



COMBINATION OF KANGAROO MOTHER CARE AND QURANIC MUROTTAL TO IMPROVE THE BODY TEMPERATURE OF LOW BIRTH WEIGHT INFANTS WITH HYPOTHERMIA

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ARTICLE INFORMATION

Received: September, 22nd, 2024

KEYWORDS

Keywords : LBW; hypothermia; kangaroo mother care; Quran recitation

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ABSTRACT

Low birth weight infants are a problem that requires special attention because they can lead to growth and developmental disturbances, as well as psychological issues. Low birth weight (LBW) infants have limited ability to regulate their body temperature, making hypothermia a common occurrence. This final project report aims to assess the improvement in thermoregulation (hypothermia) in LBW infants experiencing hypothermia through the implementation of kangaroo mother care and the recitation of the Quran in the Perinatology Room of RSUD dr. Haryoto Lumajang. This final project report utilizes a case study research design with a single participant, an LBW infant diagnosed based on medical records, with nursing issues of hypothermia, who is Muslim and has provided informed consent. The instruments used for data collection include a hypothermia observation sheet, a digital thermometer, a carrying cloth, a portable speaker, and audio of Surah Ar-Rahman verses 1-78 recited by Qari Salim Bahanan. The collected data will be analyzed using data reduction techniques, data presentation, and conclusions. The interventions provided will be kangaroo mother care (KMC) and Quran recitation. The results of this final project report showed an increase in the participant's temperature. On the first day, before the intervention, the participant's temperature was 36.1°C, which increased to 36.4°C after the intervention. On the second day, before the intervention, the participant's temperature was 36.5°C, rising to 36.9°C after the intervention. This intervention provides an opportunity for nurses to reduce the incidence of hypothermia in hospitals and enables families to independently and sustainably apply this intervention, thus effectively addressing hypothermia.



INTRODUCTION

Many countries, particularly Indonesia and other developing nations with low economic status, face low birth weight (LBW) as a health issue that requires special attention and action. ¹ LBW can lead to growth and developmental disturbances as well as psychological issues in infants, making it a problem that needs careful handling. ² Due to the underdevelopment of the thermoregulatory area in the brain, LBW infants have limited ability to regulate various body functions, including temperature regulation. As a result, hypothermia often occurs in LBW infants. One of the main indicators of increased neonatal mortality and morbidity, especially during the perinatal phase, is low birth weight newborns. Newborns with LBW account for 60-80% of all neonatal deaths, making it the most common indirect cause of neonatal mortality. Each year, approximately 15.5% of the world's population, or about 20 million people, are affected by low birth weight, with 96.5% of cases occurring in developing countries (WHO, 2015). The percentage of LBW newborns in Indonesia is 6.37%. According to data from the District/City Health Office, 19,712 of 594,416 births in East Java Province have a prevalence of LBW of 3.32%. ³

The defense mechanisms of the body are usually not fully developed in low birth weight infants, making it difficult for them to adjust to the extrauterine environment. Consequently, problems can arise, particularly temperature instability. The very thin layer of fat beneath the skin, the underdevelopment of the brain's thermoregulatory center, a high ratio of body weight to skin, insufficient brown fat, and the inability to shiver are factors contributing to temperature instability in LBW infants. ⁴ Low birth weight newborns use their brown fat reserves to generate heat in low temperatures. LBW infants have diminished stores of glycogen, brown fat, and subcutaneous fat (fat tissue beneath the skin). As a result, LBW infants are vulnerable to hypothermia due to unstable body temperature. ²

Hypothermia is a condition where body temperature falls below normal values. The axillary temperature of newborns should be between 36.5°C and 37.5°C; if it falls below 36.0°C, the infant is considered hypothermic. ⁵ Nursing interventions for hypothermia consist of primary interventions, namely hypothermia management, and supportive interventions including fluid therapy education, nutritional management, fluid management, and promotion of skin-to-skin techniques. ⁶ Research by Sriyanah et al. (2023) ¹ showed that implementing kangaroo mother care (KMC) for LBW newborns for one hour effectively increases their body temperature. The KMC technique promotes weight gain, extends sleep duration,



reduces calorie intake, and strengthens the bond between the infant and mother. It also helps stabilize the infant's body temperature, heart rate, and respiration. According to Setiyawan et al. (2019)⁴, KMC can also reduce the incidence of infectious diseases in infants. Anantasari et al. (2019)⁷ stated that KMC combined with Mozart music therapy is more effective in increasing the body temperature of LBW infants. However, in this study, the researcher introduced novelty by combining the KMC method with Quran recitation therapy. This is because Quran recitation can enhance psychological well-being and instill faith in the Almighty, who is always present in any situation. Additionally, recitation influences blood circulation, heart rate, muscle flow, and skin blood levels, thereby increasing body warmth and oxygen levels. This is consistent with research by Riska (2019)⁸, which showed that LBW infants receiving a combination of KMC and Quran recitation have a higher likelihood of achieving normal body temperature compared to those who do not receive this combination.

METHODS

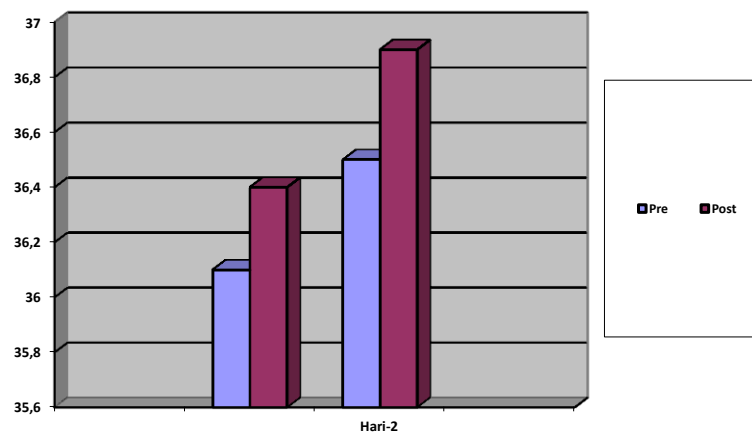
This type of research is a case report study, conducted at RSUD dr. Haryoto Lumajang on May 20-21, 2024. The population was determined based on the number of low birth weight (LBW) infants from January to March 2024, totaling 25 LBW cases. The sample size for this study is 1 respondent. Data collection methods in this research included interviews, observations, and documentation studies. The respondent selected for this study must meet specific inclusion and exclusion criteria. The inclusion criteria are: patients diagnosed with LBW in medical records, patients with nursing problems of hypothermia indicated by cool skin and body temperature below normal, patients and families who consent to participate by signing an informed consent form, and patients and families who are Muslim. The exclusion criteria include LBW infants with severe illnesses and unstable conditions, as well as LBW infants who are agitated.

The research instruments used included a digital thermometer, carrying cloth, portable speaker, audio of Surah Ar-Rahman verses 1-78 recited by Qari Salim Bahanan, and a checklist observation sheet for measuring body temperature before and after the intervention. The analysis method involved conducting interventions over two consecutive days, followed by recording temperature changes in the respondent both before and after the interventions. These records were then selected through data editing. The researcher grouped the obtained

data and compared it with the normal body temperature values for infants. The results of the analysis were collected and presented descriptively, while ensuring the privacy of the patient and family was maintained. Finally, conclusions were drawn by comparing theory with facts to answer the research objectives. This research has received ethical approval from the Health Research Ethics Committee of the Faculty of Nursing at Jember University and has been declared ethically sound with the ethical certification number No. 146/UN25.1.14/KEPK/2024.

RESEARCH RESULTS

Figure 1. Temperature increase diagram before and after implementation



Based on Figure 1, after the implementation of kangaroo mother care and the recitation of Surah Ar-Rahman over two days, the body temperature of patient C showed an improvement in thermoregulation (hypothermia). On the first day of implementation, respondents temperature increased from 36.1°C to 36.4°C, with signs of hypothermia indicated by cool skin and body temperature below normal. On the second day of implementation, respondents temperature also increased from 36.5°C to 36.9°C, with no signs of hypothermia.

DISCUSSION

The results of the study indicate that the respondent experienced hypothermia, evidenced by an axillary temperature of 36.1°C, a respiration rate of 40 breaths per minute, and a heart rate of 130 beats per minute. Symptoms found in the respondent included cool skin, no shivering, no acrocyanosis, no cyanosis, no bradycardia or tachycardia, no



hypoglycemia or hypoxia, and no use of an oxygen tube. The respondent exhibited piloerection but did not show cutis marmorata, with capillary refill taking more than 3 seconds. Several signs and symptoms of hypothermia did not manifest in the respondent due to their temperature being within a range that was not overly drastic, thus not all signs and symptoms of hypothermia fully appeared. The nursing problem of hypothermia in the respondent was due to a lack of subcutaneous fat. According to Kusumaningsih et al. (2023)⁹, the causes of body temperature instability in low birth weight (LBW) infants include extreme body weight, increased heat loss through conduction, convection, evaporation, and radiation, insufficient subcutaneous fat, a high surface area-to-weight ratio, immature thermoregulatory systems, reduced heat production due to inadequate brown fat, and an inability to shiver. Because of their thin subcutaneous fat and a larger surface area-to-weight ratio, infants are more vulnerable to hypothermia, making it easier for them to lose body heat and experience unstable fluctuations in body temperature when exposed to external temperatures.

According to PPNI (2018)⁶, interventions that can be performed on patients with hypothermia include hypothermia management, such as monitoring body temperature, identifying the causes of hypothermia, providing a warm environment, conducting passive warming, and performing active external warming. Active external warming can be implemented through kangaroo mother care (KMC), combined with Quran recitation. KMC is one method that can increase body temperature in low birth weight (LBW) infants. KMC enhances the bonding attachment (emotional relationship between mother and infant), prevents hypothermia, stabilizes the infant's body temperature, heart rate, and respiratory rate, promotes growth and weight gain, reduces stress for both the infant and mother, and increases breast milk production. In the implementation of KMC, research by Setiyawan et al. (2019)⁴ showed that LBW infants experienced an increase in temperature after 1 hour of KMC, with improvements noted over a 3-day period; on each of the first, second, and third days, all LBW infants with hypothermia showed temperature increases. The implementation of kangaroo mother care and recitation of Surah Ar-Rahman was provided to the respondent over 2 days, with one session each day lasting 1 hour. The KMC method is very effective in meeting the basic needs of infants, including warmth, breastfeeding, protection from infection, stimulation, a sense of security, and affection¹⁰. This implementation has a significant impact on increasing body temperature in LBW infants.

In addition, this study's implementation did not only use KMC but also combined it with the recitation of Surah Ar-Rahman. This surah was chosen as a form of therapy because



it is considered one of the most beautiful surahs and is often recited during various religious activities. Moreover, the meaning of this surah is very effective in reducing stress, anxiety, and pain. It sounds particularly beautiful when recited with full understanding ¹¹. The findings of this study support Kahel's (2018) statement that the Quran has remarkable benefits for physical health, especially for the human body and immune system. Even cellular systems, particularly the heart and brain two of the most vital organs can be restored to balance through it. The use of Quran recitation has a tangible positive impact. This is because Quran recitation features a constant and regular rhythm without sudden changes. When played, it allows the brain to enter alpha wave states at frequencies of 7-14 Hz, which reduces stress hormones and induces feelings of comfort. Quran recitation therapy operates on similar mechanisms to stabilize the body temperature of LBW infants, as listening to music or recitation promotes the production of endorphins, helping the infant relax and sleep soundly ⁷. The implementation of kangaroo mother care and Quran recitation can enhance the improvement of body temperature in respondents through conduction, which is the transfer of heat from the mother's body to the respondent's body. Additionally, auditory stimulation received by the ears is transmitted to the brain, which subsequently influences the hypothalamus, thereby improving the respondent's body temperature and returning it to a normal range.

CONCLUSION

The nursing problem for the respondent is hypothermia, characterized by major signs of body temperature below normal, cold skin, and minor signs of piloerection. The nursing intervention conducted for the respondent involved kangaroo mother care (KMC) combined with the recitation of the Quran, specifically Surah Ar-Rahman. The results showed an improvement in thermoregulation (hypothermia) after the implementation of KMC and Quran recitation. On the first day, the initial body temperature was 36.1°C, with signs of cold skin, below-normal temperature, and piloerection. After the implementation of KMC and Quran recitation, the body temperature increased to 36.4°C, with still cold skin. On the second day, the initial temperature for patient C was 36.5°C, again with cold skin and below-normal temperature. After the implementation, patient C's temperature rose to 36.9°C, with no signs of hypothermia present.



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