IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e- ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 7, Issue 2 Ver. X (Mar-Apr .2018), PP 40-49
www.iosrjournals.org

Evaluation of Mothers' Stress in the Neonatal Intensive Care Unit

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This reaearch was presented as an Oral Presentation on EAP 2017 Congress and Mastercourse in Ljubljana, Slovenia, on October 12-15, 2017.
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Abstract:
Objectives: *To determine the reasons for stress in mothers who had a hospitalized baby in the neonatal intensive care unit (NICU).*
Methods: *The data were collected using a self-administered questionnaire that was distributed to 150 mothers who had infants in the NICU. The questionnaire included some of the mother's and baby's characteristics, "parental stressor scale: neonatal intensive care unit", and "nurse parent support tool".*
Results: *The mean age of mothers was 27.7±6.9 years. The reasons for infant hospitalization included: sepsis (27.3%), respiratory complaints (26.0%), prematurity (25.3%), and other causes (21.3%). According to the parental stressor scale, mothers were most likely to become stressed in situations related to their baby's appearance and behaviors. There was a significant relationship between the mean score obtained from the baby's appearance and behaviors and gestational age, baby's length at birth, mother's and father's educational levels. The support provided by nurses to mothers was characterized as follows: "provide good care to her child", "be optimistic about her child" and "understand the special needs of her child".*
Conclusion: *It was determined that intensive care units for mothers is quite stressful. Being aware of the stressful conditions can help the mother get through this process with little trauma.*
Key words: *mother-infant relations; neonatal intensive care; nurse*

Date of Submission: 09-04-2018 Date of acceptance: 25-04-2018

I Introduction

Parents waiting impatiently for the birth of a healthy baby become frustrated if their newborn babies have to stay in the neonatal intensive care unit (NICU) due to a health problem. The uncertainty about the survival of their baby and about its later life, the feeling that they have lost control over an event that is important to them and their lives, and having to be physically and emotionally separated from their baby lead to such stressful feelings as distress, restlessness, guilt, helplessness, sleep disturbances, fatigue, worry, fear, etc.[1-3].

One of the important factors increasing stress in parents is the physical and psychosocial characteristics of the NICU. The sights and sounds of the monitors in the intensive care unit, the infant's physical appearance and behaviors, and parent-infant relationships and parental roles play an important role in the development of stress [4]. Several studies conducted on the issue report that the most important cause of stress experienced by families regarding the NICU environment is the infant's physical appearance and behaviors which reflect that the baby is suffering pain, and the sights of various devices such as needles and tubes attached to the baby. Another important cause of stress is the loss of the parental role. Being separate from the baby, not being able to nourish the baby and not knowing how to help the baby create significant stress in mothers. The most stressful situation in terms of the sights and sounds of monitors in the intensive care unit is that the baby is connected to a breathing apparatus. It has also been shown that these factors, which create stress, have the effect of increasing the level of stress caused by each other[5-8].

To alleviate the stress experienced by families, important tasks fall to the health personnel working in the NICU. In this regard, of the health care workers, those who are in the closest contact with patients' relatives are nurses. Nurses are not only concerned with the care and treatment of infants who are admitted to the NICU but also witness the stressful situations of their families and try to provide support for them[2,9]. Relevant studies report that nurses being concerned about the mood of the parents, helping them in the intensive care of the baby and letting parents talk with them about their babies whenever they wish alleviate parents' stress. As a result of this support, parents adapt to the intensive care environment more successfully [7, 9-11].

The aim of this study was to determine the stress levels of mothers' whose infants are hospitalized in the NICU of our city's hospital and the sources of the stress they suffer. The second aim was to determine the situations where the nurses provide support for the mothers in the intensive care environment and to evaluate the effect of this support on the mothers' stress levels.

II Material and methods

Setting and sample

The population of this descriptive study comprised mothers whose infants were hospitalized in the NICU of a public gynecology and pediatric hospital in Mersin between October 15, 2016 and January 15, 2017. Between these dates, 344 babies were admitted to the NICU. Of the mothers in the study population, 143 (107 of them were Syrian refugees) who were not literate in Turkish, 21 who had babies with anomalies and 30 who refused to participate in the study were excluded from the study. Therefore, the study was conducted with 150 mothers.

Data collection

Three forms were used to collect the study data. The forms were filled in by the mothers themselves. One of the forms had 18 questions, including socio-demographic characteristics such as the mother's age, educational status and profession, her husband's educational status and profession, her family's monthly income, her pregnancy and childbirth history, and some characteristics of the infant hospitalized in the NICU. The second form was the parental stress scale: neonatal intensive care unit (PSS: NICU) developed by Miles, Funk and Carlson in 1993[4]. The third form was the nurse parent support tool (NPST) developed by Miles, Carlson, and Brunssen in 1999[12].

PSS:NICU was developed to determine parents' perceptions of stressors arising from the physical and psychosocial environment of the NICU. Since it is a self-assessment scale, it is administered only to literate parents who can understand what they read. The study of the validity and reliability of the Turkish version of the scale was carried out by Turan & Başbakkal (2006)[13]. The cronbach's alpha coefficient of the PSS:NICU was 0.89 in the first evaluation and 0.90 in the second evaluation. The scale consists of three subscales: (1) the 6-item sights and sounds of the monitors in the NICU, (2) the 17-item infant's physical appearance and behaviors, and (3) the 11-item parent-infant relationships and parental roles subscale. Each item is rated on a 5-point likert scale: 0=not applicable, 1=not at all stressful, 2=a little stressful, 3=moderately stressful, 4=very stressful, 5=extremely stressful.

NPST was developed to determine how much support a nurse who gives care to the hospitalized infant gives to the infant's mother. The study of the validity and reliability of the Turkish version of the tool was carried out by Turan, Başkale & Öncel (2016)[14]. The cronbach's alpha coefficient was 0.95 for the original scale and 0.92 for the turkish version. Each item of the 21-item tool is scored on a 5-point likert-type scale (never, rarely, sometimes, often and always). The higher the score obtained from the tool is, the higher the perceived level of support.

The procedure in NICU

The physical conditions of the NICU in our study hospital and the procedures implemented after the baby's admission to the intensive care unit are as follow: in the NICU, 2 physicians, 35 nurses and 7 other personnel work. There are 37 incubators, 34 monitors and 11 ventilators in the unit. When the infant is admitted to the NICU, the physicians inform the parents about the infant's disease, the treatments to be applied, and the average length of stay in the NICU. Parents are given information about the baby's condition at admission to the NICU and every monday and thursday after the admission by the physicians. This information is given both to the mother and father at the same time, and they are allowed to see their babies during this period. The father is not allowed to see the baby except for monday and thursday as long as there are no special circumstances (e.g., surgery, worsening of the baby's condition, referrals, etc.). Mothers are trained by the nurses on hand hygiene, personal hygiene, breastfeeding, storage conditions of the breastmilk, feeding intervals, and special care applications for babies (such as colostomy care or wound care if the baby has undergone surgery). There is a 10-bed room for mothers to stay in the hospital. Mothers who stay in the hospital and feed their babies are told at what intervals they should nourish their babies. They are also told to wash their hands for feeding, to wear their aprons before entering the NICU, and to disinfect their hands before touching their babies. If there are other issues about which the mother wants to be informed, the intensive care workers also help with them.

Ethical considerations

To carry out the study, approvals were obtained from the ethics committee of Mersin University Social Science Researches (Irb no:2016/41) and from the general secretariat of the provincial public hospitals association, with which the hospital where the study was to be conducted was affiliated.

Data analysis

After the data were loaded onto the computer, whether the continuous variables were normally distributed was evaluated by the Kolmogorov-Smirnov test. Because the variables did not have the normal distribution, nonparametric tests were used in the analysis of the data. Descriptive statistics (percentage, mean values, standard deviation, median, minimum-maximum values) were used to summarize the data. The Mann-Whitney U test was used to assess the significance of the difference between the two means, the Kruskal Wallis variance analysis was used to compare the mean values of more than two groups, and the spearman correlation analysis was used to evaluate the linear relationship between the two continuous variables. $p<0.05$ was considered statistically significant.

III Results

The median age of the 150 mothers who participated in the study was 27 years (range 17-48). Of the mothers in the study, 62.0% had a primary school or lower level of education, and 96.0% were housewives. The participants stated that their monthly family income was about $400. The median number of pregnancies was 3 (range 1-8), and the median number of living children was 2 (range 1-6). Of the babies staying in the NICU, 54.0% were boys. The median gestational age was 38 weeks (range 24-41). Their median birth weight was 3100 grams (range 1000-4500) and birth length was 50 cm (range 34-52). The median day of life for the babies' admission to the NICU was 1 day (range 1-30 days), and the median length of stay in the NICU was 6 days (range 1-51 days). Causes for the infants' admission to the NICU were as follow: sepsis (27.3%), respiratory distress (26.0%), premature birth (25.3%), and others, such as pneumonia, dehydration, hypoglycemia, or bilirubinemia (21.3%)

The comparison of the mothers' stress states according to the three subscales of the PSS:NICU revealed that they were mostly stressed by their babies' appearance and behaviors (3.57 ± 0.97), followed by the sights and sounds in the intensive care unit (3.41 ± 1.00), and parent-infant relationships and parental roles (3.36 ± 0.85). The mothers' mean stress score was 4.21 ± 0.83.

The mothers stated that, of the stressors related to the sights and sounds in the NICU, the one which stressed them most was the sounds produced by the heart rate monitor and other devices (3.64 ± 1.11). Of the stressors related to the appearances and behaviors of their babies, the one which stressed them most was witnessing when their babies stopped breathing (3.85 ± 1.23).of the stressors related to their parental roles, the one which stressed them most was not being able to protect their babies from painful interventions and thus feeling helpless (3.93 ± 1.12) (Table 1).

Table no1. "Neonatal Intensive Care Unit: Parental Stress Scale" Results

	Mean	Standard Deviation
Sights and sounds	**3.41**	**1.00**
Presence of monitors and equipment	3.41	1.23
Noises of monitors and equipments	3.64	1.11
Sudden noises of monitor alarms	3.63	1.12
Other sick babies in the room	3.26	1.29
Large number of staff	3.01	1.47
Respirator/Continuous positive airway pressure	3.53	1.49
Infant's Appearance and Behavior	**3.57**	**0.97**
Presence of tubes and equipments	3.41	1.18
Seeing bruises/cuts/incisions on baby	3.33	1.40
Unusual color of baby	3.50	1.27
Seeing abnormal breathing	3.54	1.34
Small size of baby	3.43	1.26
Wrinkled appearance of baby	3.28	1.35
Needles/tubes put in	3.53	1.24
Baby fed by tube or intravenous line	3.55	1.28
Seeing baby in pain	3.75	1.18
Seeing baby in sad	3.74	1.20
The limp or weak appearance of baby	3.67	1.21
Jerky movements	3.63	1.18
Baby not crying like other babies	3.63	1.29
Baby long cry than other babies	3.60	1.28
Baby looks afraid	3.56	1.24
Change of color	3.73	1.30
Stop breathing	3.85	1.23
Parental role alteration	**3.36**	**0.85**
Separation from baby	3.91	0.97
Not feeding baby	3.79	1.21
Not being able to care	3.69	1.09

Not being able to hold baby	3.81	1.08
Feeling helpless and unable to protect baby	3.93	1.12
Feeling helpless about how to help baby	3.74	1.16
Not alone with baby	3.62	1.27
Sometimes for getting what baby looks like	3.42	1.39
Not being able to share baby with other family members	3.39	1.33
Afraid of holding baby	3.47	1.37
Feeling that staff is closer to baby	3.23	1.55
General Stress Score	**4.21**	**0.83**

There was no significant relationship between the mean scores the participants obtained from the 3 subscales of PSS:NICU (the sights and sounds of the monitors in the intensive care unit, the infant's physical appearance and behaviors, parent-infant relationships and parental roles) and the variables such as the participants' age, their husbands' profession, their number of live births, their number of induced and spontaneous abortions, their number of living children, the sex of the baby, and whether the pregnancy was an intended one.

There was a positive, significant relationship between the sights and sounds in the NICU subscale and the family's monthly income level (r=.226, p=.006) and the baby's length of stay in the NICU (r=.194, p=.018). There was a significant negative relationship between the sights and sounds in the NICU subscale and the baby's age at admission to the NICU (r=-.181, p=.026) (table 2, table 3). The mean scores the working mothers obtained from the sights and sounds in the NICU subscale were higher than those scores obtained by the housewives (p = 0.15) (Table 4).

Table no 2. The results of correlation between parental stress subscales and nurse support questionnaire results and some socio-demographic characteristics of mother and previous pregnancy story

	SightsandSounds	Infant'sAppearanceandBehavior	Parental Role Alteration	NurseSupport	Age	MonthlyIncome	No.ofPregnancy	No.of Live Births	No.of InducedAbortion	No.of Spontaneous Abortion	No.of LivingChildren
SightsandSounds	1										
Infant'sAppearanceandBehavior	.548***	1									
Parental Role Alteration	.375***	.672***	1								
NurseSupport	.165*	.321***	-.294***	1							
Age	.000	-.003	.043	-.032	1						
MonthlyIncome	.226**	.228**	.098	.130	.034	1					
No.ofpregnancy	.034	-.031	.026	-.019	.641***	-.003	1				
No.ofLive Births	.021	-.053	-.028	-.037	.594***	.054	.878***	1			
No.ofInducedAbortion	.019	.056	.049	.079	.311***	.038	.458***	.172	1		
No.ofSpontaneousabortion	.040	-.002	.004	-.020	.240**	-.015	.460***	.142	.192*	1	
No.ofLivingChildren	.018	-.041	-.015	-.030	.597***	-.054	.877***	.996***	.175**	.145	1

*p<.05, **p<.01, ***p<.001

*p<.05, **p<.01, ***p<.001

Table no 3. The results of correlation between parental stres scale subscles and nurse support questionnaire averages and some characteristics of the baby

	Sights and sounds	**Infant's Appearance and Behavior**	**Parental Role Alteration**	**Nurse support**	**Gestation At Birth**	**Birth weight**	**Birth height**	**Age at the baby was attended in NICU**	**Length of stay at NICU**
Sights and sounds	1								
Infant's Appearance and Behavior	.548***	1							
Parental Role Alteration	.375***	.672***	1						
Nurse support	.165*	.321***	-.294***	1					
Gestation At Birth	-.147	-.188*	-.286***	-.223**	1				
Birth weight	-.090	-.117	-.183*	-.249**	.802***	1			
Birth height	-.073	-.217**	-.275**	-.298***	.738***	.872***	1		
Age at the baby was attended in NICU	-.181*	-.135	-.223**	-.156	.488***	.437***	.456***	1	
Length of stay at NICU	.194*	.221**	.281***	.316***	-.544***	-.483***	-.445***	-.496***	1

*p<.05, **p<.01, ***p<.001

There was a positive, significant relationship between the baby's appearance and behaviors subscale and the family's monthly income level (r=.228, p=.005) and the baby's length of stay in the NICU (r=.221, p=.007) (table 2, table 3). There was a significant negative relationship between the baby's appearance and behaviors subscale and the gestational age (r=-.188, p=.021) and the baby's length at birth (r=-.217, p=0.008)(table 2, table 3). The mean scores obtained from the baby's appearance and behaviors subscale by the mothers and fathers who were high school or university graduates were higher than were those scores obtained by the mothers and fathers who had primary school or lower education (p<.001 and p=.036, respectively) (table 4). The mean scores the working mothers obtained from the same subscale were higher than the scores obtained by the housewives (p=.007) (table 4).

There was a significant negative relationship between the parent-infant relationships and the parental roles subscale and the gestational age (r=-.286, p<.001), the baby's length at birth (r=-.275, p=.001),the baby's age at admission to the NICU (r=-.223, p=.006) and the baby's weight at birth (r=-.183, p=.025).there was a significant positive relationship between the parent-infant relationships and parental roles subscale and the baby's length of stay in the NICU (r=.281, p<.001) (table 3).the mean scores obtained from the parent-infant relationships and parental roles subscale by the mothers who were high school or university graduates were higher than those scores obtained by the mothers who had primary school or lower education (p=.025) (table 4). The mean scores obtained from the same subscale by the mothers whose babies were admitted to the NICU due to premature birth were those obtained by the mothers whose babies were admitted to the NICU due to sepsis (p=.005) (Table 4).

Table no 4. The relationship between parental stres scale subfactors and nurse support questionnaire results and the results of some family and baby characteristics

	Sights and sounds (Median)	**Infant's Appearance and Behavior (Median)**	**Parental Role Alteration (Median)**	**Nurse support (Median)**
Education status				
Less than primary school	3.50	**3.41*** **	**3.29***	4.09
Secondary school	3.50	3.88	3.54	4.23
High school and university	3.75	**4.38*** **	**3.84***	4.19
Employment				
Unemployed	**3.50***	**3.55****	3.38	4.14
Employed	**4.16**	**4.55**	3.84	4.11
Husbands' Education levels				
Less than primary school	3.50	**3.47***	3.26	4.11
Secondary school	3.50	3.58	3.38	4.04
High school and university	3.50	**4.08***	3.61	4.21
Husbands' Employment				
Blue-Collar worker	3.50	3.55	3.39	4.14

Self-Employed	3.50	3.58	3.35	4.23
White-Collar worker	4.58	4.20	3.52	4.28
Officially married				
Yes	3.50	3.55	3.35	4.14
No	3.50	3.97	3.76	4.21
Current pregnancy unintended				
No	3.50	3.58	3.38	4.14
Yes	3.83	3.88	3.54	3.95
Baby's sex				
Girl	3.50	3.64	3.57	4.14
Boy	3.50	3.58	3.29	4.14
The reason for the hospitalization of NICU				
Respiratorydistress	3.50	3.58	3.57	4.19
Sepsis	3.50	3.94	**3.79****	**4.30*****
Prematurity	3.50	3.47	**3.21****	**3.76*****
Other**	3.50	3.50	3.35	4.14

*p<.05,** p<.01, ***p<.001
**Other: Pneumonia, Dehydration, Hypoglycemia, Bilirubinemia

The option marked by the mothers regarding the support given to them by the nurses was "they provided support most of the time" (mean score: 4.03±0.59). The issues on which they received the most support were as follows: provide good care to their babies (4.53±0.57), optimistic about child (4.51±0.57) and sensitive to child's individual needs (4.27±0.73). The issues on which they received the least support were as follows: familiarizing mothers with the names and roles of the team members providing care to the child (3.62±1.21), including her in discussions when decisions were made (3.63±1.17), and showing concern for the mother's well-being (3.75±1.10) (table 5).

Assessment of how mothers perceived the support given to them by nurses indicated that there was not a statistically significant relationship between the nursing support and the variables such as mother's age, mother's and father's education levels and professions, family's monthly income, number of pregnancies, number of live births, number of induced and spontaneous abortions, number of living children, and whether the last pregnancy was an intended one. However, the mothers stated that the support given by the nurses increased as the gestational age (r= -.223, p=.006), birth weight (r= -.249, p=.002), and birth length (r= -.298, p<.001) decreased and as the length of stay in the NICU (r= .316, p<.001) increased (table 3, table 4). In addition, it was determined that the nurses provided more support to the mothers whose babies were hospitalized due to premature birth than to the mothers whose babies were hospitalized due to sepsis (p <.001) (table 5). As the mean stress scores the mothers obtained from the sights and sounds in the intensive care unit subscale (r=.165, p=.044) and from the parent-infant relationships and parental roles subscale (r=.294, p<.001) increased, so did the nurses' support. However, as the nursing support increased, the mean stress score for the parent-infant relationships and parental roles decreased (r=.321, p<.001) (Table 3).

Table no 5. "Nurse-Parent Support Tool" Results

Nursing support variables	**Rank ordering of importance**	**Mean**	**Standard Deviation**
Help talk about feelings, worries, concerns	17	3.89	1.05
Help understand what is done to child	8	4.09	0.85
Teach how to give care to child	10	4.03	0.86
Make me feel important as parent	9	4.07	0.95
Let me decide whether to stay medical procedures	13	3.96	1.00
Answer questions or find some else	14	3.95	0.87
Tell me about changes in child's condition	15	3.94	0.91
Include me in discussions when decisions made	20	3.63	1.17
Help me understand child's behaviors/reactions	16	3.92	0.91
Help me know how to comfort my child	11	4.00	0.99
Let me know ı am doing a good job helping child	12	3.97	0.96
Respond to my worries or concerns	18	3.79	1.04
Show concern about my well-being	19	3.75	1.10
Help me know names and roles of staff	21	3.62	1.21
Provide good care to my child	1	4.53	0.57
Encourage me to ask questions about child	7	4.17	0.84
Are sensitive to child's individual needs	3	4.27	0.73
Allow me to be involved in child's care	6	4.21	0.93
Show they like my child	4	4.23	0.84
Respond to child's needs in timely fashion	5	4.21	0.74
Are optimistic about child	2	4.51	0.57
Overall mean		**4.03**	**0.59**

IV Discussion

In the present study, the mothers of the newborn infants admitted into the NICU stated that their babies' staying in the intensive care unit was a very stressful situation. When the mothers were asked to rate their stress level out of 5 points, of which a score of 5 referred to extreme stress, the mean score they gave to their stress was 4.2 points, which correlated with high stress. The overall stress score was 3.82 in Pritchard and Montgomery-Hönger's study [5] and 2.96 in the study by turner et al.[6].in the present study, the overall stress score was higher. In the hospital in which the present study was carried out, although mothers and fathers are informed about their baby's condition upon the baby's admission to the NICU and at certain intervals after the admission by the physicians, and they are told what to do to establish better mother-infant relationship by the nurses, the mothers were still very stressed, which suggests that providing mothers with such information did not reduce their stress. It is assumed that factors causing stress in the mothers should be determined, and interventions related to the issue should be performed.

In our study, of the three subscales in the PSS:NICU, the infant's physical appearance and behaviors subscale caused the most stress to the mothers (3.57 points). While the sights and sounds in the intensive care unit-related stress was second (3.41 points), the parent-infant relationships and parental roles-related stress was third (3.36 points). In the current study, all three factors related to the intensive care unit caused the mothers moderate levels of stress, and the levels were close to each other. In several studies, the ranking of these three subscales and the mean stress scores obtained from these subscales may vary. While the infant's physical appearance and behaviors caused the most stress in Pritchard and Montgomery-Hönger's study [5](2.50 points) as in our study, parent-infant relationships and parental roles caused the most stress in some other studies [6,8,14,15]. The comparison of the stress levels revealed that the stress score in the study by Chourasia et al. [8] was higher (4.12 points) than in our study. However, in other studies, it was similar to or lower than in our study[6,14,15].

The intensive care environment is a source of stress for the parents of admitted babies. In the early period after her baby is admitted to the NICU, the mother's attention focuses on the technology in the NICU environment that is unfamiliar to her, and the sight of the tools and devices there can be shocking to her. Therefore, families should be familiarized with the NICU environment [16,17]. In our study, the mothers stated that of the stressors related to the sights and sounds in the NICU, the one which stressed them most was the sounds produced by the heart rate monitor and other devices (3.64 points). The results obtained in the studies by turan et al. [14] (3.00 points) and grosik et al. [7] (3.45 points) were similar to the results obtained in our study. In the studies by chourasia et al. [8] (4.34 points) and turner et al. [6] (3.39 points), what stressed the mothers most was their infants' attachment to the respiratory device. As the age at which the baby was admitted to the intensive care unit decreased and as the length of the baby's stay in the intensive care unit increased, the mothers' stresses caused by the sights and sounds of the NICU increased. Additionally, the working mothers' stress scores were higher than the scores of the housewives. Similar to our study, Chourasia et al. [8] found that, as the length of the babies' stay in the intensive care unit increased, so did the mothers' stress levels, and socio-demographic characteristics such as the number of births and the education levels of the parents did not significantly affect the mothers' stress levels. On the other hand, while the mothers' age did not affect their stress level in our study, in the study by Chourasia et al. [8], the mothers' stress level increased as their age decreased. In turner et al.'s study (6), the mothers' stress level caused by the sights and sounds of the NICU increased as the mother's age and the gestational age decreased and if they had twin babies. In the same study, the parents' education levels had no effect on their stress levels. In Konukbay and Arslan's study [18], the proportion of those mothers who did not perceive the sights of the NICU as frightening increased as the education level increased. However, in our study, the parents' education level did not affect their stress levels.

Apart from the environmental factors of the intensive care unit, the physical appearance and behaviors of the baby are very stressful for the parents. Parents who expect to have a healthy baby during pregnancy are unprepared for the appearance of their baby. The various interventions that the low weight or size babies and the babies with an unhealthy appearance undergo when they are admitted to the NICU are a source of great concern for mothers [17]. In the current study, the mothers stated that, of the stressors related to the appearances and behaviors of their babies, the one which stressed them out most was witnessing that their babies stopped breathing (3.85 points). Grosik et al. [7] (4.43 points) obtained similar results to those of the present study. However, in the studies by Turner et al. [6] (3.17 points) and Turan et al.[14] (3.29 points), the parents suffered stress most when they witnessed their babies' suffering pain, and in Chourasia et al.'s study[8] (4.30 points), when they witnessed that some needles and/or tubes were attached to their babies. In the present study, the mothers' stress scores increased as the gestational age and birth length of the baby decreased and as the length of the baby's stay in the NICU increased. Additionally, the stress scores were higher in the working mothers than in the housewives. Similar to our study, Chourasia et al.'s study[8] showed that, the longer the baby's stay in the NICU, the greater the parents' stress levels. In turner et al.'s study[6], the mothers' stress levels related to the infants' appearance and behavior increased more if they had pre-term babies. Davis et al. [19] reported that parents did not know how to use their coping strategies as their education levels decreased, and because their education

levels were low, they could not recognize what was going on in the NICU and thus suffered more stress. However, in the present study, the parents with higher education levels were more stressed about the appearance and behaviors of their babies. This difference may be because families with high educational levels have fewer children, and they fear losing them. This situation can also be true of working mothers. However, one limitation of the study is that we did not ask the mother if this baby was the family's first child.

One of the most important issues causing mothers stress is the change in their parenting roles when their babies are hospitalized. They perceive themselves as inadequate because they think they cannot even take care of their babies' basic needs, such as breastfeeding the baby, changing the baby, or protecting the baby against harm [17]. In the current study, the mothers stated that, of the stressors related to their parental roles, the one which stressed them most was that they could not protect their babies from painful interventions and felt helpless (3.93 points). Parents suffered stress most when they were not with their babies in the studies by Turan et al. [14] (3.86 points), Turner et al. [6] (4.32 points) and Grosik et al. [7] (4.27 points), when they could not feed their babies (4.27 points), and when they did not know how to help their babies (4.57 points) in Chourasia et al.'s study [8]. In Konukbay and Arslan's study [18], the parents had the greatest concern when they could not participate in the care of their child staying in the intensive care unit. In our study, the mothers became more stressed as the baby's birth week, birth length and age at admission to the NICU decreased and as the length of the baby's stay in the NICU increased. The stress scores obtained from the parental roles subscale by the mothers who were high school or university graduates were higher than those scores obtained by the mothers who had primary school or lower education. In addition, the stress scores obtained from the parental roles subscale by the mothers whose babies were admitted to the NICU due to premature birth than were those obtained by the mothers whose babies were admitted to the NICU due to sepsis. Similar to our study, in Chourasia et al.'s study [8], prolonged length of stay in the intensive care unit increased the stress levels of the mothers. Additionally, Chourasia et al.'s study [8] showed that the stress level of premature infants' mothers was higher than that of mothers of full-term newborns. In turner et al.'s study [6], the stress score obtained from the parental roles subscale increased if the baby was a pre-term baby.

Giving birth to a sick baby, the baby's admission to the NICU, and the NICU environment can be so stressful that the parents need support [7].establishing communication with the parents and providing them with information about their babies' health status, familiarizing them with the intensive care environment, and allowing the mother's participation in the care of the babies reduce their stress. In this regard, of the health care workers, those who are in the closest contact with parents are nurses [2,10,17]. Parents cannot always be together with their babies in the intensive care unit, and thus knowing that in the unit there are nurses who care about the baby comforts mothers [20].in the present study, the mothers stated that intensive care nurses often gave support to them. The issues on which they received the most support were as follow: looking after their babies, optimistic about their child and understanding the specific needs of their child. In studies conducted on the issue, mothers stated that intensive care nurses treated their children very positively [12,14,15,21]. However, the mothers also stated that they did not receive enough support from the nurses in some cases related to them. In the present study, the mothers indicated that the issues on which they received less support were as follows: familiarizing mothers with the names and roles of the team members providing care to their children, allowing mothers to participate in discussions about the child, and showing concern for the mother's well-being. Similar results were obtained in the literature [14,21]. In Guillaume et al.'s study [22], the parents indicated that consistent communication was always necessary. They also stated that the nurse's introducing himself/herself in a friendly way by saying "my name is x, and i am looking after your baby" was also important for them. In Çalışır et al.'s study [11], approximately 2/3 of the mothers wanted the hospital staff to show that they understood them, and a large majority of the mothers (85.7%) said that they needed to be able to talk to the nurse who was looking after their baby whenever they wanted.

In the present study, there was no relationship between the support given by nurses to the mothers and socioeconomic characteristics, such as the mother's age and educational status, her or her husband's educational status and professions, the family's monthly income and the history of previous pregnancies of the mother. In their study, Mok and Leung [21] obtained similar results. Health care workers are supposed to provide equal services to people who present to receive health service, regardless of their socioeconomic levels. In the present study, the intensive care nurses displayed very positive attitudes in this regard. The nurses' support of the mother increased if the baby was pre-term or if the length of the baby's stay in the intensive care unit was long. The support also increased as the mother's stress due to the sights and sounds in the intensive care unit and parental roles increased. The nurses tried to give the mothers more support when they noticed that their stress level was high. In the current study, the factors most stress-inducing to the mothers were due to the appearance and behaviors of the babies. As the nursing support increased, the stress score related to the infants' appearance and behaviors decreased. This finding indicates that when their baby is admitted to the NICU, intensive care workers' familiarizing parents with the intensive care unit and the features of the devices in the unit, telling them what interventions the baby might undergo and how the baby will look will reduce mothers' stress levels.

Limitations of the study: This study was conducted only with the mothers of babies who were admitted to the NICU of a public hospital within a certain period of time (3 months), which is a main limitation of the study. Because the fathers were not included in the study, the stress they experienced was not assessed.

V Conclusion

The mothers who had babies in the NICU experienced high levels of stress. They felt the stress most in situations related to their babies' appearance and behaviors. Stress caused by the sights and sounds of the intensive care devices, by the baby's appearance and behaviors and by the parental roles affect one another mutually, and the presence of stress caused by one factor either triggers the stress likely to be caused by another factor or is added to it. Of the mothers, those who had pre-term babies or who had babies small in weight and/or length, or whose babies' age at admission to the NICU was low were more stressed. Prolonged length of stay in the NICU also increased the mothers' stress levels. If the mother's and father's education level was high or if the mother was a working mother, the stress level was higher. Being aware of these stressful conditions can help the mother get through this process with little trauma.

It seems that the nurses were very supportive in reducing the stress of the mothers. The NICU nurses' treating everybody equally regardless of the socioeconomic status of the families indicated that they behaved ethically. The mothers noted that the nurses were quite supportive with issues related to the baby, but less supportive on the issues such as familiarizing the mothers with the names and roles of the team members providing care to their children, mothers' participating in decision making processes, and showing concern for the mother's well-being. It is considered that mothers' being informed about the intensive care environment, the baby's appearance in this environment and the interventions the baby is likely to undergo will reduce mothers' stress levels.

Conflicts of interest: The authors declared no conflict of interest.
Source of funding: This research did not receive any specific Grant from funding agencies in the public, commercial, or not-for-profitsectors.

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Gulcin Yapici "Evaluation of Mothers' Stress in the Neonatal Intensive Care Unit "IOSR Journal of Nursing and Health Science (IOSR-JNHS) , vol. 7, no.2 , 2018, pp. 40-49