

Research article

Araştırma makalesi

Individualized Developmental Care Practices of Nurses Working in Neonatal Intensive Care Units: A Qualitative Study



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ABSTRACT

Aim: This study aimed to identify and compare neonatal intensive care nurses who received training in individualized developmental care practices with nurses who did not.

Material and Methods: This study was conducted with a qualitative design in the third-level neonatal intensive care units of two tertiary hospitals. Seven nurses from each hospital participated in the study. A semi-structured interview form was used. The interviews were recorded with a voice recorder and then transferred to a computer. Content analysis was used to analyze the interview data.

Results: Seven themes, 14 sub-themes, and 78 codes were created for the nurses who received training, and 7 themes, 13 sub-themes, and 30 codes were created for the nurses who did not receive training. Since the themes of the two groups were common, the results of the two groups were compared and discussed.

Conclusion: It was found that nurses who received training in individualized developmental care approached the newborn and family more holistically, planned, implemented, and evaluated their care more comprehensively than the nurses who did not receive training.

Keywords: Developmental care, neonatal intensive care, newborn, nursing

ÖZ

Yenidoğan Yoğun Bakım Ünitelerinde Çalışan Hemşirelerin Bireyselleştirilmiş Gelişimsel Bakım Uygulamaları: Nitel Bir Çalışma

Amaç: Bu çalışmanın amacı, bireyselleştirilmiş gelişimsel bakım uygulamalarına yönelik eğitim alan yenidoğan yoğun bakım hemşireleri ile eğitim almayan hemşirelerin bakım uygulamalarını belirlemek ve karşılaştırmaktır.

Gereç ve Yöntem: Bu çalışma, iki üçüncü basamak hastanenin üçüncü düzey Yenidoğan Yoğun Bakım Ünitelerinde nitel tasarımda yapılmıştır. Yarı yapılandırılmış görüşme formu kullanılmıştır. Görüşmeler ses kayıt cihazına ve ardından bilgisayara kaydedilmiştir. Görüşme verilerinin analizinde içerik analizi yöntemi kullanılmıştır.

Bulgular: Eğitim alan hemşireler için yedi tema, 14 alt tema ve 78 kod oluşturulmuştur. Eğitim almayan hemşireler için yedi tema, 13 alt tema ve 30 kod oluşturulmuştur. İki grubun temaları ortak olduğu için iki grubun bulguları karşılaştırıldı ve tartışıldı.

Sonuç: Bireyselleştirilmiş gelişimsel bakım eğitimi alan hemşirelerin, eğitim almayan hemşirelere göre bebek ve aileye daha bütüncül yaklaştığı, bakımı planladığı, uyguladığı ve daha kapsamlı değerlendirdiği belirlendi.

Anahtar kelimeler: Gelişimsel bakım, hemşirelik, yenidoğan, yenidoğan yoğun bakım

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INTRODUCTION

Approximately 4% of average birth weight newborns and 85% of low birth weight newborns are admitted to high-tech neonatal intensive care units (NICUs) each year¹. While the NICU can provide extraordinary life-saving care for these vulnerable babies after birth, it also exposes them to a traumatic process. This process results in critical illness due to separation from the mother, pain, social isolation, insomnia, and environmental stressors that activate the hypothalamic-pituitary-adrenal (HPA) axis^{2,3}. The presence of complex and multidimensional (physical, psychosocial, clinical practice) practices, painful negative stimuli, and lack of developmentally supportive stimuli in the NICU constitute significant and destructive stressors in other systems of these fragile infants, primarily in their brain development⁴. Newborns are exposed to approximately 70 stressful procedures per day during their stay in the NICU, resulting in permanent and negative changes in the baby's developing brain¹. Premature infants use more energy due to these stressors, and their healing process, growth, and organizational skills are negatively affected^{5,6}.

The primary purpose of NICU interventions is to support, facilitate, and enhance the baby's growth and development⁶. 15% to 25% of premature infants who remain in the NICU face many developmental and growth challenges, such as motor, hearing, visual, cognitive, behavioral, and verbal problems, including attention-deficit/hyperactivity disorder, which may develop in the future⁷. Tailoring the care and environment provided to newborns in the NICU to their needs reduces the baby's stress, strengthens his or her physiological balance, and positively affects brain development⁸. Heidelise Als argued in 1982 that a theory was needed to understand the individual organism and development of the baby in studies of infants and developed the synactive theory. Over the years, Als has tried to identify and interpret the physiological and behavioral responses of high-risk newborns^{9,10}. The Synactive Theory is based on the newborn's self-defense against environmental stimuli. Accordingly, the theory examines the observable behaviors of the newborn within five subsystems. These subsystems are defined as "autonomic system, motor system, state regulation system, attention/interaction system, and self-regulation system"^{9,11}.

Als developed the Newborn Individualized Developmental Care and Assessment Program (NIDCAP) in 1986 to better understand and apply his theory¹². NIDCAP includes evidence-based practices that support the care of infants according to their developmental and behavioral status¹³. The use of the NIDCAP model, particularly with preterm infants, has been reported as B-level evidence^{14,15}. The main components of NIDCAP have been reported as family-centered care, kangaroo care, pain management, therapeutic positioning, replacement of negative environmental stimuli with positive stimuli, non-nutritive sucking, and clustered care^{14,16}. Although the benefits of the NIDCAP model have been demonstrated, not all NICUs have integrated this model into their care. In this study, we

sought to analyze the impact of NIDCAP on nursing practice using qualitative data.

Aim

In accordance with the main components of NIDCAP, this study aimed to identify the nursing practices of NICU nurses and to compare the practices of nurses who received training in individualized developmental nursing practices based on the NIDCAP model with those of nurses who did not receive training.

MATERIALS and METHODS

Study Design

This study was conducted in two hospitals between June and December 2020. One of the hospitals had 28 beds in the NICU, and the nurses in this group did not receive NIDCAP training (G-NRNT). The other hospital had 16 beds in the NICU, and the nurses in this group received NIDCAP training (G-RNT). This study was conducted using a descriptive qualitative design. The authors followed the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist throughout the research¹⁷.

The Research Team and Reflexivity

The research team included an assistant professor (MCI), a training nurse (EC), two unit charge nurses (VK and NUÖ), and an assistant nurse manager (MS). The researcher, MCI, conducted the qualitative research and conducted contact meetings about the "Descriptive Qualitative Study Design", the semi-structured interview form, and the questions to be considered during the interview. A sample interview on a semi-structured interview form was conducted before the researcher EC and the researcher VK, who conducted the research interviews, started the research to clarify the questions.

Study Sample

Using purposive sampling, the study population consisted of nurses working in the NICUs of two hospitals. Sample inclusion criteria were defined as having a bachelor's degree in nursing, having worked as a nurse in the hospital's NICU for at least one year, and having provided primary care to premature and/or high-risk newborns for at least one year. Exclusion criteria of the sample: The nurses who received this nursing training in the G-NRNT group were excluded. The nurses who wanted to participate in the study and met the inclusion criteria were included in the study.

Data Collection

A semi-structured interview form based on the essential components of the neonatal developmental care model was used. The interviews were conducted in a quiet, empty room in both units, with only researchers and nurses present. The nurses followed the principles of asepsis, wore masks, and were seated at least two meters apart. The interviews were recorded on the voice recorder and then on the computer. Nurses' preferences and appropriate times were taken into account when determining interview times. Because the study reached data saturation with the number of samples available, no attempt was made to increase the sample.

The interviews were listened to by the nurses (MCI, MS and NUÖ) who were not interviewed in the study. Codes were

determined after interviewing seven nurses from each hospital. Since no new codes were created and data saturation was achieved, no more nurses were included, and interviews of 14 nurses were analyzed in the research. The training nurse (EC) of the G-RNT unit was also the researcher of this study and received a certificate from the relevant course in Turkey. The training nurse has regularly trained all the nurses in her clinic on NIDCAP practices every six months for four years.

Trustworthiness

In qualitative research, the primary measurement tool is the researcher since the researcher is the center of the research. Considering that the researcher's subjectivity and objectivity are limited research tools, the concept of "trustworthiness" is considered in qualitative research instead of validity and reliability¹⁸. For this reason, all records in data collection and analysis processes were kept regularly. All data sources were cited. Verifiability was achieved through a collaborative data analysis study between researchers to reduce researcher bias.

Data Analysis

The content analysis method was used to analyze the interview data¹⁹. The interview data was read several times independently by three researchers who did not conduct the interview, and the appropriate codes were determined. Then the research team met online, reread the data and created a common code list. From the generated codes, sub-themes and themes were created. Themes and subthemes were created based on the essential components of the neonatal developmental care model.

Ethical Considerations

Approval for the research was obtained from the Istanbul Gedik University Ethics Committee. Written consent was obtained from the clinics of the hospitals where the research was conducted. Verbal and written consent was obtained from the nurses who volunteered to participate in the study.

Limitations

Since a qualitative design was applied in the study and the sample size was limited.

RESULTS

Seven themes, 14 sub-themes, and 78 codes were created from the G-RNT data (Table 1). Seven themes, 13 sub-themes, and 31 codes were created from the G-NRNT data (Table 2). Since the themes of G-RNT and G-NRNT were common, the results of the two groups were compared and discussed.

Theme 1: Family-centered care

Although a common sub-theme of "family involvement in care" was created based on the G-RNT and G-NRNT data under this theme, ten codes were created in the G-RNT (Table 1) and four codes were created in the G-NRNT (Table 2).

Theme 2: Kangaroo Care

Although a common sub-theme of "skin-to-skin contact" was created with the data from G-RNT and G-NRNT under

this theme, ten codes were created in G-RNT (Table 1) and four codes were created in G-NRNT (Table 2).

Theme 3: Pain management

Under this theme, three sub-themes and ten codes were created in G-RNT (Table 1), and four sub-themes and five codes were created in G-NRNT (Table 2).

Theme 4: Provision of Therapeutic Position

One sub-theme and five codes were created under this theme in G-RNT (Table 1), and one sub-theme and four codes were created in G-NRNT (Table 2).

Theme 5: Replacing negative external stimuli with positive ones

Under this theme, six sub-themes and 35 codes were created in G-RNT (Table 1), and four sub-themes and ten codes were created in G-NRNT (Table 2).

Theme 6: Non-nutritive sucking

Under this theme, one sub-theme and one code were created in G-RNT (Table 1) and G-NRNT (Table 2).

Theme 7: Providing clustered care

Although a common sub-theme "Distribution of appropriate care for the baby across hours of care" was created with the G-RNT and G-NRNT data under this theme, seven codes were created in the G-RNT (Table 1) and two codes were created in the G-NRNT (Table 2).

DISCUSSION

Nurses reported that practices such as sharing information with parents, providing family support, ensuring parental involvement in care, and supporting parents in providing care were positively reflected in nursing care and contributed to positive feedback from families²⁰. It has been reported that practices such as 24-hour family access to the baby, family-infant closeness, early and prolonged skin contact, family-centered care^{21,22} and family education²³ were at level A¹⁴. Although our study found that both groups provided family-centered care, it was found that the nurses who received training applied family-centered care more extensively. From this result, receiving training in developmental care is effective.

It was reported that skin-to-skin contact was defined as the only developmental care dedicated to bilateral interaction. It would be more effective if both sides smiled and made eye contact with vocalizations²⁴. One study found that kangaroo care reduced maternal stress and increased milk production²⁵. Another study found that skin-to-skin contact activated the release of salivary oxytocin in mother, father, and baby, reduced the baby's salivary cortisol, and reduced stress levels in both mother and father²⁶. It has been reported that skin contact at least once a day, inclusion in routine care, use for painful procedures and use from 26 weeks is evidence at level A^{14,27}. Our study observed that nurses in both groups applied kangaroo care to both mothers and fathers and paid attention to hygiene. It was also found that the nurses in the trained group emphasized mother and baby preparation, skin-to-skin contact for half

Table 1. Themes and Quotations to Illustrate Sub-Themes for Group Receiving NIDCAP Training (G-RNT)

Themes and subthemes	Quotations
1. Family-centered care	
1.1. Family involvement in the care	
Taking the baby during visit hours of the family	We have family-centered care options, such as having the mothers during visit hours and including the families in the care. (RNT-Nurse 1)
Care training	Taking the baby with the family during visiting hours. We provide training to parents of babies who need to be fed by orogastric catheter. (RNT-Nurse 7)
Participation of the parents in daily care	In family-centered care, we already provide baby-oriented, patient-oriented care; therefore, we prefer to include parents in our care process as much as possible. (RNT-Nurse 4)
Independent care provided by the mother	We ensure that parents provide more care in the following care periods. We also assist the parents with care that they cannot provide. (RNT-Nurse 1)
Basic care	They already contribute to the feeding, diaper change, etc. (RNT-Nurse 2)
Skin-to-skin contact	We provide skin-to-skin contact with the mother and father. (RNT-Nurse 4)
Treatment	The patients may have oral tablets, which should be administered during feeding. Parents do not participate in the preparation phase. (RNT-Nurse 1)
Cooperation of parents in care	We also provide the contribution of fathers to the care in cooperation with mothers. (RNT-Nurse 6)
Adaptation to discharge	Adaptation is already provided before discharge. (RNT-Nurse 1)
Training for discharge	After training the mother, we discharge babies with orogastric catheters or any other medication. (RNT-Nurse 2)
2. Kangaroo care	
2.1. Skin-to-skin contact	
Willingness of the parents	The willingness of the parents is essential for kangaroo care. (RNT-Nurse 1)
Hygiene	We tell them not to put perfume on or smoke and to shower before coming. (RNT-Nurse 7)
Preparation of the mother	An apron is put onto the mother. (RNT-Nurse 1)
Preparation of the baby	The environment is prepared first; for example, the hat is out on the baby. If the baby's overall condition is suitable, she/he is given to the mother. (RNT-Nurse 2)
Skin-to-skin contact with the mother	We put the baby onto the mother's chest; the mother should be naked; skin-to-skin contact is required. (RNT-Nurse 4)
Skin-to-skin contact with the father	We may apply this to fathers of the babies whose mothers cannot come. (RNT-Nurse 1)
Care period	We apply for 30 minutes in minimum. (RNT-Nurse 5)
Monitoring of the baby during the process	During kangaroo care, we also monitor the baby's vital signs, body temperature, and respiration count. (RNT-Nurse 6)
The checklist for kangaroo care	We have a kangaroo care form; we fill in that form and record any changes in the baby's vital signs, including the blood pressure and pulse. (RNT-Nurse 2)
Safety of the baby	We should adapt the safety of the baby and the mother to the environment. (RNT-Nurse 4)
3. Pain management	
3.1. Emotional environment	
Light	We may close the lights at night for pain management. (RNT-Nurse 2)
Noise	We have some procedures like noise management. (RNT-Nurse 1)
Mother's odor	We ask the mother to keep a clean tissue on her chest and conduct it to us; we may provide pain relief if we put this in a suitable place for the baby to have the smell. (RNT-Nurse 1)
Breast milk	Because the breast milk or any oral nutrient would relieve them. (RNT-Nurse 2)
Dextrose	We have procedures to support them with dextrose to achieve relief. (RNT-Nurse 6)
Filled hand	The glove is like a pillow in glove shape; we use this in our clinic to make the baby feel safe by touching it to relieve the pain. (RNT-Nurse 2)
3.2. Position	
Taking into a nest	We make a nest for our babies and make them feel safer to help with pain management. (RNT-Nurse 6)
Enwrapping	The baby's swaddling may be allowed to cover the arms without covering the hip tightly. (RNT-Nurse 1)
Facilitated tucking	We can give the baby a facilitated tucking. (RNT-Nurse 7)
3.3. Non-nutritive sucking	
Pacifier	We try to relieve the pain and calm the baby by giving a pacifier. (RNT-Nurse 4)
4. Providing therapeutic position	

Table 1. Themes and Quotations to Illustrate Sub-Themes for Group Receiving NIDCAP Training (G-RNT) (cont.)

4.1. Lateral (right/left), prone, supine, facilitated tucking, taking into the nest	
Eligibility of the baby for the procedure	Some babies may have special conditions; for example, a baby cannot lie face-down, or a baby may have atelectasis; a baby should lie on the right or left side; we care about these factors and try to give the position of the baby. (RNT-Nurse 1)
Position according to the baby	We position the baby in prone, supine, or lateral positions. (RNT-Nurse 6) We take the babies to the facilitated tucking. We take the baby into the nest to make her/him feel in the mother's womb. (RNT-Nurse 7)
Choosing the appropriate position for the baby	Babies love the supine position more. (RNT-Nurse 2)
Position period	The babies are positioned every 3 hours. (RNT-Nurse 5)
Position checklist	We mark the positions on the nurse observation notes as positioned. (RNT-Nurse 1)
5. Replacing negative stimuli of the external environment with positive stimuli	
5.1. Light	
Incubator cover	A cloth covers the incubators to avoid direct light to the baby. (RNT-Nurse 2)
Light adjustment	Our buttons are adjusted gradually; we arrange the light accordingly. (RNT-Nurse 4)
Circadian rhythm	We keep the lights open during the day and close them at night to provide the circadian rhythm for the babies. (RNT-Nurse 6)
Eye band	Eye bands may be used. (RNT-Nurse 1)
5.2. Noise	
Covering the head with a gauze	If the baby is too small, we may wrap the head with gauze and make the baby less affected by the noise. (RNT-Nurse 1)
Noise measurement	We had audiometers for a while. (RNT-Nurse 1)
Reducing the noise	We try to reduce the decibel of the noise. (RNT-Nurse 4)
Being quiet	We need to provide a quiet environment; our goal is to provide the environment in the mother's womb. (RNT-Nurse 2)
Closing the incubator caps quietly	We try to make minimum noise in every procedure, like opening the incubator caps. (RNT-Nurse 5)
Putting the phone on silent	We always put our phones on silent. (RNT-Nurse 5)
Talking with a hoarse voice	Everybody tries to walk with a hoarse voice as much as possible. (RNT-Nurse 6)
Hanging small notes/warning signs	We hang a warning paper or similar thing onto the incubator to warn others to be quiet or careful with a baby. (RNT-Nurse 2)
Turning the device volumes down	We may turn the baby monitor volumes down. We have a central system and may directly close them. (RNT-Nurse 7)
Not putting something onto the incubator	We do not put any material on to the incubator. (RNT-Nurse 4)
Rapid response to alarms	We should close the monitor sounds as rapidly as possible. (RNT-Nurse 2)
Reducing the bedside daily rounding	We try to minimize the bedside daily rounding. (RNT-Nurse 4)
5.3. Odor	
Vanilla	We applied vanilla odor. (RNT-Nurse 5)
Coconut	Care was applied with coconut oil. (RNT-Nurse 1)
Breast milk	We use wipes wet with breast milk. (RNT-Nurse 5)
Mother's odor	We used to ask for tissues from mothers to relieve the baby. (RNT-Nurse 3)
Removing the malodor	We are trying to eliminate the bad smell. If garbage, etc., smells, we throw away the garbage to eliminate that foul smell. (RNT-Nurse 7)
Avoiding the use of heavy perfumes, deodorants, etc.	We already know that we should not use heavy deodorants. (RNT-Nurse 3)
Using odorless disinfectants, incubators, and sheets.	Odorless disinfectants, the incubator, and sheets are already odorless. (RNT-Nurse 6)
5.4. Taste	
Taste areas	We considered these points during feeding since they have areas for sweet, sour, and bitter tastes. (RNT-Nurse 1)
Breast milk	We give 1-2 cc or 0.5 cc to the babies' mouths and try to achieve such a sense of taste. (RNT-Nurse 6)
Dextrose	We may give dextrose. (RNT-Nurse 3)

Table 1. Themes and Quotations to Illustrate Sub-Themes for Group Receiving NIDCAP Training (G-RNT) (Cont.)

5.5. Touching	
Touching by the mother	We see that the tachycardia of a baby with restless tachycardia is decreased after touching by the mother, and their restlessness becomes tame. We see that mothers are effective. (RNT-Nurse 1)
Touching by the nurse	We calm the baby down by holding them from the head to the bottom. (RNT-Nurse 4)
Filled hand	We have a small glove; we put those hands to support the baby. (RNT-Nurse 6)
Care without gloves	If no extra situation is required or the baby has no infection, we apply the care except diaper change without gloves and try to give such a sense of trust by touching. (RNT-Nurse 6)
Taking into a nest	We make a nest for the babies and try to make them feel safe to mimic the sense of touching. (RNT-Nurse 6)
Enwrapping	Since enwrapping is like touching, all these procedures may be considered touching. (RNT-Nurse 2)
5.6. Temperature	
Body temperature of the baby	The body temperature of the baby is measured at every care. (RNT-Nurse 6)
Incubator temperature and humidity	We adjust the incubator temperature and humidity. (RNT-Nurse 4)
Room temperature and humidity	All rooms have thermometers and humidity charts. (RNT-Nurse 6)
6. Non-nutritive sucking	
6.1. Improving sucking-swallowing reflex	
Pacifier and finger	We use pacifiers to support sucking and swallowing, especially in premature babies, or we try to support them with fingers. (RNT-Nurse 7)
7. Clustered care providing	
7.1. Distribution of care which are suitable for the baby to care hours	
Not disturbing the baby	We should not irritate the baby much during care. (RNT-Nurse 4)
Touching the baby less	We try to combine the care required and perform them in a session to touch the baby less. (RNT-Nurse 3)
Maintaining the sleep	To let them sleep and not to disturb them during sleep. (RNT-Nurse 2)
Prolonging the resting period	We try to provide better quality care by shortening the baby's care time and extending the rest period. (RNT-Nurse 4)
Routine care	We have weighing care at six o'clock in the morning during our last care before shift delivery; we also change fixed apparatuses, the orogastric catheter, and the hat; we have such a routine. (RNT-Nurse 1)
Determination of specific hours for care.	We have care hours every 3 hours, like 9, 12, and 3 p.m. (RNT-Nurse 6)
Reducing the intensity	If blood pressure measuring will be done four times a day, we try to arrange it by skipping one care, like 9 a.m. and 3 p.m. Therefore, the intensity at one shift is prevented. (RNT-Nurse 1)

Table 2. Themes and Quotations to Illustrate Sub-Themes for Group Not Receiving NIDCAP Training (G-NRNT)

Themes and subthemes	Quotations
1. Family-centered care	
1.1. Family involvement in the care	
Training for baby care	We teach the mother how to breastfeed, how to take care of the baby, what to do and what not to do when to express her milk... (NRNT-Nurse 3)
Contribution of the family to daily care	Parents come to the care every 3 hours. (NRNT-Nurse 6)
Adaptation to discharge	We used to have an adaptation process to observe how parents followed hygiene rules, how they changed the diaper, or if they could feed the baby before discharging the baby. (NRNT-Nurse 2)
Discharge training	We provide discharge training during discharge. (NRNT-Nurse 1)
2. Kangaroo care	
2.1. Skin-to-skin care	
Mother and baby connection	We make kangaroo care to provide a close connection between the mother and the baby. (NRNT-Nurse 1)
Hygiene	The family should especially be clean and take a shower one day before. (NRNT-Nurse 4)
Skin-to-skin contact with the mother	We lie the baby onto the mother's chest to achieve skin contact and perform kangaroo care to provide harmony between the mother and the baby. (NRNT-Nurse 7)
Skin-to-skin contact with the father	We also provide kangaroo care with the father. (NRNT-Nurse 5)
3. Pain management	
3.1. Emotional environment	
Touching and singing a lullaby	We try to help the baby say, "I am here, "and "You are safe," by caring for the baby, touching the baby, and singing a lullaby. (NRNT-Nurse 1)
Dextrose	We perform some procedures to minimize the pain of the baby by giving dextrose. (NRNT-Nurse 7)
3.2. Position	
Enwrapping	We may calm the baby down and wrap the baby like saddling. (NRNT Nurse 3)
3.3. Non-nutritive sucking	
Pacifier	We give pacifiers to calm the babies down. (NRNT-Nurse 6)
3.4. Pharmacological methods	
Analgesic	We inject analgesics if necessary. (NRNT-Nurse 4)
4. Providing a therapeutic position	
4.1. Lateral (right/left), prone, supine	
Eligibility of the baby for the procedure	We arrange the most comfortable position for the baby and provide positions accordingly. (NRNT-Nurse 7)

Table 2. Themes and Quotations to Illustrate Sub-Themes for Group Not Receiving NIDCAP Training (G-NRNT) (cont.)

Position according to the baby	Lateral, supine, or prone in general. (NRNT-Nurse 1)
Position asked by the baby	Some babies like to lie down more. (NRNT-Nurse 6)
Position duration	We have a routine position change every 3 hours. (NRNT-Nurse 5)
5. Replacement of negative stimuli with positive stimuli	
5.1. Light	
Incubator cover	We cover a cloth on all incubators to avoid light exposure in the intensive care unit. (NRNT-Nurse 7)
Adjustment of the light	We carefully turned off the room's light when we finished our work. (NRNT-Nurse 6)
Eye band	We use eye bands for babies who receive phototherapy. (NRNT-Nurse 1)
5.2. Noise	
Reducing the noise	We try to reduce the sensitivity to the sound by reducing the noise in the intensive care unit. (NRNT-Nurse 5)
Being quiet	We try to be silent as much as possible. (NRNT-Nurse 7)
Talking with a hoarse voice	We always try to talk with a hoarse voice in the intensive care units. (NRNT-Nurse 2)
Responding fast to alarms	Immediately intervene when ventilators or monitors operate loudly. (NRNT-Nurse 4)
5.3. Touching	
Touching less	We try to contact smaller babies less; we touch less. (NRNT-Nurse 4)
Touching with passion	We have such procedures to show passion to the babies, like touching and embracing them during feeding. (NRNT-Nurse 5)
5.4. Temperature	
Body temperature of the baby and the humidity of the incubator	We follow babies with heat probes; we monitor the babies within the most stable temperature range, around 36.5°C in the incubators; we provide the humidity if needed. (NRNT-Nurse 7)
6. Non-nutritive sucking	
6.1. Improving the sucking reflex	
Pacifier	We work the sucking reflex of the babies through a pacifier. (NRNT-Nurse 5)
7. Clustered care providing	
7.1. Distribution of suitable care for the babies to care hours	
Not disturbing the baby	We try to touch once every 3 hours. There is no need to touch continuously and disturb the baby. (NRNT-Nurse 3)
Determination of specific hours for care.	We have certain care hours, like 9-12-15. (NRNT-Nurse 7)

an hour, and safety and follow-up of the baby during the procedure using a checklist during application. The trained group uses kangaroo care more extensively.

Non-pharmacological methods such as breastfeeding, breast milk, swallowing sucrose or glucose, swaddling, non-nutritive sucking, and odor were reported at the B level^{14,28}. Pharmacologic methods were A-level evidence and should be used with caution, taking into account the baby's pain level and benefit after developmental interventions^{14,29}. Breast milk scenting³⁰, lavender scenting³¹, swaddling³², Yakson and gentle human touch methods³³ were reported to be effective in pain management as non-pharmacological methods. In our study, it was observed that the nurses in both groups used non-pharmacological methods in pain management. However, it was found that nurses in G-RNT used more nonpharmacological methods, and nurses in G-NRNT used more pharmacological methods.

The prone position effectively oxygenates the baby during mechanical ventilation³⁴; wrapping the baby reduces physiological distress and provides self-regulation. The lateral position reduces crying and sleep distribution of the baby after the painful procedure, and the change of position reduces postural deformities³⁵ and such practices are proven at level A¹⁴. The prone position has been found to be the most comfortable position for preterm infants³⁶, and preterm infants are more affected by environmental stimuli in the supine position³⁷. A study found that the use of a scale was effective in nurses' use of developmental positioning³⁸. The same codes were created in the nurses' practices in the trained and untrained groups, but it was found that the trained nurses used the lateral, supine, and prone positions in addition to the facilitated tucking and nesting positions. However, they were found to use checklists for positioning. It has been reported that planning and implementing early positive sensory exposures, such as tactile, auditory, visual, kinesthetic, taste, smell, etc., for each baby in the NICU improves baby outcomes, and the use of cyclical lighting³⁹ is level B evidence¹⁴. Reducing environmental noise during procedures⁴⁰, using single-family rooms to reduce noise and light and involving the family in care⁴¹, measuring noise in the unit⁴², human voice⁴³, and reading books⁴⁴ are level A evidence¹⁴. It has been reported that vanilla extract reduces the frequency of apnea⁴⁵, topical coconut oil is effective in maintaining skin integrity and reducing the risk of bloodstream infection⁴⁶, sunflower seed oil and almond oil can be used to moisturize the baby's skin⁴⁷, maternal touch is effective⁴⁸, dynamic touch is practical⁴⁹, wrapping and nesting methods improve sleep quality⁵⁰, and frequent monitoring of armpit and body temperature measurement is essential to prevent hypothermia and hyperthermia⁵¹. Our study showed that nurses who received training were more effective in managing the baby's sensory environment. Nurses who did not receive training reported no use of taste and smell applications.

Non-nutritive sucking and swallowing exercises have been reported to be effective in preparing for oral feeding⁵². In the first transition of preterm infants to oral feeds, pacifiers support the sucking reflex, allowing them to be ready for

feeding and to be calmed⁵³. In our study, although the nurses in both groups used pacifiers to improve the sucking reflex in non-nutritive feeding, it was found that the nurses in the training group tried to improve the sucking and swallowing reflexes with the pacifier and finger method.

It was found that preterm infants who were less touched by collective care practices had a decrease in apnea frequency, a decrease in mean heart rate, an increase in weight gain, and an increase in rest and sleep duration⁵⁴. Nursing interventions that may occur in collaborative care are reported as feeding practices, hygiene practices, therapeutic positioning, ensuring mother-infant bonding, improving NICU conditions, stress management, pain management, and sleep support¹⁶. Maintaining and protecting sleep is cited as level A evidence that should be taught to nurses, medical staff, parents, and other caregivers as a cornerstone of neonatal care^{14,55}. Kangaroo care, massage therapy, and cyclic light have been reported to positively affect sleep quality in NICU infants⁵⁶. Our study found that nurses who received training were more aware of collaborative care and used it extensively.

CONCLUSION

Our study found that nurses who received training in individualized developmental care approached the baby and family more holistically and planned, implemented, and evaluated their care more comprehensively than nurses who did not receive training. When caring for high-risk newborns, it is important to remember that the care they receive during their treatment and care in the NICU will not be the same every day; each newborn will receive special, individualized care, and most importantly, the newborn will need humanistic care. The use of individualized developmental care practices in planning, implementing, and evaluating the care of preterm or high-risk newborns will contribute to the holistic and systematic treatment of infants and reduce inconsistencies in care.

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