



Research Article

Perceptions on Pain Management among Korean Nurses in Neonatal Intensive Care Units



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SUMMARY

Purpose: The present survey was conducted to investigate the perceptions among nurses of neonatal pain and the associated use of pharmacologic measures (PMs) and nonpharmacologic comfort measures (CMs) in neonatal intensive care units (NICUs). Pain perception, the necessity and actual use of PMs and CMs, and their relationships were investigated and compared according to nurses' positions, educational levels, the existence of guidelines, and prior education on neonatal pain management.

Methods: Participants were 141 nurses from five NICUs at university hospitals. A questionnaire was developed by researchers based on previous studies of neonatal pain management and current practices in surveyed NICUs. Five-point Likert scales were used to assess nurses' perceptions of pain, the necessity of PMs and CMs, and their actual use in 29 painful procedures.

Results: The mean scores of perceived pain and the necessity of PMs and CMs were 3.68, 2.96, and 3.79 points, respectively. The actual use of PMs and CMs was 1.67 and 2.63 points, respectively. The perceived necessity of PMs correlated with the actual use of PMs ($r = .316, p < .001$), and CMs were performed ($r = .390, p < .001$). Keeping or reading guidelines, or receiving education on pain management resulted in a higher perception of the necessity of PMs.

Conclusion: Korean nurses in NICUs often underestimate the necessity of pain relief measures and use few PMs or CMs. Therefore, systematic approaches to implement guidelines, such as adaptation of guidelines for each NICU, dissemination of guideline content to all NICU staff, and regular measurements of compliance with the guidelines, are recommended.

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Introduction

The survival rate of premature babies and high-risk newborns has significantly improved due to the rapid development of medical technologies and equipment associated with managing newborns, and the intensive care provided at neonatal intensive care units (NICUs) (Jang, 2010). However, during treatment procedures, high-risk newborns are repeatedly exposed to painful procedures that could induce various levels of pain or discomfort. Recent studies have reported that these delicate subjects are experiencing an

average of 12–14 painful procedures during the first 2 weeks of their lives (Carbajal et al., 2008; Simons et al., 2003).

Newborns are more sensitive to pain than are infants, toddlers, and adults; this sensitivity is more pronounced in premature babies (Fitzgerald, Millard, & Macintosh, 1988). Repeated and prolonged exposure to pain in newborns is associated with developmental disabilities, affecting the brain, behavior, and long-term cognitive, social, and emotional functions (Bhutta, Cleves, Casey, Craddock, & Anand, 2002; Buskila et al., 2003). In particular, compared to healthy, full-term babies, the brain is not fully developed in premature babies, likely lowering their threshold for pain and increasing their sensitivity to a given level of pain (Bouza, 2009; Buskila et al.).

Based on these negative consequences of pain in newborns, several societies and professional organizations from western countries have proposed guidelines for assessing, preventing, and

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managing neonatal pain (American Academy of Pediatrics & Canadian Paediatric Society, 2006; Anand, 2001). Such guidelines recommend that printed guidelines or protocols on neonatal pain management be furnished in newborn nurseries or NICUs. Further, they recommend that healthcare professionals be responsible for the assessment, prevention, and management of neonatal pain. The recommended interventions for pain prevention include reducing and preventing unnecessary procedures and selecting measures that induce the least amount of pain (Harrison, Yamada, & Stevens, 2010). When painful procedures are unavoidable, the guidelines recommend nonpharmacologic comfort care measures (CMs), such as providing sweet solutions, wrapping the infants with blankets, and allowing direct skin-to-skin contact with the mother, or pharmacologic measures (PMs), including administering acetaminophen, other analgesics, or local anesthetics (Anand; Harrison et al.).

However, there is a discrepancy between the recommended guidelines by academic societies and actual healthcare practices. A number of studies reported that not all NICUs have pain management guidelines for newborns (Codipietro, Bailo, Nangeroni, Ponzzone, & Grazia, 2011; Harrison, Loughnan, & Johnston, 2006; Lago et al., 2005). One study from Japan reported that about 60% of NICUs had no guidelines for pain management (Ozawa & YoKoo, 2013). In other cases, even if they have these guidelines, the healthcare professionals do not strictly follow them (Carbajal et al., 2008; Lago et al.; Stevens et al., 2010). In China, healthcare professionals in NICUs did not provide pain relief interventions at all for procedural pain (Chen et al., 2012). Further, there was an underestimation of the PMs or CMs considered adequate or necessary in each case (Andersen, Greve-Isdahl, & Jylli, 2007).

This underestimation and improper management of pain among healthcare professionals in NICUs may be because these individuals do not have sufficient time to manage neonatal pain, they are not confident of the benefit–risk ratio of PMs, or they are not fully educated about pain management (Bae, 2012; Lago et al., 2005; Oh & Noh, 2009). Furthermore, they may have insufficient skills in neonatal pain assessment or do not know which pain relief interventions are effective in neonates (Kim, Lee, Ham, Kim, & Yi, 2010; Noh & Oh; Oh & Noh, 2009; Shin & Kim, 2003).

Therefore, in this study, we investigated perceptions of neonatal pain, the necessity of PMs and CMs, the use of each measure, and their relationships among Korean nurses in order to identify factors that influence neonatal pain management in Korean NICUs.

Methods

Study design

This was a cross-sectional, descriptive survey study.

Setting and samples

The participants of this study were 141 nurses working in five different NICUs in university-affiliated general hospitals located in three metropolitan centers, Seoul, Daejeon, and Yangsan. A convenience sampling method was used. In order to obtain diverse samples, differences in the level of each NICU, region in which each NICU was located, and the total number of nurses in each NICU were considered. After the selection of NICUs, we tried to include all nurses working at all five NICUs. At the time of this study, of the 147 nurses working in five NICUs, 141 nurses participated in the study, resulting in a response rate of 95.9%.

Ethical considerations

Before the initiation of this study, approval from the hospital's institutional review board was obtained. Participation in the study was voluntary, and any refusal to participate was accepted. Signed consent was obtained, and anonymity and confidentiality were assured to all participants.

Measurements

The self-administered questionnaire consisted of five sections: general characteristics of the participants, utilization of and prior training on pain management guidelines, perception of pain levels, perception of the necessity of PMs or CMs, the use of those measures for 29 painful procedures selected by researchers based on previous studies (Andersen et al., 2007; Carbajal et al., 2008; Simons et al., 2003), and current practices in the study NICUs.

PMs were defined as pharmacologic measures, including administration of intravenous fentanyl, morphine, a topical eutectic mixture of lidocaine and prilocaine, acetaminophen, or other medications. CMs were defined as nonpharmacologic comfort measures, including providing a sweet solution, tucking or swaddling with blankets, nonnutritive sucking, skin-to-skin contact with the mother, or breastfeeding (American Academy of Pediatrics & Canadian Paediatric Society, 2006; Anand, 2001; Harrison et al., 2010; Stevens et al., 2011).

Perception of pain (e.g., How much pain do you think the neonate feels for each procedure?) was measured on a 5-point scale (1 = *no pain* to 5 = *very severe pain*), where higher scores were associated with a greater perception of pain. Internal consistency was measured by Cronbach's alpha as .926.

The perception of the necessity of PMs or CMs (e.g., How necessary do you think PMs or CMs are for reducing pain in neonates for each procedure?) was measured on a 5-point scale (1 = *not necessary to use* to 5 = *must use*), where higher scores presented a higher perception of the necessity of using PMs or CMs. Internal consistency was measured by Cronbach's alpha as .959 for PMs and .966 for CMs.

The actual use of PMs or CMs (e.g., How often do you use PMs or CMs to reduce pain in neonates for each procedure?) was measured on a 5-point scale (1 = *never* to 5 = *always*), where higher scores represented more frequent use of PMs or CMs. Internal consistency was measured by Cronbach's alpha as .906 for PMs .965 for CMs.

Data collection

Data were collected between September 2010 and February 2011. With permission from the nursing department at each hospital, we contacted head nurses of each NICU and directly explained the purpose of this study and how to collect data using the questionnaires. The questionnaires and return envelopes were delivered directly to each head nurse, who distributed the questionnaires to the nurses. The completed questionnaires were sent to the research team in sealed envelopes.

Data analysis

The data were coded and analyzed using SPSS version 18.0 for Windows (SPSS Inc., Chicago, IL). A *p* value less than .05 was considered statistically significant. General characteristics of the participants were analyzed using means and for continuous variables, and frequencies and percentages for categorical variables. Perception of pain level, the necessity of PMs or CMs, and the use of those measures were analyzed using means and standard deviations. The relationships between pain level perception,

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