. Conversely, specific exclusion criteria were applied to reject articles that lacked full-text availability, were duplicate publications, or were published in languages other than English or Indonesian. Eight primary articles were selected, including Randomized Controlled Trials (RCT), meta-analyses, and quasi-experimental studies. To ensure the quality and validity of findings, each selected article underwent a critical appraisal process using standardized review tools prior to data synthesis.

Results and Discussion

A summary of the research findings is presented in the following table:

Table 1. Results of Journal Analysis			
No	Research	Method	Results
1.	Gong et al. (2025)	Meta-Analysis	Long-duration KMC (≥8 hours/day) increased average weight by 5.04 g/day more than the control group.
2.	Bueno-Pérez (2025)	Systematic Review	KMC improves breastfeeding success and kinesthetic stimulation, triggering body mass increase.
3.	Rafiq et al. (2023)	Quasi-Exp	The KMC group experienced a gain of 16.42 g/day; significantly higher than the control (10.42 g/day).
4.	Ahmad et al. (2022)	RCT	KMC accelerates the achievement of weight targets for discharge compared to incubators.
5.	Lintungsari (2024)	Quasi-Exp	Significant influence (p < 0.05) of skin-to-skin contact on infant weight stability.
6.	Sartika et al. (2023)	Case Study	Weight gain reached 100–200 grams within 4 days through routine KMC.

7.	Purnama S (2023)	Pre-Exp	Maternal knowledge regarding KMC plays a crucial role in the success of infant weight gain.
8.	Sivanandan (2023)	Meta-Analysis	KMC consistently increases weight and length growth rates in preterm infants.

Clinical Efficacy and Underlying Mechanisms

Analysis across various literatures shows consistent positive results regarding KMC as a driver for physical growth in preterm and LBW infants. Significant statistical findings in the meta-analysis by Gong et al. (2025) noted a quantitative advantage of 5.04 g/day in the KMC group over conventional care. This is reinforced by Rafiq et al. (2023), who reported daily weight gain rates up to 16.42 grams, showing a sharp statistical difference compared to the 10.42 g/day seen in control groups. This strengthens the evidence that human intervention (the mother) in neonatal care provides more dynamic results than static incubator environments.

The literature review demonstrates that KMC influences weight gain through three primary mechanisms: 1) Thermal Stability: Conductive skin-to-skin contact transfers maternal heat to the infant, preventing cold stress; 2) Nutritional Optimization: Physical proximity triggers maternal oxytocin, facilitating milk secretion and enhancing infant sucking reflexes; 3) Energy Efficiency: Infants receiving KMC tend to have quieter sleep patterns (anabolic), ensuring calories are not wasted on crying or shivering.

To elaborate on thermal stability and energy efficiency, skin-to-skin contact between the mother and the infant facilitates direct conductive heat transfer, which helps maintain the infant’s body temperature within a neutral thermal zone. When body temperature is stabilized, the infant does not need to expend excessive metabolic energy to produce heat and prevents cold stress. When body temperature is stabilized, the infant does not need to expend excessive metabolic energy to produce heat. Furthermore, infants receiving KMC tend to exhibit calmer behavior and quieter sleep patterns. This condition promotes an anabolic state, where calories are not wasted on crying or shivering, and energy is fully utilized for tissue growth and cellular development.

Duration Factors and Supporting Mechanisms

The correlation between intervention duration and clinical outcomes is a pivotal point in this analysis. Data indicate an efficacy threshold where long-duration KMC (≥8 hours per day) provides significantly superior impacts compared to short durations. Prolonged skin-to-skin contact ensures sustained thermal stability and optimal physiological adaptation. Physiologically, longer durations support deep sleep phases in neonates, which optimizes growth hormone secretion and further accelerates weight gain.

In addition to thermal regulation and duration, KMC significantly enhances weight gain through nutritional optimization. The synergy between KMC and exclusive breastfeeding success, as emphasized by Sivanandan (2023), serves as a primary determinant. Physical proximity and skin-to-skin contact trigger the release of maternal oxytocin, which plays a critical role in increasing milk supply and facilitating milk ejection. At the same time, infants exhibit improved sucking reflexes due to frequent feeding opportunities. This dual mechanism ensures that nutritional requirements are met more effectively compared to isolated infants in incubators, directly contributing to accelerated weight gain.

Implementation, Managerial Impact and Overall Viability

Managerially, KMC is proven to shorten the length of hospital stay, indirectly reducing the risk of nosocomial infections and healthcare costs. Local studies by Lintungsari (2024) and Sartika et al. (2023) show that this method is highly adaptable for health facilities with limited resources, making KMC a highly feasible and cost-effective intervention.

However, the analysis also highlights that the success of KMC is highly dependent on maternal knowledge, motivation, and support from healthcare providers. Without an adequate understanding of techniques and proper guidance, the growth potential and effectiveness of this intervention cannot be optimally realized. Therefore, integrating family support and educative nursing care is a prerequisite for maximizing clinical outcomes in LBW infants.

Conclusion

Based on the review of various clinical studies, it is concluded that Kangaroo Mother Care (KMC) is a highly effective intervention strategy with strong clinical significance for increasing LBW infant weight. Its success is fundamentally driven by sustained thermoregulation stability through skin-to-skin contact, allowing for energy metabolism efficiency to support neonatal anabolism and cellular growth. Intervention duration is the primary determinant, with long-duration KMC (at least 8 hours per day) proven to provide more optimal results than conventional care. Beyond physical growth, KMC contributes to exclusive breastfeeding success and reduced hospitalization duration. Therefore, KMC is

strongly recommended for broad integration into neonatal nursing protocols as a safe, low-cost, and evidence-based solution for optimizing LBW infants' quality of life.

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