Journal of Pediatric Nursing 45 (2019) e79–e88

Contents lists available at ScienceDirect

Journal of Pediatric Nursing

journal homepage: www.pediatricnursing.org

Nurses' and Physicians' Experiences of the NIDCAP Model Implementation in Neonatal Intensive Care Units in Iran

Jila Mirlashari, Ph.D., Associate Professor [a], Fatemeh Khoshnavay Fomani, Assistant Professor [a], Helen Brown, RN, PhD, Associate Professor [b], Beheshteh Tabarsy, Ph.D., Candidate [a,*]

[a] School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran
[b] School of Nursing, University of British Columbia, Vancouver, Canada

ARTICLE INFO

Article history:
Received 26 May 2018
Revised 29 December 2018
Accepted 29 December 2018

Keywords:
NIDCAP
NICU
Nurse
Physician
Experience

ABSTRACT

Purpose: The Newborn Individualized Developmental Care and Assessment Program (NIDCAP) provides comprehensive newborn focused family-centered care in the Neonatal Intensive Care Unit (NICU). The purpose of this study was to investigate nurses' and physicians' experiences of implementing the NIDCAP model to optimize its implementation for both caregivers, infants, and families in the NICU.

Design & methods: A purposes sample of 11 nurses and four physicians participated in this qualitative study. Data were collected by face-to-face and semi-structured interviews and analysis were guided by principles of thematic analysis as per Graneheim and Lundman (2004).

Results: Six themes and 20 sub-themes were constructed during data analysis. These included; *NIDCAP as a milestone*, *Helping to rebuild the core of the family*, *Caregiver excellence*, *Realism towards the feasibility of NIDCAP*, *Proper managerial position of NIDCAP specialists in the health system*, *and Caring for the caregiver*.

Conclusions: The findings of this study highlight how NIDCAP provides a comprehensive and effective care model for premature infants, with the goal to promote neonatal growth and development while also facilitating the self-efficacy of caregivers. Implementation of the NIDCAP model requires attention to be paid to social context, infrastructure, adjustment of the program according to the facilities and resources of each country, and the needs of caregivers.

Practice implications: Health care resources are required to sustain NIDCAP specialists and a favorable environment as the necessary conditions for its multidimensional application across NICU units around the world.

Introduction

Premature infants in intensive care units are affected by various sensory triggers, including olfactory and tactile stimuli, pain, unpleasant tastes and flavors, light and sound (White, Smith, & Shepley, 2013). Associated cerebral changes in premature infants are also higher in comparison with term infants (Constable et al., 2008). Brain imaging confirms that noxious hospitalization stimulation creates regional changes to the structure and function of the premature infant's brain. For example, the cerebral cortex exposed to inappropriate stimuli has smaller diameters in the frontal and parietal areas and measurable changes that have occurred in the communication function of their temporal lobe. These infants also show visible behavioral changes in neurodevelopmental examinations (Smith et al., 2011). These findings reveal the importance of implementing neurodevelopmental care during NICI admission. Neurodevelopmental care for neonates involves the designing of care plans that provide brain developmental care as well as addressing the neonate's physiological needs.

The average length of stay in the neonatal intensive care unit can be several months. For premature infants, during a time of rapid brain growth, any positive or negative environmental stimulation can have a lasting effect on neural cell development. Between 15% and 25% of premature infants admitted to the NICU will eventually develop some type of growth and developmental disorders, including motor, hearing, visual, cognitive, behavioral and verbal problems, including attention-deficit/hyperactivity disorder (Haumont, 2014). Immediate post-birth developmental and supportive care for preterm infants that optimizes parental involvement and participation in care has been increasingly implemented and studied. Parental involvement in NIDCAP has been shown to improve the nervous system and brain development (Als et al., 2012; Guimarães et al., 2015).

* Corresponding author at: School of Nursing Midwifery, Tehran University of Medical Sciences, Nosrat st. Tohid sq., Tehran 141973317, Iran.
E-mail addresses: mirlashari@sina.tums.ac.ir (J. Mirlashari), f-khoshnava@sina.tums.ac.ir (F.K. Fomani), Helen.Brown@ubc.ca (H. Brown), tabarsi-b@razi.tums.ac.ir (B. Tabarsy).

https://doi.org/10.1016/j.pedn.2018.12.014
0882-5963/

Today, in many NICUs, traditional care is changing; increasingly, parents are present and are engaged and active in their infant's care, such as through kangaroo care. The Mother Infant Transaction Program (MITP) and the Infant Behavioral Assessment and Intervention Program (IBAIP) are examples of in-hospital and post-discharge developmental care programs (Westrup, 2014).

Newborn individualized developmental care and assessment program (NIDCAP)

Early Developmental Care (EDC) and Newborn Individualized Developmental Care and Assessment Program (NIDCAP), examples of NICU developmental models, provide comprehensive and family-centered care and interventions that are focused on the infant's behavior (Haumont, 2014). The phrase "infant's early developmental care" includes a wide range of interventions such a monitoring physical activities such as light, sound and position control, and implementing non-nutritional suckling along with other behavioral activities with a higher level of complexity (Symington & Pinelli, 2006).

NIDCAP was first developed based on Professor Heidelise Als' research in 1986, and thereafter her research created an international teaching and training program in 2000. NIDCAP is a developmental and early intervention care model that is based on observing the behavior of newborn, and developing relationships between parents and care providers in the NICU. NIDCAP care reduces the developmental challenges of high risk neonates, such as premature birth and low birth weight (Als et al., 1994; Legendre, Burtner, Martinez, & Crowe, 2011). NIDCAP is a collection of evidence-based practices that support the care of infants based on their developmental and behavioral status (Macho & Zukowsky, 2017).

Professor Als addressed the evolution and function of five behavioral sub-systems, including the motor system, autonomic system, organizational system (maturation of well-defined sleep and awake states), attentional/interactional system and ultimately self-regulatory system in premature newborns and the interdependence of these sub-systems. To maintain normal growth and development, all of these interconnected systems require supportive care (Als et al., 1994). From 2010 to 2012, several systematic reviews and meta-analysis of several clinical trials confirmed the positive impact of NIDCAP on the medical outcomes and neural development of infants (Ohlsson & Jacobs, 2013).

Although studies confirm the effectiveness of NIDCAP on improving care for neonates and their families, there is resistance to its implementation. It has been argued that an important reason for implementation resistance is the culture and structure of NICU care within the broader healthcare system (Haumont, 2014). For example, findings from a Swedish study showed that, despite the confirmed positive NIDCAP effects on motor and cognitive development, obstacles to implementation existed; thus, further studies, regular monitoring of newborns and developing evidence of NIDCAP effectiveness could contribute to reducing implementation barriers and obstacles (Wallin & Eriksson, 2009).

Studies comparing the comprehensive developmental care and basic care indicated differences in the nurses' support of parents, paying attention to family comfort, and parents' stress (Van der Pal et al., 2007). Hence, the need to examine the barriers and facilitators of early developmental care continues to be relevant. Resistance to change in health care is a global issue (Wellman, Jeffries, & Hagan, 2016), and Iran is no exception. In Iran, four NICUs in teaching hospitals in Tehran, Tabriz, and Shiraz, with the support of UNICEF and the Ministry of Health, are shifting from traditional care to the implementation of the NIDCAP program. In the four centers,16 nurses and neonatal specialists have received professional and international certification by the NIDCAP Federation.

Currently, there are large scale workshops being implemented around the country to promote NIDCAP. Although this program has initially been welcomed by physicians and nurses in Iran, there remains resistance towards its implementation in some NICUs, with only some aspects of NIDCAP being implemented. It has been argued that more efforts are needed to establish a favorable ground for NIDCAP implementation (Godarzi et al., 2015; Mirlashari, Sadeghi, Sagheb, & Khanmohammadzadeh, 2015).

Nurses and physicians play an essential role in working together to change care philosophy and to make positive changes in health care settings (Merighi, Jesus, Santin, & Oliveira, 2011). Therefore, studying physicians' and nurses' experiences who are directly involved in the provision of NIDCAP care will provide essential knowledge for successful implementation in a variety of contexts; investigating context barriers and facilitators of NIDCAP implementation can contribute to developing interventions for effective neonatal and family care. Successful implementation within health care institutions of early developmental care through NIDCAP needs to align with and be tailored to the cultural, social and therapeutic health care context in local settings, such as in Iran. This qualitative study was conducted to understand and describe the nurses and physicians' experience of NIDCAP program implementation in Iran.

Ethical issues

The study began following ethical approval from the Ethics Committee of the University. Informed consent from each participant was obtained, including an overview of the right to withdraw from the research at any time, privacy and the confidentiality of the data, and an invitation to receive the results of the study to the participants were among items that were preserved in this study.

Method

Study design

This qualitative study was conducted to understand and describe the nurses and physicians' experience of early developmental and NIDCAP from 2017 to 2018. Content analysis was undertaken from narrative interviews conducted with the participants, which are described in greater detail below (Graneheim & Lundman, 2004; Hsieh & Shannon, 2005).

Participants and setting

The participants in this study consisted of 11 nurses and four physicians who were selected through the purposeful sampling method. Since NIDCAP implementation requires teamwork among nurses and physicians, the experiences of both were examined. The study inclusion criteria were: willingness to participate in the study, currently working in the neonatal intensive care unit, and being involved and familiar with the developmental care program. Some of the participants had a NIDCAP international certificate, while others had participated in developmental care and NIDCAP workshops. In order to facilitate maximum variation during the data collection, three interviews were conducted with participants who were working in the same NICUs but did not take part in NIDCAP workshops.

The research settings included four NICUs in Tehran, Tabriz, and Shiraz. Each hospital had been selected for the pilot of NIDCAP program; many of NICU nurses and physicians had participated in workshops or training courses on under the supervision of Professor Heidelise Als and Dr. Nikk Conneman. Semi-structured, face-to-face and in-depth interviews were used for data collection. During the interviews, general questions were first asked about the experiences of nurses and physicians in the implementation of NIDCAP program and, when necessary, probing questions were asked: such as can you explain more please? can you provide an example? and what do you mean? The interview guide consisted of 13 questions, designed based on a literature review

and the research questions guiding the study. Some of these questions were as follows:

- Since the neonatal developmental care is underway in your hospital, can you tell us about your experience in the implementation of this care model?
- What challenges did you face during the implementation of this type of care?
- Can you explain your experiences of the implementation of the NIDCAP program?

Data collection

The purpose of the study was explained and consent obtained to participate prior to the interviews with the physicians and nurses. The interviews lasted between 50 and 60 min. Immediately after each interview, the interview audio files from one voice recorder were transcribed verbatim by the lead researcher, followed by coding. The coding process was guided by the conventional content analysis approach; the codes and categories were derived directly from the narrative data. When existing studies and theories about the phenomenon are limited, this type of analysis is appropriate. Following the construction of codes, the themes and sub-themes were generated based on the similarities and differences between the codes. For every concept, evidence from the narrative data was retrieved and recoded (Elo & Kyngäs, 2008). The interviews continued until no new codes emerged until data saturation was reached.

Data analysis

To analyze the data, content analysis was guided by Graneheim and Lundman (2004) method; this approach guides the researcher to avoid the use of predetermined categories, allowing categories and themes to emerge from the data. Data analysis consisted of following steps: 1) The interview text was transcribed verbatim and word documents of transcripts produced. 2) The entire text was read several times to obtain a general understanding. 3) The initial codes were identified. 4) New codes were identified according to their differences and similarities and shared characteristics. 5) Through constant comparison, new codes were refined, organized into sub-themes and six main themes were constructed (Lincoln & Guba, 1985; (Speziale, Streubert, & Carpenter, 2011).

Each theme reflects the phenomena under study and was named by aligning it with the narrative data. Using the reflexive journaling technique, the researchers kept notes to becoming conscious of their personal biases and perspectives be aware of how those may be influencing data analysis.

Rigor

To ensure the trustworthiness of the data, methods were used to ensure research rigor as per Lincoln and Guba's (1985) principles. Accordingly, credibility was ensured to improve the accuracy of the findings. Credibility relates to the methodology, credibility of the researcher, and the research philosophy (Patton, 1999). There are several ways to increase the credibility of data such as immersion in the data, continues observations that will further enhance the understanding of the culture, language and the perspective of individuals under study, continuous presence in the research setting that influences the researcher's acceptance of the culture and the research environment, external review by colleagues and participants, and combining of the data resources, theories and methods (Patton, 1999; Polit, Beck, & Hungler, 2006). In this study, extensive engagement with participants and immersion in the data were also important alongside member-checking to confirm the findings with participants.

To ensure the reliability of the data, a complete and continuous recording of the decisions and activities of the researcher regarding the data collection and analysis were presented to colleagues for secondary review. Confirmability refers to the consistency of the results in different times and situations, while transferability refers to whether the results of research are applicable to other situations, groups or contexts (Polit et al., 2006). To achieve confirmability, details of the research and its stages were recorded by the researchers in detail, a report of the research process was prepared, and the opinions of experts was solicited. To determine the transferability of the results, appropriate description and details of the participants' selection and characteristics is important to provide, along with supporting narrative data to facilitate the transferability of the findings to other environments.

Results

Sample characteristics

In total, 15 participants including 11 nurses and 4 physicians participated in this study. All the nurses identified as female, 82% had an undergraduate degree and 18% had master's degrees. In terms of roles, four of them were head nurses, two were training instructors and five were staff nurses. Seventy-eight percent of nurses were between 31 and 35 years old, and 64.3% had work experience of more than 10 years. The majority of the nurses were working for more than 5 years in the NICU. Among the physicians, 100% of them were neonatal specialists and fellows who had at least 5 years of experience working in NICU.

Themes

Nurses and physicians' experiences of NIDCAP implementation in the NICU were analyzed in this study. In total, 462 primary codes, 20 sub-themes, and six main themes were constructed during data analysis (Fig. 1).

NIDCAP: A milestone

The participants perceived and experienced the implementation of NIDCAP from several perspectives. A significant aspect of the participants' experiences specifically related to the nature of the program. Most of the participants considered NIDCAP as a *milestone* in the care of infants. The majority of participants viewed the NIDCAP developmental care as a unique program that allows caregivers to regain their *lost roles* in the care process. Participants detailed their view of how the role of healthcare providers has abandoned in many healthcare settings or has been affected by issues and challenges, such as health care mismanagement. Investigating these challenges can inform how NIDCAP can facilitate positive outcomes for both newborns as the recipients of care and for physicians, nurses, and parents as the caregivers.

Reconstruction of professional identity and regaining lost roles: The participants spoke about how NIDCAP implementation contributed to the reconstruction of their professional identity and regaining of their lost roles as the caregiver.

Today, in many hospitals, the nurses have been distanced from their original roles. … When we started this program, I began to find out how much we have been drifted away from our main roles. NIDCAP reminded us that, the patient has priority, not filling of the sheets and writing continuously. Although we still write quite often, our aim is not writing anymore.

[(*A female nurse with 8 years of work experience in neonatal nursing*)].

Highlighting the art of caring: The participants pointed to the art of caring embodied in the work of nurses and physicians, speaking to humanizing aspects of caring for the newborn that is core to the NIDCAP program. Believing in and engaging in NIDCAP was seen as a way of facilitating the aesthetic aspects of care.

When you take care of a baby through NIDCAP program as a caregiver, when you view the baby as a human being and have a holistic view towards

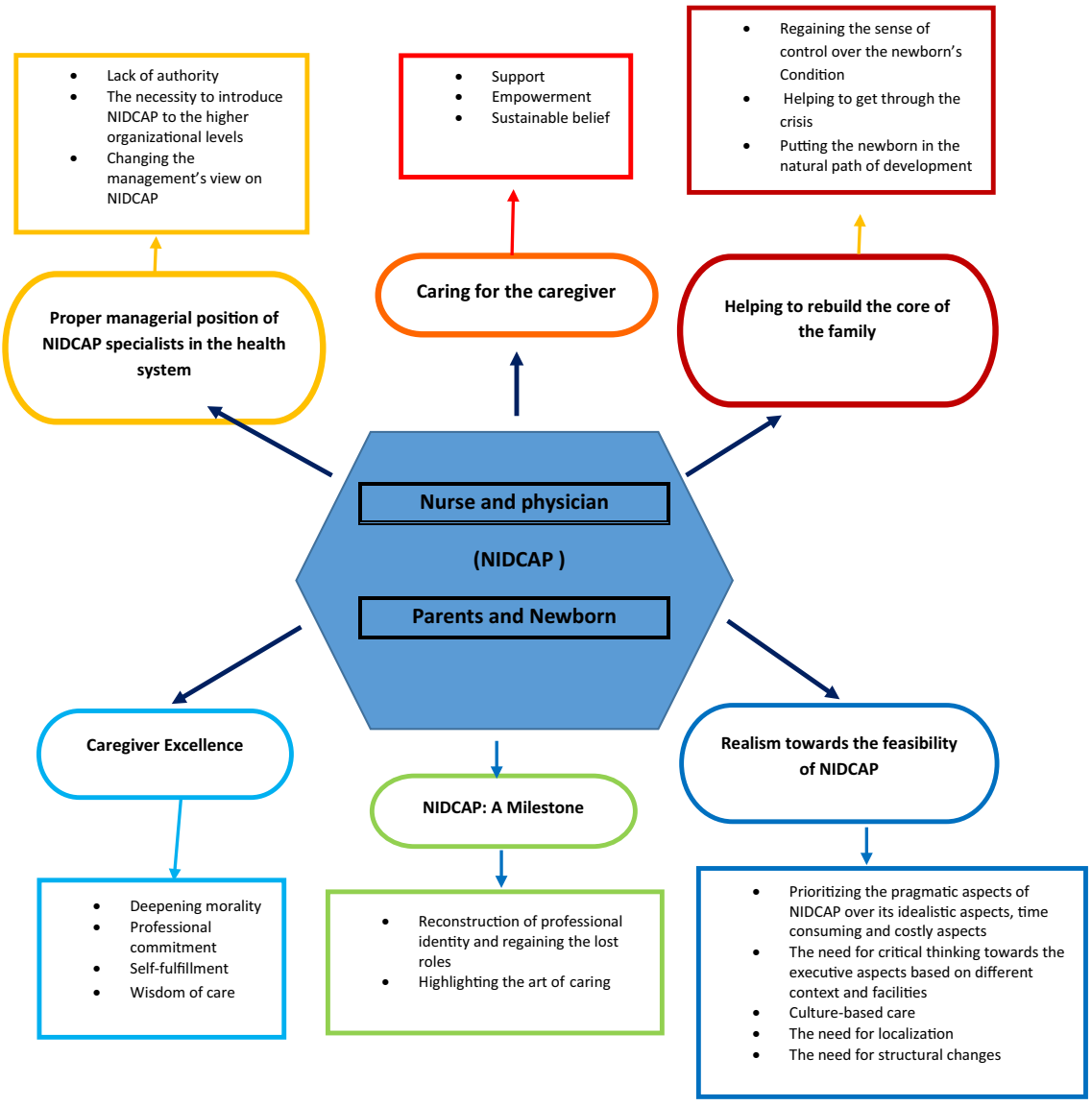

Fig. 1. NIDCAP Implementation: Schematic view of the themes and sub-themes.

him, you will experience a marvelous encounter with the love and care, and this way, the whole care becomes meaningful. In fact, we as caregivers have a good mental experience in protecting babies and their families.

[(*A female nurse with 10 years of work experience in neonatal nursing*)].

Helping to rebuild the core of the family

Helping to rebuild the core of the family was expressed by the participants; the 3 related subthemes are helping families to: regain control over their newborn's condition, manage through the crisis and facilitate a healthy and normal development path for their infant.

Regaining control over the newborn's condition: Participants indicated that regaining control not only benefits the parents and staff but also helps newborns to grow more appropriately within more natural NICU settings.

Our attitude towards the presence of parents in the unit has changed significantly, and the training on the implementation of NIDCAP has been very influential in the change of our attitude, while in the past, we did not like parents to get in our way. Now, when I look back I realize that parents are much more satisfied and they can feel more relaxed about being able to provide care for their child.

[(*A female nurse with 5 years of work experience in neonatal nursing*)]

Helping to get through the crisis: The participants referred to the significant impact of family-based care as a vital component of early developmental care and NIDCAP; family-based care was described by participants as gradually helping families to overcome their fears, move through the crisis successfully, take some degree of control and regain their role as parents.

I think parents can play their parental role better now. This is also very important for the infants and positively affects their development. Seeing parents on the bedside and supporting them will enable them to withstand the crisis.

[(*A female nurse with 5 years of work experience in neonatal nursing*)]

Putting the newborn in the natural path of development: The participants highlighted how NIDCAP is highly compatible with the natural development of newborns. In fact, participants indicated that many of the care and treatment programs are not compatible with the patient's natural growth and development, and are, in fact, obstacles.

When you think about NIDCAP, you realize that it is very well suited to the process of newborn's development, and as a care program in the

hospital, it not only causes no regression in the care process but also is quite compatible with it.

[(*A male physician with 10 years of work experience in NICU*)]

Caregiver excellence

The participants described the positive moral impacts of participating within the NIDCAP program, not only increase their knowledge and skills but also their capacities for humanizing care. For example, participants spoke about their values about respecting human dignity and other facets of humanizing care. Engaging and implementing this program helped the participants to reach a "higher self-perception", develop the wisdom of care, become a better person, all qualities they associated with caregiver excellence. The four sub-themes are Deepening morality, professional commitment, self-fulfillment and wisdom of care.

Deepening morality: Participants in the study referred to the individual, ethical and professional aspects of NIDCAP program and acknowledged that engaging in the program was an opportunity for their moral and professional growth.

NIDCAP has given us a new vision of care. NIDCAP is very ethical and significantly affects your personality. It gives you a spirit of support and empathy and makes you sensitive towards everything.

[(*A female nurse with 6 years of work experience in neonatal nursing*)]

Professional commitment: Participants stated that NIDCAP is a team activity that requires professional commitment, one that has direct impacts on the newborn's trajectory of care, such as early discharge and the limitations of routine care.

It causes you to consider all aspects, and not just the routine tasks. On the other hand, you need to keep your knowledge up-to-date at all times in order to be able to implement it properly. You also need to be committed to your profession as a care provider in order to be a good nurse.

[(*A female nurse with 6 years of work experience in neonatal nursing*)]

Self-fulfillment: Participants stated how NIDCAP plays a significant role in the ethical development of staff, while also influencing positive relationships among neonates, parents, and healthcare team members. NIDCAP was believed to create a culture of kindness and humanity that shapes relationships among families, staff and infants.

In my opinion, the NIDCAP program makes you a better care provider and motivates you to flourish in your profession.

[(*A female nurse with 6 years of work experience in neonatal nursing*)]

Wisdom of care: Several participants described how the NIDCAP program influenced how they see the newborns as a human being which means they look more carefully at their behavioral cues and health indicators. To reach this level of awareness of care provision, participants emphasize the importance of understanding the fundamental philosophy and authentic spirit of NIDCAP.

Before, I did not have this level of understanding of newborns that I have now. During the implementation of NIDCAP, there was a time when I was looking at the newborns for one or two hours and analyzed their behaviors. I gradually learned what these behaviors meant. My perception gradually changed, and I understood the caring philosophy of NIDCAP. Now, I have become more accurate; for example, instead of prescribing medication immediately, I observe the behavior of newborn for a while and this helps me to have a more accurate diagnosis.

[(*A female physician with 7 years of work experience in NICU*)]

Realism towards the Feasibility of NIDCAP

The experience of all participants concerning the implementation of NIDCAP indicated that, although NIDCAP itself is a transcendental program in its approach to caring, like all programs its feasibility should be considered in its ongoing implementation. In this section, data analysis produced five sub-themes; prioritizing the pragmatic aspects of NIDCAP over its idealistic, time-consuming and costly aspects, the need for critical thinking in the executive aspects of the program based on different context and facilities, culture-based care, the need for localization, and the need for structural changes.

The participants believed that, while NIDCAP philosophy is an idealistic approach in the care of the newborn, the pragmatic aspects of the program should be prioritized. This means NIDCAP implementation requires thoughtful contemplation, requiring tailoring to cultural, organizational and social context.

Prioritizing the pragmatic aspects of NIDCAP over its idealistic, time-consuming and costly aspects: Most of the participants stated NIDCAP implementation program ought to focus on the feasibility of the program and, on that basis, implement new methods to support its effectiveness.

NIDCAP program should be desacralized and a more realistic approach should be considered for it.

[(*A female nurse with 9 years of work experience in neonatal nursing*)]

Critical thinking when implementing NIDCAP in different context and facilities: The participants believed that the NIDCAP program reflects the socio-cultural context within which it is implemented in leading countries; therefore, the Iran socio-cultural context needs to be carefully considered during implementation.

You see, in advanced countries that run the NIDCAP program in their NICUs, things are totally in line with the principles of NIDCAP, but in our country, this may not be the case.

[(*A female nurse with 4 years of work experience in neonatal nursing*)]

Socio-cultural context: According to the participants, there are cultural differences among the NIDCAP implementation settings.

Our culture and religion are different from the American and European cultures. Our people still have a traditional look at the presence of men in the unit and do not easily welcome the long time presence of fathers in the ward. In our patriarchal society, the father's view on participation in the newborn's care is different from the developed societies where men and women have a relatively equal position.

[(*A female nurse with 4 years of work experience in neonatal nursing*)]

The need for localization: All participants acknowledged that the NIDCAP program needs to be localized.

We need to localize the NIDCAP program so that, we have more effective care and it prevents waste of resources as well.

[(*A female nurse with 5 years of work experience in neonatal nursing*)]

The need for structural changes: Most of the participants mentioned the importance of challenges in the implementation of NIDCAP. There are issues such as inadequate training, lack of specific job descriptions, shortages of personnel and equipment, which require structural changes.

It's true that NIDCAP is a great program, and it has a lot of positive effects on staff, families, and newborns, but there is also a very important issue. We have many structural problems, as well as equipment and nurse shortages.

[(*A female nurse with 4 years of work experience in neonatal nursing*)]

Proper managerial position of NIDCAP specialists in the health system

The lack of authority, the necessity to introduce NIDCAP to the higher organizational levels and changing managerial leadership's view on NIDCAP were three sub-themes constructed from the data.

Lack of authority: Most of the participants stated that the professionals who have been trained for NIDCAP program have almost no formal status in the hospitals or the Ministry's management structure; resulting in lower levels of authority and effectiveness. The impact on implementation is reduced opportunities to extend the program and optimize its positive effects for infants, families, and caregivers.

We try to implement all of the components of NIDCAP in our NICU, but we face a variety of challenges, such as lack of equipment, a high volume of work, and crowded NICU. When I say to the authorities, they do not provide the necessary co-operation, they only ask us to do the routine care. We are not able to solve problems because we do not have any authority, we have not any managerial position.

[(*A Nurse, female, 5 years work experience in neonatal nursing*)]

The necessity to introduce NIDCAP to the higher organizational levels: The participants highlighted how only a few healthcare team members have been trained in the field of NIDCAP, noting there has been a related attitudinal shift but that more still needs to be done to support implementation. And, there is a concurrent need to introduce and explain the NIDCAP to the higher organizational levels to promote successful institutional support and implementation.

It's not enough to train just a few people about the NIDCAP, because it won't be effective. You will have a few who want to implement a new and more complete approach in the clinical settings, but since they do not receive any support and due to the natural resistance towards any change, they will not succeed.

[(*A Physician, male, 5 years work experience in NICU*)]

Changing the management's view on NIDCAP: Participants identified an inappropriate attitude towards NIDCAP among managers. Participants believed that the attitudes and views of most managers were routinized and only focused on the survival of premature infants. Participants emphasized the importance of changing knowledge, attitudes, and views of managers towards NIDCAP for its successful implementation.

Implementation and institutionalization of the program require structural changes, purchase of equipment and/or modification of human resource structure in terms of quantity and quality. When the people at the higher levels of management system are not aware of this issue, or are not convinced about it and view NIDCAP as a luxury care program, there is no chance for a successful implementation of the program.

[(*A Physician, male, 8 years work experience in NICU*)]

Caring for the caregivers

As expressed in the theme, *caring for the caregivers*, three subcategories of support, empowerment and sustainable belief were constructed through data analysis. All participant nurses and physicians emphasized the significance of caregiver support.

Support: Receiving support from families, colleagues and managers was a priority expressed by all participants.

Those nurses who pay close attention to the components of the NIDCAP are not encouraged by the system. There is a need for continues training or special equipment which are costly. The system does not support us. For example, I had to buy a cover for the incubator at my own expense.

[(*A Head Nurse, female, 9 years work experience in neonatal nursing*)]

When more tasks are added to your previous tasks without any support, you have to spend a lot of time and extra energy to be able to provide compassionate care with high quality. This process does not work in the long run and causes people to lose their motivation.

[(*A Physician, male, 6 years work experience in NICU*)]

Another participant stated:

I very much agree with the implementation of this care, but when there are a lot of newborns in our unit and at least 2–3 of them are critically ill, or when the beds and facilities in our unit are not adequate, how can I deliver NIDCAP care? I sometimes feel tormented and bad when I see these things and cannot do anything about them. It makes me really upset.

[(*A Nurse, female, 3 years work experience in neonatal nursing*)]

Empowerment: Participants highlighted the importance of program development and implementation focused on empowering members of the NIDCAP team.

Last year, we planned a lot of training classes for the staff and got a good result. But this year I came to the conclusion that, it's not good enough to have some training classes, and think it is all over. Our training needs to be dynamic to empower staff.

[(*An educational instructor, female, 12 years work experience in neonatal nursing*)]

Sustainable belief: Participants also stated that in supportive and empowering context members of the NIDCAP team could sustain their belief in making positive changes in the care of newborns.

If we deliver training classes in the unit, we can talk about various topics and show a lot of things to staffs and this will have a good effect on their performance. In my opinion, these trainings are necessary for medical and nursing students before they enter the department, so that, they can take proper care of the infants.

[(*An educational instructor, female,12 years work experience in neonatal nursing*)]

Discussion

The NIDCAP program in Iran is a nursing program for neonatal care; this program has been accepted as a standard of care in many NICUs throughout the world (Legendre et al., 2011). Currently, in Iran, four hospitals are implementing NIDCAP program as pilot sites, while only 16 nurses and physicians have received the international certificate. The number of physicians and nurses, however, who have completed training workshops in the country is increasing. The timing of this study is important in this context; the neonatal care providers in the four sites are just embarking in NIDCAP implementation and there remains a gap in strategies and insights about how to tackle emerging challenges and successful uptake of the model of neonatal care. This qualitative study focused on learning about NIDCAP implementation from nurses and physicians to enhances the potential its success and improving neonatal and families' neurodevelopmental outcomes.

The results of this study confirmed how all participants considered NIDCAP to be a valuable program in the neurodevelopmental care of newborns. Existing studies have confirmed the positive effects of NIDCAP program on the management of developmental challenges, especially in the high-risk newborns (Als et al., 2012). Participants in this study also criticized their current practice environments that they see as affecting a shift of roles that reduces their professional identity; they spoke to how the program could help to reconstruct their professional nursing and physician roles in accordance principles NIDCAP principles. Various studies have shown that factors such as the high volume of paperwork (Alromaihi et al., 2011), an unsupportive organizational culture, excessive workload alongside inadequate staffing and the lack of compassionate care (Valizadeh & Ghasemi, 2008) result in healthcare providers distancing from their professional role identity. These findings emphasize the importance of supportive practice environments for professional role enactment.

Participants' experience in this study highlight how the NIDCAP program facilitates the "*reconstruction of their professional identity and retrieval of lost roles*". Professional identity is defined as the self-perception towards attitudes, beliefs, feelings, values, motivations, and experiences (Marañón & Pera, 2015). Studies in Iran have shown that the formation of professional identity, especially for nurses, is associated with major challenges and often is due to power imbalances in health systems and social status; as a result, nurses may not have an adequate understanding of their professional identity (Nasrabadi, Lipson, & Emami, 2004). However, the results of the present study show how being involved in the NIDCAP program facilitates the rebuilding of professional roles precisely because NIDCAP is a positive experience of providing care to newborns and is largely based on values (VandenBerg, 2007).

Accordingly, the NIDCAP program can be considered as "a milestone" in care according to the experience of the participants in this study. This milestone was pervasive in the four NICU; it created a major change in the concepts driving excellence in care and create strategies for how such excellent should be achieved. Another sub-theme found in the present study was; "highlighting the art of caring". According to the aesthetic models, caring can be considered art (Thompson, 2015). The purposefulness of caring, the transfer of good feelings to care users, and the focus on the recipient of services are the components that can evolve caring into an artistic and aesthetic art (Siles-Gonzalez & Solano-Ruiz, 2016). The NIDCAP program, as viewed in this study as

values-based indicates its potential for enhancing the artistic and aesthetic potential of neonatal care.

"Helping to rebuild the core of the family" is another key theme that was found in the present study; the participants referred to "regaining the sense of control over the newborn's condition", "helping to get through the crisis" and "putting the baby in the natural path of development". Supporting parents can lead to their further involvement in newborn care, reducing the stress and fear parents face and enabling them to effectively and meaningfully participate in the care of their newborns. NIDCAP creates a sense of proximity to newborns and promotes communication and, consequently, increases the level of satisfaction of the parents. In this regard, O'Brien et al. (2013) concluded that parents become more relaxed when they participate in the care of their newborn and their stress reduces significantly (O'Brien et al., 2013).

Parents, on the other hand, may also greatly suffer by staying at the unit and seeing the condition of their newborn. The support of nurses, physicians and other people involved in the unit can help parents to overcome the crisis (Guimarães et al., 2012). Implementing the NIDCAP optimizes newborns' growth and development; the evidence is clear from an array of studies. For example, Wallin and Eriksson (2009) argued that NIDCAP improves cognitive and psychomotor skills of newborns and leads to positive outcomes.

Also well documented in how premature newborns in the NICU are faced with a variety of sensory stimuli such as thermal, tactile, olfactory, auditory and visual stimuli. In NIDCAP, relevant and regular observation of the behavior of newborns is done undertaken before, during and after any intervention. These observations describe the performance of the infant and their self-regulating capabilities; this provides staff and parents the chance to provide timely supportive strategies such as the need for suckling, positioning, containment or kangaroo care. For neonates who had received developmental care, they demonstrate better growth and improved white matter development in their brain imaging (Haumont, 2014; Milgrom et al., 2010).

Similarly, the results of a study by Wielenga, Smit, and Unk (2006) focused on assessing parents' satisfaction with both traditional and early developmental care show that parent satisfaction with was higher for the NIDCAP care group (Wielenga et al., 2006). Moody, Callahan, Aldrich, Gance-Cleveland, and Sables-Baus (2017) assessed the length of a newborn's stay following NIDCAP care and showed how NIDCAP implementation reduced the duration of hospitalization and decreased the treatment costs of the NICU. NIDCAP not only provides a framework for empowering parents to take care of their newborns but also provides a comprehensive educational tool for training novice nurses to develop skills. Additional skills develop also include how to monitor resources for NIDCAP implementation aimed at improving neonatal outcomes (Moody et al., 2017).

" Caregiver excellence" was another theme constructed in the present study. The experience of most participants indicated that NIDCAP causes "deepening morality", "professional commitment", "self-fulfillment" and "wisdom of care". Participants believe that NIDCAP is not just a routine task and, instead, address all dimensions of optimal care which can facilitate moral and professional development and self-fulfillment. Sheldon (2017) poignantly stated that NIDCAP has extensive benefits; for example, caregivers become more able to effectively communicate with newborns and leads them to better respond to the needs of neonates. Also, when a caregiver learns how to connect with the infant and meaningfully involve parents in the care, the result is satisfaction and a sense of purpose in achieving optimal neonatal outcomes (Sheldon, 2017).

The participants also described how this care model has changed their view on the newborn and involvement of parents in care and strengthened their relationships with the newborn and parents; a critical shift occurs when caregivers see newborns as a human being whose neurodevelopmental needs are to respected and attended to. Similarly, Merighi et al. (2011) state that, through NIDCAP, nurses become aware of the needs of parents, and gain positive experience and knowledge from parental care which also results in better communication (Merighi et al., 2011).

Professional commitment was another sub-theme in the present study. Nelson and Bedford (2016) examined the experiences of mothers of newborns admitted to the level 3 NICU who were provided NIDCAP care with the goal of helping professionals to use these experiences in clinical settings. This study confirmed how mothers valued the educational and supportive effects of the NIDCAP. Participants believed that NIDCAP specialists should help and support them to overcome their fear, gain self-confidence, and participate in NIDCAP without fear of being judged. Consultation and problem-solving sessions are also required during the NIDCAP program (Nelson & Bedford, 2016). Depending on their resources and conditions, participants implemented NIDCAP components such as pain and stress control strategies, patient intervention screening, parent-infant interaction programs, and father's presence in the care of the newborn to enhance care or kangaroo mother care (Sizun, Ansquer, Browne, Tordjman, & Morin, 2002).

In regard to " Realism towards the feasibility of NIDCAP", the participants expressed that, despite believing in the effectiveness of NIDCAP program, they also believed that issues such as "prioritizing the pragmatic aspects of NIDCAP over its idealistic, time-consuming and costly aspects", "the need for critical thinking towards the executive aspects based on different context and facilities", "culture-based care", "the need for localization", and "the need for structural changes" are critical factors that need to be considered in the implementation of this care model.

In regard to the prioritizing the pragmatic aspects of NIDCAP over its time-consuming and costly idealistic aspects, Merighi et al. (2011) concluded that, in the emergency situations, the parents' presence creates some problems for medical and nursing personnel, which reduces the functionality of this care model.

In relation to critical thinking, the Swedish, Danish and Norwegian nurses, who share a similar a socio-cultural background, within Kymre's (2014) study referred to need for critical thinking towards different dimensions of the care implementation based on different contexts and facilities. In this study, the nurses' attitudes towards one dimension of NIDCAP, skin-to-skin care (SSC), were investigated; the results highlight how attitudes shift in different situations and that they are shaped by practice norms and structural challenges associated with the work environment and professional responsibilities (Kymre, 2014).

Culturally-based care also emerged as a sub-theme in this section. From the participants' point of view, cultural differences make it difficult for the entire aspects of the NIDCAP program to be equally functional in societies with different cultures. A NICAP care model needs to be tailored to the social and culture cultural context within which the NICU is embedded. Despite the importance of interaction between mother and newborn and the attention to the developmental care of the neonate, there is still regional resistance (Greisen et al., 2009). Proper and successful implementation of the NIDCAP program depends on the practice culture, staff education, and engagement of parents. Creating a change in the culture and care structure to facilitate the developmental care of the newborn is a critical challenge in health care systems around the globe (Haumont, 2014).

Accounting for the socio-cultural context requires thoughtful attention be paid to integrating fathers into neonatal care. Garten, Nazary, Metze, and Bührer (2013) examined the experiences and needs of fathers of premature newborns admitted to the neonatal intensive care unit. The results of this study indicate how the length of stay and presence of fathers in the NICU during the hospitalization period was less than the mothers, their contact with the newborn was less than mothers, and the mother's responsibility towards the care of a newborn was more prominent. (Garten et al., 2013).

van der Pal et al. (2007) also pointed out how NIDCAP reduces the stress of parents, especially the father in comparison with routine

care, which is probably due to the father's participation in the care of a newborn (Van der Pal et al., 2007). Also, the participants believed that this care model should be localized. Family performance varies according to culture and environmental policies, and people in different countries may have different interpretations of care definitions. Implementation and acceptance of this care model may require a significant investment of time. Localization of this model of care can accelerate its acceptance in different cultures and contexts (Soleimani, Mohammadi Shahboulaghi, Nayeri, Dalili, & Shariat, 2016).

The necessity of structural changes was the last sub-theme that emerged from the data analysis. Participants believe that structural changes were required to provide quality care. Mirlashari et al.'s (2015) found in their Iranian study focused on barriers to family-centered care (FCC) from the perspective of nurses and physicians in NICU indicated that FCC, one of the dimensions of NIDCAP, is useful and effective. However, they referred to structural barriers and the lack of family involvement in the care as one obstacle to the implementation of the FCC program. To facilitate FCC, attention must be paid to the views of both groups in order to provide the appropriate environment and necessary changes in the neonatal intensive care units (Mirlashari et al., 2015).

In this regard, Soleimani et al. (2016) conducted a qualitative study in Iran with the aim of explaining the needs and skills required for the neonate specialists in terms of neurodevelopmental care, and pointed out the necessity for reforming the medical education system of the country. They also believed that, effective strategies should be designed for developmental training in terms of neuro-brain development. According to the results of this study, implementing the curriculum for pediatric specialists program on neurodevelopmental care along with concurrent clinical skills training are useful and essential (Soleimani et al., 2016).

Traditional care in the neonatal intensive care unit is inadequate and moving from traditional care towards early developmental care and the implementation of NIDCAP components is a challenge for modern care of the newborns. The NIDCAP components such as the supportive care of the nervous system, the design of the NICU environment, physical and emotional proximity of parents to the newborn, and caring based on the behavioral assessment of the newborn are among the issues that need to be considered structurally (Flacking et al., 2012).

“Proper managerial position of NIDCAP specialists in the health system” was another theme found in this study. Based on participants' experience, this theme contained several sub-themes, including “the lack of authority”, “the necessity to introduce NIDCAP to the higher organizational levels”, and “changing the management's view on NIDCAP”. Vasli, Salsali, and Tatarpoor (2012) in a qualitative study undertaken in Iran showed that the lack of support for nurses, shortages of workforce, nurses' workload, and ineffective teamwork between physicians and nurses are among the factors influencing the proper implementation of care and lack of parental involvement in care (Vasli et al., 2012). Similarly, the results of a study by Laudert et al. (2007) indicated that nursing shortages, high numbers of patients, limited time of nurses, financial problems and lack of environmental facilities, crowded environment, lack of adequate training, and lack of cooperation between caregivers and parents were among the barriers of the implementation of developmental care (Laudert et al., 2007).

In this study, the participants' named one of the barriers to NIDCAP implementation as the lack of authority. The implementation of care models in every environment has problems and obstacles, thus the support of authority and leaders at various levels (management and organization) is critical for appropriate training for physicians and nurses in intensive care units (Bamm & Rosenbaum, 2008). On the other hand, professionals will often accept changes when managers and leaders come up with practical solutions and support the implementation of new approaches (Shields, Pratt, & Hunter, 2006).

The need for changing the managerial perspective towards NIDCAP was detailed by the participants. That developmental care has not been taken into consideration in nursing and medical curriculum and that educational planners do not emphasize the training of developmental care in medical education were critical issues. Considering the rapid growth of medical knowledge and the entry of new science and technology, and also the changing of stakeholder's expectations, the educational curriculum should be continuously revised and new approaches of care such as early developmental care should be added. This may encourage authorities and managers to become more familiar with the new approaches and change their perspective towards it (Yamani & Firoozabadi, 2012). Hence, changing the managerial perspective towards NIDCAP is an important factor that affects its institutionalization.

“Caring for the caregiver” was the last major theme that was extracted from the data in this study. In this theme, several sub-themes were extracted from the data, including “support”, “empowerment” and “sustainable belief”. Undoubtedly, caregivers have various needs which, if neglected, make them unable to provide optimal care. Participants in the present study referred to the issues such the lack of spiritual, material and educational support, and pointed out that despite the staff shortages and the high level of workload, they still receive no support.

Spiritual support plays an important role in the mental and physical health of individuals and is considered as a solution to many problems. Duggleby et al. in their study showed that spiritual well-being is one of the important factors in job satisfaction (Duggleby, Cooper, & Penz, 2009). Another issue is financial support that should be considered. The basic and essential needs of the NICU staff should be acknowledged and prioritized. The NIDCAP model requires more time and interventions such as providing education, paying individual attention to newborn, supporting parents and involving them in the care of their baby are among the factors that increase the roles of nurses compared to the traditional care (Legendre et al., 2011).

Macho and Zukowsky (2017) showed that members of the healthcare team and the parents of infants should be supported educationally and receive required training to create an appropriate environment for the implementation of this care model. More research should be conducted in order to find out the short-term and long-term effects of such care. The question of what the caregivers and parents need was among the questions that can be answered by the support of authorities and the provision of necessary facilities (Macho & Zukowsky, 2017). In addition, physicians, nurses and other caregivers who are involved in such care, need psychological empowerment, interactions, ethical values, patient and family respect, and greater tolerance as well as flexibility (Bruce et al., 2002).

The employee's competency plays an important role in the quality of care. Obtaining competency requires the use of technical skills, knowledge, clinical reasoning, communication, emotions, and values in the clinical setting (Tilley, 2008). Accordingly, the extraction of sub-theme of empowerment is justifiable. The sustainable belief was another subtheme found in this study. The developmental care model has many diverse dimensions and just the employees' attitude towards providing proper care is not enough, so they must initially reach a certain belief in order to provide optimal care (Kymre, 2014).

Limitations

One of the limitations of this research was the difficulty accessing participants to maximize sample variability for data collection. The sampling challenge reflected the geographic dispersion of hospitals operating the NIDCAP project in different cities; this meant the researchers coordinated the interviews by various methods such as telephone, virtual communication channels, and follow-up. Based on cultural differences, some of our participants varied in their modifications for NIDCAP implementation in ways that reflect the cultural norms of the patriarchal society; however, the findings here emphasize important

directions for NIDCAP implementation tailored to specific contexts, cultures, and settings.

Practice implications

The NIDCAP program facilitates the collaboration between parents, nurses, and physicians in the care of the newborn, which creates a sense of satisfaction (Haumont, 2014). For physician, nurses, and others, accepting a new approach may be difficult, but when they see the previous and traditional approaches cannot meet the needs of patient, they consider it as a valuable work, accept it and remain committed to it especially when they see its positive results (Sheldon, 2017). According to the findings, there are some important aspects which might be considered as barriers to proper implementation of NIDCAP. Based on our participants' experience, having a realistic approach towards the implementation of all components of NIDCAP has been considered pivotal.

Many participants mentioned that we need to have a flexible approach regarding its application in different contexts. Shortage of nurses, not having enough facilities and lack of resources might be considered as main barriers to its implementation in developing countries. We need to think carefully and plan for finding strategies by which we would be able to overcome these inhibitors or mainly focus on those important aspects of NIDCAP which are feasible in each community. NIDCAP is a socio-culturally based care; as a result, not paying attention to the different cultures and religions might act as a barrier in its implementation. Moreover, those nurses and physicians who are going to apply NIDCAP in the unit should be supported, also they need to have a proper placement in the system otherwise they will face resistance and gradually become disappointed. Furthermore, management's view towards the importance of this approach of care should be positive, if not its implementation would face so many challenges and barriers.

Conclusion

In the present study, participants had a positive perception of earl y developmental care and NIDCAP and considered it a milestone in the care of premature infants. The participants acknowledged that their participation in the NIDCAP program has contributed to their excellence and professional identity development and role enactment. Participating in this program through regaining the sense of control over the infant's condition, helping out the crisis and putting the infant on the natural path to development, helped to rebuild the core of the family, and helped parents to evolve and regain their role. In spite of the above factors, the participants were also realistic towards the feasibility of NIDCAP.

The implementation of care models such as NIDCAP requires time and may take several months or years. This care model should be carried out according to the cultural level, resources, and backgrounds. On the other hand, changing the viewpoints of managers and introducing this model to higher organizational levels is necessary for its proper managerial position in the health system. Also, without considering the needs of physicians and nurses, or caring for the caregiver, this goal cannot be achieved. However, by the support of authorities, paying attention to challenges experienced by caregivers, increasing the personnel's ability with continuous and dynamic training, and building a lasting belief to change the attitude from traditional care towards the early developmental care, can achieve this goal.

Policy issues

All authors have participated in this research and agree with the contents of the material.

Ethics approval

Tehran University of Medical Sciences Ethics Board approval was obtained.
(IR.TUMS.FNM.REC.1396.4272).

Conflicts of interest

There is no conflict of interest or disclosures.

Sources of funding

The present study is a research project with the code: 96022835493, which was sponsored by the Tehran University of Medical Sciences. Therefore, we thank the Tehran University of Medical Sciences for support to conduct this research.

CRediT authorship contribution statement

Jila Mirlashari: Associate ProfessorConceptualization, Formal analysis, Funding acquisition, Methodology, Project administration, Supervision, Validation, Writing - review & editing. **Fatemeh Khoshnavay Fomani:** Assistant ProfessorConceptualization, Data curation, Formal analysis, Methodology, Project administration, Investigation, Validation, Writing - original draft, Writing - review & editing. **Helen Brown:** Associate ProfessorConceptualization, Formal analysis, Writing - review & editing. **Beheshteh Tabarsy:** CandidateConceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Validation, Writing - original draft.

Acknowledgments

The researchers would like to announce their gratitude to all the participants who participated in this research and provided us with their valuable experiences. Furthermore, we thank Tehran University of Medical Sciences for support to conduct this research.

References

Alromaihi, D., Godfrey, A., Dimoski, T., Gunnels, P., Scher, E., & Baker-Genaw, K. (2011). Internal medicine residents' time study: Paperwork versus patient care. *Journal of Graduate Medical Education*, *3*(4), 550–553.

Als, H., Duffy, F. H., McAnulty, G., Butler, S. C., Lightbody, L., Kosta, S., ... Ringer, S. A. (2012). NIDCAP improves brain function and structure in preterm infants with severe intrauterine growth restriction. *Journal of Perinatology*, *32*(10), 797.

Als, H., Lawhon, G., Duffy, F. H., McAnulty, G. B., Gibes-Grossman, R., & Blickman, J. G. (1994). Individualized developmental care for the very low-birth-weight preterm infant: Medical and neurofunctional effects. *JAMA*, *272*(11), 853–858.

Bamm, E. L., & Rosenbaum, P. (2008). Family-centered theory: Origins, development, barriers, and supports to implementation in rehabilitation medicine. *Archives of Physical Medicine and Rehabilitation*, *89*(8), 1618–1624.

Bruce, B., Letourneau, N., Ritchie, J., Larocque, S., Dennis, C., & Elliott, M. R. (2002). A multisite study of health professionals' perceptions and practices of family-centered care. *Journal of Family Nursing*, *8*(4), 408–429.

Constable, R. T., Ment, L. R., Vohr, B. R., Kesler, S. R., Fulbright, R. K., Lacadie, C., ... Schafer, R. J. (2008). Prematurely born children demonstrate white matter microstructural differences at 12 years of age, relative to term control subjects: An investigation of group and gender effects. *Pediatrics*, *121*(2), 306–316.

Duggleby, W., Cooper, D., & Penz, K. (2009). Hope, self-efficacy, spiritual well-being and job satisfaction. *Journal of Advanced Nursing*, *65*(11), 2376–2385.

Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, *62*(1), 107–115.

Flacking, R., Lehtonen, L., Thomson, G., Axelin, A., Ahlqvist, S., Moran, V. H., ... Dykes, F. (2012). Closeness and separation in neonatal intensive care. *Acta Paediatrica*, *101*(10), 1032–1037.

Garten, L., Nazary, L., Metze, B., & Bührer, C. (2013). Pilot study of experiences and needs of 111 fathers of very low birth weight infants in a neonatal intensive care unit. *Journal of Perinatology*, *33*(1), 65–69.

Godarzi, Z., Rahimi, O., Khalesi, N., Soleimani, F., Mohammadi, N., & Shamshiri, A. (2015). The rate of developmental care delivery in neonatal intensive care unit. *Journal of Nursing*, *8*, 117–124.

Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today*, *24*(2), 105–112.

Greisen, G., Mirante, N., Haumont, D., Pierrat, V., Pallás-Alonso, C. R., Warren, I., & Maraschini, A. (2009). Parents, siblings and grandparents in the neonatal intensive care unit a survey of policies in eight European countries. *Acta Paediatrica*, *98*(11), 1744–1750.

Guimarães, H., Rocha, G., Almeda, F., Brites, M., Van Goudoever, J. B., Iacoponi, F., ... Buonocore, G. (2012). Ethics in neonatology: A look over Europe. *The Journal of Maternal-Fetal & Neonatal Medicine*, *25*(7), 984–991.

Guimarães, H. l., Guedes, B., Almeida, S., Rodrigues, M., Ramos, M., Maia, T., & Clemente, F. t. (2015). Parents in the neonatal intensive care unit of "hospital de São João"(Porto, Portugal). *Journal of Pediatric and Neonatal Individualized Medicine*, *4*(1), e040120.

Haumont, D. (2014). NIDCAP and developmental care. *Journal of Pediatric and Neonatal Individualized Medicine*, *3*(2), e030240.

Hsieh, H. -F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, *15*(9), 1277–1288.

Kymre, I. G. (2014). NICU nurses' ambivalent attitudes in skin-to-skin care practice. *International Journal of Qualitative Studies on Health and Well-Being*, *9*(1), 23297.

Laudert, S., Liu, W., Blackington, S., Perkins, B., Martin, S., MacMillan-York, E., ... Handyside, J. (2007). Implementing potentially better practices to support the neurodevelopment of infants in the NICU. *Journal of Perinatology*, *27*, S75–S93.

Legendre, V., Burtner, P. A., Martinez, K. L., & Crowe, T. K. (2011). The evolving practice of developmental care in the neonatal unit: A systematic review. *Physical & Occupational Therapy in Pediatrics*, *31*(3), 315–338.

Lincoln, Y. S., & Guba, E. G. (1985). Establishing trustworthiness. *Naturalistic inquiry* (pp. 289–331).

Macho, P., & Zukowsky, K. (2017). Individualized developmental care in the NICU. *Advances in Neonatal Care*, *17*(3), 162–174.

Marañón, A. A., & Pera, M. P. I. (2015). Theory and practice in the construction of professional identity in nursing students: A qualitative study. *Nurse Education Today*, *35*(7), 859–863.

Merighi, M. A. B., Jesus, M. C. P. d., Santin, K. R., & Oliveira, D. M. d. (2011). Caring for newborns in the presence of their parents: The experience of nurses in the neonatal intensive care unit. *Revista Latino-Americana de Enfermagem*, *19*(6), 1398–1404.

Milgrom, J., Newnham, C., Anderson, P. J., Doyle, L. W., Gemmill, A. W., Lee, K., ... Inder, T. (2010). Early sensitivity training for parents of preterm infants: Impact on the developing brain. *Pediatric Research*, *67*(3), 330–335.

Mirlashari, J., Sadeghi, T., Sagheb, S., & Khanmohammadzadeh, T. (2015). Nurses' and physicians' perspective about barriers to implement family centered Care in Neonatal Intensive Care Units. *Iran Journal of Nursing*, *28*(93), 140–150.

Moody, C., Callahan, T. J., Aldrich, H., Gance-Cleveland, B., & Sables-Baus, S. (2017). Early initiation of newborn individualized developmental care and assessment program (NIDCAP) reduces length of stay: A quality improvement project. *Journal of Pediatric Nursing*, *32*, 59–63.

Nasrabadi, A. N., Lipson, J. G., & Emami, A. (2004). Professional nursing in Iran: An overview of its historical and sociocultural framework. *Journal of Professional Nursing*, *20*(6), 396–402.

Nelson, A. M., & Bedford, P. J. (2016). Mothering a preterm infant receiving NIDCAP care in a level III newborn intensive care unit. *Journal of Pediatric Nursing*, *31*(4), e271–e282.

O'Brien, K., Bracht, M., Macdonell, K., McBride, T., Robson, K., O'Leary, L., ... Levin, A. (2013). A pilot cohort analytic study of family integrated Care in a Canadian neonatal intensive care unit. *BMC Pregnancy and Childbirth*, *13*(1), S12.

Ohlsson, A., & Jacobs, S. E. (2013). Authors' response: NIDCAP: A systematic review and meta-analyses of randomized controlled trials. *Pediatrics*, *132*(2), e553–e557. https://doi.org/10.1542/peds.2013-1447E.

Patton, M. Q. (1999). Enhancing the quality and credibility of qualitative analysis. *Health Services Research*, *34*(5 Pt 2), 1189.

Polit, D. F., Beck, C. T., & Hungler, B. (2006). Essentials of nursing research. *Methods, appraisal, and utilization* (pp. 6).

Sheldon, R. E. (2017). Developmental Care for Preemies and their families: One Neonatologist's journey toward NIDCAP practice. *NeoReviews*, *18*(10), e568–e575.

Shields, L., Pratt, J., & Hunter, J. (2006). Family centred care: A review of qualitative studies. *Journal of Clinical Nursing*, *15*(10), 1317–1323.

Siles-Gonzalez, J., & Solano-Ruiz, C. (2016). Sublimity and beauty: A view from nursing aesthetics. *Nursing Ethics*, *23*(2), 154–166.

Sizun, J., Ansquer, H., Browne, J., Tordjman, S., & Morin, J. -F. (2002). Developmental care decreases physiologic and behavioral pain expression in preterm neonates. *The Journal of Pain*, *3*(6), 446–450.

Smith, G. C., Gutovich, J., Smyser, C., Pineda, R., Newnham, C., Tjoeng, T. H., ... Inder, T. (2011). Neonatal intensive care unit stress is associated with brain development in preterm infants. *Annals of Neurology*, *70*(4), 541–549.

Soleimani, F., Mohammadi Shahboulaghi, F., Nayeri, F., Dalili, H., & Shariat, M. (2016). Assessment of educational curriculum of neonatal subspecialty in the field of challenges in neurodevelopment care. *Tehran University Medical Journal TUMS Publications*, *74*(3), 208–212.

Speziale, H. S., Streubert, H. J., & Carpenter, D. R. (2011). *Qualitative research in nursing: Advancing the humanistic imperative*. Lippincott Williams & Wilkins.

Symington, A. J., & Pinelli, J. (2006). *Developmental care for promoting development and preventing morbidity in preterm infants*. The Cochrane Library.

Thompson, J. (2015). Towards an aesthetics of care. *Research in Drama Education: The Journal of Applied Theatre and Performance*, *20*(4), 430–441.

Tilley, D. D. S. (2008). Competency in nursing: A concept analysis. *Journal of Continuing Education in Nursing*, *39*(2), 58–64.

Valizadeh, F., & Ghasemi, S. (2008). Medical staff attitude toward parents' participation in the care of their hospitalized children. *Journal of Hayat*, *14*(1), 69–76.

Van der Pal, S., Maguire, C., Le Cessie, S., Wit, J., Walther, F., & Bruil, J. (2007). Parental experiences during the first period at the neonatal unit after two developmental care interventions. *Acta Paediatrica*, *96*(11), 1611–1616.

VandenBerg, K. A. (2007). Individualized developmental care for high risk newborns in the NICU: A practice guideline. *Early Human Development*, *83*(7), 433–442.

Vasli, P., Salsali, M., & Tatarpoor, P. (2012). Perspectives of nurses on barriers of parental participation in pediatric care: A qualitative study. *Journal of Hayat*, *18*(3), 22–32.

Wallin, L., & Eriksson, M. (2009). Newborn individual development care and assessment program (NIDCAP): A systematic review of the literature. *Worldviews on Evidence-Based Nursing*, *6*(2), 54–69.

Wellman, J., Jeffries, H., & Hagan, P. (2016). *Leading the lean healthcare journey: Driving culture change to increase value*. CRC Press.

Westrup, B. (2014). Family-centered developmentally supportive care. *NeoReviews*, *15*(8), e325–e335.

White, R., Smith, J., & Shepley, M. (2013). Recommended standards for newborn ICU design. *Journal of Perinatology*, *33*, S2–S16.

Wielenga, J. M., Smit, B. J., & Unk, L. K. (2006). How satisfied are parents supported by nurses with the NIDCAP® model of care for their preterm infant? *Journal of Nursing Care Quality*, *21*(1), 41–48.

Yamani, N., & Firoozabadi, N. (2012). Core curriculum in medical education: Introducing some approaches. *Iranian Journal of Medical Education*, *11*(9), 1263–1273.