



# Evaluation of the Relationship Between Perceived Nursing Support and Parental Stress Among Mothers of Hospitalized Preterm Infants in Neonatal Intensive Care Units

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## Abstract

**Background and Aim:** Hospitalization of preterm infants in neonatal intensive care units (NICUs) is a stressful event for mothers. The present study aimed to evaluate the relationship between perceived nursing support and parental stress among mothers of hospitalized preterm infants.

**Methods:** This descriptive, analytical study was conducted on 100 mothers of neonates, who were hospitalized in the NICU of Valiasr Hospital, Birjand, Iran during 2014 - 2015. Data were collected using a questionnaire of demographic and clinical characteristics, nurse-parent support tool, and parental stressor scale. Data were analyzed using independent sample t test, one-way analysis of variance, Pearson's correlation test, and univariate or multivariate stepwise linear regression analysis.

**Results:** The mothers' parental stress had a significant inverse correlation with the perceived nursing support ( $r, -0.23; P = 0.02$ ). Among the subscales of perceived nursing support, only the subscale of emotional support was a significant predictor of parental stress and its subscales ( $P < 0.5$ ). Moreover, maternal stress was inversely correlated with neonatal age and birth weight ( $P = 0.01$ ).

**Conclusions:** Nursing support plays a pivotal role in alleviating stress among mothers of preterm infants. Therefore, nurses should provide adequate informational and emotional support for these mothers.

**Keywords:** Support, Nursing, Stress, Mother, Preterm Infant, Neonatal Intensive Care Unit

## 1. Background

Infants born before the 37th week of pregnancy are considered preterm. Each year, 15 million preterm infants are born in the world. The prevalence of preterm birth in different countries ranges from 5% to 18%. However, there are no reliable statistics on the prevalence of preterm birth in developing countries, including Iran (1). Due to the immaturity of body organs and systems, these infants suffer from or are at risk of a wide range of physical problems; therefore, most of them are hospitalized in neonatal intensive care units (NICUs) immediately after birth (1).

NICU hospitalization is an unexpected and highly stressful experience for parents (2), as it is associated with parent-infant separation and potential complications (3). Moreover, parents of preterm infants have limited or no knowledge about their infants' problems, their parental roles, and communication with their preterm infants during the hospital stay. These problems can negatively affect the infants' physical and emotional development and cause different problems for parents, such as depression

(2, 4), anxiety, despair, discomfort, aggression, irritability, fear, grief, hopelessness, low self-confidence, parental role changes, and feelings of guilt and failure (4).

Sources of parental stress include the size and appearance of the infant, presence of numerous equipments around the infant, invasive procedures used for the infant, changes in parental roles, long separation from the infant, prolonged hospital stay, and unique circumstances of NICUs; these problems are more serious among mothers than fathers (5). A study showed that long infant-mother separation causes different levels of anxiety and depression in mothers, undermines their ability to care for their infants, and negatively affects their relationship with their infants (6).

Due to different problems and lack of knowledge about preterm birth, mothers of preterm infants need strong nursing support (7). Informational and emotional support for these mothers helps them cope with their infants' hospitalization, enables them to continue care delivery to their infants after hospital discharge, empowers them

to control their situation (8), and improves infantile outcomes (2). Support for these parents is among the main nursing responsibilities. Nursing and medical staff can prevent infant-mother detachment during hospitalization and promote maternal involvement in infant care through providing the necessary information and support.

Due to their constant presence in NICUs, nurses play an important role in supporting mothers and alleviating their stress. On the contrary, inadequate responsiveness of NICU nurses to the parents' needs can cause high levels of fear and anxiety for the parents (9). In this regard, a study in NICUs of Italy showed that nursing support significantly alleviated parental stress, caused by the appearance and behaviors of preterm infants; however, it did not reduce the stress related to parental roles (5).

Despite the importance of nursing support for maternal and infantile outcomes, the main goal of neonatal nursing care in Iran is to meet the physical needs of hospitalized infants. However, there is limited information about the role of nursing support in alleviating stress among mothers of preterm infants (10). Therefore, the present study aimed to evaluate the relationship between perceived nursing support and parental stress among mothers of preterm infants in NICUs.

## 2. Methods

This descriptive, analytical study was conducted on 100 mothers of neonates, who were hospitalized in the NICU of Valiasr hospital, Birjand, Iran during 2014 - 2015. The sample size was calculated using the results of a previous study (3) and the following formula:

$$n = \left( \frac{\left( z_{1-\frac{\alpha}{2}} + z_{1-\beta} \right)^2}{C^2} \right) + 3 \quad (1)$$

The convenience sampling method was applied in the present study. Mothers were included if they had no psychological disorders and agreed to participate in the study. Also, their infants had no congenital diseases and were hospitalized in the NICU for at least 24 hours.

Data were collected using a questionnaire of demographic and clinical characteristics, nurse-parent support tool (NPST), and parental stressor scale (PSS). The demographic and clinical questionnaire included items on the infant's age, gender, birth weight, length of hospital stay, and history of hospitalization; mother's age, employment status, education level, and type of attendance at hospital; and mode of delivery, having another child, type of pregnancy, and multiple pregnancy.

NPST is a 21-item scale with 4 subscales of emotional support (5 items), informational and communicative support (7 items), esteem support (4 items), and quality caregiving support (5 items). Each NPST item is scored from 0 (never) to 4 (always). This scale has acceptable reliability (Cronbach's alpha, 0.90) and validity (5, 8, 11). Another data collection tool in this study was PSS. This scale contains 34 items on environmental stressors (6 items), behavioral/appearance stressors (17 items), and communicative stressors (11 items); each item is scored from 0 to 5. Previous studies have reported the acceptable reliability (Cronbach's alpha, 0.86) and validity of this scale (1, 4, 5).

The collected data were entered into SPSS v. 16.0. First, the data were tested in terms of normal distribution, using Kolmogorov-Smirnov test. Then, data analysis was conducted using independent sample t test, one-way analysis of variance, Pearson's correlation test, and univariate or multivariate stepwise linear regression analysis. In all analyses, the significance level was set at  $P < 0.05$ .

## 3. Results

In this study, 100 mothers of preterm infants, who were hospitalized in the NICU, were assessed. Nearly 39% of the participants had education below high-school diploma, 36% were 26 - 30 years old, and 90% were housewives (Table 1). The mean scores of parental stress and perceived nursing support were  $107.91 \pm 23.76$  and  $44.65 \pm 15.47$ , respectively.

The results of independent sample t test and one-way analysis of variance showed that the mean scores of parental stress and perceived nursing support had no significant relationship with maternal age, employment status, type of attendance at hospital, type of pregnancy, multiple pregnancy, having another child, infant's gender, or length of hospital stay ( $P > 0.05$ ). Moreover, mothers' perceived nursing support had no significant relationship with the infants' age ( $P = 0.68$ ). However, the results of one-way analysis of variance revealed that maternal stress was significantly correlated with the age of their infants ( $P = 0.01$ ).

The results of Tukey's post hoc test showed that the mean score of parental stress was significantly higher in mothers whose infants were  $< 30$  days in comparison with mothers whose infants were  $\geq 31$  days ( $P = 0.01$ ). In addition, mothers' mean score of parental stress significantly changed relative to the infants' birth weight ( $P = 0.001$ ). The results of Tukey's post hoc test showed that the mean score of parental stress was significantly higher in mothers of infants with a birth weight  $\leq 1300$  g, compared to the mothers of infants with a birth weight  $\geq 1301$  g ( $P < 0.05$ ; Table 1).

**Table 1.** The Mean Scores of Mothers' Parental Stress and Perceived Nursing Support Based on the Demographic and Clinical Characteristics of Mothers and Infants

Characteristics	Stress and Support				
	No. (%)	Parental Stress		Perceived Nursing Support	
		Mean ± Standard Deviation	P Value	Mean ± Standard Deviation	P Value
<b>Mother's age, y</b>			0.98		0.08
≤ 25	33 (33)	107.73 ± 21.97		40.15 ± 16.82	
26 - 30	36 (36)	107.42 ± 23.60		45.33 ± 14.77	
≥30	31 (31)	108.68 ± 26.41		48.64 ± 13.97	
<b>Education level</b>			0.64		0.73
Illiterate	9 (9)	107.78 ± 32.33		40.56 ± 6.54	
Below diploma	39 (39)	111.64 ± 20.02		44.56 ± 16.25	
Diploma	34 (34)	104.76 ± 24.83		44.26 ± 16.26	
Bachelor's degree	18 (18)	105.83 ± 25.45		47.61 ± 15.90	
<b>Employment status</b>			0.83		0.23
Housewife	90 (90)	107.73 ± 23.73		44.02 ± 15.06	
Employed	10 (10)	109.50 ± 25.26		50.30 ± 18.75	
<b>Having another child</b>			0.15		0.60
No	40 (40)	103.68 ± 21.17		45.65 ± 17.06	
Yes	60 (60)	110.73 ± 25.12		43.98 ± 14.43	
<b>Mode of delivery</b>			0.14		0.39
Normal vaginal delivery	31 (31)	102.65 ± 23.55		46.65 ± 17.49	
Cesarean section	69 (69)	110.28 ± 23.64		43.75 ± 14.53	
<b>Hospital attendance</b>			0.69		0.32
Constant	46 (46)	106.89 ± 23.30		42.98 ± 14.59	
Temporary	54 (54)	108.78 ± 24.33		46.07 ± 16.19	
<b>Type of pregnancy</b>			0.52		0.21
Wanted	78 (78)	107.09 ± 24.81		45.68 ± 15.77	
Unwanted	22 (22)	110.82 ± 19.83		41 ± 14.14	
<b>Multiple pregnancy</b>			0.12		0.76
Yes	10 (10)	96.70 ± 24.33		43.20 ± 13.19	
No	90 (90)	109.16 ± 23.51		44.81 ± 15.77	
<b>Infant's gender</b>			0.58		0.48
Female	46 (46)	106.47 ± 25.25		45.85 ± 14.91	
Male	54 (54)	109.13 ± 22.58		43.63 ± 16.01	
<b>Infant's age, d</b>			0.01		0.68
≤ 30	24 (24)	119.83 ± 23.68		46.63 ± 14.94	
31 - 34	44 (44)	106.36 ± 22.50		44.80 ± 16.82	
> 34	32 (32)	101.09 ± 22.88		42.97 ± 14.18	
<b>Infant's birth weight, g</b>			0.001		0.44
≤ 1300	33 (33)	120.94 ± 22.94		45.73 ± 15.40	
1301 - 2000	38 (38)	105.42 ± 22.04		46.08 ± 14.31	
> 2000	29 (29)	96.35 ± 20.14		41.55 ± 17.07	
<b>Length of hospital stay, d</b>			0.06		0.08
< 3	38 (38)	100.68 ± 21.07		43.87 ± 14.75	
4 - 8	39 (39)	113.18 ± 23.12		41.82 ± 16.08	
> 8	23 (23)	110.91 ± 26.87		50.74 ± 14.54	

The results of Pearson's correlation test showed that emotional support was inversely correlated with parental stress and subscales of environmental, behav-

ioral/appearance, and communicative stressors ( $P < 0.05$ ). Moreover, informational and communicative support had a significant inverse correlation with parental stress and

subscale of behavioral/appearance stressors ( $P < 0.05$ ). Quality care-giving support was also inversely correlated with the environmental stressor subscale of parental stress ( $P = 0.02$ ). Finally, perceived nursing support had a significant inverse correlation with parental stress and subscales of environmental and behavioral/appearance stressors ( $P < 0.05$ ; [Table 2](#)).

The results of univariate linear regression analysis revealed that perceived nursing support could explain 5% of the total variance of parental stress ( $P = 0.02$ ). Moreover, stepwise multiple linear regression analysis showed that among the subscales of perceived nursing support, only emotional support was a significant predictor of parental stress and its subscales ( $P < 0.5$ ; [Table 3](#)).

#### 4. Discussion

The present study aimed to evaluate the relationship between perceived nursing support and parental stress among mothers of preterm infants hospitalized in the NICU. The findings indicated a significant inverse correlation between the mothers' perceived nursing support and parental stress ( $P = 0.02$ ). Similarly, the results of a previous study showed that social support diminished the effects of stress in mothers of preterm neonates ([12](#)). Another study on the parents of hospitalized preterm infants reported that parental stress had an inverse correlation with perceived nursing support; also, mothers experienced higher levels of stress than fathers ([3](#)). Overall, parental stress and anxiety can be alleviated through encouraging parents to visit their infants at hospital, involving them in clinical decision-makings, and educating them about infant care ([13](#)). Another study on the parents of preterm infants indicated that stress-reducing interventions for nurses had significant effects on maternal stress, but no major effects on fathers' stress. However, no explanation was presented for the insignificant effects of nursing interventions on the fathers' stress ([14](#)).

Generally, nurses are advocates for their patients and play significant roles in educating and supporting mothers for infant care ([15](#)). The findings of the present study revealed that among the subscales of perceived nursing support, only emotional support was a significant predictor of mothers' parental stress ( $P = 0.003$ ). The greatest predictive power of emotional support was related to the subscale of environmental stressors.

However, an earlier study reported that emotional support only had a significant negative correlation with stress due to parental role changes. This contradiction may be attributed to differences in the statistical methods, sociocultural contexts, and NICU services in these studies ([10](#)). In

line with our findings, another study reported that emotional and informational support by healthcare providers enabled mothers to cope with their situation and environment and alleviated their anxiety and stress ([16](#)).

Identification and management of stress factors in parents of hospitalized infants can significantly alleviate their stress. For instance, encouraging parents to use monitoring devices or equipment alarms can be stress-relieving ([17](#)). In addition, the physical environment of the NICU is a major source of stress for parents. Parents may feel highly stressed by seeing numerous equipments, tubes, devices, and wires connected to their infants. Therefore, women with high-risk pregnancies need to visit the NICU during pregnancy and receive information both during and after pregnancy ([18](#)).

Among the demographic and clinical characteristics, only infant's age and birth weight had significant correlations with the mothers' parental stress; in fact, mothers of infants with a lower birth weight and younger age experienced higher levels of parental stress. An earlier study also reported that the small and thin body of a preterm infant is a major source of stress for the parents; therefore, healthcare providers need to inform the parents that their infants will gain weight over time ([19](#)). Our findings also showed that as infants grow older, the level of maternal stress decreases significantly; this may be due to the increase in body size and weight over time.

#### 4.1. Conclusions

Nursing support, particularly emotional support, plays a pivotal role in alleviating stress among mothers of preterm infants. Nurses need to increase their knowledge about the potential stressors for mothers of preterm infants in order to provide adequate emotional and informational support for these mothers and alleviate their parental stress. Given the limitations of quantitative studies, which mainly focus on data collection through structured questionnaires, in-depth qualitative studies are recommended to determine the major causes of parental stress among mothers of hospitalized preterm infants.

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**Table 2.** Correlation of Perceived Nursing Support and Its Subscales with Parental Stress and Its Subscales

Nursing Support	Stress			
	Environmental Stressors	Behavioral/Appearance Stressors	Communicative Stressors	Total
<b>Emotional support</b>				
r	-0.28	-0.24	-0.24	-0.30
P Value	0.005	0.02	0.02	0.003
<b>Informational and communicative support</b>				
r	-0.14	-0.22	-0.09	-0.21
P Value	0.160	0.03	0.37	0.05
<b>Self-esteem support</b>				
r	-0.10	-0.08	-0.06	-0.09
P Value	0.31	0.45	0.53	0.35
<b>Quality care-giving support</b>				
r	-0.23	-0.15	-0.09	-0.18
P Value	0.02	0.14	0.36	0.08
<b>Total</b>				
r	-0.22	-0.21	-0.14	-0.23
P Value	0.03	0.04	0.15	0.02

**Table 3.** The Regression Analysis for Prediction of Mothers' Parental Stress Based on the Perceived Nursing Support

Dependent Factors	Independent Factors	B	SE	Beta	t	P Value	Adjusted R-Squared
Parental stress	Total nursing support	-0.36	0.15	-0.23	2.36	0.02	0.05
	Emotional support	-1.49	0.48	-0.30	3.09	0.003	0.09
Environmental stressors	Emotional support	-0.36	0.13	-0.28	2.88	0.05	0.08
Behavioral/appearance stressors	Emotional support	-0.73	0.30	-0.24	2.46	0.02	0.06
Communicative stressors	Emotional support	-0.40	0.17	-0.24	2.40	0.02	0.06

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