

Effect of Kangaroo Mother Care (KMC) and Touching Therapy Techniques on Weight Gain in LBW Infants

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Abstract: Low Birth Weight (LBW) infants are at higher risk for developmental delays, stunting, and increased morbidity. Non-pharmacological interventions such as Kangaroo Mother Care (KMC) and Touching Therapy have been shown to improve the physical growth and emotional well-being of LBW infants. This case study aims to evaluate the effect of Kangaroo Mother Care (KMC) combined with Touching Therapy on weight gain in an infant with Very Low Birth Weight (VLBW). A single-case report was conducted on a neonate diagnosed with severe asphyxia and VLBW (birth weight 1130 grams) at RSUD Tidar Magelang. The intervention consisted of KMC and Touching Therapy sessions performed for 2 hours daily over six consecutive days. Body weight was measured before and after each intervention to assess daily changes. The infant's weight increased steadily from 1266 grams on day one to 1397 grams on day six, resulting in a total weight gain of 131 grams. This suggests that the combination of KMC and Touching Therapy may support short-term weight gain in VLBW infants. The findings demonstrate a notable improvement in body weight following six days of combined KMC and Touching Therapy. These interventions may be recommended to parents and caregivers both in clinical and home settings to promote healthy growth in LBW infants.

Keywords: Low Birth Weight, Kangaroo Mother Care, Touching Therapy

1. Introduction

Low Birth Weight or often called LBW is a baby or neonate who is born weighing less than 2500 grams, which is 2499 grams and below. Based on the therapy, babies with LBW are divided into three categories, namely, Low Birth Weight (LBW) with a birth weight between 1500 and 2500 grams and Very Low Birth Weight (VLBW) with a birth weight below 1500 grams. And the third is

Extremely Low Birth Weight (ELBW) with a birth weight below 1000 grams (Prawirohardjo, 2014 in Karen et al., 2024). LBW is one of the health problems that requires special attention, especially in developing countries and low social economic status such as Indonesia and other developing countries (Sriyanah et al., 2023).

In 2020, there were 19.8 million newborns worldwide and 14.7 percent of all babies born that year suffered from low birth weight (Unicef, 2023). Low birth weight (LBW) is one of the leading causes of neonatal mortality in Indonesia. Low birth weight babies (LBW) can have a serious impact on infant health, including stunting. Referring to the Indonesian Nutrition Status Survey (SSGI) 2022, the prevalence of LBW in Indonesia is 6.0%. Meanwhile, according to the Central Java Provincial Statistics Agency (BPS) in 2023, there were 25,121 LBW babies and 953 babies from Magelang Regency (Badan Pusat Statistik, 2024).

Low birth weight (LBW) babies are caused by several factors such as maternal conditions during pregnancy, malnutrition, pregnancy complications, twin births, genetic abnormalities, and placental problems that can affect the growth of babies in the womb. Low Birth Weight (LBW) babies are also at risk of stunting and are prone to other diseases. Infants with low birth weight are particularly at risk of complications. One of the complications of low birth weight is respiratory problems and can even be life-threatening, so low birth weight babies require different therapies to ensure their growth (Pitriani et al., 2023). One of the right approaches to overcome this problem is to use Kangaroo Mother Care (KMC) and Touching Therapy. Kangaroo Mother Care (KMC) is a nursing method given to babies born prematurely or with a body weight of less than 2500 grams (LBW). The Kangaroo Mother Care (KMC) method is the position of the baby placed in the mother's arms which creates skin-to-skin contact with the mother, Kangaroo Mother Care (KMC) is a care approach that involves mothers and families as providers of biological factors, namely warmth and psychoemotional factors, namely attention and comfort needed by babies (Wulaningsih et al., 2023). While Touching Therapy is a therapy that can provide positive stimulation in the physical and emotional development of infants in the form of decreased crying patterns, increased body weight, increased adequate sleep patterns, and increased affection between parents and infants. Touch therapy can be performed on babies with slow and gentle stroking and rubbing movements on the baby's body (Syahmanis & Prasetyorini, 2020).

Kangaroo Mother Care (KMC) and Touching Therapy are one of the solutions to increase weight in LBW babies with other advantages such as minimum costs because it does not require expensive tools and materials, only requires health education provided by authorized medical personnel to the baby's mother and can increase the bond between mother and baby (Sriyanah et al., 2023). Therefore, this case study aims to evaluate the effect of using Kangaroo Mother Care (KMC) and Touching Therapy methods in increasing the weight of infants with Low Birth Weight (LBW).

2. Methods

The purpose of this study was to evaluate the effectiveness of using Kangaroo Mother Care (KMC) and Touching Therapy methods in increasing the weight of infants with Low Birth Weight (LBW).

The research method in this paper uses a case report design and a nursing care approach. Case selection was done randomly without using specific criteria. The samples of this study were neonate patients with LBW babies who were treated in the Neonatal/perinatal unit, Cempaka room of RSUD Tidar Magelang. This study was conducted on April 21-26, 2025. Before the implementation of the intervention, the researcher gave informed consent to the baby's parents. Data collection was done by assessing the baby's condition followed by making a nursing intervention plan. In this case, researchers provided interventions in the form of Kangaroo Mother Care (KMC) and Touching Therapy. Before performing the intervention, the researcher prepared tools and materials for data collection in the form of monitoring sheets, forehead thermometer, oximetry, baby scales, cloth for Kangaroo Mother Care (KMC), hand sanitizer and asked the mother to wear a clean gown provided by the hospital. Furthermore, neonate patients were checked for temperature, oxygen saturation, pulse and weight before Kangaroo Mother Care (KMC) and Touching Therapy. Then explained the Kangaroo Mother Care (KMC) and Touching Therapy procedures to the patient's mother. Furthermore, helping the patient's mother to do Kangaroo Mother Care (KMC) with a combination of Touching Therapy for 2 hours and carried out for 6 consecutive days. Weight assessment was carried out using an observation monitoring sheet. After the intervention was completed, the patient's weight was re-evaluated to assess the effect of Kangaroo Mother Care (KMC) and Touching Therapy on increasing baby weight. Data on weight change before and after intervention for 6 days were collected and analyzed to evaluate the effectiveness of Kangaroo Mother Care (KMC) and Touching Therapy on weight gain of neonates with Low Birth Weight (LBW).

3. Results and Discussion

3.1. Results

This case study report was conducted on a neonate patient By. Mrs. R with medical diagnosis of severe asphyxia and Very Low Birth Weight (BBLSR), who was born on spontaneous date 25/3/25 at 02.40 WIB, male, with birth weight 1130 grams and body length 35 cm, head circumference: 27 cm, chest circumference: 21 cm, abdominal circumference: 12, upper arm circumference: 5 cm, with APGAR score 6,7,8. The results of the assessment on Monday, 21/04/2025 showed that the patient was treated in an incubator with the patient's consciousness compos mentis, weak and infrequent crying, moderately active movements, lack of suction and swallowing reflexes, still attached NGT, 20 cc / 2 hours PASI diet and no residue, temperature: 36.8°C, pulse: 166x/min, GDS: 76 mg/dL, SpO₂: 94%.

The nursing problems found in these neontaus patients are Risk of Nutritional Deficits (D.0032), Infant Nutritional Status outcomes (L. 03031), and Nutritional Management interventions

(I.03119) and Risk of Attachment Disorders (D.0127), Attachment outcomes (L.13122), and Parental Education interventions: Infant Phase (I.12400) (PPNI, 2017). The implementation that can be done in these neonatal patients is the provision of nutrition in the form of PASI 20 cc / 2 hours and Kangaroo Mother Care (KMC) education and Touching Therapy to the patient's mother. Implementation is done 2 hours every day for 6 consecutive days when the patient's mother visits the Cempaka room at RSUD Tidar.

Table 1. Baby Weight Gain Results

Day	Date of Intervention	Body Weight	
		Before Intervention	After Intervention
Day 1	21/04/2025	1266 gram	1287 gram
Day 2	22/04/2025	1286 gram	1310 gram
Day 3	23/04/2025	1313 gram	1339 gram
Day 4	24/04/2025	1350 gram	1370 gram
Day 5	25/04/2025	1362 gram	1391 gram
Day 6	26/04/2025	1374 gram	1397 gram

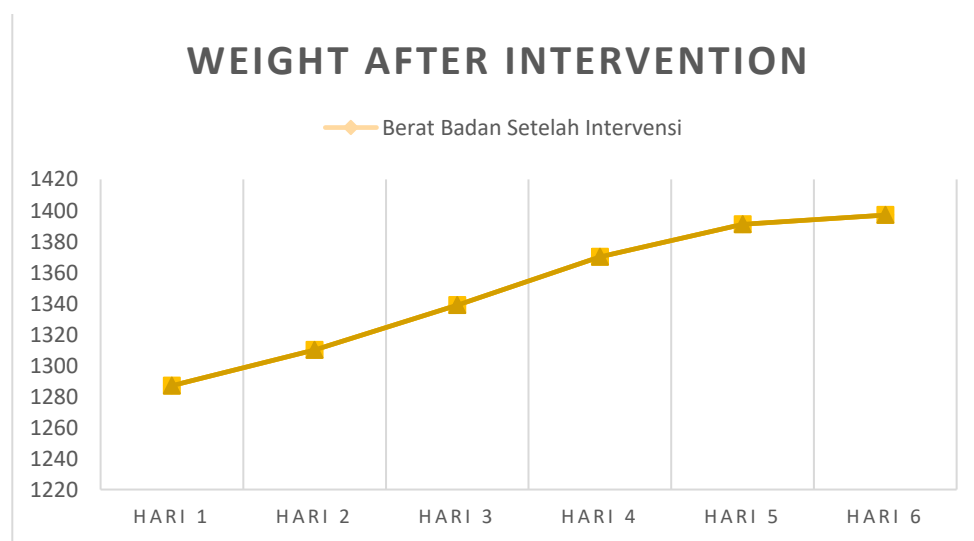


Image 1 Results of Weight Gain After Intervention

After the Kangaroo Mother Care (KMC) intervention with a combination of Touching Therapy every 2 hours per day for 6 consecutive days. The results showed an increase in the baby's weight every day. Day 1 after the intervention the baby's weight was 1287 grams, day 2 the weight increased to 1310 grams, day 3 to 1339 grams, day 4 the baby's weight to 1370 grams, and day 5 the baby's weight to 1391 grams, then on the last day of intervention the baby's weight increased to 1397 grams. So that in 6 days of implementing Kangaroo Mother Care (KMC) with a combination of Touching Therapy there was an increase in baby weight of about 110 grams. These results can be concluded that the provision of Kangaroo Mother Care (KMC)

intervention with a combination of Touching Therapy shows an increase in the weight of babies with low birth weight (LBW)

3.2 Discussion

Risk factors that can increase the incidence of LBW babies are the age of pregnant women who are less than 20 years old or more than 35 years old, close pregnancy distance, parity or repeated pregnancies, lack of hemoglobin levels in pregnant women, poor nutrition of pregnant women, There are other factors, namely pregnancy factors (Eclampsia / pre-eclampsia, premature rupture of membranes, antepartum hemorrhage, gestational age less than 37 weeks, congenital defects / congenital abnormalities, fetal infection in the womb, and twin pregnancies) (Marlina & Idealistiana, 2024). So that babies with LBW really need special attention. One of the therapies that can be done in these cases is to do the KMC method and a combination of Touching Therapy which is proven to increase the baby's weight (Marlina & Idealistiana, 2024).

This is in line with research conducted (Karen et al., 2024) for 14 days of intervening the KMC method in infants with LBW at Temanggung Hospital there was an increase in body weight in the baby. This was shown from the baby's weight data on the first day of the study, which was 1040 grams to 1305 grams on the last day of the study. LBW infants are at risk of long-term health problems such as delays in motor and social development and learning disabilities in the future (Wigati et al., 2025). KMC implementation is very influential on changes in body weight in LBW babies. KMC can increase body weight in LBW babies because the KMC method has the concept of skin to skin between the baby and mother or close family. The skin-to-skin concept can stimulate the production of the hormone cortisol which can increase body weight. In addition, physical interaction between the baby and mother during KMC, which is a bonding process that can increase the comfort of the baby both physiological and psychological aspects of the baby (Agussafutri, 2022).

Research carried out by (Medvedev et al., 2020) related to the effectiveness of KMC in reducing mortality in neonates in Uganda, Africa. Respondents in the study were infants with BW ≤ 200 gr who were hospitalized. Then KMC intervention was carried out for approximately 18 hours per day, which was implemented in 4 to 10 weeks after the baby was born. The results of the study explained the increase in daily weight in infants with LBW. LBW infants are in dire need of this concept to promote their growth (Ezeanosike et al., 2019).

Research (Syahmanis & Prasetyorini, 2020) Touch therapy can improve the nutrition and weight of LBW infants. The study showed that there was an increase in nutrition after a gentle touch therapy intervention from mother to baby with LBW for 2×15 minutes which ran for 2 weeks. The results obtained in 2 respondents experienced an increase in body weight. In the first respondent, the body weight increased to 500 grams from the initial body weight, while in the second respondent it increased by 670 grams from the body weight before the intervention, namely 2230 grams to 2900 grams. In this case, it can be concluded that gentle touching therapy from mother to baby can increase the body weight of LBW babies. In addition to increasing weight, touching therapy can also stimulate hormones in the baby's body, so that this method can affect sleep time, mood, muscle contractions, body temperature regulators, metabolic regulators, and baby growth regulators. Touching Therapy is a touch therapy that can be performed on LBW babies that does not require time and expensive costs because this method only requires sufficient knowledge and can be done every time because it only requires a gentle touch from mother to baby (Syahmanis & Prasetyorini, 2020). Another study also mentioned that there are interventions that can be done to babies in the NICU room, namely Bonding attachment. The method is in the form of physical contact or touch between the mother and her baby to support the baby's psychological and emotional state. The inner

bond that is established through touch between mother and baby can increase a sense of comfort that affects the physiology of babies who are treated in the NICU room (Mariyam et al., 2025).

Other research states that bonding attachment in the form of physical touch or touching therapy to babies can stimulate the baby's nerves to become more active, thus increasing the baby's muscle strength and affecting the baby's development (Appleton & Hughes, 2021). Other studies have also revealed that physical touch between mother and baby can affect the physiological and emotional state of the baby. The results show that parents who visit the baby and touch the baby are able to maintain body temperature, optimize the baby's breathing rate and heart rate, and increase the baby's comfort because of the physical bond with his parents (Chiappedi et al., 2024)

KMC can not only be done in hospitals, but KMC can also be done at home by mothers who are armed with sufficient knowledge about KMC. KMC and touching therapy methods can also be done at home using a "kangaroo bag" made of flannel material to make skin contact by hugging and touching the baby. Mothers are encouraged to do KMC and touching therapy for as long as possible, at least 1-2 hours per session, day or night. KMC and touch therapy can be done by mothers to their babies by hugging and touching them, so that there can be direct contact between the baby's skin and the mother's skin which is very beneficial for LBW babies to improve baby development and create confidence in mothers and families in caring for their babies (Putri Perdani, 2021).

4. Conclusions

After 6 days of KMC therapy and Touching Therapy, the baby's weight increased significantly. The baby's weight on the first day was 1266 grams and on the 6th day after KMC therapy and Touching Therapy the baby's weight was 1397 grams, which means that there was an increase in body weight of 131 grams during the 6 days of intervention. From these results, it can be concluded that the provision of KMC therapy and Touching Therapy can increase body weight in infants with LBW every day. Therefore, parents or families of patients can be encouraged to do KMC and Touching Therapy while in the hospital and at home to help increase the baby's weight at home. Medical personnel are expected to introduce KMC and Touching Therapy to parents of patients with LBW. Hopefully, future researchers can conduct further research on the effectiveness of KMC and Touching Therapy on weight gain in LBW patients in a larger population.

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