



Original article

Effect of recorded maternal voice, breast milk odor, and incubator cover on pain and comfort during peripheral cannulation in preterm infants



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ABSTRACT

Purpose: This study was conducted to assess the effect of recorded maternal voice, breast milk odor, and incubator cover on the pain and comfort of preterm infants during peripheral cannulation.

Methods: This study was a randomized controlled trial. The sample of the study included 136 preterm infants who met the case selection criteria. The infants were randomly assigned to different groups.

Data collection tool: In the study, a recorded maternal voice was played to the maternal voice group. The breast milk odor group was exposed to the odor of breast milk. The incubator cover group was covered by using an incubator cover before, during, and after the peripheral cannulation procedure on the infants in the experimental group.

Result: While no difference was observed between the groups before the peripheral cannulation procedure in terms of the total Premature Infant Pain Profile (PIPP) scores, a significant difference existed between the PIPP scores during and after the procedure. This difference was due to the incubator cover group.

Conclusion: Breast milk odor, recorded maternal voice, and incubator cover in preterm infants are recommended as simple, safe, and supportive stimuli that facilitate positive effects during painful procedures.

1. Introduction

Preterm infants in a modern neonatal intensive care unit (NICU) are frequently exposed to stress in the form of painful procedures and high levels of ambient light and noise. The vulnerability of these infants is being increasingly recognized. Consequently, different attempts are being made to reduce the negative effect of potentially harmful stimuli. Developmental care (DC) is the general term that signifies the efforts to reduce stressful exposure. DC includes a range of different interventions such as reduction of sound and light, clustering of care activities, positioning and swaddling of the infant, kangaroo care, and non-nutritive sucking (Sizun & Westrup, 2004; Symington & Pinelli, 2006).

Preterm infants are exposed to unfamiliar stimuli in the NICU and are also deprived of the intrauterine sensory experience (Ramachandran & Dutta, 2013; Reid & Freer, 2010; Vandenberg, 2007). Although mortality is decreased, neurodevelopmental problems, permanent learning and behavior disorders, decreased motor skills, and an increase in other developmental disorders have been observed in these infants (Özdemir & Tüfekci, 2014; Vandenberg, 2007). This situation indicates a need for developmental support approaches. DC involves arrangements for supporting the development of preterm infants during and after an intensive care procedure in an NICU setting. These

arrangements include reduction of stressful stimuli and increasing the stimuli that support development based on observations with regard to an infant's physiological responses and behaviors to various stimuli (Eras, Atay, Şakrucu, Bingöler, & Dilmen, 2013; Reid & Freer, 2010).

Various studies have applied the stimulation of the olfactory system in term and preterm infants. The odors that induce positive responses are that of the breast milk of the infant's own mother, (Bingham, Churchill, & Ashikaga, 2007; Raimbault, Saliba, & Porter, 2007; Yıldız, Arıkan, Gözümlü, Taştekin, & Budancamanak, 2011), that of the breast milk of other mothers, that of the mother's belongings, that of amniotic fluids among maternal odors, and that of infant formula and vanilla (Goubet, Strasbaugh, & Chesney, 2007; Marlier, Schaal, Gaugler, & Messer, 2001; Nishitani et al., 2009; Rattaz, Goubet, & Bullinger, 2005). Some of the results that have been observed are faster weight gain due to calmness and reduced energy expenditure, less pain, decreased apnea frequency and severity, earlier start on oral feeding, and decreased length of hospital stay (Sullivan & Toubas, 1998; Varendi, Christensson, Porter, & Winberg, 1998).

Ambient light has a direct effect on the infant's visual ability, physiological stability, and organization of the central nervous system. The visual environment in NICUs reportedly reduces visual activity, causes problems with visual processing, and changes visual attention-

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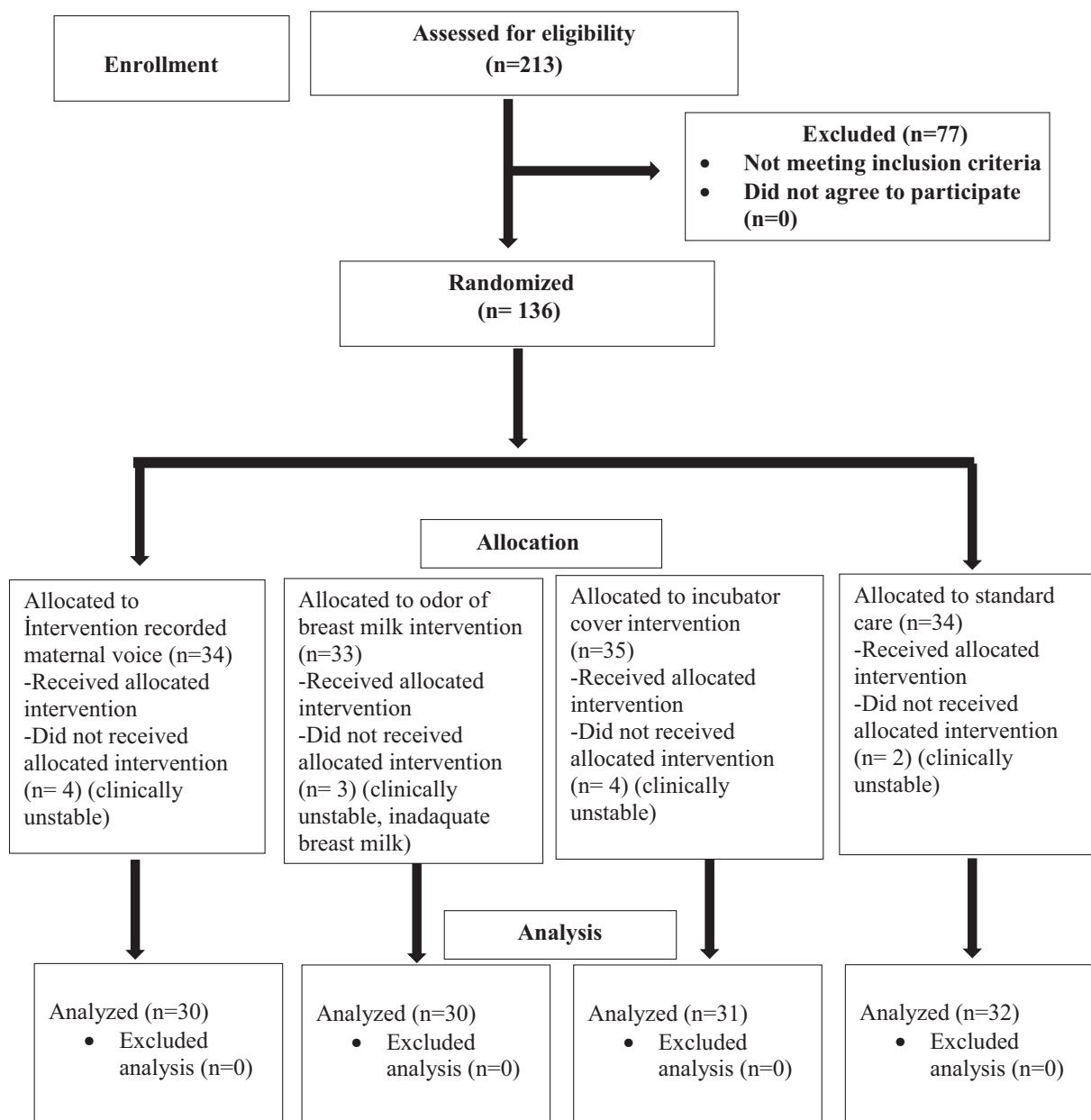


Fig. 1. Diagram showing the flow of participants.

perception, visual memory, and visual identification (Eras et al., 2013; Reid & Freer, 2010). Overall, the aim is to preserve life and provide proper medical care in a uterus-like environment, thus continuing the experience that was interrupted at an early stage as much as possible. Some NICU environments are constantly bright and noisy, which is in stark contrast to the dark intrauterine environment, where perceptible ambient sounds consist of the maternal heart and voice filtered through amniotic fluid (Küçük, 2015; Mirmiran & Ariagno, 2000). To prevent preterm infants' exposure to excess light, the American Academy of Pediatrics (1997), the American College of Obstetricians and Gynecologists (2007) suggested that the ambient light level at each infant bedside should be adjustable from 10 lx to 600 lx.

Even though 646 lx is the maximum light intensity recommended for NICUs, the light intensity in the intensive care units easily reaches 600 lx to 900 lx (Küçük, 2015). Various methods can be used to reduce the negative effects of light intensity in NICU. Intermittent lighting reportedly reduces infants' heart rate and activities, strengthens the biological rhythm, and increases restful sleep, nutrition, weight gain,

and attention of the infant toward its surrounding (Küçük, 2015; Ramachandran & Dutta, 2013; Reid & Freer, 2010). Other suggested ways to address this issue is to prevent direct light from shining on the baby, covering lighted equipment, and reducing the intensity of light by using various options such as veils for incubators and pads for closing eyes (Eras et al., 2013; Sizun & Westrup, 2004; Vandenberg, 2007).

Reducing pain and stress in preterm infants is an important issue in the NICU (Symington & Pinelli, 2006). Numerous pharmacological and non-pharmacological interventions are used to reduce pain during invasive methods. Audio stimulation effectively distracts a baby and provides a pain control and cognitive strategy to suppress the pain response (Hartling et al., 2009; Kemper & Danhauer, 2005; Kisilevsky et al., 2009; Reid & Freer, 2010; Standley, 2001). However, infants mostly hear maternal heart sounds in the intrauterine period. Therefore, infants will remember their secure environment as soon as they hear these familiar sounds that they heard while they were in the womb, thereby creating a sense of relief in these infants (Panagiotidis & Lahav, 2010). Previous studies found that soothing music (Hartling

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