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# Iranian parent-staff communication and parental stress in the neonatal Intensive Care Unit

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## Abstract:

**INTRODUCTION:** The birth of an infant requiring hospitalization in the neonatal Intensive Care Unit (NICU) uniformly is reported to be stressful for parents and family members. This study aimed to determine parent-staff communication in the NICU and its relationship to parent stress.

**MATERIALS AND METHODS:** Two hundred and three Iranian parents with preterm infants hospitalized in the NICU participated in this descriptive-correlational study. The participants were selected by the quota sampling method. Data collected included a three-part: questionnaire, the first part covered demographic parent and infant information, the second was the Parent-Staff Communication Scale (the score of which ranged from 0 to 180), and the third was the Parental Stress Scale (the score of which ranged from 0 to 102). Descriptive and inferential statistics including the Pearson's correlation coefficient test were applied to the data, using SPSS software Version 16.

**RESULTS:** This study revealed that fathers and mothers' stress and communication scores were almost comparable and both higher than expected. The total mean score of the two main variables, i.e., parent-staff communication and parental stress were, respectively,  $100.72 \pm 18.89$  and  $75.26 \pm 17.6$ . A significant inverse correlation was found between parental stress and parent-staff communication scores ( $r = -0.144$ ,  $P = 0.041$ ).

**CONCLUSIONS:** Based on this study finding showed that better parent-staff communication is related to lower parent stress scores, it is recommended that nurses and physicians receive specific skill training for the establishment of effective parent-staff communication. It is anticipated that such improved staff skills will help decrease parent stress and therewith likely promote parent and infant health in the NICU.

## Keywords:

Infant, Iran, neonatal Intensive Care Unit, parental stress, parent-staff communication

## Introduction

Birth of an infant is a stressful life event, and the birth of an infant who requires hospitalization in a neonatal Intensive Care Unit (NICU) for any reason causes significantly more stress for the family involved.<sup>[1]</sup> Worldwide, annually more than 15% of live newborns are admitted to NICUs. Many of them are born prematurely. It is estimated that each year more than 5 million hospital beds in the world are dedicated to the care of premature infants.<sup>[2]</sup> Keshavars *et al.* stated that the premature birth rate is 10% of live births in Iran.<sup>[3]</sup>

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Emotional and psychological stresses of parents with premature infants in NICUs may lead to inadequate parent-infant attachment, which increases the long-term vulnerability of infant and parents.<sup>[4]</sup> The parents of premature infants and of any infant admitted to a NICU are faced with various stressors such as maternal medical conditions before and after the birth, as well as other common stressors connected with accepting their roles as parents in the stressful environment of the NICU.<sup>[5]</sup> Such parents find themselves trapped under potentially critical emotional pressures.<sup>[2]</sup> In addition, the frequent separations from their child that are part of NICU hospitalization are very painful for parents.<sup>[6]</sup>

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Parents' stress is known to further increase when their infant's NICU stay is prolonged since they are perceived as visitors rather than parents of their infants, for long periods.<sup>[7]</sup> A study conducted in Iran showed that 73.8% of the NICU parents experienced severe stress, whereas only 20.9% and 5.2% of them, respectively, experienced moderate or mild stress. The stress involved in the NICU caregiver–parent interactions has been implicated as one of the important determinants of parents' stress.<sup>[8]</sup>

The parents of premature infants, especially the mothers, experienced high stress and a sense of hopelessness in the NICU.<sup>[9]</sup> This stress and hopelessness affected the interaction between infant and parent and the infant's emotional and physical development. Parents whose infants are admitted to a NICU experience more stress than parents of healthy newborns. NICU parent exhibits increased anxiety, depression, and trauma symptoms. According to Shin, such parents experience ambivalence, shame and embarrassment, and a sense of guilt and failure.<sup>[10]</sup> The most common reactions of their parental role change, namely, their inability to protect their newborn child from pain and to comfort their child effectively, include anxiety, hopelessness, loss of control, fear, uncertainty, and concern about their child's future.<sup>[7]</sup> Although great advances have been made over the past two decades in the care and treatment of premature infants, the supportive measures to care for their families have not increased significantly; NICUs continue to be extremely stressful for most families.<sup>[2]</sup>

### Aims

One of the most important indices of the quality of nursing care is the nurse–parent communication. Although the family-oriented NICU care model asserts that staff must involve the parents and other family members in the care and decision-making of their infant, there is little information on parents' perception of staff communication skills.<sup>[11]</sup> Therefore, this study aimed to investigate parent–staff communication from the parents' perspective and in its relationship to parent stress. The study was approved by the Institutional Review Board for research with human participants at Isfahan University of Medical Sciences.

## Materials and Methods

### Design

The study employed a cross-sectional, descriptive-correlational design. It examined the quality of parent–staff communication and its relationship to parent stress experienced by parents of prematurely born infants admitted to the NICU of one of three University Medical Centers in the city of Isfahan, Iran in 2015.

### Sample

The study participants in terms of parents consisted of fathers and mothers, and in terms of staffs comprised nurses and physicians. The parents were selected by the quota sampling method based on the parent and infant inclusion criteria. Quota sampling was chosen to assure that the number of parents from each of the participating hospitals was proportionate to the respective hospital's NICU bed numbers. The participants of each hospital were recruited through convenient sampling method.

Considering estimated population size of 1200, a sample size of 200 parents was considered as sufficient based on Krejcie and Morgan Daryle's suggestion.<sup>[12]</sup> Therefore, to account for attrition, 220 participants were selected. The study inclusion criteria were as follows: parents with prematurely born infants, who according to their medical records and verified by self-report without a history of psychiatric disorders such as major depression and/or anxiety and without major chronic and/or acute medical conditions requiring treatment.

Three questionnaires which were developed and validated in Persian version were used for data collection. The first questionnaire covered demographic parent and infant information. The second was the Parent–Staff Communication Scale (PSCS) and the third was the Parental Stress Scale (PSS). The PSCS consists of 30 items rated from 0 to 6 on a 7-point Likert Scale. Items were adapted from the Parent–Staff Association Inventory,<sup>[11]</sup> the Parental Stress Scale, NICU Inventory,<sup>[13]</sup> and the Nurses' Communication Skills Questionnaire.<sup>[14]</sup> The total score of the questionnaire is obtained by summing the values of the individual items yielding a minimum score of zero and a maximum score of 180, respectively.

The PSS is based on the Parental Stress Inventory,<sup>[8]</sup> the Daily Hassles Scale, Perceived Stress Scale (PSS-14),<sup>[15]</sup> and the DASS-21 Inventory.<sup>[16]</sup> The PSS consists of 17 items, is also scored from 0 to 6 on a 7-point Likert Scale, and yields a total score that ranges from 0 to 102. The content validity assessment of the in-house questionnaires consisted of the following steps: the initial drafts of the questionnaires were given to twenty experts in Isfahan University of Medical Sciences (11 faculty members of the Department of Nursing and Midwifery, two psychiatrists, two experts from the Department of Social Medicine, one professor in statistics, and four board certified pediatricians). The comments of these experts were analyzed, and revisions were made. After finalization for the assessment of internal consistency, the questionnaire was given to twenty independent parents with preterm infants who met the same criteria as the study parents and were cared for in one of the three University Medical Centers. After completion, Cronbach's alpha was calculated. The Cronbach's alpha

values for the PSCS and the PSS, respectively, were 0.89 and 0.9, indicating high internal consistency of the questionnaires.

### Subject recruitment and data acquisition

Participation of all the participants in this study was completely voluntary. Before data gathering, the researcher introduced herself, explained the aim of the study to the participants, and asked them to review and if desired sign the informed consent. To maintain confidentiality, the names of the parents and of the respective hospital were removed from the data collection sheets and replaced by numeric codes. Only the principal investigator held access to the code.

### Data analysis

For data analysis, statistical package for the social sciences (SPSS) software, version 16.0. (IBM Corporation, New York, U.S.) was utilized. Descriptive and inferential statistics including the Pearson’s correlation coefficient test were applied to the data.

## Results

Of the 220 subjects recruited successfully, 17 parents failed to complete the questionnaires, which left a total sample of 203 (response rate: 92.3%) participants with complete data. As Table 1 shows, the means and standard deviations of parent stress scores and the parent–staff communication scores were  $75.26 \pm 17.06$  and  $100.72 \pm 8.89$ , respectively. Based on the results from the Pearson’s correlation coefficient calculations, there is a significant statistical association between parent stress and the quality of parent–staff communication ( $P < 0.041$ ). The significant correlation coefficient of  $-0.144$  [Table 1] indicates that better parent–staff communication is associated with lower parent stress.

The results of the Pearson’s correlation coefficient test of parent stress scores with key parent and infant demographic variables showed that there is a negative significant correlation between parental stress and gestational age, number of parent–infant contacts, number of physician–parent contacts, and number of nurse–parent contacts. This means that parent stress appears to decrease with the increase in these variables. However, there was no significant correlation between parent stress and the infant’s length of hospitalization ( $P > 0.05$ ). Furthermore, the results of Pearson’s correlation coefficients showed a negative relationship between parent–staff communication and parental age. This means that with an older parent, the parent–staff communication score was poorer. There was a positive correlation between parent–staff communication with gestational age: The older the infants

at birth, the better the parent–staff communication. The parent–staff communication was not significantly correlated with the rest of the variables such as infant’s length of hospitalization and number of contacts between parent and infant, parent and physician, or parent and nurse [Table 2].

The results of the evaluation of the relationship between parent stress and demographic characteristics of the study population using independent *t*-tests showed no statistically significant relationship between parent stress and gender of infant, type of pregnancy, or history of previous NICU hospitalization; however, there was a significant statistical association between parent stress and history of infertility ( $P < 0.05$ ). Thus, parents with a history of infertility showed more stress than others. Furthermore, the results of independent *t*-test showed no statistically significant association between parent–staff communication and gender, type of pregnancy, history of infertility, and admission history [Table 3].

While the relationship between parent stress and the demographic variables of infant birth order and parent education levels using the F-test (ANOVA) was not significant. There was a significant correlation between parent stress and parent occupation as well as marital status ( $P < 0.05$ ). The F-test results also showed a statistically significant relationship between quality of parent–staff communication and parent education

**Table 1: Relationship between parental stress score and parent-staff communication score**

Main variables	Mean±SD	Correlation coefficient (r)	Significance level (P)
Parental stress	75.26±17.06	-0.144	0.041
Parent-staff communication	100.73±18.89		

SD = Standard deviation

**Table 2: Pearson’s correlation coefficients between the parental stress scores and parent-staff communication with quantitative variables**

Main variable 1	Demographic variable 2	r	P
Parental stress	Parental age	0.268	<0.001
	Gestational age at birth	0.263	<0.001
	Length of hospitalization	-0.083	0.279
	Number of contacts with the infant	0.372	0.033
	Number of children	-0.05	0.51
	Number of contacts with doctor	0.207	0.01
Parent-staff communication	Number of contacts with nurse	0.248	0.001
	Parental age	-0.156	0.026
	Gestational age	0.144	0.040
	Length of hospitalization	0.044	0.568
	Number of contacts with the infant	0.047	0.797
	Number of children	-0.02	0.79
	Number of contacts with doctor	-0.003	0.98
	Number of contacts with nurse	-0.04	0.82

levels ( $P < 0.05$ ), yet not between the infant’s birth order, parents’ occupation, or quality of spousal relationship. ( $P > 0.05$ ) [Table 4].

The  $t$ -test results revealed that the mean stress scores of mothers were significantly higher than of fathers ( $P < 0.05$ ), whereas the mean scores of parent–staff communication between mothers and fathers showed no significant difference ( $P = 0.959$ ) [Table 5].

## Discussion

The study results showed that better parent–staff communication was related to significantly lower parent stress scores. The study also showed that parent–staff communication was better with better educated and younger parents. However, no differences were observed when comparing parent–staff communication skills with fathers to those with mothers, nor was there an association

**Table 3: The relationship between the mean score of parental stress and parents-staff communication scores with demographic characteristics of the participants using independent  $t$ -test**

Main variable	Demographic characteristics	Mean±SD	$t$	Significance level ( $P$ )
Parental stress	Infant’s gender			
	Female	76.53±15.06	0.854	0.394
	Male	74.43±18.26		
	Type of pregnancy			
	Wanted	75.49±17.81	0.047	0.962
	Unwanted	75.37±14.72		
	History of infertility			
	Yes	80.91±15.05	2.14	0.034
No	74.11±17.25			
Parents-staff communication	Infant’s gender			
	Female	100.66±18.24	-0.40	0.968
	Male	100.77±19.37		
	Pregnancy type			
	Wanted	98.87±19.57	0.050	0.960
	Unwanted	104.28±17.48		
	History of infertility			
	Yes	97.35±19.98	-1.14	0.254
No	101.40±18.64			
History of admission	Yes	98.43±18.23	-0.751	0.454
	No	100.86±20.28		

SD = Standard deviation

**Table 4: Relationship between parental stress and parent-staff communication with some of demographic characteristics of the study population using ANOVA**

Main variable	Demographic variable	Level of variable	Mean±SD	$F$	Significance level ( $P$ )
Parental stress scores	Parents’ (mother and father) occupation	Unemployed	73.38±13.55	8.988	0.000
		Self-employed	67.03±14.73		
		Employee	83.92±18.20		
		Homemaker	78.39±16.74		
	Relationship with spouse	Excellent	76.52±19.44	2.959	0.033
		Good	72.69±14.23		
Parents-staff communication scores	Parent’s (mother and father) education level	No formal schooling	93.89±19.91	5.389	<0.001
		Primary degree	97.84±18.03		
		Secondary and high school education	92.26±13.16		
		Diploma (graduated from high school)	107.95±17.26		
		Higher than diploma (associate degree, bachelor’s degree, and higher education)	99.32±21.41		

SD = Standard deviation

**Table 5: Comparison of mothers and fathers in terms of parent stress and parent-staff communication**

Main variable	Parents	Mean±SD	t	Significance level (P)
Parental stress	Father	67.8±15.3	5.12	0.001
	Mother	79.8±16.6		
Parent-staff communication	Father	103.9±25.7	0.055	0.959

SD = Standard deviation

of parent–staff communication skills and a history of previous NICU hospitalizations or the type of delivery or pregnancy. Although Reid *et al.* reported that parents who rated communication with staff more negatively tended to have higher levels of anxiety/depression and more negative perceptions of social support, the Reid *et al.* study differed from the current study in that they reported a significant relationship between the infant's health status, length of stay in the NICU, type of delivery, and certain medical personnel factors such as doctor or nurse and the nurse's seniority level.<sup>[11]</sup> The differences in results of the two studies may be due to the different measures used, Reid's larger sample size (748), and the specific demographic variables examined.

The current study emphasizes the importance of staff–parent communication skills and of the frequency of communication between staff and parents in reducing parent stress in the NICU. Furthermore, parents' frequent contact with their infants appears very effective in reducing parent stress. One would conclude from the results that parents should have free access to their infants and the opportunity to live with their infants in the NICU,<sup>[17]</sup> which in turn appears to help reduce the parents' stress. Nyqvist and Engvall suggest that the parents of hospitalized newborns also must have the opportunity to communicate freely with the staff. Such a relationship must respect the parental role of the parents and is a two-way communication and exchange of information.

They also suggest that the role of the nursing staff should change from that of direct care provider to helper and guide of the parents so that they may care of their infants themselves. The nurses should support the parents in obtaining their natural parenting role in the NICU.<sup>[18]</sup> Montirosso *et al.* argue that the parents' informational needs also must be considered. They suggest that systematic programs are needed to ensure adequate information for the parents as well as ensure that they may share their feelings.<sup>[19]</sup>

The current study also found a significant relationship between high parental stress and a history of infertility, low occupational status, poor parent–spouse communication, early (young) parenthood age, and an early-born (low gestational age) infants. Staff awareness

of these factors will be important in terms of increasing staff efforts to compensate for these exacerbating factors with improved staff communication skills and frequency of contact.

Carter *et al.* also showed that parents experience high stress simply due to the fact that their infants are hospitalized in a NICU. Carter *et al.* also reported that mothers experienced more stress than fathers. Maternal stress was greater than paternal stress on subscales that related to sounds and lights in the ward, staff behavior and staff communication, NICU-related parental role change, and the appearance and behavior of the infant. The most stressful factor for both parents was the role change subsequent to their infant's NICU admission and hospitalization.<sup>[5]</sup>

Sloan *et al.* reported that fathers of infants admitted to a NICU experienced moderate stress. They suggested that the mean of the stress experienced by fathers was comparable to the average stress of the general population ( $11.96 \pm 7.08$ ). Among the main reasons for the lower stress experienced by fathers in the Sloan *et al.*'s study than the current study may be that Sloan *et al.* studied the fathers' stress after the acute phase of hospitalization when their infants were already steadily improving.<sup>[20]</sup> In contrast, the current and several other studies, which all reported higher parent stress scores, were conducted in the acute phase of NICU hospitalization.

Olshtain-Mann and Auslander showed that parents of preterm newborns even 2 months after discharge from the hospital still experienced higher levels of stress and lower levels of competence as compared with parents of full-term infants.<sup>[21]</sup> Schappin *et al.* concluded on the basis of a meta-analysis, in contrast to these and the current study, that the stress experienced by parents of preterm infants was only somewhat higher than the stress experienced by parents of term newborns. On the other hand, similar to the current study, they showed that mothers showed more stress than fathers, while the effect size was low. Finally, they stated that there was a strong association between parental stress level and the year of the newborn's birth; parental stress had gradually declined since 1980, which they attributed to the technological and the caregiving advances in NICUs.<sup>[22]</sup>

Most studies, similarly to the results of the current study as mentioned, showed that mothers in the NICU experienced more stress than fathers.<sup>[5,23,24]</sup> Jackson *et al.* suggest that due to the strong link made by mothers during pregnancy with their infant, mothers have an initially higher expectation of themselves regarding the role of a caregiver than fathers. Thus, when the preterm

infant is admitted to a NICU, mothers are reported to feel that they would take better care of their infant than the staff. They also are reported to feel that they have lost their role as the primary caregiver to the staff, while the fathers have more confidence in the personnel as specialist caregivers.<sup>[22,24]</sup>

The current study showed a statistically significant inverse relationship between parental stress and parent–staff communication. This means that with better parent–staff communication, parent stress is lower. Ballantyne found that after implementing an educational program of behavioral and information training for parents, parent stress was reduced; parents established more positive relationships with their infants, and they showed improved beliefs about their parental role.<sup>[25]</sup> According to Young Seideman *et al.* providing enough information and appropriate communication support for the parents as well as good physical care of the infants by the staff could help to reduce parental stress and increase parental adjustment. In NICU and pediatric Intensive Care Unit,<sup>[26]</sup> Ahn and Kim suggested that specific care training for the parents of infants hospitalized in the NICU improved parents' understanding of their infants. They also concluded that the improvement in the quality of family-centered care in the NICU and training provided tailored to the wishes of the parents in the NICU reduced fathers' stress although maternal stress was not reduced in this study.<sup>[27]</sup> Karami *et al.* (2009) demonstrated that educational, supportive intervention programs significantly reduced the stress of mothers of premature infants in the NICU/yet did not shorten the lengths of hospital stays.<sup>[28]</sup> The findings of Khalilzadeh *et al.* showed that after implementation of a family-centered care program, mean parental anxiety of the intervention group moved from intense to mild.<sup>[29]</sup> Preyde and Ardal examined the influence of a peer group (trained mothers who formerly had preterm infants admitted to the NICU) on stress, state and trait anxiety, depression, and perceived social support. Four weeks after implementing the program, the mothers in the intervention group reported less stress than the control group.<sup>[30]</sup>

Wigert *et al.* study such as results of our study showed when parents feel dissatisfied with their communication with staff, their stress increase. Therefore, they suggested that training both doctors and nurses in communication skills, especially in how to meet parents' emotional needs better, could make communication at the NICU more effective and improve parental well-being. Furthermore, they mentioned that creating a framework for the parents of what to expect from NICU communication might also be helpful. In addition, their results supported that the use of primary nurse teams could improve continuity of care and so to promote successful communication.<sup>[31]</sup>

The present study has shed light on the parent–staff communication and parental stress in the NICU which has been reported to be stressful and challenging for parents and clinicians, respectively. Nevertheless, results from univariate analyses have not included potential mediating factors comes from the study context, and therefore, it has added a caution on the interpretation and generalizability of the results. Therefore, we suggest future researches to consider multivariate analyses to capture interrelationships among other factors influential on the association between parent–staff communication and parental stress.

## Conclusions

The current study showed that with better parent–staff communication, parent stress decreases. Therefore, better staff education and training must be provided that targets the improvement of establishing effective therapeutic communication with parents; medical and nursing staff in NICUs has the professional responsibility to seek opportunities for education and training in their communication skills with parents to reduce significantly parental stress in the NICU.

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## Conflicts of interest

There are no conflicts of interest.

## References

1. Jones L, Woodhouse D, Rowe J. Effective nurse parent communication: A study of parents' perceptions in the NICU environment. *Patient Educ Couns* 2007;69:206-12.
2. Cleveland LM. Parenting in the neonatal Intensive Care Unit. *J Obstet Gynecol Neonatal Nurs* 2008;37:666-91.
3. Keshavars M, Eskandari N, Jahdi F, Ashaieri H, Hoseini F, Kalani M. The effect of Holly Quran recitation on physiological responses of premature infants. *Koomesh J* 2010; 11: 169-177.
4. Bagloo A, Valizadeh L, Asadullahi M. Comparison of midwives and nurses about the sources of stress in parents of premature infants admitted to neonatal Intensive Care Unit. *J Crit Care Nurs* 2011;21:11-6.
5. Carter JD, Mulder RT, Darlow BA. Parental stress in the NICU: The influence of personality, psychological, pregnancy and family factors. *Pers Ment Health* 2007;1:40-50.
6. Watson G. Parental liminality: A way of understanding the early

- experiences of parents who have a very preterm infant. *J Clin Nurs* 2011;20:1462-71.
7. Hall EO. Being in an alien world: Danish parents' lived experiences when a newborn or small child is critically ill. *Scand J Caring Sci* 2005;19:179-85.
  8. Heidari H, Hasanpour M, Fooladi M. Exploring the Concept of Parental Stress in the Neonatal Intensive Care Unit (NICU): Developing a Care Program Using Exploratory Mixed Method Research. [Dissertation for PhD Degree]. Isfahan, Iran: Isfahan University of Medical Sciences; 2013.
  9. Borimnejad L, Mehrnoosh N, Seyed Fatemi N, Haqani H. Stress in mothers of preterm infants admitted to neonatal Intensive Care Units. *J Crit Care Nurs* 2011;4:44-39.
  10. Shin HJ. Situational meaning and maternal self-esteem in mothers with high risk newborn. *Taehan Kanho Hakhoe Chi* 2004;34:93-101.
  11. Reid T, Bramwell R, Booth N, Weindling M. Perceptions of parent-staff communication in neonatal intensive care: The findings from a rating scale. *J Neonatal Nurs* 2007;13:64-74.
  12. Krejcie RV, Morgan Daryle W. Determining sample size for research activities. *Educ Psychol Meas* 1970;30:3, 607-10.
  13. Miles MS, Funk SG, Carlson J. Parental stressor scale: Neonatal Intensive Care Unit. *Nurs Res* 1993;42:148-52.
  14. Nasiripour AA, Saeidzadeh ZS, Sabahi Bidgoli M. Correlation between nurses' communication skills and inpatient service quality in the hospitals of Kashan University of Medical Sciences. *Journal of Health Promotion Management* 2011;1:45-54.
  15. Cohen S, Janicki-Deverts D. Who's stressed? Distributions of psychological stress in the United States in probability samples from 1983, 2006 and 2009. *J Appl Soc Psychol* 2012;42:6, 1320-34.
  16. Lovibond SH, Lovibond PF. Manual for the Depression Anxiety and Stress Scales. 2<sup>nd</sup> ed.. Sydney: Psychology Foundation; 1995.
  17. Heinemann AB, Hellström-Westas L, Hedberg Nyqvist K. Factors affecting parents' presence with their extremely preterm infants in a neonatal intensive care room. *Acta Paediatr* 2013;102:695-702.
  18. Nyqvist KH, Engvall G. Parents as their infant's primary caregivers in a neonatal Intensive Care Unit. *J Pediatr Nurs* 2009;24:153-63.
  19. Montirosso R, Provenzi L, Calciolari G, Borgatti R; NEO-ACQUA Study Group. Measuring maternal stress and perceived support in 25 Italian NICUs. *Acta Paediatr* 2012;101:136-42.
  20. Sloan K, Rowe J, Jones L. Stress and coping in fathers following the birth of a preterm infant. *J Neonatal Nurs* 2008;14:108-15.
  21. Olshtain-Mann O, Auslander GK. Parents of preterm infants two months after discharge from the hospital: Are they still at (parental) risk? *Health Soc Work* 2008;33:299-308.
  22. Schappin R, Wijnroks L, Uniken Venema MM, Jongmans MJ. Rethinking stress in parents of preterm infants: A meta-analysis. *PLoS One* 2013;8:e54992.
  23. van der Pal SM, Maguire CM, le Cessie S, Wit JM, Walther FJ, Bruil J. Parental experiences during the first period at the neonatal unit after two developmental care interventions. *Acta Paediatr* 2007;96:1611-6.
  24. Jackson K, Ternstedt BM, Schollin J. From alienation to familiarity: Experiences of mothers and fathers of preterm infants. *J Adv Nurs* 2003;43:120-9.
  25. Ballantyne M. An educational-behavioural intervention for parents of preterm infants reduced parental stress in the NICU and infant length of stay. *Evid Based Nurs* 2007;10:41.
  26. Young Seideman R, Watson MA, Corff KE, Odle P, Haase J, Bowerman JL. Parent stress and coping in NICU and PICU. *J Pediatr Nurs* 1997;12:169-77.
  27. Ahn YM, Kim NH. Parental perception of neonates, parental stress and education for NICU parents. *Asian Nurs Res (Korean Soc Nurs Sci)* 2007;1:199-210.
  28. Karami K, Rostami SH, Ghadirian F. Effect of educational-supportive interventions on premature infants' length of hospitalization and maternal stress. *Yafteh* 2009;11:67-73.
  29. Khalilzadeh H, Happiness F, Feizi A, Khalkhali H. The effect of family-centered care on the anxiety of a parent with a child with urinary tract infection hospitalized in the pediatric ward of Shahid Motahary Medical Training Center in Urmia. *J Urmia Sch Nurs Midwifery* 2012;11:34-41.
  30. Preyde M, Ardal F. Effectiveness of a parent "buddy" program for mothers of very preterm infants in a neonatal Intensive Care Unit. *CMAJ* 2003;168:969-73.
  31. Wigert H, Dellenmark MB, Bry K. Strengths and weaknesses of parent-staff communication in the NICU: A survey assessment. *BMC Pediatr* 2013;13:71.