



Full length article

Maternally administered interventions for preterm infants in the NICU: Effects on maternal psychological distress and mother–infant relationship



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ABSTRACT

Although studies have examined the effects of interventions focused on preterm infants, few studies have examined the effects on maternal distress (anxiety, depressive symptoms, post-traumatic stress symptoms, parenting stress) or parenting. This study examined the effects of the auditory–tactile–visual–vestibular (ATVV) intervention and kangaroo care (KC) on maternal distress and the mother–infant relationship compared to an attention control group.

240 mothers from four hospitals were randomly assigned to the three groups. Maternal characteristics in the three groups were similar: 64.1% of ATVV mothers, 64.2% of KC mothers, and 76.5% of control mothers were African American; maternal age averaged 26.3 years for ATVV mothers, 28.1 for KC mothers, and 26.6 for control mothers; and years of education averaged 13.6 for ATVV and KC mothers, and 13.1 for control mothers. Mothers only differed on parity: 68.4% of ATVV and 54.7% of KC mothers were first-time mothers as compared to 43.6% of control mothers. Their infants had a similar mean gestational ages (27.0 weeks for ATVV, 27.2 for KC, and 27.4 for control) and mean birthweights (993 g for ATVV, 1022 for KC, and 1023 for control).

Mothers completed questionnaires during hospitalization, and at 2, 6 and 12 months corrected age on demographic characteristics, depressive symptoms, state anxiety, post-traumatic stress symptoms, parenting stress, worry about child health, and child vulnerability (only at 12 months). At 2 and 6 months, 45-min videotapes of mother–infant interactions were made, and the HOME Inventory was scored. Behaviors coded from the videotapes and a HOME subscale were combined into five interactive dimensions: maternal positive involvement and developmental stimulation and child social behaviors, developmental maturity, and irritability.

Intervention effects were examined using general linear mixed models controlling for parity and recruitment site. The groups did not differ on any maternal distress variable.

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Kangaroo care mothers showed a more rapid decline in worry than the other mothers. The only interactive dimensions that differed between the groups were child social behaviors and developmental maturity, which were both higher for kangaroo care infants. Change over time in several individual infant behaviors was affected by the interventions. When mothers reported on the interventions they performed, regardless of group assignment, massage (any form including ATVV) was associated with a more rapid decline in depressive symptoms and higher HOME scores. Performing either intervention was associated with lower parenting stress. These findings suggest that as short-term interventions, KC and ATVV have important effects on mothers and their preterm infants, especially in the first half of the first year.

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1. Introduction

Preterm infants' need for intensive care often leads to psychological distress in mothers (Kong et al., 2013; Miles, Holditch-Davis, Scher, & Schwartz, 2007). This distress may be due to the loss of the parental role during infant hospitalization and worry about infant health or survival and leads to heightened anxiety, depression, and post-traumatic stress (Holditch-Davis et al., 2009; McCabe et al., 2012; Lasiuk, Corneau, & Newburn-Cook, 2013; Rogers, Kidokoro, Wallendorf, & Inder, 2013). Maternal distress continues after the infant is discharged home, interfering with mother–infant interactions and infant development (Feeley et al., 2011; Gray, Edwards, O'Callaghan, & Cuskelly, 2012; Holditch-Davis et al., 2009; Lefkowitz, Baxt, & Evans, 2010). Interventions to address the early loss of maternal role, reduce psychological distress, and improve mother–infant interactions are needed (Lasiuk et al., 2013). Several studies have examined interventions that focus specifically on parents (e.g., Benzies, Magill-Evans, Hayden, & Ballantyne, 2013; Melnyk et al., 2006; Morey & Gregory, 2012; Ravn et al., 2012). Less is known about the degree to which interventions focused on the preterm infant might also affect mothers, especially when administered by mothers. This study compared the effects of two maternally administered interventions – the auditory, tactile, visual, and vestibular (ATVV) intervention and kangaroo care (KC) – that offer mothers a role in the care of their preterm infants. The effects of these interventions on maternal psychological distress and the mother–infant relationship were evaluated in comparison to an attention control group.

The in-hospital interventions in this study have been rigorously tested (Ludington-Hoe, Nguyen, Swinth, & Satyshur, 2000; White-Traut et al., 2013; White-Traut et al., 2002c). These interventions can be administered by mothers, thus providing an opportunity for mothers to have a role in the neonatal intensive care unit (NICU). However, little is known about maternal response to these interventions or their long-term outcomes.

Specifically, the auditory, tactile, visual, and vestibular (ATVV) intervention involves moderate stroking, eye contact with, talking to, and rocking the infant (Burns, Cunningham, White-Traut, Silvestri, & Nelson, 1994). ATVV tends to arouse infants (White-Traut et al., 1999; White-Traut et al., 2002c). It has resulted in positive infant outcomes including increased alertness before and after feedings, more rapid progression from gavage to complete oral feedings, better growth, increased responsiveness to mothers, and earlier hospital discharge than controls (Nelson et al., 2001; White-Traut et al., 1999; White-Traut, Schwertz, McFarlin, & Kogan, 2009; White-Traut & Tubeszewski, 1986).

The ATVV intervention and other forms of massage also positively affect mothers and the mother–infant relationship. Mothers who provided ATVV for their infants showed more positive interactive behaviors during feeding than comparison mothers (White-Traut & Nelson, 1988), and their infants had clearer behavioral cues and were more responsive to their mothers (White-Traut & Nelson, 1988; White-Traut et al., 2013). Preterm infants massaged by mothers or trained interveners interacted more positively with their mothers than comparison infants (Ferber et al., 2005). Massaging infants reduced maternal anxiety and depression (de Macedo, Cruvinel, Lukasova, & D'Antino, 2007; Feijo et al., 2006).

Kangaroo care involves holding the infant in skin-to-skin contact between the mother's breasts. KC was developed to warm the infant, involve the mother, and foster early home discharge in low resource countries. When mothers perform KC continuously around the clock in the hospital or at home, it is called kangaroo mother care. In developed countries, KC is not usually used as an alternative to hospitalization but as a way for preterm infants to have more contact during parental visits. Studies of intermittent KC have shown it to be safe: temperature, heart rate, respiratory patterns, and oxygenation remained stable or improved during KC as compared to incubator care or standard holding (Chwo et al., 2002; Karlsson, Heinemann, Sjörs, Nykvist, & Agren, 2012; Ludington-Hoe, Anderson, Swinth, Thompson, & Hadeed, 2004). During KC, infants exhibited more sleep (especially quiet sleep), less crying, more regular respiration, and more mature behavioral organization than when in the incubator (Chwo et al., 2002; Neu, Robinson, & Schmiede, 2013). KC has also been related to better head growth but not with greater weight gain (Ahn, Lee, & Shin, 2010; Roberts, Paynter, & McEwan, 2000). Studies using historical controls or allowing mothers to choose whether they provided KC found that infants receiving KC had more rapid maturation of sleep–wake states, more positive mood at 6 months, and better development through 2 years (Feldman & Eidelman, 2003; Feldman, Rosenthal, & Eidelman, 2014; Ohgi et al., 2002).

KC has also been shown to benefit mothers and the mother–infant relationship. Most mothers reported positive experiences with KC and preferred it to just holding the infant (Johnson, 2007; Mahmood, Jamal, & Khan, 2011; Neu, 2004), but some were anxious about dislodging medical tubing or harming the baby during KC, especially if the infant was

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