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Barriers to the Implementation of "Newborn Individualized Developmental Care and Assessment Program" from the Perspectives of Nurses and Physicians

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ABSTRACT

Background: "Newborn Individualized Developmental Care and Assessment Program (NIDCAP)" is a caring approach based on individual neonatal behaviors that provides preventive measures for injuries caused by environmental stimuli. The present study aimed to investigate the barriers to the implementation of NIDCAP from the perspectives of nurses and physicians.

Methods: This descriptive-comparative included 100 nurses and 21 physicians working in the Neonatal Intensive Care Unit (NICU). They were selected using a complete enumeration sampling method. Data were collected using a researcher-made questionnaire. The validity and reliability of the questionnaire were determined in this study. The data were analyzed in SPSS software (version 25) through descriptive and inferential statistics.

Results: According to the nurses' perspective, the most imperative hurdles to the implementation of NIDCAP were environmental-structural, human resources, and communicational barriers. On the other hand, environmental-structural barriers obtained the highest score by the physicians and were placed in the first rank contrary to the management and human resources barriers that were placed in the second rank with equal scores. Furthermore, family-based care and communication were not considered obstacles to the implementation of the NIDCAP.

Conclusion: According to the findings of this study, environmental-structural barriers were considered the main hurdles to the implementation of NIDCAP. Therefore, hospital administrators should make efforts to eradicate the existing barriers by making appropriate decisions in order to improve the quality of this method of care.

Keywords: Developmental care, Intensive care unit, Neonatal physician, NIDCAP, Nurse, Premature infant

Introduction

A newborn infant before 37th weeks of age is defined as premature or preterm (1, 2). The prevalence of preterm births by analogy with all live births was 11.1% across the world in 2010, whereas it was reported 12.7% in Iran between 2013 and 2015 (3, 4).

Preterm newborns are hospitalized in the Neonatal Intensive Care Unit (NICU) due to prematurity and physiological problems (5-7). Despite the increased survival rate of these infants, there are still concerns about the long-term complications of their inadequate care which consequently leads to future abnormalities (8). Evidence shows an elevated incidence of these disorders in preterm infants. Such disorders include motor, visual, auditory, cognitive,

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behavioral, and attention deficits, as well as hyperactivity disorder (9).

The results of a study conducted on 576 cases in 2012 showed severe imperfections after birth (13.4%) and mild injuries (11.8%). Among these injuries, neurological and brain damage can be noted in which cerebral palsy was observed in 14% of the infants (n=83) (10). In an extra study conducted in Iran, the abundance of retinopathy was reported in 16.4% out of the cases (n=146) (11). Consequently, the impact of the NICU environment on the brain system is uncovered in the long term (12, 13).

In cases whose admission to the NICU is inevitable, a "Neonatal Individualized Developmental Care Assessment Program" (NIDCAP) approach has been suggested to minimize the complications for such infants (8). The NIDCAP is a caring approach by which the caregivers do their best to minimize the stress of the infant and reduce the impact of external stressors, such as light and noise (6). This care program, which has been used and generalized since the 1980s, is an individual care plan based on family-centered care, which is designed in NICU and makes use of the five subsets, namely "Autonomic", "Motor", "State", "Organization" and "Attention/Interaction" (9).

In NIDCAP, a care team, including a physician and a nurse, accompanying a family member, is involved in taking care of the infant to implement the family-center care program (12). The presence of family members, especially the mother, is a principle of NIDCAP in the process of taking care of the infant, optimizing the care, and providing her with the necessary training (14, 15).

Studies on the merits of this care program revealed a constructive impact on reducing the short- and long-term complications of newborns admitted to the NICU, hospital costs, parental stress, as well as enhancing infant intelligence, brain function, and development.

Physicians and nurses believe that the developmental care of premature infants has many redeeming features (16). Despite the good points of NIDCAP, findings of different studies indicate that this care program is restricted in performing throughout the world (6). According to a study performed in the United States, it was found that out of 146 nurses, 125 cases (86%) did not consider the developmental care for newborns (15). Moreover, the rate of NIDCAP implementation in the NICUs was obtained at 53.66% in a study conducted in Iran (6).

Since this care program is based on communication, not merely on treatment procedures and difficult medical protocols, its implementation can be difficult and is accompanied by barriers in NICUs that are based on medical protocols and caregivers (16). It is not easy to make changes or implement specific programs in every dimension. Furthermore, to require firm planning, it is necessary to have access to the facilities and efforts of all professionals involved, and this process requires a change in the attitudes and behavior of individuals (8). Therefore, considering the importance and utility of the NIDCAP program and limitations in its implementation, the present study aimed to determine the barriers in performing NIDCAP from nurses' and physicians' perspectives in the NICUs.

Methods

The study population of this comparative-descriptive study included all physicians (i.e., pediatrics and fellowships) and nurses (i.e., undergraduate and postgraduate) working in the NICUs of the hospitals. The samples were randomly selected, and a total of 121 participants (100 nurses and 21 physicians) participated in this study.

After obtaining the required permission from the Ethics Committee of Shahid Beheshti University of Medical Sciences, Tehran, Iran (IR.SBMU.PHNM.1395,689), the researcher referred to the research setting in various work shifts. After introducing herself and providing explanations on the research objectives to the subjects, informed consent was obtained from the participants. Moreover, they received the necessary explanations in terms of the confidentiality of the information, the preservation of anonymity, and the possibility of leaving the study. The questionnaires were then distributed and then collected at the end of the shift of the same day. If the questionnaires were not completed on the same day, they were collected by specifying the next time.

The data were gathered using a researcher-made questionnaire. Previously conducted studies, as well as the tools and available textbooks, were used to design and compile the questionnaire. Moreover, the comments of Dr. Silvia Wonderpalp (Ph.D. in Psychology) were employed to extract the items. The questionnaire consists of two parts. The first part asks information about the demographic characteristics of the physicians and nurses (i.e., age, gender, work experience in the neonatal specialty, education, and pedagogical education)

and the other section seeks information about the barriers to the implementation of NIDCAP from the perspective of physicians and nurses including five dimensions, namely Administrative (n=11), Environmental and Structural (n=12), Communicational (n=11), Human resources (n=15), and Family-centered care (n=13). The scoring was based on a five-point Likert type from one to five. The highest and lowest scores were 310 and 62, respectively. The content validity index of the tool was determined at 0.8. Moreover, the internal consistency of the questionnaire was calculated by Cronbach's alpha coefficient which was obtained at 0.78, 0.81, 0.81, 0.79, and 0.80 for administrative, environmental-structural, communicational, human resource, and family-based care barriers, respectively. It is worth mentioning that the internal consistency of the whole questionnaire was estimated at 0.75.

The data were analyzed in SPSS software (version 25) through descriptive statistics (i.e., mean and standard deviation) and inferential statistics (i.e., t-test, Pearson correlation coefficient, and one-way analysis of variance).

Results

The present study aimed to investigate the perspective of nurses and practitioners about the barriers to NIDCAP implementation. According to the results, the nurses had a mean age of 31.3±1.6 (age range: 22-49 years) with a mean overall work record of 7.2±5.6 years (range 0.5-24 years). Moreover, the mean work experience in the special sector was obtained at 5.5±4.8 (range: 0.5-18 years).

All nurses were female, and the majority of them were in their undergraduate education (91%) and nursing staff (96%). In addition, most of them (78%) received education in the field of developmental care.

Furthermore, the demographic characteristics of the physicians showed the mean age of 41.8±6.9 years (age range: 30-59 years) with a mean overall work record of 9.9±6.6 (range: 23-23.5/0) years and mean work experience of 3.8±6.7 years (range 23-5/0) in the special sector. The majority of them were female (85.7%), and most of them were clinical physicians (90.5%) who received developmental care education (71.4%).

Tables 1 and 2 summarize the findings of the study on the barriers to the implementation of the NIDCAP from the viewpoint of nurses and physicians, respectively.

The t-test was used to compare the standpoints of the nurses and physicians. According to the results, the mean score of management and communication barriers by nurses was significantly lower than that of given by physicians. Table 3 summarizes the findings of the study comparing the perspectives of nurses

Table 1. Mean scores of obstacles for NIDCAP implementation from the perspective of nurses

Obstacles	Mean	Standard Deviation	Base score=3	
			Statistic T	P-value
Administrative	3	0.5	0.2	0.839
Environmental-structural	3.3	0.5	6.2	0.001
Communicational	2.6	0.6	-6.0	0.001
Human resources	3.1	0.5	2.7	0.009
Family based care	3	0.4	-1.1	0.283

Table 2. Mean scores of obstacles for NIDCAP implementation from the perspective of physicians

Obstacles	Mean	Standard Deviation	Base score=3	
			Statistic T	P-value
Administrative	3.3	0.3	4.5	0.001
Environmental-structural	3.4	0.6	3.1	0.006
Communicational	2.9	0.7	-0.4	0.687
Human resources	3.3	0.3	4	0.001
Family based care	3	0.3	0.4	0.714

Table 3. Differences in mean scores of obstacles for NIDCAP implementation from the perspective of nurses and physicians

Obstacles	Difference		Base score=3	
	Mean	Standard Deviation	Statistic T	P-value
Administrative	-0.2	0.1	-3.2	0.002
Environmental and structural	-0.1	0.1	-0.6	0.577
Communicational	-0.3	0.2	-2.1	0.040
Human resources	-0.2	0.1	-1.7	0.088
Family based care	-0.1	0.1	-0.7	0.457

and physicians regarding the obstacles for the use of NIDCAP.

The results of investigating the relationship of demographic characteristics of nurses and physicians with their viewpoints on the barriers to implement NIDCAP are as follows:

There was a positive and significant correlation between nurses' age and their viewpoints on communication barriers (P=0.045, r=0.206). In other words, older nurses revealed that communication barriers significantly impeded the NIDCAP. However, there was no significant relationship between the ages of nurses with their viewpoints regarding other barriers to implementing NIDCAP. In addition, the t-test indicated that nurses who were trained in developmental care significantly reduced the staffing barriers (P<0.001) to implement family-based care (P=0.041). Furthermore, one-way ANOVA showed that nurses with a background of using more developmental care significantly lowered the barriers to family-based care provision (P<0.001). In other words, nurses that experienced more developmental care had less family-centric implementation of this program.

Regarding the physicians, there was no meaningful relationship between these specifications and the barriers to performing NIDCAP in each of the five dimensions.

Discussion

According to the findings of this study, from the nurses' perspective, the most imperative obstructions to the implementation of NIDCAP were divided into three dimensions, namely environmental-structural and human-related communication. In contrast, there was no family-centered care management and no management support for the implementation of NIDCAP. Various studies confirmed the structural problems as a serious barrier to NIDCAP implementation from nurses' viewpoints.

Barriers to the implementation of NIDCAP included the noise and physical structure of the department (8), ambient light (16), lack of light and noise adjustment due to the lack of equipment (15), and inappropriate equipment and physical structure in NICU (6).

In line with the study conducted by Goodarzi et al., the issue of high workload and nurses' fatigue were identified as barriers to perform NIDCAP in human resources. In the present study, nurses' viewpoint of communication problems hindered the implementation of NIDCAP. This problem was addressed in a study carried out by Mosqueda and Partners who found difficulty in communicating between parents and caregivers, as well as lack of coordination among caregivers as an obstacle to the implementation of NIDCAP (8).

In this study, nurses identified management barriers for performing NIDCAP as a chief assessment issue. However, in a study conducted in the Netherlands, the important obstacles to the management of the NIDCAP implementation included the timeliness of writing for the implementation of the program, reduction of satisfaction with the use of lighting for the environment, and the poor participation of managers based on the nurses' perspectives (16).

According to a study conducted by Zang et al., limitation of the family's visit time of their infant and lack of adequate skills in communicating with parents were regarded as obstacles to the implementation of NIDCAP (14), which can be categorized as communication barriers and barriers to implementing family-based care services.

In the present study, nurses announced communication barriers; however, they showed no problems in terms of implementing family-based care. Therefore, it can be concluded that nurses are likely to face fewer obstacles in implementing NIDCAP in Iran; nonetheless, the structural factors, such as physical space, facilities for families in providing care, light and noise control equipment, facilities for follow-up after discharge, the number of nurses, the number of neonates, as well as the nurses' viewpoint, are necessary for the implementation of the developmental care. Therefore, in order to implement optimal developmental care, the modification of the physical environment and the viewpoints of the professional people, as well as team training, can be considered the most important factors (17).

According to the results obtained from the physicians' viewpoints on the barriers to the implementation of NIDCAP, the environmental and structural barriers obtained the first rank with the highest score. However, management and human resource barriers as barriers to the implementation of this type of care were in second place with the same scores. On the other hand, family-based care and communication barriers were not considered obstacles to the implementation of NIDCAP. The results of a study conducted by Mosqueda et al. (2013) showed that 61% of the physicians participating in this study reported environmental noise as one of the obstacles to the implementation of NIDCAP (8)

since they are regularly commuting through the wards and are more perceptible to the overhead noises. The results of this study were consistent with the findings obtained from the physicians' viewpoints.

There are a limited number of studies assessing the viewpoints of physicians on the implementation of NIDCAP; however, at the same time, it is necessary to summarize the perspectives of the physicians and nurses in various studies in order to eliminate barriers to the implementation of NIDCAP.

The results of the evaluation of the differences in viewpoints of physicians and nurses about the barriers in performing NIDCAP showed that management and communication barriers were considered barriers to NIDCAP implementation by nurses and physicians, respectively. Moreover, there was no difference between the viewpoints of nurses and physicians in terms of environmental-structural barriers, human resource barriers, and barriers to the implementation of family-based care.

In a study performed by Wendropol et al., both nurses and physicians had positive perspectives regarding the implementation of developmental care and the evaluation of NIDCAP, and there was no difference between the two groups in terms of providing this kind of care (16). In a study carried out by Mosqueda et al., it was revealed that more than half of the physicians stated that the nursing colleagues were obstacles to the implementation of newborn individualized developmental care and assessment. However, only 33% of the nurses and physicians prevented the implementation of NIDCAP, which was consistent with the results of the present study. There were also similarities between physicians and nurses regarding the barriers of communication (8).

In the same line, in a study conducted by Mosqueda et al., the physicians suggested an increase in the number of professional nurses. They also stated that the implementation of developmental care increased the workload of nurses and created a barrier to human resources for NIDCAP implementation. Therefore, the implementation of this program requires more professional nurses, compared to physicians. In other words, the human resource barrier has been a factor in preventing nurses from providing quality developmental care that was not physically important to them (8). In the present study, there was no difference between the viewpoints of nurses and physicians regarding the dimension of human resources, which can be due to the better cooperation between Iranian physicians and nurses in implementing NIDCAP.

The relationship of the demographic characteristics of nurses and physicians was investigated with their viewpoints on the obstacles to NIDCAP implementation. According to the results, it was found that only the age of nurses correlated significantly with communication barriers, history of training with human resource barriers, and history of NIDCAP implementation with barriers to family-based care.

With respect to other demographic characteristics, such as work experience and education level, there was no significant relationship between these factors and the dimensions of barriers to the implementation of NIDCAP.

Senior nurses emphasized the communicational barriers in NIDCAP implementation. In this regard, in a study conducted by Barati et al. on the professional communication skills of the medical staff, it was found that age was a notable factor associated with communication skills. In other words, increasing age leads to a reduced level of communication skills (18). The reason for this difference is probably the fact that professional communication skills focus on the specialized aspects of communication; however, in the present study, the relationship is generally evaluated.

In a similar vein, Mosqueda et al. showed the work experience of caregivers as an obstacle to the implementation of this type of care (8). This result was not consistent with the findings of the present study since there was no relationship between them in this regard. It seems that with increasing work experience, the resistance of people to implement the new rules will increase and their tendency becomes more rooted; nonetheless, with increasing tendency to study and learn new therapeutic approaches, they can see a change in their attitudes toward new care approaches. Although the level of education of physicians and nurses did not correlate with the barriers of NIDCAP implementation, Zhang et al. found that a high educational level was one of the obstacles for the implementation of developmental care and a single assessment of the infant.

The reason was that younger nurses who have higher levels of education and less history of performing NIDCAP are less aware of this program and less likely to implement NIDCAP (14). Therefore, the presence of specialized

training is essential for NIDCAP employees and the core of this care program (6, 14).

Conclusion

According to the findings of this study, environmental-structural barriers were identified as the main barrier to the implementation of single-care and developmental care from the viewpoints of physicians and nurses. Therefore, hospital administrators should try to remove existing barriers by taking appropriate measures. The simple arrangements and cost-effective measures, such as adjusting and monitoring the lights, as well as sound and temperature of the specially designed environment can be a worthwhile step to improve the quality of infants' care with appropriate equipment.

Regarding the limitations of this study, it is worth mentioning that our focus was on the barriers that exist only in teaching hospitals under the supervision of a university due to the short time of postgraduate research. Therefore, it is suggested that further studies investigate the views of other providers of this kind of care in different teaching hospitals and compare the results with the findings of the present study. Moreover, considering the viewpoints of nurses and physicians about the barriers (i.e., structural-environmental and communication barriers) to the implementation of NIDCAP, further studies are required to moderate the above barriers and investigate its impact on the success rate of NIDCAP implementation.

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Conflicts of interest

There is no conflict of interest regarding the publication of this study.

References

1. Sadeghi A, Rassouli M, Gharehdaghi F, Nourian M, Nasiri M, Farhadi R, et al. Validation of the Persian version of premature infant pain profile-revised in hospitalized infants at the neonatal intensive care units. Iran J Pediatr. 2017; 27(5):e10056.
2. Alijahan R, Hazrati S, Mirzarahimi M, Pourfarzi F, Ahmadi Hadi P. Privalence and riskfactors associated with preterm birth in Ardabil, Iran. Iran J Reprod Med. 2014; 12(1):47-56.
3. Blencowe H, Cousens S, Oestergaard MZ, Chou D, Moller AB, Narwal R, et al. National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: a systematic analysis and implications. Lancet. 2012; 379(9832):2162-72.
4. Jaberi E, Mirkazemi R. A study on preterm births during 2013–2015, Shiraz, Iran. J Obstet Gynaecol. 2017; 38(1):22-6.
5. Dashti E, Rassouli M, Khanali Mojen L, Puorhoseingholi A, Shirinabadi Farahani A, Sarvi F. Neonatal factors associated with preterm infants' readmissions to the neonatal intensive care units. Hayat. 2015; 21(3):29-40.
6. Godarzi Z, Rahimi O, Khalessi N, Soleimani F, Mohammadi N, Shamshiri A. The rate of developmental care delivery in neonatal intensive care unit. Iran J Crit Care Nurs. 2015; 8(2):117-24.
7. Salimi M, Masoumpoor A, Shirinabadi Farahani A, Shakeri N, Alaee Karharoudy F, Shiri H. Auditing nursing care related to weaning neonates from mechanical ventilation in neonatal intensive care units. Hayat. 2016; 22(2):159-74.
8. Mosqueda R, Castilla Y, Perapoch J, Lora D, López-Maestro M, Pallás C. Necessary and barriers perceived by professionals in the implementation of the NIDCAP. Early Hum Dev. 2013; 89(9):649-53.
9. Haumont D. NIDCAP and developmental care. J Pediatr Neonatal Individ Med. 2014; 3(2):e030240.
10. Moore T, Hennessy EM, Myles J, Johnson SJ, Draper ES, Costeloe KL, et al. Neurological and developmental outcome inextremely preterm children born in England in 1995 and 2006: the EPICure studies. BMJ. 2012; 345:e7961.
11. Nakhshab M, Ahmadzadeh Amiri A, Dargahi S, Farhadi R, Yazdani J. The incidence rate of retinopathy of prematurity and related risk factors: a study on premature neonates hospitalized in two hospitals in sari, Iran, 2014-2015. J Kerman Univ Med Sci. 2016; 23(3):296-307.
12. Vandenberg KA. Individualized developmental care for high risk newborns in the NICU: a practice guideline. Early Hum Dev. 2007; 83(7):433-42.
13. Valizadeh L, Asadollahi M, Mostafa Gharebaghi M, Gholami F. The congruence of nurses' performance with developmental care standards in neonatal intensive care units. J Caring Sci. 2013; 2(1):61-71.
14. Zhang X, Lee SY, Chen J, Liu H. Factors influencing implementation of developmental care among NICU nurses in China. Clin Nurs Res. 2016; 25(3):238-53.
15. Hendrick-Munoz KD, Prendergast CC. Barriers to provision of developmental care in the neonatal intensive care unit: neonatal nursing perceptions. Am J Perinatol. 2007; 24(2):71-7.
16. van der Pal SM, Maguire CM, Cessie SL, Veen S, Wit JM, Walther FJ, et al. Staff opinions regarding the newborn individualized develomental care and assessment program. Early Hum Dev. 2007;

83(7):425-32.
17. Soleimani F, Torkzahrani S, Rafiey H, Salavati M, Nasiri M. Assessing factors influencing the quality of developmental care in neonatal intensive care units of Tehran. Iran J Pediatr. 2017; 27(1):e6733.
18. Barati M, Moini B, Afsar A, Ahmad Panah M. Professional communication skills of medical practitioners city in spring of 2010. Sci J Hamdan Uni Med Sci. 2012; 19(1):62-9.