

Maternal Stressor Agents with Premature Infants in Neonatal Intensive Care Units

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Abstract

Introduction: Birth of a premature infant is associated with separation from family and hospitalization. Actually, parents would undergo a lot of stress. The present study aimed to determine stressor agents of the mothers with premature infants admitted to the neonatal intensive care units (NICUs).

Methods: This was a descriptive study with 140 mothers with premature infants admitted to the NICUs of three educational medical centers affiliated to Tehran University of Medical Sciences using Parental Stressor Scale (PSS) Questionnaire of Miles and Funk (1998). The data analyzed using descriptive-analytical statistical method and SPSS 16 software.

Results: Among the cases related to environmental stressor agents, the following items were reported as the most experienced stressor agents by mothers: breathing apparatus for infants (37.9%), the sudden sound of the monitor buzzer (25.7%) and cases related to appearance and behavior of the infant and special treatments such as stop breathing (70.7%), sudden skin discoloration of infant (55%) and cases related to parental-neonatal relationship such as separation from the infant (69.3%) and feeling helpless to protect the infant from pain and painful procedures (60.7%). Furthermore, the aspect of "appearance and behavior of the infant and special treatments" was more stressful in comparison with other stressor aspects.

Conclusion: According to study findings, it is suggested to provide necessary preparations after the birth for parents (particularly mothers) with premature infants to face with the infants and make appropriate relation with them in NICUs.

Keywords: Neonatal Intensive Care Unit, Stressor agents, Mothers with premature infants, Premature infants.

Introduction

Preterm labor approximately includes 8 to 10 percent of the total labors and prematurity is considered as the most important cause of mortality and morbidity of the infants in all over the world without considering the congenital anomaly [1]. In recent decades, preterm birth rate substantially has been increased; hence, thank to NICUs, the mortality rate of this group of infants had been dramatically decreased [2]. Therefore, hospitalization of the infant in most of the cases is inevitable.

It may be possible that due to long-term hospitalization of the premature infant in NICU, the parents and family members experience sense of loss which causes disruption of the maternal-neonatal emotional connection; in fact, parents would undergo a

lot of stress [3]. The parents of the premature infant would experience high stress and sense of hopelessness in NICU which mostly is due to inadequate knowledge and awareness on how to play their parental role and how to interact with their premature infant during hospitalization. The parents are faced with many problems in how to interact with their infant. This process would influence parental interaction with the infant and emotional and physical growth and development of the infant. Prevalence of some of the problems such as depression, anxiety disorder and abnormality in parental patterns subsequently has been reported [4]. Moreover, the mental responses expressed by parents are hopelessness, guilt, sadness, depression, hostility, irritability, fear, anxiety, grief, loneliness, failure and losing confidence [5].

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Several studies of 70s to 90s indicated that sources of the parental stress include shape and appearance of the infant who is surrounded by equipments, the experience of multiple invasive treatments, changes in the parental roles, long-term separation and compatibility with hospital and NICU environment. Mothers often become happy for discharge of their infant but when they have to take all the responsibilities of the infant, they would confront with anxiety and depression [6].

Disregarding the parental emotional and psychological stress would cause parents do not have enough dependency to their infant at the time of discharge, which can increase the vulnerability of the infant and the parents [7]. Considering that most of these studies in our country have focused on treatment problems of this group of infants or taking care of the premature infant in hospital and published studies about family-centered nursing from these infants is low, this study aimed to determine the stressor agents of the mothers with premature infants admitted to NICU.

Methods

This was a descriptive study and its sample size estimated 140 subjects with 95% confidence level and 80% test set. It also should be noted that according to the similar studies, stress variance was considered equal to 0.45.

Mothers with premature infants admitted to NICU were randomly selected. The data collection tools included Parental Stressor Scale (PSS) of Miles and Funk (1998) and a questionnaire on demographic data of the mother and infant. This scale consisted of 34 statements which had been designed by Margaret Miles in 1998 to evaluate parental stressor agents during the hospitalization of their infants in NICU. This scale included lights and sound of the environment of NICU

(6 statements), appearance and behavior of the infant (17 statements) and changing parental roles (11 statements). Each item was scored based on Likert rating scale in six parts. Score 0 or no confronting means parents did not face with this stress at all; score 1 means no stress, i.e., parents did experience the case but had no stress; score 2 means there was very little stress; score 3 means there was a moderate stress; score 4 means there was a high stress and score 5 means there was a very high stress. The range of the scores was 0 to 170 and high scores indicated high stress of the parents.

The validity of the scale was evaluated by content validity. Hence, this scale had already been translated to Persian and by modifying some reforms, it was given to 8 faculty members of School of Nursing to be confirmed in terms of validity and again, it was given to two professors to be confirmed in terms of validity. Reliability of PSS was tested by Cronbach's Alpha method. For this purpose, the questionnaire was given to 15 eligible mothers and after collecting the data, the Cronbach's Alpha was obtained ($\alpha=0.86$). It should be noted that this 15 mothers excluded from the study.

The researcher, after obtaining the permission of Ethics Committee of School of Nursing and Midwifery of Tehran University of Medical Sciences and receiving the letter of introduction from the relevant authorities, referred to three hospitals of Akbar Abadi, Ali Asqar and Rasoul-e-Akram and after receiving the permission and approval from administrators of health department centers and related units, started the sampling. In this study, sampling was in consecutive method, i.e., the researcher referred everyday to NICU and collected the samples after explaining to the study objectives and completing the consent forms by mothers who had inclusion criteria for entering the study and had

willingness to participate. The questionnaire was completed once by the study samples in individual interviewing method conducted by the researcher.

Results

Mean age of the mothers was 26.88 ± 5.1 years. Seventy-nine subjects (56.4%) had cesarean delivery and 117 (83.6%) had vaginal delivery. Seventy-one mothers (50.7%) were primiparous, 48 (34.3%) were high school graduates, and 101 (72.8%) were not staying in the hospital. Ninety-five percent of the mothers were housewives, 42.9% were living in Tehran and 75.7% had no history of preterm labor in their family or relatives. The profile of the premature infants was as the following: 55.7% were the first child and 56% were males.

Their mean weight was 1840 ± 424.23 grams and birth weight dispersion was 1000 to 2500 gram; the gestational age at birth was 28 to 37 weeks with the mean of 32 ± 2.7 weeks. The results indicated that the following items were experienced by the mothers as the most

stressor agents: breathing apparatus for infants (27.9%), the sudden sound of the monitor buzzer (25.7%) and monitors and special facilities and equipments (17.1%).

Besides, the cases related to the appearance and special treatment included sudden skin discoloration of the infant (55%), pain in the infant (47.9%), frail and pale appearance of the infant (36.4%), abnormal and unusual respiratory patterns of the infant (36.4%) and connection of the pipes and equipments to them (26.4%) which reported as the most stressful agents, respectively. Among the cases related to parental-neonatal relationship, the following items reported as the most stressful agents, respectively: separation from the infant (69.3%), lack of breastfeeding by the mother (59.3%), feeling helpless to protect the infant from pain and painful procedures (60.7%) and loneliness in helping the infant during the painful procedures (53.6%). Mean and standard deviation of three areas of stressor agents for mothers in NICU (NICU environment, appearance and behavior of the infant and parental-neonatal relationship) is represented in Table 1; the

Table 1. The effectiveness of three areas of stressor agents of mothers in NICUs

Areas of Stressor agents	Minimum	Maximum	Mean	SD	p value
					df = 2
The environmental stressor of NICU	5	30	20.04	5.17	p = 0.000
The stressor agents of appearance and behavior	24	85	63.3	13.87	
The stressor agents of parental-neonatal relations	15	55	39.4	9.29	
Total stress of the mothers	55	170	123	24.97	

results of Friedman test showed the difference between stressor agents for mothers in NICUs. The mean score of stressor agents related to appearance and behavior of the infant area was higher than that of the other areas. Mean total stress in mothers was 123 ± 24.97 .

Discussion

The present study showed that the most stressor agent in mothers' view in order of importance included "the appearance and behavior of the infants and special treatment", "relationship of the parents and parental role" and "environmental factors". The results of the present study in terms of environmental stressors showed that "the sudden sound of the monitor buzzer and monitors and special facilities and equipments of the unit", respectively, were the most experienced stressor agents by mothers with premature infants in NICU. Frank (2004) believed that physical environment of NICU is a source of stress for the parents. Watching their ill infants connected to the equipments, pipes and wires that are surrounded by the physicians can be very annoying for the parents [5]. Therefore, it is recommended that parents, particularly mothers with high risk pregnancies be provided with some explanations before labor in NICU during checking the neonatal intensive care unit. These explanations include the causes of devices alarms, rush of the staff, equipments and facilities of the unit, ventilators, intravenous tubes and monitors [8]. Studies such as Miles (2003) and Griffen (1998) also emphasized the environmental stressor agents of NICU for the parents with premature infants [9, 10]. Considering the stressors related to the appearance and behavior and special treatments, the results of the present study indicated that stop breathing, sudden skin discoloration of the infant, pain in the

infant, frail and pale appearance, abnormal and unusual respiratory patterns and connection of the pipes and equipments to them reported as the most stressful agents, respectively. Griffen et al. (1998) showed that mothers, who experienced preterm labors and delivery of premature infants, reported the experience as the specific stressor and lack of physical and emotional preparation for the delivery. Sense of confusion and surprising would be manifested at this time and also mothers would search for an explanation for the preterm labor.

They have felt the sense of failure, because they were not able to continue their pregnancy till the full-term period [10]. The study results of Jarvi et al. (2006) showed that physical appearance of the premature infant also might be stressful. The characteristics of a premature infant should be explained to the parents such as size, lack of subcutaneous fat, infant's breathing and weak crying of the infant. Moreover, they should be told that the infant who has a tube inside the trachea is not able to cry. They should be told about infants characteristics with positive sentences [11]. The study of Nystrom et al. (2002) and Davis et al. (2003) showed that mothers had stress and anxiety about the appearance, behaviors and frail and weak appearance of the infants and also had fear of lack of survival of the infants [12, 13]. In stressor agents related to parental-neonatal relationship and parental roles, the results indicated that separation from the infant, lack of breastfeeding by the mother, and feeling helpless to protect the infant from pain and painful procedures and loneliness in helping the infants during the painful procedures reported as the most experienced stressful agents, respectively. Griffen et al. in his study showed that separation from the infant is one of the other stressful agents for the parents. Normally, after the labor, the premature infants

immediately are transferred to the NICU for primary efforts and are separated from the parents.

Short duration between the birth and the first meeting may reduce the stress of the parents [10]. The study of Frank et al. indicated that the most stressful reported source by the parents was losing expected and optimal parental role. Because they could not do their parental duties, they felt guilt and despair. Furthermore, they had a high sense of stress and frustration for their inability to protect their infants against the damages [5]. The study of Nystrom and Axelsson in Sweden (2002) indicated that mothers with premature infants admitted to NICU suffered from grief caused by separation and inability to take care of their infants in critical situations [12]. Furthermore, Carter et al. (2007) in a study showed that the most difficult source of stress was changes in parental role and they found that mothers had a higher stress than fathers [8].

References

1. Khalessi N, Kamerani K. Evaluation of surfactant effects on newborns. *Journal of Hamadan University of Medical Sciences*, 2006;13(3):5-9.
2. Fallahi M, Jodaki N, Mohseni H. The causes of mortality of hospitalized neonatal in Tajrish Hospital in 2004-2007. *Journal of Pajohande*. 2009;14(1):43-6.
3. Mok E, Loung SF. Nurses as providers of support for mothers of premature infant. *Journal of Clinical Nursing*. 2006;15(6):726-34.
4. Melnyk BM, Feinstein NF, Gillis LA, Fairbanks E, Crean HF, Sinkin RA, et al. Reducing premature infants' length of stay and Improving parents' mental health outcomes with the creating opportunities for parent empowerment (COPE) neonatal Intensive care unit program: A randomized, controlled trial. *Pediatrics*. 2006;118(5):1414-27.
5. Franck L.S, Cox S, Allen A. Measuring neonatal intensive care unit-related parental stress. *Journal of Advanced Nursing*. 2005;49(6):608-15.
6. Miles MS, Carlson JMS, Brunssen S. The nurse parent support tool. *Journal of Pediatric Nursing*. 1999;14(1):44-50.
7. Valizadeh L, Akbarbegloo M, Asadollahi M. Stressors affecting mothers with hospitalized premature newborn in NICUs of three teaching hospitals in tabriz. *Medical Journal of Tabriz University of Medical Sciences*. 2009;39(1):22-30.
8. Carter J.D, Mulder R.T, Darlow BA. Parental stress in the NICU: The influence of personality, psychological, pregnancy and family factors. *Personality and Mental Health*. 2007;1(1):40-50.

Conclusion

Considering the results of the present study, the parents of premature infants, particularly mothers would experience high stress and hopelessness in NICU which would influence parental interaction with the infant and emotional and physical growth and development of the infant. In such a situation, implementing measures which can protect the parents during the acute phase of hospitalization in NICU seems necessary. Therefore, it is recommended that after the birth of the premature infant, parents should be provided with the necessary preparations to face with infant in NICU and make appropriate relation with them in NICU.

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9. Miles MS, Brunssen SH. Psychometric properties of the parental stressor scale: Infant hospitalization. *Advances in Neonatal Care*, 2003;3(4):189-96.
10. Griffen T, Wishba C, Kavanaugh K. Nursing interventions to reduce stress in parents of hospitalized preterm infants. *Journal of Pediatric Nursing*. 1998;13(5):290-5.
11. Jarvi A, Haapamaki ML, Paavilainen E. Emotional and informational support for families during their Childs illness. *International Nursing Review*. 2006;53(3):202-10.
12. Nystrom K, Axelsson K. Mothers experience of being separated from their newborns. *JOGNN*. 2002;31(3):275-82.
13. Davis L, Edward H, Mohay H, Wollin J. The impact of very premature birth on the psychological health of mother. *Early Human Development*. 2003;73(2):61-70.