# Knowledge and Attitude of Nurses Toward Developmental Care of Premature Babies in Indonesia

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## Abstract

**Objective**: The aim of this study is to assess neonatal nurses' knowledge and attitudes toward developmental care, while also examining the characteristics of the nursing staff.

**Method**: This research employs a quantitative descriptive approach with a cross-sectional design, involving 103 respondents. Inclusion criteria specify that participants must be NICU nurses with over one year of experience. The study utilizes the Individualized Developmental Care Knowledge and Attitude Scale (2023).

**Results**: The findings indicate that nurses scored highest on the subscale related to Creating a Healing Environment, with an average score of 3.53 and a standard deviation of 0.58. In contrast, the subscale for Individualized Developmental Care Practices received the lowest average score, with a mean of 3.36 and a standard deviation of 0.62.

**Conclusion**: The results suggest that neonatal nurses demonstrate the greatest knowledge and positive attitudes towards Creating a Healing Environment, while their knowledge and attitudes towards Individualized Developmental Care Practices are comparatively lower. This underscores the need for targeted education and resources to enhance the application of developmental care in the NICU.

**Keywords:** Developmental care, premature babies, Knowledge and Attitudes

## INTRODUCTION

Premature infants born before 37 weeks of gestation represent a significant neonatal health concern, serving as a primary risk factor for increased morbidity and mortality rates (Hendrawati et al., 2020). The implementation of developmental care for premature infants remains inadequate, with substantial variation in knowledge regarding its application. The lack of a standardized developmental care model in neonatal nursing practices further exacerbates this issue (Ainous, 2009). Nurses often hold misconceptions about the feasibility of providing developmental care for critically ill infants in the Neonatal Intensive Care Unit (NICU) (Hendrawati et al., 2020).

In 2020, it was estimated that 13.4 million infants were born prematurely. Premature birth complications are the leading cause of death in children under five years old, accounting for approximately 900,000 deaths globally in 2019. The global preterm birth rate ranged between 4-16% in 2020 (WHO, 2020). Over a 29-year period, the preterm birth rate has increased from an average of 0.19% in 1990 to 1.52% annually in 2019. During the same period, the

global neonatal mortality rate for premature infants decreased by 5.26% and 47.71%, respectively. However, the incidence of preterm birth has risen in some countries, including high-income nations, likely due to factors such as increased twin births, delayed parenthood, and other societal changes (Cao et al., 2022). To prevent complications, various methods, particularly developmental care in the NICU, have been utilized over recent decades. The more premature the infant, the more vulnerable their brain, necessitating specialized neurological care (Altimier, 2015).

Developmental care in neonatal intensive care was first implemented in 1986 and encompasses external sensory regulation (vestibular, auditory, visual, and tactile), noise reduction, and positioning premature infants in ways that mimic the intrauterine environment. This care has been shown to reduce the risks of retinopathy and desaturation, while promoting weight gain by term age (Chen et al., 2013).

The practice of developmental care is crucial for facilitating the growth and development of premature infants, especially those at high risk, and for preventing both short- and long-term adverse effects of intensive care. Specifically, developmental care accelerates the neurological development of premature neonates and shortens their hospital stay (Akça & Kurudirek, 2023). Successful implementation of developmental care is supported by the availability of skilled healthcare professionals. Nurses, in particular, require comprehensive knowledge to deliver optimal and holistic care (Asmarawanti, 2015). A nurse's understanding of developmental care is integral to its effective application in clinical practice (Marilyn J. Hockenberry, 2015).

Neonatal nurses play a key role in supporting the application of developmental care and are responsible for providing such care to premature infants (Cao et al., 2022). For effective implementation, nurses must enhance their awareness and understanding by seeking accurate information, thereby ensuring high-quality care (Milette et al., 2017). Many neonatal nurses possess limited knowledge regarding developmental care in the NICU, often due to insufficient opportunities for attending seminars or professional development, heavy workloads, and a lack of educational resources (Sathishet al., 2019).

At present, not all nurses demonstrate a positive attitude toward developmental care. One contributing factor is a lack of deep understanding of its significance. Nurses who have not experienced the benefits of developmental care for premature infants are less likely to adopt a positive attitude compared to those who have observed its positive impact on neonatal outcomes, largely due to insufficient knowledge regarding the proper implementation of developmental care (Hendrawati et al., 2020). While neonatal nurses may possess general knowledge, many are unfamiliar with developmental care practices. There is a need for continuous education to enhance their understanding and foster positive attitudes toward the care of premature infants. Educational interventions, such as seminars, can play a vital role in improving knowledge and raising awareness about the importance of developmental care (Mosqueda-Peña et al., 2016). The aim ot this study is to identify the knowledge and attitudes of nurses towards developmental care in premature infants.

## METHODS
### Study Design
This research is conducted using a descriptive qualitative research design, specifically a cross-sectional approach in five hospitals in Indonesia on one month period May-June 2024

### Sample
The population used in this study consists of all nurses work in baby ward with inclusion criteria are nurses with at least a D3 (Diploma 3) education, hold a STR (*Professional Registration Certificate*) and work over a year. Convenience sampling technique was applied in this study.

### Instrument
The research instrument used is an Individualized Developmental Care Knowledge and Attitude Scale, developed by Akça and Kurudirek in 2023. In its Indonesian version, the

instrument was modified and tested for reliability, yielding a Cronbach's alpha of 0.973 and a content validity index of 0.930. The instrument consists of 34 items divided into 4 subscales: Nursing care, Family-centered care, Creating a healing environment, and Individualized developmental care practices. The scale used in this study is a Likert scale, where scores range from 4 to 1 (4 = Always, 3 = Often, 2 = Sometimes, 1 = Never). The total score range is from 34 to 136, with higher scores indicating better knowledge and attitudes.The original instrument was in English. The researcher conducted forward translation, translating it from English to Indonesian by an official translation service. Afterward, a backward translation was done, translating it from Indonesian back to English by a different official translation service. Following that, content validity was assessed by two experts in the field evaluated the translation in terms of accuracy, clarity, ease of understanding, and relevance to the topic. Each aspect was rated on a scale from 1 to 4, where 1 = not relevant, 2 = somewhat relevant, 3 = fairly relevant, and 4 = highly relevant. The scores from both experts were then calculated to determine the content validity index, which was 0.930, indicating that the translation of the instrument was acceptable

**Data Analysis**

Descriptive statistic was used to identify the knowledge and attitudes of nurses towards developmental care in premature infants

## RESULTS

### Table 1. Demographic characteristics of nurses (n=103)

| Variables | n % | Min-Max |
|---|---|---|
| Nurses age (years old (mean±SD) | 26.77 ± 5.57 | 20 – 48 |
| >20 | 1 (1) | |
| 20-40 | 97 (94.5) | |
| >40 | 5 ( 4.8) | |
| Work duration (years)(mean±SD) | 4.10 ± 4.57 | 0 – 24 |
| <5 | 86( 77.8) | |
| 5-15 | 12 (16.5) | |
| >15 | 5 (4.9) | |
| Work as premature nurses (years) (mean±SD) | 3.09 ± 4.62 | |
| <5 | 85(82.5) | |
| 5-15 | 13 ( 12.5 ) | 0 – 24 |
| >10 | 5 (4.9) | |
| | | |
| Workplace | 9 (8.7) | |
| Referred hospital | 54 (52.4) | |
| Primary hospital | 40 ( 38.9) | |
| Secondary hospital | | |
| | | |
| Gender | 94 ( 91.3) | |
| Female | 9 ( 8.7) | |
| Male | | |
| | | |
| Pendidikan | 52 ( 50.2 ) | |
| Diploma III Nurse | 51 (49.5) | |
| Bachelor Nursing | | |
| | | |
| Neonatus training | | |
| Yes | 51 ( 49.5) | |

| | |
|---|---|
| No | 52 (50.5) |
| | |
| Developmental care training | |
| Yes | 26 ( 25.2) |
| No | 77 ( 74.8) |
| | |
| Marital Status | |
| Married | 39 ( 37.9) |
| Single | 64 ( 62.1) |
| | |
| Income (million) | |
| < 4.400.000 | 54 ( 52.4) |
| >4.400.000 | 49 ( 47.6) |
| | |
| Family type | |
| Nuclear | 79 ( 76.7) |
| Extented | 24 ( 23.3) |

**Table 2. Total score of knowledge and attitude developmental care of nurses**

| Variables | Mean ± SD | Min-Max |
|---|---|---|
| Total score knowledge and attitude developmental care | 116.83 ± 19.98 | 34 – 136 |
| Nursing care (Q 1,2,3,4,5) | 3.38 ± 0.73 | 5 – 20 |
| Crealting al healling environment (Q 6,7,8,9,10,11,22,24,25) | 3.53 ± 0.58 | 9 – 36 |
| *Falmily-centred calre* (13,14,15,16,17,18,19,20,21) | 3.42 ± 0.63 | 9 – 36 |
| *Individuallised developmentall calre pralctices* (18,19,30,32,33,34) | 3.36 ± 0.62 | 1 – 24 |

**Table 3. Analysis of subgroup with knowledge and attitude**

| Variables | F test | p-value |
|---|---|---|
| Nurse Age (years) | 0.17 | 0.08 |
| Nurse Work Experience (years) | 0.22 | 0.02* |
| Experience Working with Infants (years) | 0.16 | 0.10 |
| Workplace | 0.03 | 0.76 |
| Gender | -0.33 | 0.00* |
| Education Level | -0.01 | 0.92 |
| Neonatal Resuscitation Training | -0.01 | 0.86 |
| Developmental Care Training | 0.00 | 0.96 |
| Marital Status | -0.11 | 0.26 |
| Current Income | 0.04 | 0.63 |
| Family Type | -0.29 | 0.00* |

In this study, based on Table 1 a total of 103 respondents were included based on the inclusion and exclusion criteria. When divided by age range, the most common age group was 20-40 years, with 97 respondents (94.5%), and the average age of the nurses was 26.77 years with a standard deviation of 5.57. In terms of work experience, the most common range was less than 5 years, with 86 respondents (77.8%), and the average work experience was 4.10 years with a standard deviation of 4.57. Regarding experience working in the neonatal unit, the most common range was also less than 5 years, with 85 respondents (82.5%), and the average experience was 3.09 years with a standard deviation of 4.62. The most common type of workplace was a primary hospital, with 54 respondents (52.4%). The majority of respondents were female, with 94 respondents (91.3%). The most common educational level was a DIII Nursing degree, with 52 respondents (50.2%). The majority had never attended neonatal resuscitation training, with 52 respondents (50.5%). Similarly, the majority had never attended developmental care training, with 77 respondents (74.8%). In terms of marital status, the majority were unmarried, with 64 respondents (62.1%). The most common income status was below 4,400,000, with 54 respondents (52.4%). The most common family type was nuclear, with 79 respondents (76.7%). Based on Table 2. he analysis of 103 respondents revealed that the overall knowledge of nurses regarding developmental care for premature infants had an average score of 116.83 with a standard deviation of 19.98. After conducting an ANOVA test, it was found that the independent variables significantly influenced the knowledge and attitudes towards developmental care in premature infants, with a p-value < 0.05. Specifically, the variables of the nurse's gender had a p-value of 0.00, and the nurse's family type had a p-value of 0.00.

## DISCUSSION

Knowledge is one of the human senses, including smell, taste, hearing, vision, and touch, and it provides information. The eyes and ears are the primary sources of human knowledge. Both are crucial for the domains that shape an individual's actions (Notoadmojo, 2010). The knowledge and attitudes measured in this study refer to the nurses' understanding and attitude toward developmental care for premature infants. The subscales in this study include nursing care, creating a healing environment, family-centered care, and individualized developmental care practices. Regarding the overall knowledge and attitude toward developmental care, the average score was 116.83 with a standard deviation of 19.98. The highest subscale score was found in the "Creating a Healing Environment" domain, which had an average score of 3.53 and a standard deviation of 0.58, while the lowest score was in "Individualized Developmental Care Practices," with an average of 3.36 and a standard deviation of 0.62. In the "Creating a Healing Environment" subscale, consisting of 9 items (items 6, 7, 8, 9, 10, 11, 22, 24, 25), the respondents demonstrated the highest scores compared to the other subscales. This indicates that most respondents had implemented actions related to creating a healing environment for premature infants.

The developmental care process involves various nursing interventions, such as organizing care and creating a healing environment. Creating a healing environment refers to the physical environment of the NICU, including space, privacy, security, temperature, sensory touch, proprioception, smell, taste, sound, and light. Creating an environment suitable for premature infants minimizes stress, reduces pain, provides sensory experiences appropriate for the baby's development, encourages neurobehavioral organization, and helps develop the infant's self-regulation skills (Maria et al., 2021).

The human body has the ability to "self-heal" when placed in an environment that provides positive and healthy energy (Schaller, 2012). The environment can stimulate emotions that help minimize the negative effects of stress and elicit positive psychological responses. A healing environment is a physical setting that supports patients and their families in minimizing stress caused by the patient's physical and

psychological conditions and healing process. The physical environment is expected to reduce the duration of the recovery and healing process. However, this finding contrasts with a study by Abdelaziz Hendy (2023), which reported that less than two-thirds (62.4%) of the nurses studied had poor knowledge about the healing environment and care categorization, while fewer than one-fifth (16.3%) had good knowledge.

In contrast, the "Individualized Developmental Care Practices" subscale, consisting of 6 items (items 18, 19, 30, 32, 33, 34), showed the lowest average scores. Individualized Developmental Care is a comprehensive approach involving behavioral observation methods and the creation of individualized developmental care plans (VandenBerg, 2007). It is designed to support infant development based on the interactive relationship between the baby and the parents (Kleberg, Hellström-Westas, & Widström, 2007). This suggests that the knowledge and attitudes of respondents regarding individualized care practices were still low. Regarding the analysis of the relationship between demographic factors and nurses' knowledge and attitudes toward developmental care for premature infants, an ANOVA test revealed that independent variables significantly influenced knowledge and attitudes toward developmental care with a p-value < 0.05. Specifically, the nurse's gender had a p-value of 0.00, and the nurse's family type had a p-value of 0.00.

The study also found that the proportion of female respondents (91.3%) was much higher than male respondents. This is because the majority of nurses working in the NICU are female. This aligns with the theory that nursing has historically been a profession dominated by women, as caregiving roles traditionally emerged within families and communities (Rollinson & Kish, 2017). Gender refers to a person's behavior and appearance.

## CONCLUSIONS

This study concludes that while nurses demonstrated relatively strong knowledge and attitudes in the domain of creating a healing environment for premature infants, their understanding and implementation of individualized developmental care practices remain limited. The highest scores in environmental care suggest a well-established focus on optimizing NICU settings to support infant recovery, whereas the lower scores in individualized care reflect a need for further training in behavior-based, family-centered approaches. Additionally, demographic factors such as gender and family type were significantly associated with knowledge and attitudes, highlighting the importance of personalized and context-aware professional development. These findings emphasize the need for targeted educational interventions to strengthen nurses' competencies in comprehensive developmental care, ultimately enhancing outcomes for premature infants.

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