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DETERMINING THE STRESS AND ANXIETY LEVELS OF MOTHERS WITH INFANTS IN THE NEONATAL INTENSIVE CARE UNIT DURING THE COVID-19 PANDEMIC

COVID-19 PANDEMİSİ DÖNEMİNDE BEBEĞİ YENİDOĞAN YOĞUN BAKIM ÜNİTESİNDE YATAN ANNELERİN STRES VE ANKSİYETE DÜZEYLERİNİN BELİRLENMESİ

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ABSTRACT

Objective: The hospitalization of a newborn for any reason and the separation of mother and infant can be a source of stress during the Covid-19 pandemic. The aim of this study was to determine the stress and anxiety levels of mothers with babies in the neonatal intensive care unit (NICU) during the pandemic.

Methods: This descriptive study was carried out with 105 mothers whose babies were hospitalized in the NICU of a hospital in Eskisehir province in Turkey between May 14 and June 14, 2020.

Results: Participants ranged in age from 18 to 42 years old, with an average age of 29.63±5.78. It was determined that 54.3% of the infants (n=57) were admitted to the NICU immediately after birth and remained in the NICU for an average of 7.61±15.18 days. It was found that mothers experienced moderate stress (PSS: NICU score 3.48±0.99) and anxiety (PSAS score 82.07±21.41) during the pandemic. A significant positive relationship was found between PSAS and PSS: NICU (p=.003; r=0.290).

Conclusions: It was concluded that in order to reduce levels of stress and anxiety, mothers with babies in the NICU during the pandemic period should increase the time they spend with their baby, and both doctors and nurses should provide mothers with information about the infant's condition.

Keywords: Anxiety, COVID-19 pandemic, stress, neonatal intensive care unit

ÖZET

Amaç: Covid-19 Pandemisi döneminde herhangi bir sebeple bebeğin hastaneye yatırılması ve anne ve bebeğin ayrı kalması bir stres kaynağı olabilmektedir. Araştırma, pandemi döneminde bebeği yenidoğan yoğun bakım ünitesinde (YYBÜ) yatan annelerin stres ve anksiyete düzeylerini belirlemek amacıyla yapıldı.

Yöntemler: Tanımlayıcı tipte olan bu araştırma, 14 Mayıs – 14 Haziran 2020 tarihleri arasında Eskişehir ilinde bulunan bir hastanenin YYBÜ'nde bebeği yatan 105 anne ile tamamlandı.

Bulgular: Katılımcıların yaşları 18 ile 42 arasında değişmekte olup, yaş ortalamaları 29.63±5.78'tür. Bebeklerin %54.3'ünün (n=57) doğduktan hemen sonra YYBÜ'ne yatışının yapıldığı ve ortalama 7.61±15.18 gün YYBÜ'ne yatmakta oldukları belirlendi. Araştırmada pandemi döneminde annelerin orta düzeyde stres (NICU Anne-Baba Stres Ölçeği 3.48±0.99) ve anksiyete (PSAS Ölçeği puanı 82.07±21.41) yaşadıkları saptandı. PSAS Ölçeği ile NICU Anne-Baba Stres Ölçeği arasında önemli düzeyde pozitif yönlü bir ilişki saptanmıştır (p=0.003; r=0.290).

Sonuç: Çalışmada, pandemi döneminde bebeği YYBÜ'ne yatan annelerin stres ve anksiyete düzeyinin azaltılması için, bebeği ile birlikte geçireceği sürenin artırılması gerektiği ve bebeği hakkında bilginin hem doktor hem de hemşire tarafından verilmesi gerektiği bulundu.

Anahtar Kelimeler: Anksiyete, COVID-19 pandemisi, stres, yenidoğan yoğun bakım ünitesi

INTRODUCTION

The COVID-19 virus created a worldwide pandemic starting at the beginning of 2020 (1,2). Many measures have been taken to prevent the spread of the disease in Turkey and throughout the world and efforts have been made to keep hospital bed capacities in balance. These measures include contact isolation, quarantine, frequent hand washing, and social distancing (2). In this process, going out of the house and especially to the hospital causes anxiety about the possibility of falling ill (3). There are however mandatory situations that require being in the hospital during the pandemic (4). One of these is the need to hospitalize a newborn for close monitoring and treatment.

Being a mother is one of the most pleasurable experiences in a woman's life. However, adapting to a new situation that presents added responsibilities can be psychologically challenging for a mother (5-7). Hospitalization of a newborn for any reason and separation of the mother and baby can be a further source of stress in this period (8-10), especially in a pandemic, when mothers can experience much more anxiety and stress (1,7,11). This is why nurses need to determine and be aware of the needs of mothers with babies in the neonatal intensive care unit (NICU) during high-risk periods such as a pandemic and make an effort to reduce anxiety and stress through the use of the appropriate nursing approach.

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The aim of this study was to determine the stress and anxiety levels of mothers with infants in the NICU during the pandemic.

MATERIAL AND METHODS

Research Type

The study is descriptive and cross-sectional.

Location and Time of the Research

The research was carried out at the NICU of a hospital in Eskisehir province in Turkey between May 14 and June 14, 2020.

Research Sample

Sample calculations was not made in the study; the total count method was used instead. The research was completed within one month after the required permissions were obtained. A total of 105 mothers of infants in a NICU participated in the study. Research inclusion criteria were the mothers' consent for participation in the study, the ability to speak, read and write in Turkish, and not having the infant connected to a mechanical ventilation device.

Data Collection Tools

A "Descriptive Information Form," the "Parental Stressor Scale: Neonatal Intensive Care Unit (PSS: NICU)" and "Postpartum Specific Anxiety Scale (PSAS)" were used to collect the study data.

The descriptive information form was designed by the researchers in line with the literature (5,6,9), and includes questions about the sociodemographic characteristics of the mothers, the presence of chronic diseases, and COVID-19.

The Parental Stressor Scale: Neonatal Intensive Care Unit (PSS: NICU) was designed by Miles et al. (1993) to measure the parental perception of stressors arising from the physical and psychosocial environment of the NICU (Cronbach's alpha=0.94 and 0.89) (12). The Turkish validity and reliability study of the PSS: NICU was carried out by Turan and Başbakkal (2006) (Cronbach's alpha=0.89 and 0.90). The scale consists of 29 items and has three sub-dimensions: Parental Role Alterations, Sights and Sounds of the Unit, and Infant Behavior and Appearance. The scale is a 5-point Likert-type of scale (1 = Not Stressful, 2 = Mildly Stressful, 3 = Moderately Stressful, 4 = Very Stressful, 5 = Extremely Stressful). In the scale score calculation, when there is an item that cannot be applied to the parent, that item is not marked but calculated as 1 point (not stressful). The mean score on the scale is expressed as between 1 and 5, and the increase in the score shows increased stress (9). Cronbach's alpha coefficient in this study is 0.96.

The Postpartum Specific Anxiety Scale (PSAS), developed by Fallon et al. (2016), is used to assess symptoms of postpartum anxiety. The scale consists of 51 items and has four sub-dimensions. These sub-dimensions are Maternal competence and attachment anxieties, Infant safety and welfare anxieties, Practical infant care anxieties, and Psychosocial adjustment to motherhood. In the analysis of the internal consistency of the PSAS, Cronbach's alpha coefficient of reliability was .88 for the overall scale (6). The validity and reliability study of the Turkish version of the PSAS was carried out by Duran (2020) (Cronbach's alpha=0.91). Four items on the scale were not included in the scoring. The scale score calculation consists of 47 items and a single dimension. Each item on the scale is scored on the basis of 1 = Not At All, 2 = Not Very Often, 3 = Often, and 4 = Almost Always. Scores of 73 and below indicate "mild" symptoms of anxiety, scores between 74 and 100 points indicate "moderate", and 101 points and above indicate "severe" symptoms of anxiety (5). Cronbach's alpha coefficient in this study is 0.96.

Data Collection

The data were collected in a questionnaire through face-to-face interviews with the mothers of infants hospitalized in the NICU.

Ethical Aspect of the Research

Approvals for the study were obtained from the COVID-19 Scientific Research Evaluation Commission of the Ministry of Health (Date:04.05.2020 No:2020-05-03T17_48_56), the relevant Ethics Committee (Date:06.05.2020 No:25403353-050.99-E.46292), and the institution (Date:13.05.2020 No:52167207-604.02-E.906). In addition, permission was received for use of the scales in the study. Only mothers who supplied their voluntary written consent were included in the study.

Statistical Analysis

The data collected were analyzed with the IBM SPSS 21.0 package program; $p < .05$ was considered statistically significant. Continuous data are provided in terms of mean ± standard deviation (SD), frequency, median, minimum (min) and maximum (max). Categorical data are expressed in percentages (%). The Shapiro-Wilks test was used to examine the distribution normality of the data. Since the data were not normally distributed, the Kruskal-Wallis and Mann-Whitney U tests were performed. The Pearson chi-square analyses were used in the analysis of the cross tables created.

RESULTS

Participants ranged in age from 18 - 42 years old, at a mean age of 29.63±5.78. The mean number of the mothers' living children was 1.87±0.91 (1-4). All mothers were married,

Table 1. Comparison of Mothers' Descriptive Characteristics with Stress and Anxiety Scores (n = 105)

Variable	n (%)	PSS: NICU Scores		Statistical	PSAS Scores		Statistical
		Median	Min-Max	Analysis	Median	Min-Max	Analysis
Educational Status							
Illiterate	2 (1.9)	2.76	2.54-2.99		59.50	58.00-61.00	
Primary Education	23 (22.0)	3.59	1.20-5.00	χ^2 = 3.958	82.00	53.00-135.00	χ^2 = 4.000
High school	41 (39.0)	3.88	1.11-5.00	p = .266	76.00	54.00-140.00	p = .261
University	39 (37.1)	3.20	1.40-5.00		76.00	47.00-128.00	
Income Level							
Income < Expenses	23 (21.9)	3.52	1.11-5.00	χ^2 = 1.012	85.00	54.00-122.00	χ^2 = 2.870
Income = Expenses	72 (68.6)	3.51	1.20-5.00	p = .603	74.50	47.00-140.00	p = .238
Income > Expenses	10 (9.5)	3.34	2.75-4.58		88.00	55.00-122.00	
Number of Living Children of Mothers							
1 or 2 children	81 (77.1)	3.50	1.11-5.00	Z = -0.218	84.00	53.00-140.00	Z = -2.649
3 or more children	24 (22.9)	3.66	1.20-5.00	p = .828	70.50	47.00-135.00	**p = .008**
Baby's Week of Gestation							
<37 weeks	27 (25.7)	3.40	1.11-5.00	χ^2 = 5,287	76.92	47.00-140.00	χ^2 = 2,997
37 - 40 weeks	74 (70.5)	3.56	1.20-5.00	p = .071	84.24	47.00-138.00	p = .223
40 weeks<	4 (3.8)	2.43	1.96-3.20		76.75	66.00-96.00	
Nutritional Status of the Infant in NICU							
Breast milk only	89 (84.8)	3.33	1.11-5.00	Z = -2,979	75.00	47.00-138.00	Z = -1.427
Breast milk and OG/NG/IV	16 (15.2)	4.09	2.94-5.00	**p = .003**	84.50	55.00-140.00	p = .154
Frequency of Mother's Visiting Baby in NICU							
Every 3 hours every day	93 (88.6)	3.36	1.11-5.00	Z = -2,796	76.00	47.00-138.00	Z = -0.433
3 times a week	12 (11.4)	4.45	2.94-5.00	**p = .005**	80.50	55.00-140.00	p = .665
Who Provides Mother with Information on Baby's Condition and Treatment							
Doctor	45 (42.9)	3.90	1.20-5.00	Z = -3.890	79.00	47.00-140.00	Z = -0.243
Doctor and Nurse	60 (57.1)	3.07	1.11-5.00	**p < .001**	75.00	47.00-125.00	p = .808
Status of Mother's Thinking She Has Enough Information about Her Baby's Condition and Treatment							
Has Enough Information	67 (63.8)	3.51	1.11-5.00	Z = -0.297	75.00	47.00-138.00	Z = -1.184
Not Having Enough Information	38 (36.2)	3.56	1.20-5.00	p = .767	77.00	58.00-140.00	p = .236

χ^2= Kruskal-Wallis H test, Z = Mann-Whitney U test, Min-Max= Minimum-Maximum, NICU= The Parental Stressor Scale: Neonatal Intensive Care Unit, PSAS: The Postpartum Specific Anxiety Scale.

39.2% (n=41) were high school graduates, 37.1% (n=39) were university graduates, 78.1% (n=82) were housewives, and 89.5% (n=94) were members of a nuclear family. The majority of the participants (71.4%) (n=75) were living in the provincial center. It was determined that 82.9% (n=87) of mothers had planned pregnancies, 64.8% (n=68) had a normal delivery, and 58.1% (n=61) had a baby girl.

The mean gestational age of infants in the NICU was 37.36±2.82 weeks (min: 25 - max: 42); the postpartum mean age was 9.45±14.91 days (1- 105), and average weight was 3.03±0.68 kg (0.720-4.20). It was determined that 54.3% of the infants (n=57) were admitted to the NICU immediately after birth and were at NICU for an average of 7.6 ±15.18 days (1-105). It was seen that 32.4% of the infants were admitted to the NICU due to respiratory distress, 28.6% (n=30) for hyperbilirubinemia, 19.0% (n=20) for infection, 11.4% (n=12) because of premature birth and 8.6% (n=9) due to hypoglycemia. Only 17.1% of the infants (n=87) were being given oxygen.

A comparison of the mothers' descriptive characteristics and their stress and anxiety scores is presented in Table 1. The infants in the NICU and their mothers did not have a diagnosis of COVID-19 during the period of the study. It was found that 100.0% of the mothers (n=105) knew that COVID-19 is transmitted through close contact with people, that touching the face and mouth should be avoided to prevent COVID-19 transmission when it is necessary to go out of the house, and that people should practice social distancing, keeping a distance of at least 1 meter. During the COVID-19 pandemic, 100.0% (n=105) of mothers were found to wash their hands, wear masks and wear disposable aprons given by the hospital when they saw and held their babies.

Table 2. Overall Scoring Averages of Mothers on PSAS and PSS:NICU during the Covid-19 Pandemic (n = 105)

Scale Scores	Min-Max	Mean ± Standard Deviation	Pearson Correlation	
			r	p
PSS:NICU Score	1.11 - 5.00	3.48 ± 0.99	0.290	**.003**
PSAS Score	47.00 - 140.00	82.07 ± 21.41		

Min-Max: Minimum-Maximum,
NICU: The Parental Stressor Scale: Neonatal Intensive Care Unit, PSAS: The Postpartum Specific Anxiety Scale.

The PSS: NICU mean score of the mothers was 3.48±0.99 (moderately stressed), and the PSAS mean score was 82.07±21.41 (moderate anxiety). A significant positive relationship was found between PSAS and PSS: NICU (Pearson Correlation, p=.003; r=0.290) (Table 2).

DISCUSSION

This study was conducted to determine the stress and anxiety levels of mothers of infants in the NICU during the COVID-19 pandemic.

Discussion of the findings on the comparison of participants' characteristics and PSS: NICU scores

No significant difference was found in this study between stress scores and participants' educational status, income level, and the number of living children. Although the authors of some studies have found that there is no relationship between the mother's level of education and stress score (8,13), others reported that the stress score increased as the level of education rose (14,15). There is also a study in the literature showing that stress increases with the increase in the number of children a mother has (8), as well as a study demonstrating that there is no difference in terms of the number of pregnancies and the stress score of the mother (13) and that the stress score decreases as the number of births increases (14).

In this study, no significant difference was found between gestation weeks and the mothers' stress scores. Some studies have indicated that the stress score increases as gestational age decreases (15-17), while others report no relationship between the stress score of mothers and the gestational age of their infants in the NICU (8,14,18). The result of this study is consistent with the results of studies (8,14,18) that did not indicate a relationship between gestational age and the stress score.

The stress score of mothers of infants who were fed only breast milk (breast milk + OG/NG or IV) was found in the study to be lower than that of other mothers (p=.003). It has been shown in previous studies (13,19) that breastfeeding

babies in the NICU reduces the mother's stress. Gianni et al. stated in their study that mothers were happy to breastfeed their babies in the NICU (83.0%) and that they believed breast milk to be beneficial for their babies (97.0%) (20). In a qualitative study conducted in China (21), it was determined that mothers whose babies were in the NICU had difficulties with breastfeeding or pumping but still considered pumping their breast milk, if necessary, an integral part of their motherhood role. It can be stated then that breastfeeding infants in the NICU reduces mothers' stress.

The stress score of mothers who saw their baby only three times a week was higher than that of mothers who saw their baby every day and every three hours. The results of previous studies (8,17) are similar to the results of the present study. However, during the COVID-19 pandemic, many NICU's took measures by restricting parental presence, while others completely banned parents from entering the NICU (22). These restrictions were practiced despite the indisputable benefits that staying together brings to both mother and child (23). In light of this result, it can be concluded that NICU-related stress is reduced by increasing the time that mothers spend with their babies. Necessary conditions should be provided for the mother and baby to be together as much as possible in the NICU.
There was no significant correlation found in this study between the participants' stress levels and their knowledge about their baby's condition and treatment. It was seen that the stress scores of mothers who received information about their baby's condition and treatment only from the doctor were higher compared to mothers who received this information from both doctors and nurses. In the qualitative study of Acikgoz and Ayvaz, the authors stated that mothers of infants in the NICU want to receive clearer information about their babies' condition (24). It was noted in the study of Yayan et al., that parents who believed they had received sufficient information about their baby from the medical staff had lower stress levels (17). No study was found in the literature that examines the relationship between stress levels and which member of the medical team informed mothers about the medical condition and treatment of their baby.

Discussion of the findings on the comparison of participants' characteristics and PSAS scores

No significant difference was found in the study in terms of postpartum anxiety scores and mothers' education and income. Similar to this result, Cakmak and Unver and Arslan also did not find any relationship in their studies between mothers' postpartum anxiety levels and their education (25,10). It was noted in a meta-analysis (26) that postpartum anxiety was more prevalent in mothers living in low- and middle-income countries. In the study of Unver & Arslan, conducted in Turkey, it was found that among the mothers of infants in the NICU, those with higher economic status had higher anxiety, while in another study, Cakmak found no difference to report (25). The inconsistency in the results of these studies can be attributed to the fact that the studies were conducted in sample groups with different sets of characteristics.

It was determined in this study that the postpartum anxiety levels of those mothers who had one or two children were higher than those with three or more children. Contrary to these results, Cakmak found no relationship between the anxiety state of mothers and the number of children (25). Meeting the needs of an infant in the NICU as well as the needs of her children at home presents a challenge for mothers (27). However, mothers with three or more children have more experience with baby care than mothers with one or two children. This may be the reason behind this particular research outcome.

No significant difference was found in the study between the postpartum anxiety scores of the mothers and the infants' gestational week, feeding status, and the frequency of visiting the infant. Unver & Arslan found that mothers of infants at 39 - 40 gestational weeks experienced more anxiety than mothers of infants at 37 - 38 gestational weeks (10). Another study (28) stated that mothers of infants at less than 32 gestational weeks experience more anxiety. Some studies (29-31) state that mothers who both breastfeed their babies and offer supplementary nutrients experience higher levels of anxiety. There was no study discovered in the literature that compares levels of postpartum anxiety with the duration time mothers spend with their baby.
It was found in this study that mothers' postpartum anxiety levels did not differ according to whether they believed they had received sufficient information about the medical condition and treatment of their baby or depending on from whom they received this information. There was no study found in the literature that compares the level of postpartum anxiety according to these variables.

Discussion of the relationship between the PSS: NICU scores and PSAS scores

The PSS: NICU mean score of the mothers was found to be 3.48±0.99 (moderate stress). It was observed that in different studies (8,15-18,32-34) the NICU Parental Stress Scale mean score of the mothers ranged from 1.62±0.4 (less stressful) to 4.00±0.5 (very stressful). Getting used to living with a newborn is a stressful situation for mothers. The fact that an infant can require close monitoring and

treatment and therefore admission to the NICU during the COVID-19 pandemic is a factor that can exacerbate this stress.

The mean PSAS score of mothers was found to be 82.07±21.41 (moderate anxiety). In a systematic review and meta-analysis (26) in which postpartum anxiety status was examined, parental anxiety was found to be quite common and although it declined to some extent in the following weeks, it was seen to be a continuous factor in parents' lives. In Kocak's study using a postpartum mobile support application, it was determined that mothers experienced mild anxiety at the end of delivery (29). Ashfor et al. found that the state of mild anxiety continued during the postpartum period (35). In line with these results, it can be concluded that mothers experience mild anxiety during the postpartum period, while mothers of infants in the NICU during the COVID-19 pandemic experience moderate anxiety and need support.

In this study, a positive relationship was found between mothers' PSAS scores and PSS: NICU scores (p=.003; r=0.290). As mothers' stress scores increase, so do anxiety scores, and anxiety scores decrease as stress scores decrease. Under pandemic conditions, the need for professional health support may arise for mothers who are adversely affected physically, psychologically, and socially (1,7,11). This result shows that mothers of infants in the NICU during the pandemic should be supported psychologically.

Limitations

The study has some limitations. Although the researchers sent the questionnaires to all mothers who had infants in a NICU, only volunteer participants filled out questionnaires. The mothers' with deteriorated stress and anxiety may have been more willing to fill out the questionnaires. The researchers did not know the stress and anxiety levels of the participants in the pre-pandemic period.

CONCLUSION

As a result, mothers who were informed about the condition of their baby in the NICU by both doctors and nurses, those who fed their baby only with breast milk and who spent more time with their baby in the NICU experienced less stress. In addition, mothers with three or more children experienced less postpartum anxiety than mothers who had one or two children.

It was found that increasing the time a mother spends with her infant and ensuring that parents receive information about the baby from both doctors and nurses are factors that contribute to reducing the stress and anxiety levels of mothers of infants in the NICU during the pandemic. Our recommendation is that the stress and anxiety status of mothers of infants in the NICU during the pandemic period should be identified and that health workers be posed to provide mothers with the support they need.

Ethics Committee Approval: Approvals for the study were obtained from the COVID-19 Scientific Research Evaluation Commission of the Ministry of Health (Date:04.05.2020 No:2020-05-03T17_48_56), the relevant Ethics Committee (Date:06.05.2020 No:25403353-050.99-E.46292), and the institution (Date:13.05.2020 No:52167207-604.02-E.906).

Informed Consent: Informed consent was provided from all patients who wanted participated in the study.

Authorship Contributions:
Idea/Concept: DŞ, ÖM, AA, Design: DŞ, ÖM, AA, Supervision: DŞ, ÖM, AA, Data Collection or Processing: DŞ, ÖM, AA, Analysis or Interpretation: DŞ, ÖM, AA,

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