Factors Affecting the Implementation of Developmental Care in the Care of Premature Babies in NICU Nurses: A Systematic Review

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ABSTRACT

Introduction: Developmental care-based preterm infant care management that aims to protect the neurological system and reduce adverse effects has developed over the last few decades. The study aimed to explore the factors that influence the implementation of developmental care among NICU nurses.

Methods: The study was systematically identified by searching an electronic database using keywords “preterm infant” AND “developmental care” AND “nursing care” AND “NICU” and consisted of 2130 articles from Scopus, Science Direct, google scholar, ProQuest, and PubMed. Data sources were limited to articles published from 2015 to 2020 and those published in English. Thirteen studies were included in this systematic review. The inclusion criteria were nurses caring for preterm infants at the NICU, a cross-sectional descriptive study of quantitative or qualitative research.

Results: Thirteen articles indicated that the developmental care implementation among NICU nurses was influenced by positive perceptions, knowledge, attitudes of developmental care. Professional skills are the most substantial impact on developmental care implementation to improve nurses’ nursing development and increase the competence of individual nurses.

Conclusion: Positive perceptions about organizational support and developmental care are needed. The training care program also benefits to nurses by increase self-confidence in implementing developmental care for premature babies.

INTRODUCTION

Developmental care-based preterm care management that aims to protect the nervous system and reduce harmful effects has evolved over the last few decades. Due to advances in science and technology, babies born at 23 weeks gestation or less now have a chance to survive (Altimier & Phillips, 2016). One of the biggest reasons is that developmental care is a challenging and time-consuming task that requires some training by the nurse as premature babies in the NICU require highly specialized medical care (Park & Kim, 2019).
Complications of preterm birth cause 15 million babies to be born prematurely and about 1 million children die (WHO, 2012). Indonesia is included in the top 10 of 184 countries with a high preterm birth rate (15.5 premature births per 100 births) in 2012 (WHO, 2012). Neurodevelopmental care is a family and infant care philosophy and framework (Lynn Lingen, 2019). The goals of developmental care are to reduce stress in premature infants, improve neurological, cognitive, and behavioral functions, and prevent neurodevelopmental problems (Mosqueda-Peña et al., 2016). Even though it has been implemented in several hospitals, many nurses have not carried out developmental care due to a lack of confidence. Besides that, previous study proved that skin-to-skin contact is the primary treatment of developmental care (Deng et al., 2018). It was still found that the level of knowledge, attitudes, and practices of neonatal nurses about skin-to-skin contact was still relatively low. Developmental care is indispensable in the care of premature babies, taking into account the effects of preterm birth. The new environment in the intensive care unit causes stress in infants which adversely affects the quality of life of premature infants and their families (Macho, 2018). Stress caused by a new environment can affect brain development, causing neurodevelopmental disorders in premature babies (Altimier et al., 2015), which results in the risk of permanent physical, motor, cognitive impairment (Su et al., 2016).

The role of the nurse is very important for the success of treatment for the neurodevelopment of premature infants (Park & Kim, 2019). Meanwhile, research (Mahl et al., 2015) reported that professional ability had the most decisive impact on developmental care practice in NICU nurses. High professional ability, a strong sense of optimism and motivation have a positive impact on the professional performance of nurses. The positives about developmental care are the reduction in developmental disorders and psychomotor delays in a two-year-old child with a history of 32 weeks’ gestation (Kiechl-Kohlendorfer et al., 2015). The purpose of this study was to explore the factors that influence the implementation of developmental care among NICU nurses.

**METHOD**

**Database**

The sources of the articles used in this systematic review were research databases such as Scopus, ProQuest, Pubmed, Google Scholar, and Science Direct. Additional articles were selected through citations to the papers included in this systematic review.

**Keywords and Search Terms**

The search for articles in selected databases was carried out with the help of Boolean Operators with a combination of keywords and search terms as follows: “preterm infant” OR “preterm babies” AND “developmental care” OR NIDCAP AND nursing OR “nursing care” AND NICU OR “neonatal intensive”.

**Article Selection**

Systematic reviews were written based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyzes) guidelines. We limit the period of search literature from 2015 to 2020: original articles in English, sources from journals, nurses’ knowledge, skills, attitudes, perceptions, practices of developmental care, available in full text. Only articles that met the following inclusion criteria were included in this systematic review, namely participants or the sample. The population was limited to nurses caring for premature babies (gestational age <37 weeks--Intervention or implementation of development care by nurses. Comparisons or research contexts carried out in hospitals in both developing, developed, and emerging countries. Results and objectives was to explore the factors/predictors/determinants and contributors to the nurses’ behavior in implementing developmental care for caring for premature babies. The exclusion criteria were secondary data, review articles, conference articles and did not explain the factors that influence the implementation of developmental care among NICU nurses (Figure 1).

**Data Extraction**

All titles were filtered from the source database to exclude irrelevant studies. The systematic
preferred reporting items for systematic reviews (the JBI Critical Appraisal) guidelines were used for design and results.

RESULT

General Characteristics

Based on the 13 articles analyzed (Table 1), the most common type of research was cross-sectional research with 7 articles and qualitative research with 1 article, mixed-method 2 articles and Quasi-experiment 1 article, observation study 1, pilot study 1. The most types of intervention were educational interventions (30.76 %), monitoring the implementation of developmental care (15.3%), surveys about knowledge, attitudes, perceptions, skills (46.15%). There are several types of interventions, namely pain assessment, kangaroo mother care, lactation in premature babies (Deng et al., 2018), (Capolingu & Gill, 2018), (Blatz et al., 2020). The NIDCAP training is linked to attitudes, perceptions, knowledge, practices for NICU nurses (Charafeddine et al., 2020; Baghlani et al., 2019). More specific details about each study are given in Table 2. The main result measured in this study was the implementation of developmental care by nurses in practice.
which is influenced by factors of knowledge, attitudes, perceptions, skills, training. Thirteen studies conducted a review show that training such as The Wee Care Neuroprotective NICU Program, Family-Centered Developmental Care can significantly improve nurses’ knowledge, positive perceptions, attitudes, skills.

**DISCUSSION**

**Knowledge, Attitude, Perception**

It was reported that practices and attitudes towards pain assessment and management as components of developmental care were positive (Capolingua & Gill, 2018). The level of education was identified as having an impact on knowledge so that nurses identify negative signals from babies due to pain and pain pathways (Capolingua & Gill, 2018). In another study, after receiving NIDCAP training, most of the respondents had positive attitudes about NIDCAP implementation. Nurses and doctors think that the NIDCAP model improves the quality of the well-being of babies, the caregivers’ relationships with parents, their working conditions (Charafeddine et al., 2020). A high level of knowledge will indicate that nurses obtain a better level of job satisfaction through the application of developmental care and show better performance, higher confidence in their professional role (Baghli et al., 2019). Nursing perceptions of the action are also a factor influencing developmental care practice among NICU nurses. Nurses’ perceptions can lead to better implementation of developmental care (Mosqueda-Peña et al., 2016).

**Training of Developmental Care**

The benefits of developmental care show that with training, good education and supportive leadership, it has been successful in applying neuroprotection to family knowledge to support developmental care (Altimier et al., 2015). Research results from (Konishi et al., 2017) demonstrated that participants’ neonatal particular education program was found to experience changes in their perception of their role and differences in their interactions with peers.

**The Practice of Developmental Care**

This study shows that the professional skills of nurses have a significant effect on the practice of nursing care in the NICU room. Professional skills, a strong sense of optimism and motivation to work have a positive impact on the professional performance of NICU nurses (Park & Kim, 2019). Barriers to developmental care practices were also found in family-centered care; this was due to a lack of knowledge regarding developmental care and

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<th>Table 1. General Characteristics of Selected Studies (n=13).</th>
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<td><strong>Type of Intervention</strong></td>
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<td>Training of developmental care</td>
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<td>The practice of developmental care</td>
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<td>Survey knowledge, attitude, perception, skill</td>
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<td>Interview</td>
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<td><strong>Type of Study</strong></td>
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<td>Cross-sectional research</td>
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<td>Pilot study</td>
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<td>Mix Qualitative and Quantitative study</td>
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hospital policies, make it difficult for parents to be involved during treatment (Zhang et al., 2016).

CONCLUSION

Nurses’ knowledge, attitudes, and perceptions of self-competence positively correlate with implementing individual developmental care in the neonatal intensive care unit. Training on developmental care and observation in its implementation is required to improve the nursing development of nurses and increase the competence of individual nurses. Positive perceptions about developmental care and organizational support are needed. The training program also provides benefits to
nurses; namely, it can increase self-confidence in implementing developmental care for premature babies.

**CONFLICT OF INTEREST**

No conflicts of interest were declared

**REFERENCES**


