Journal of Pediatric Nursing (2012) **27**, e29–e37

Nurses' Expectations of Using Music for Premature Infants in Neonatal Intensive Care Unit

Tarja Pölkki RN, PhD [a,*], Anne Korhonen RN, PhD [b], Helena Laukkala MA [c]

[a] *Institute of Health Sciences, University of Oulu, Finland*
[b] *Department of Pediatrics and Adolescence, Oulu University Hospital, Finland*
[c] *Department of Research Methodology, University of Lapland, Finland*

Key words:
Music;
Infant;
Neonatal intensive care;
Nurses;
Expectations

This study aimed to describe nurses' expectations of using music for premature infants in the neonatal intensive care unit (NICU) and to find out about the related background factors. The subjects consisted of 210 Finnish nurses who were recruited from the country's five university hospitals providing premature infant care in NICU. The data were collected by validated questionnaire, and the response rate was 82%. Most nurses preferred recorded music to live music in the NICU. They expected that music would have positive effects on premature infants, parents, and staff. Few demographic and many background factors of the respondents' music-related experiences correlated significantly with the expectations concerning their preference. In conclusion, the nurses' expectations were positive regarding the use of music in the NICU, which supports evidence regarding the efficacy of music therapy for premature infants.

PRETERM INFANTS IN the neonatal intensive care unit (NICU) are exposed to a variety of painful procedures and to environmental stress characterized by extensive exposure to stimuli, such as noise, light, and activity related to monitors (Anand et al., 2006; Cignacco et al., 2006). In developmental care, the care given to preterm infants is adapted accordingly in consideration of their behavioral signs, and the modification of the environment is enhanced, for example, with reduced stressful stimulus and increased parental participation (Als et al., 1994; Maguire et al., 2009; Symington & Pinelli, 2006; Vanderveen, Bassler, Robertson, & Kirpalani, 2009). The recognition of the importance of alleviating stress and pain during hospitalization to promote optimal neurobehavioral function has inspired the development and use of many therapies for infants (Arnon et al., 2006). During recent years, there has been an increasing interest in testing the efficacy of nonpharmacologic interventions in the management of pain, as these methods have short-term efficacy and are tolerated well without the adverse consequences of opiates (Anand et al., 2004; Bouza, 2009).

Review of the Literature

Music as an intervention is associated with the amelioration of some of the adverse neurologic effects and negative consequences of prolonged hospitalization (Stadley, 1998). In addition, it appears to exert direct physiologic effects through the autonomic nervous system (Kember & Danhauer, 2005). According to some researchers (Chou, Wang, Chen, & Pai, 2003; Standley, 2002), music is an auditory stimulus that enables the promotion of neurologic organization in masking adverse, stressful noise and leads to a more harmonious, reassuring environment for the neonates in a NICU. A meta-analysis of nine randomized trials showed that music as an intervention can have a significant clinical benefit for preterm infants (Hartling et al., 2009). However, the

* Corresponding author: Tarja Pölkki, RN, PhD.
E-mail address: tarja.polkki@nic.fi (T. Pölkki).

0882-5963/$ – see front matter © 2012 Elsevier Inc. All rights reserved.
doi:10.1016/j.pedn.2011.06.001

authors conclude that the heterogeneity in study populations, interventions, and outcomes precludes definitive conclusions concerning the efficacy of music for infants. In addition, music is often combined with other interventions, such as skin-to-skin contact (Lai et al., 2006) or pacifier sucking (Cevasco & Grant, 2005; Standley, 2003; Standley et al., 2010). It is also important to consider the decibel level of music, as well as the frequency, periodicity, and duration when using music in the NICU (American Academy of Pediatrics, 1997; Lubetzky et al., 2010).

Many studies have investigated the short-term effects of music therapy on preterm infants, including variables such as oxygen saturation, heart rate, respiratory rate, blood pressure, behavioral state, and pain (Arnon et al., 2006; Chou et al., 2003; Hartling et al., 2009; Pölkki, 2006; Teckenberg-Jansson, Huotilainen, Pölkki, Lipsanen, & Järvenpää, 2010). For example, Chou et al. discussed that premature infants receiving music therapy with endotracheal suctioning had significantly higher oxygen saturation, and the level of oxygen saturation returned to baseline level faster than when they did not receive music therapy. Teckenberg et al. reported that music therapy combined with kangaroo care affected the blood pressure in premature infants significantly more compared with kangaroo care without music. Music also modulated pain behaviors of premature infants, such as decreasing the state of arousal and facial actions, especially during acute painful procedures (Bo & Callaghan, 2000; Butt & Kisilewsky, 2000).

For premature infants, there is also evidence that music has positive effects on long-term variables, including length of hospitalization, weight gain, nonnutritive sucking, and stress behaviors (Caine, 1991; Cevasco & Grant, 2005; Lubetzky et al., 2010; Standley, 2000, Standley, 2003; Standley et al., 2010; Whipple, 2008). For example, Caine investigated 52 preterm and low-birth-weight newborns in a NICU by playing tape-recorded music. The results showed significantly reduced stress behaviors, duration of hospitalization in the NICU, total and daily average weight gain, and nutritional intake. According to Lubetzky et al., the effects of music on weight gain are related to reducing resting energy expenditure among healthy preterm infants. Standley et al. reported that the pacifier-activated lullaby system significantly shortened gavage feeding days and had effects on the length of hospitalization of premature infants at 34 weeks.

In a few studies, music has shown to benefit infants' caregivers and staff in the NICU. The positive effects include variables such as mood, behavior, and attitudes (Arnon et al., 2006; Kemper & Danhauer, 2005; Teckenberg-Jansson et al., 2010; Whipple, 2008). For example, according to the study of Arnon et al., in which the infants randomly received live music, recorded music, and no music therapy, the nurses were reported to be more relaxed and positive, and their interactions with infants and parents improved. Both parents and medical staff considered live music to be more beneficial than recorded music. Whipple (2000) indicated that infants whose parents received training in music and multimodal stimulation had improved parent–infant bonding, as the parents in the experimental group spent more time visiting in the NICU than the parents of control infants. However, training parents in music could also increase parental involvement in the infant's care, despite the effects of music therapy itself.

In summary, earlier studies have provided evidence about the effects of music, focusing especially on the variables of premature infants. However, when using interventions, such as music in the NICU, it is important to consider the infant's maturation level, medical condition, and the individuality of their responses to stimuli (Als et al., 2003; Standley et al., 2010; Symington & Pinelli, 2006). Parents also have a crucial role in neonatal care, and nurses should support infant–parent bonding by encouraging parents to participate in their infant's care (Franck, Cox, Allen, & Winter, 2004; Örtenstrand et al., 2010).

The focus of this study is to examine the use of music from the viewpoint of nurses. Up to this date, there has been only one study that examined attitudes and expectations about music intervention for premature infants among staff in the NICU (Kemper, Martin, Block, Shoaf, & Woods, 2004). However, it is the nurses whose role is important in alleviating premature infants' stress and pain because they determine nursing practice and influence whether music is implemented or what kind of music is chosen in the NICU. It is obvious that music offered individually for preterm infants is beneficial, but if the nurses' expectations of using music are negative, they will not use or encourage parents to use music in the NICU. Furthermore, there is a little research focusing on the nurses' viewpoints regarding their musical preferences and choice of music for premature infants.

Purpose and Research Questions

The purposes of this study are to describe nurses' expectations concerning the use of music for premature infants and to reveal the related background factors in a NICU.

The specific research questions were the following:

1. Do nurses prefer live or recorded music for the premature infants?
2. What are the effects of the choice of music on the premature infants, parents, and staff according to nurses' expectations?
3. Which background factors (i.e., respondents' demographics and experiences with music) are related to the nurses' expectations of using music in the NICU?

Methods

Study Design

A cross-sectional, descriptive and correlation survey design using a questionnaire was conducted in October–December 2006.