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Randomized controlled trial of music during kangaroo care on maternal state anxiety and preterm infants' responses

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Abstract

The purpose of this randomized controlled trial was to investigate the influences of music during kangaroo care (KC) on maternal anxiety and preterm infants' responses. There are no experimental studies that explore the influences of combination of music and KC on psychophysiological responses in mother–infant dyads. Purposive sampling was used to recruit 30 hospitalized preterm infants body weight 1500 gm and over, gestational age 37 weeks and lower from two NICUs. Mother–infant dyads were randomly assigned to the treatment and the control group using permuted block randomization stratified on gender. There were 15 mother–infant dyads in each group. Subjects in the treatment dyads listened to their choice of a lullaby music during KC for 60 min/section/day for three consecutive days. Control dyads received routine incubator care. Using a repeated measures design with a pretest and three posttests, the responses of treatment dyads including maternal anxiety and infants' physiologic responses (heart rate, respiratory rate, and O_2 saturation) as well as behavioural state were measured. The results revealed that there were no significant differences between the two groups on infants' physiologic responses and the values were all in the normal range. However, infants in the treatment group had more occurrence of quiet sleep states and less crying ($p < 0.05-0.01$). Music during KC also resulted in significantly lower maternal anxiety in the treatment group ($p < 0.01$). Maternal state anxiety improved daily, indicating a cumulative dose effect. The findings provide evidence for the use of music during KC as an empirically-based intervention for bahavioural state stability and maternal anxiety in mother–infant dyads.

Keywords: Kangaroo care; Music intervention; Preterm infant; Anxiety; Behavioural state

What this paper adds

What is already known about this topic?

- Kangaroo care (KC) for preterm infants has been reported to have beneficial effects for parents and infants.

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- Previous studies have found that soft music had beneficial effects on psychophysiological responses.

What do we now know as a result of this study?

- This is the first randomized controlled trial of music during KC on maternal anxiety and preterm infants' responses. It showed that a lullaby music intervention improved infants' quiet sleep and less crying.

1. Background

There are approximately 300 thousand newborn babies in Taiwan each year, of which 8–10% are prematurely born. That makes 30 thousand premature babies each year (Premature Baby Foundation of Taiwan, ROC., 2004). These babies and their parents are confronted with numerous frustrations, worries and other psychophysiological burdens. Reviewers found that parenting a prematurely born infant begins with a psychological perspective that is different from parenting a full-term baby. The life-threatening events associated with the NICU experience, compounded by the differences in the needs and behaviour of preterm infants, present a considerable challenge to mothers (Miles et al., 1998). Mothers of premature infants experience stress and other emotional responses related to the birth, hospitalization, and long-term care needs of their infants. Parenting premature infants may be affected by such emotional responses. Anxiety disorders may develop before or at any time during the perinatal period and can coexist with other stressors. Anxiety in relation to their pretem infant's behaviour is one of the common perceptions of parents (Neu, 1999).

Advances in technology have resulted in increasing survival rates even for extremely premature infants. While sophisticated medical management is vital to infant survival, research has found that alternative interventions are important factor of infants' later outcome. Consequently, evidence is accumulating to demonstrate the fundamental role of neonatal nurse and mothers to the optimal developmental outcome of premature infants. Numerous factors can increase a preterm infant's risk for disease and impairment and the neonatal nurses can perform a significant role in minimizing this risk and promoting positive outcomes.

KC for preterm infants has been reported to have beneficial effects for parents and infants. Music and KC are two of the frequently being used complementary care in the neonatal intensive care unit (Burke et al., 1995; Jones and Kassity, 2001). Many nurse researchers have adopted KC as a result of research in several populations of term and premature infants yielding positive physiologic results. Smith's study involving spontaneously breathing preterm infants during skin-to-skin care indicate no energy depletion in terms of thermoregulation, oxygenation, heart rate, and sleep states.

These parameters did not differ significantly at the 5% level in the KC group when compared to the incubator routine care (Smith, 2001). As a matter of fact, with proper medical and nursing care, babies born prematurely can lead a normal neonatal life and be as robust and active as full-term infants.

Yet little research using music during KC has been conducted on this group of mother–infant dyads in terms of their psychophysiological responses. Thus, the aim of the study was to test the effects of music during KC on maternal anxiety and preterm infants' responses.

2. Literature review

2.1. Kangaroo care

It is well known that KC was originally developed to overcome problems associated with traditional incubator care in developing countries. KC was proposed as a caring alternative for low birth weight (LBW) infants. These results show that KC is a safe approach to the care of clinically stable LBW infants. KC is a method of holding an infant in skin-to-skin contact, prone and upright on the chest of the parent. During KC, the infant is removed from the neutral thermal environment of the incubator or radiant warmer for contact with the parent's skin and clothing to ensure that his or her body maintains the infant's temperature.

The use of KC holding of neonates, is gaining acceptance as a standard of care in (NICUs) around the world. A systematic review by Davis et al. (2003) have found that KC promotes parental feelings of mastery, crisis resolution, positive attitude toward the infant, emotional completion of the pregnancy, and increased length of breastfeeding when compared with control groups. Infants experienced both heart rate and temperature increases during kangaroo care, these values remained within normal limits (Bauer et al., 1997). Other studies have supported that KC improved survival, earlier hospital discharge, prolonged lactation, and reduced behavioural problems have been associated with this care modality (Charpak et al., 1997; Sloan et al., 1994). However, in contrast to these studies on the effects of KC, a recent study by pediatricians revealed that KC was associated with a significant increase in the combined frequency of bradycardia and hypoxemia and with less regular breathing (Bohnhorst et al., 2001). Regarding the findings of those previous research, more studies concerning KC are needed.