



The Effects of Kangaroo Care in the Neonatal Intensive Care Unit on the Physiological Functions of Preterm Infants, Maternal–Infant Attachment, and Maternal Stress

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Object attachment;
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Purpose: This study was conducted to identify the effects of kangaroo care on the physiological functions of preterm infants, maternal–infant attachment, and maternal stress.

Design and Methods: For this study, a quasi-experiment design was used with a nonequivalent control group, and a pre- and post-test. Data were collected from preterm infants with corrected gestational ages of ≥ 33 weeks who were hospitalized between May and October 2011. Twenty infants were assigned to the experimental group and 20 to the control group. As an intervention, kangaroo care was provided in 30-min sessions conducted thrice a week for a total of 10 times. The collected data were analyzed by using the t test, repeated-measures ANOVA, and the ANCOVA test.

Results: After kangaroo care, the respiration rate significantly differed between the two groups ($F = 5.701$, $p = .020$). The experimental group had higher maternal–infant attachment scores ($F = 25.881$, $p < .001$) and lower maternal stress scores ($F = 47.320$, $p < .001$) than the control group after the test. In other words, kangaroo care showed significantly positive effects on stabilizing infant physiological functions such as respiration rate, increasing maternal–infant attachment, and reducing maternal stress.

Conclusion: This study suggests that kangaroo care can be used to promote emotional bonding and support between mothers and their babies, and to stabilize the physiological functions of premature babies.

Practice Implications: Kangaroo care may be one of the most effective nursing interventions in the neonatal intensive care unit for the care of preterm infants and their mothers.

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Background

A preterm infant is an infant born prior to 37 weeks of gestation or 259 days before the mother's last menstruation

period (Ahn, 2012). According to Statistics Korea (2012), the number of premature babies born between January 1, 2012, and December 31, 2012, was 30,376 (6.3%) of the 484,550 total births for that year. In addition, regardless of gestational age, the number of low-birth-weight infants who weighed <2500 g at birth was 25,870 (5.3%). Furthermore, 3037 (0.6%) of the low-birth-weight infants weighed <1500 g at birth (Statistics Korea, 2012). The percentage of premature births increased steadily from 3.8% in 2000 to 4.9% in 2012.

Premature babies are well known to have many health problems. They commonly have poor body temperature control and can have cardiovascular and respiration complications. In addition, intracranial hemorrhage is a possible problem in premature babies (Bera et al., 2014). Further disadvantages of hospitalization occur in the neonatal intensive care unit (NICU). In the NICU, premature infants are exposed to stressors such as noise from medical machines, bright light, and invasive medical procedures (Cho & Lee, 2010). It is important to note that infants' separation from their mothers and the NICU environment itself limit the visual, acoustic, and tactile interactions between mothers and babies. This limitation causes anxiety in mothers, affects maternal bonding, and leads mothers to a negative understanding of their maternal role (Bang, Kang, & Kwon, 2015).

In addition, having a preterm infant is a stressful experience for mothers. They tend to feel guilty because they believe that the premature birth was caused by their carelessness or ignorance, and is an unexpected event in their lives, so the hospitalization of their babies is extremely stressful (Bang et al., 2015; Hwang, Kim, Yoo, & Shin, 2013). Thus, such events could result in a crisis that disturbs the normal living patterns of the family (Jang, 2009). The birth and hospitalization of a premature baby increase the mother's emotional vulnerability, thereby contributing to the increases in stress and anxiety related to the infant, the risk of possible complications, and the need for long-term separation. Although both parents of premature babies have this level of stress, a study by Jeon (2011) demonstrated that mothers have greater stress than fathers and other family members. Long-term hospitalization of premature babies leads to limited contact with parents and difficulty bonding with mothers. These issues can produce developmental delay, developmental disorders, and personality disorders, as well as interrupt the natural attachment between mothers and infants (Jang, 2009; Lee, 2008). In the care of preterm infants, perceiving and interpreting their needs, and providing appropriate stimulation, experienced nursing interventions are needed to eliminate these barriers. Moreover, providing an optimal environment for these infants is crucial for their later development (Head, 2014).

Many research studies have identified the positive effects of skin-to-skin contact such as sense stimulation on the growth and behavioral development of preterm infants (Bera et al., 2014; Head, 2014; Jang, 2009; Samra, Taweel, & Cadwell, 2013). In fact, a study by Lee (2009) showed that

kangaroo care leads to greater preterm infant growth development, and physiological and behavioral stability through positive and consistent skin-to-skin contact with mothers. Therefore, skin-to-skin care, called kangaroo care, can be effective for reducing the possible complications in preterm infants.

Kangaroo care was developed in Columbia in the 1970s to maintain infant body temperature. The position used in kangaroo care is similar to the position of baby kangaroos with their mothers, where the human infant has skin-to-skin contact by being positioned between the mother's clothes and her skin (Samra et al., 2013). The World Health Organization (WHO) in 2003 indicated that kangaroo care is the most effective method for body temperature maintenance, infection prevention, sense stimulation, and offering maternal love for the baby's well-being. In addition, kangaroo care is beneficial to preterm infants for maintaining their regular breathing and reducing energy consumption, thereby providing the needed weight gain in infants. Furthermore, a regular sleeping pattern with kangaroo care helps brain development, allows for smoother delivery of oxygen supply to the brain and better secretion of gastric hormones, reduces the risk of infection, and reduces pain (Bera et al., 2014). Kangaroo care is a safe, effective, and feasible method for premature infant care, and thus designated as an effective and comprehensive intervention in the NICU setting (Samra et al., 2013). This study was conducted to identify the effects of kangaroo care on preterm infants' physiological functions, maternal-infant attachment, and maternal stress in South Korea.

Purpose

This study aimed to analyze the physiological effects (weight, heart and respiration rates, oxygen saturation, and body temperature) of kangaroo care in two groups, one provided with kangaroo care and the other not provided with kangaroo care. In particular, the study was conducted with the following objectives:

1. To determine the effects of kangaroo care on the physiological functions of premature infants
2. To analyze the difference in maternal-infant attachment between the two aforementioned groups
3. To analyze the difference in maternal stress between the two groups

Methods

Design

In this study, a nonequivalent comparison group design was used with both a pre- and a post-test (Figure 1).

Setting and Sample

The participants included in this study were preterm infants with corrected gestational ages ≥ 33 weeks who completed ventilator care in a general hospital in Seoul, South Korea. The reason for using 33 weeks as the gestational age cutoff was that premature babies aged <33 weeks are more prone to health problems such as respiration distress syndrome, apnea, and infection. Preterm babies without sepsis, eating disorders, and

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