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The Anxiety Levels of the Parents of Premature Infants and Related Factors

Prematüre Bebeği Olan Anne ve Babaların Kaygı Düzeyleri ve İlişkili Faktörler

Raziye Çelen, Fatma Taş Arslan

Selçuk University Faculty of Health Sciences, Department of Pediatric Nursing, Konya, Turkey

ABSTRACT

Aim: The aim was to determine the anxiety levels of parents with premature infants and related factors.

Materials and Methods: This comparative descriptive study was conducted in the neonatal intensive care unit of four hospitals located in Konya, Turkey between March and April 2012 with the parents (n=194; 97 mothers, 97 fathers) of premature infants who were 32-37 weeks gestational. Data were collected using Parents and Infant Information Form prepared by the researchers, and State-Trait Anxiety Inventory Scale.

Results: The mean state anxiety scores of the mothers and fathers were similar (p>0.05). The mothers had higher mean trait anxiety scores compared to the fathers and this difference was found to be statistically significant (p<0.05).

Conclusion: It was observed that parents with premature infants experienced mild anxiety.

Keywords: Anxiety, parents, premature, related factors, State-Trait Anxiety Inventory

ÖZ

Amaç: Çalışma prematüre bebeği olan anne ve babaların kaygı düzeyleri ve ilişkili faktörleri belirlemek amacıyla yapıldı.

Gereç ve Yöntemler: Karşılaştırmalı tanımlayıcı çalışma, Konya ili kent merkezinde yer alan, yenidoğan yoğun bakım ünitesi bulunan dört hastanede, Mart-Nisan 2012 tarihleri arasında yapıldı. Örneklem grubunu 97 prematüre bebeğin anne ve babası oluşturdu (n=194). Verilerin toplanmasında araştırmacılar tarafından oluşturulan Ebeveyn ve Bebek Bilgi Formu ve Durumluk-Sürekli Kaygı Ölçeği kullanıldı.

Bulgular: Annelerin ve babaların durumluk kaygı puan ortalamaları benzer olduğu saptandı (p>0,05). Annelerin sürekli kaygı puan ortalamalarının babalara göre yüksek olduğu ve bu farkın istatistiksel olarak anlamlı olduğu bulundu (p<0,05).

Sonuç: Prematüre bebeği olan anne ve babaların hafif düzeyde kaygı yaşadıkları görüldü.

Anahtar Kelimeler: Anksiyete, anne-baba, prematüre, ilişkili faktörler, Durumluk-Sürekli Kaygı Ölçeği

Introduction

Premature delivery is a major critical problem that causes high perinatal morbidity and mortality rates (1-3). The World Health Organization reports that one of every 10 births is premature (2). In Turkey, the rate of premature delivery is reported to be 12% (4).

Parents who are not psychologically ready for a preterm delivery, go through high levels of anxiety (5-7). The fact that a premature infant has more common health problems also affects the anxiety levels of the parents. Factors such as family and infant characteristics, the severity of the infant's health condition, parent-infant relationship are related to the outcome of premature infants (8). The mother and father

Address for Correspondence/Yazışma Adresi
Raziye Çelen MD, Selçuk University Faculty of Health Sciences, Department of Pediatric Nursing, Konya, Turkey
Phone: +90 332 223 35 46 E-mail: rturgut42@gmail.com

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must adapt to their new roles in providing a safe environment for and taking care of their infant. In this process, they should learn how to communicate with their infant as well as how to manage the baby's problems. Also social support should be provided for both the mothers and fathers to prevent stress and anxiety during this period (9,10).

The parents of infants in neonatal intensive care units (NICUs) may feel high anxiety due to the severity of their infant's illness, the ambiance of the unit, and the psychosocial feeling of seperation (9). Previous studies show that the mothers of premature infants in the NICU may have a mild level (11,12), medium level (13,14) and high level (15,16) of anxiety.

Most of the studies focus on maternal stress in general; there is even less information about a father's long-term adaptation (9,17,18). However, the family should be evaluated as a whole including both parents. More studies are needed as the number of premature deliveries is high and this group of babies require special care. Studies conducted in this field shall make positive contributions to creating awareness among parents and nurses of newborns, and create an important literature specific to this field.

The aim of our study was to determine the anxiety levels of the parents of premature infants. We also aimed to determine the factors that could impact anxiety on these parents.

Materials and Methods

Setting

This comparative descriptive study was conducted in the NICU of four hospitals located in Konya between March and April 2012.

Sample

The table presented in "determine sample size of descriptive studies with dependent variables" (19) was used to determine the sample size of the study, and we used the rate reported by Özyazıcıoğlu and Tüfekci (20) (52.88±10.18). The aim was to determine the score to be taken from the state trait anxiety scale within 95% confidence level and ±2 point confidence interval. Accordingly, the total width was taken as 4 points (2 points above and 2 points below). In the calculation standardized range width= the total width/ standard deviation (SD) (4/10.18=0.37 approximately 0.40) was found (19). The calculated sample size in each group was 97 (97 mothers, 97 fathers). Considering 10% drop out rate the study sample size was set to 107. Three fathers among these did not agree to join the study for confidentiality reasons, and seven parents did not complete the questionnaire.

Inclusion criterion was to be the mother and father of a premature infant of 32-37 weeks of gestational age, hospitalized at the NICU, and planned to be discharged from the NICU in 2-3 days. All the parents were required to sign the informed consent.

Exclusion criteria were the infants diagnosed with a genetic disorder and/or major congenital malformations, and parents who had a previously hospitalized premature infant younger than 32 weeks of gestational age.

Data Collection

Data were collected from the parents by the researcher via face-to-face interview in a separate room outside the NICU.

Measures

"Parents and Infant Information Form" and "State-Trait Anxiety Inventory (STAI)" were used.

Parents and Infant Information Form was developed by the researcher (21-23). The form included five questions regarding the socio-demographic characteristics of the parents (age, education level, working status, health insurance, perceived income), 11 questions concerning the mother and the infant (gender, delivery method, gestational week of the mother, postmenstrual age of the infant, diagnosis, interventions implemented to the infants in the postpartum period, feeding methods, number of children, having premature infants previously, birth weights, the hospitalization period of the infants), and the opinions of the parents regarding the care of the premature infant (currently experienced anxiety regarding the infant's care), and 6 questions on the perception of the mothers concerning their adequacy fields in the field of infant care (feeling sufficient for the baby's care, moniliasis care, evaluating respiration, discharge training regarding infant care).

STAI Scale, Spielberger STAI (STAI-I), developed by Spielberger et al. (24) in 1983 and adapted to Turkish by Öner and Le Compte (25) in 1985 was used to assess the anxiety level. This assesses both state anxiety, i.e. current mood; and trait anxiety, i.e. general predisposition towards anxiety. It is a 4-point scale consisting of 40 items. Both scales include 20 items, such as I am worried (state anxiety) and I feel nervous and restless (trait anxiety). Both showed good internal consistency-Cronbach's α=0.86 and 0.89. Internal consistency was adequate in this sample (Cronbach's α=0.92 and 0.89).

Ethical Considerations

Before the study was started, Ethical Committee consent was received from Selçuk University Faculty of Medicine in January 2012 (approval number: 2012/01) and the related permissions were obtained from each hospital where the study took place, and from the all parents within the study population.

Statistical Analysis

Data were analysed using the SPSS version 20 (SPSS; IBM, New York, USA). Normal distribution of dependent variables was evaluated by conducting a normality analysis through Kolmogorov-Smirnov test and it was found that they showed normal distribution. Number, percentage and mean ± SD were used to determine descriptive data. Independent

samples t test, Mann-Whitney U (U) tests, and Kruskal-Wallis (KW) and Bonferroni-corrected Mann-Whitney U (for KW test) were used to determine the differences between groups. P<0.05 value was accepted significant in all the analyses.

Results

Features of the Parents and Infants

Mean age of the mothers participating in the study was 26.77±5.31 and mean age of the fathers was 30.13±5.35. Of the mothers 38.2% were primary school graduates, 86.6% were unemployed, 66% evaluated their monthly income as mediocre, while 37% of the fathers were primary school graduates, 91.8% had a wage-earning employment, and 72.2% evaluated their monthly income as mediocre (Table I). In addition, 87.6% of the parents had a health insurance, 44.2% had one child, and 14.4% previously had a premature infant.

Of the premature infants 52.6% were born in gestational weeks 35-37, 55.7% were planned to be discharged in gestational weeks 35-37, 50.5% were male, 67% were born via cesarean section, and 44.3% were in hospital only because of being premature. While 81.5% of the infants stayed in an incubator, 76.3% were fed only with breast milk (Table II). The gestational weeks of the premature infants were 34.51±1.68, and their postmenstrual ages were 36.12±2.01 weeks. Their birth weights were 2210.03±568.17 grams, and postmenstrual weights were 2264.36±568.72 grams. Mean hospitalization period of the premature infants was found to be 8.49±6.66 days (minimum: 2.00, maximum: 35.00).

Table I. Socio-demographic characteristics of parents (n=194)

	Mothers (n=97)		Fathers (n=97)	
Characteristics	**n**	**%**	**n**	**%**
Age*				
18-24 years	38	39.2	14	14.5
25-31 years	39	40.2	46	47.4
32 and more years	20	20.6	37	38.1
Educational levels				
Primary school	37	38.2	36	37.0
Secondary school	33	34.0	18	18.6
High school	14	14.4	25	25.8
University	13	13.4	18	18.6
Working status				
Working	13	13.4	89	91.8
Not working	84	86.6	8	8.2
Perceived income status				
Good	29	29.9	19	19.6
Mediocre	64	66.0	70	72.2
Low	4	4.1	8	8.2

*Mothers' mean age=26.77±5.31, fathers' mean age=30.13±5.35

State-Trait Anxiety Levels of the Parents

While mean state anxiety score of the mothers was 40.15±11.25 (minimum: 20, maximum: 72), that of the fathers was 37.32±10.87 (minimum: 20, maximum: 67), and this difference was not found to be statistically significant (t=1.785, p=0.076). However, mean trait anxiety score of the mothers was 44.30±8.98 (minimum: 26, maximum: 65), while that of the fathers was 39.45±8.58 (minimum: 20, maximum: 67), and this difference was found to be statistically significant at an advanced level (t=3.842, p=0.000) (Table III).

Factors Related to the Anxiety Levels of the Parents

When the anxiety levels were examined according to the socio-demographic features of the parents, no statistically significant difference was found between the mothers' ages, educational levels, employment status, perceived income, number of children, previously having had premature infants,

Table II. Characteristics of premature infants (n=97)

Characteristics	**n**	**%**
Gender		
Female	48	49.5
Male	49	50.5
Delivery method		
Vaginal	32	33.0
Cesarean	65	67.0
Gestational age		
32-34 weeks	46	47.4
35-37 weeks	51	52.6
Postmenstrual age		
32-34 weeks	21	21.6
35-37 weeks	54	55.7
38 weeks and over	22	22.7
Diagnosis		
Premature	43	44.3
Premature + additional problems*	54	55.7
Interventions implemented to infants in postpartum period		
Incubator	79	81.5
Cot	4	4.1
Mechanical ventilation	14	14.4
Feeding methods of infants		
Breast milk	74	76.3
Breast milk and formula	23	23.7

*Additional problems (hyperbilirubinemia, respiratory distress syndrome, meconium aspiration syndrome, malnutrition, intrauterine growth retardation)

and state-trait anxiety mean scores (p>0.05). No significant difference was found between the fathers' ages, number of children, previously having premature infants, and state-trait anxiety mean scores (p>0.05). The difference between the education levels and trait anxiety mean scores of the fathers was statistically significant in the study (trait anxiety KW=11.042 p=0.012). In the advanced analysis conducted through Bonferroni-corrected Mann-Whitney U test, it was determined that primary school graduate fathers had higher trait anxiety mean scores (43.33±8.48) compared to high school graduate fathers (36.32±7.94) and this difference was significant (p=0.003). Trait anxiety mean scores of unemployed fathers (46.75±11.25) were significantly higher (trait anxiety U=161.0 p=0.010). Trait anxiety mean scores of the fathers were also significant according to their perceived income status (trait anxiety KW=8.300 p=0.016). In the advanced analysis conducted through Bonferroni-corrected Mann-Whitney U test, it was determined that the fathers who perceived their income levels to be low had significantly higher trait anxiety mean scores than those who perceived their income to be good or mediocre (Table IV).

When anxiety levels of the parents were evaluated according to the features of the premature infants, no significant difference was found between gender, delivery method, gestational age (GA), postmenstrual age (PMA) (trait anxiety mean score), diagnosis, feeding methods, and state and trait mean scores of the parents (p>0.05). However, when the PMA of the infants and state anxiety levels of the mothers were examined, a significant difference was found between the groups (KW=7.701 p=0.021). In the advanced analysis performed in order to determine between which groups there was a difference, it was noted that the mothers whose PMA was 38 weeks or more, had significantly higher state anxiety scores than those whose PMA was 35-37 weeks.

When anxiety levels of the parents were assessed according to their current anxiety experience regarding the care of their premature infants, parents who stated they currently experienced anxiety had higher state and trait anxiety mean scores, and this difference was found to

Table III. Comparison of mean anxiety score of the mothers and fathers (n=194)

Status of anxiety	Mothers (n=97)	Fathers (n=97)	t	p
	$\bar{x}$ ± SD	$\bar{x}$ ± SD		
State anxiety	40.15±11.25	37.32±10.87	1.785	0.076
Trait anxiety	44.30±8.98	39.45±8.58	3.842	**0.000**

SD: Standard deviation

Table IV. Comparison of mean anxiety score by socio-demographic characteristics of the mothers and fathers

Characteristics	Mothers (n=97)			Fathers (n=97)		
	n	State anxiety $\bar{x}$ ± SD	Trait anxiety $\bar{x}$ ± SD	n	State anxiety $\bar{x}$ ± SD	Trait anxiety $\bar{x}$ ± SD
Educational levels						
Primary school	37	41.24±11.53	45.22±10.48	36	40.14±9.73	43.33±8.48[a]
Secondary school	33	38.94±11.74	45.33±9.01	18	37.50±13.46	37.56±5.85
High school	14	41.36±10.75	40.57±6.47	25	33.68±11.37	36.32±7.94[b]
University	13	38.85±10.46	43.08±5.48	18	36.56±8.51	37.94±9.59
KW (SD: 3)		1.392	3.463		6.542	11.042
p		0.707	0.326		0.088	**0.012 (a>b)**
Working status						
Working	13	38.69±9.83	43.46±7.04	89	36.76±10.85	38.80±8.06
Not working	84	40.38±11.49	44.43±9.27	8	43.50±9.78	46.75±11.25
U		510.5	488.0		218.0	161.0
p		0.707	0.539		0.070	**0.010**
Perceived income status						
Good	29	36.97±9.76	43.41±7.43	19	37.00±9.79	36.68±7.49[a]
Mediocre	64	41.02±11.29	43.92±9.33	70	37.29±11.29	39.13±7.83[b]
Low*	4	-	-	8	38.38±10.88	48.88±11.74[c]
U		735.50	870.50	**KW (SD: 2)**	0.119	8.300
p		0.110	0.633		0.942	**0.016 (a<c, b<c)**

*Data excluded from the analysis because the number of sample was small
KW: Kruskal-Wallis test, SD: Standard deviation, U: Mann-Whitney U test

be statistically significant (mothers state anxiety t=3.728 p=0.000, trait anxiety t=2.239 p=0.027; fathers state anxiety t=3.697 p=0.000, trait anxiety t=2.436 p=0.017). When anxiety levels of the mothers were evaluated according to their perceptions of regarding their adequacy in the field of care, mothers who did not feel sufficient had higher state and trait anxiety mean scores (state anxiety 46.11±8.88, trait anxiety 49.74±7.24), and this difference was found to be significant in the advanced analysis (state anxiety U=428.50 p=0.004, trait anxiety U=405.00 p=0.002 respectively). In terms of counting and evaluating the infant's respiration, mothers who did not feel adequate had higher state anxiety mean scores, and this difference was found to be statistically significant (state anxiety t=-2.233 p=0.028), whereas the difference between trait anxiety mean scores was not significant (p>0.05) (Table V). The difference between the state and trait anxiety mean scores of the mothers in providing moniliasis care for the infant was not statistically significant (p>0.05). Nor was the difference statistically different (p>0.05) when the mothers' state and trait anxiety mean scores were evaluated according to the hospital discharge training to be received regarding the infant's care.

Discussion

The study determined that the mothers of premature infants had higher anxiety than their fathers. While the anxiety of the father was more influenced by reasons such as being primary school graduates, unemployment and low income; the anxiety of the mothers was mostly related to infant care.

It was also determined that the mothers included in the study had higher state anxiety mean scores than the fathers (p>0.05). The trait anxiety levels of the mothers were also higher than those of the fathers and they experienced mild anxiety (p=0.000) (Table III). State anxiety levels of the parents are thought to be changing depending on the momentary behaviors and reactions of their infants. The fact that infants were kept in a safe environment where medical intervention could be provided for 24 hours in case of a problem could have affected the state anxiety levels of parents positively, and the fact that the mothers had higher state anxiety levels than the fathers may be associated with the mothers' being more sensitive to the negative changes in the infants compared to the fathers. The study also determined that the mothers had higher trait anxiety

Table V. Comparison of mean anxiety score by the feeling of sufficiency of the mothers regarding infant care, and opinions of the mothers and fathers regarding infant care

	n	%	State anxiety	Trait anxiety
			$\bar{x}$ ± SD	$\bar{x}$ ± SD
Current anxiety experience status of the mothers regarding the care of their infants				
Yes	47	48.5	44.28±9.64	46.36±8.30
No	50	51.5	36.28±11.35	42.36±9.24
t			3.728	2.239
p			**0.000**	**0.027**
Current anxiety experience status of the fathers regarding the care of their infants				
Yes	40	41.2	41.90±10.38	41.93±9.38
No	57	58.8	34.11±10.11	37.72±7.58
t			3.697	2.436
p			**0.000**	**0.017**
Feeling of sufficiency of the mothers regarding infant care				
Yes	78	80.4	38.71±11.33	42.97±8.90
No	19	19.6	46.11±8.88	49.74±7.24
U			428.50	405.00
p			**0.004**	**0.002**
Feeling of sufficiency of the mothers in terms of counting and evaluating infant's respiration				
Yes	32	33.0	36.59±10.16	42.97±7.80
No	65	67.0	41.91±11.41	44.95±9.49
t			-2.233	-1.024
p			**0.028**	0.308

SD: Standard deviation

mean scores than the fathers, and mothers experienced a mild anxiety, which may be arising from the uncertainty related to the future, inability to continue infant care at home sufficiently, distress about how to cope with problems after being discharged from hospital, and the fear of losing her infant. Additionally, the mothers' more intense anxiety levels may be explained with the fact that they play the primary role in providing care for their infant and other children, and they are affected more by an unreliable environment. Ghorbani et al. (13) and Gambina et al. (26) showed that anxiety levels in parents of preterm infants were higher than those of term infants. In another study, it was reported that the mothers whose infants stayed in NICU attached to their infants earlier in the postpartum period compared to the fathers, they were more sensitive to negative changes in the infant, and they experienced more fear, depression, feeling of worthlessness and uneasiness (27).

It was seen that only trait anxiety levels of the fathers differed with three variables. In the study, primary school graduate fathers had significantly higher trait anxiety levels (p=0.012) (Table IV). This may be due to the fact that the fathers with lower education levels could not comprehend sufficiently the explanations made regarding the infant's state of health, and they were unsuccessful in developing solutions for problems they encountered. In a study conducted by Miles et al. (28), the mothers with lower education levels were reported to be more worried about the medical conditions of their infants compared to the mothers who had higher education levels.

In this study, fathers who did not work had higher trait anxiety levels compared to those who were working and had mild levels of anxiety (p=0.010) (Table IV). Unemployment of the fathers affected the economical status and welfare of the family directly in a negative way. Fathers with low income levels also had high levels of trait anxiety (p=0.016) (Table IV), which may be related to the anxiety that they may not be able to afford care and medical services for the infant. Additionally, economic status plays an important role in reaching information and meeting requirements.

Mothers whose PMA was 38 or more weeks were found to have higher state anxiety levels than those whose PMA was 35-37 weeks (p=0.008) because premature infants in 35-37 weeks PMA have been in hospital for a longer period and their mothers may have adapted to the situation. They might have had slight anxiety because their infants would be discharged, and they were worried that they were not fully recovered and they did not feel ready for discharge.

It was observed that both the mothers and fathers had different anxiety scores. Parents who stated that they currently experienced anxiety were found to have high state and trait anxiety scores (mothers state anxiety p=0.000 trait anxiety p=0.027; fathers state anxiety p=0.000 trait anxiety p=0.017) (Table V). Parents may have experienced mild anxiety by thinking that home care would not be sufficient for the infant after being discharged from the hospital, or the infant is too young or they could not be discharged due to some reasons. In a study conducted by Kurnaz and Gençalp (12), no statistically significant difference was found in terms of state anxiety scores between the mothers who stated and those who did not state anxiety before their infants were discharged from the hospital. However, when their state anxiety scores were considered, the mothers stated that they experienced mild anxiety about themselves and their infants (12).

Our results showed that the mothers who did not feel self-sufficient concerning the infant's care had higher anxiety levels compared to those who felt adequate (Table V). A higher anxiety level is expected as a result of the inadequate information had by mothers regarding the infant's care, the fact that almost half of them were primipara, and they did not have a premature infant before. This result reveals the need that mothers should be informed regarding premature infant care.

Mothers who were not sufficient in counting and evaluating respiration had higher state anxiety scores (p=0.028) (Table V), which may be associated with the inadequate information received by the mothers from the medical personnel, and inadequate practices conducted in the clinic with the NICU nurses before being discharged from the hospital.

Study Limitations

This study has some limitations. First of all, self-report measures like STAI may only indicate the level of anxiety without yielding information about the clinical diagnosis. A further limitation of the study was that the parents of premature infants younger than 32 weeks GA were not included in the study. Finally, we included both first time parents and parents that already had children. So they could have experienced anxiety at different levels.

Conclusion

Parents of premature infants had mild anxiety, also the mothers had higher trait anxiety levels than the fathers. Being primary school graduates, unemployment, low income affected the anxiety levels of the fathers. Anxiety levels of the mothers whose premature infants were in 38 weeks or more PMA, who did not feel adequate about their infant's care, were found to be higher. State anxiety levels of the mothers who felt inadequate in counting and evaluating the respiration of their infants, were found high. Also current anxiety levels of both the mothers and fathers were high.

Family-centered care practices should be developed to support both the mother/father-infant attachment and parents' empowerment in the care of their infant. Nurses have a vital role in family-centered care and they should apply supportive nursing interventions such as encouraging parents to visit and touch their infants; and explaining the intended use of medical devices.

Ethics

Ethics Committee Approval: The study was approved by the Selçuk University Faculty of Medicine Ethics Committee (Approval number: 2012/01, 31.01.2012).

Informed Consent: Consent form was filled out by all participants.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: R.Ç., F.T.A., Design: R.Ç., F.T.A., Data Collection or Processing: R.Ç., Analysis or Interpretation: R.Ç., F.T.A., Literature Search: R.Ç., Writing: R.Ç., F.T.A.

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