

THE EFFECT OF ANXIETY ON RESILIENCE LEVEL IN MOTHERS OF BABIES EXAMINED FOR RETINOPATHY OF PREMATURE: A REGRESSION STUDY

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ABSTRACT

Aims: The purpose of this study was to assess the effect of anxiety on resiliency levels in mothers of babies with retinopathy of prematurity.

Methods: This is a descriptive and correlational study conducted with mothers who brought their babies to the retinopathy of prematurity examination unit of a university hospital in eastern Turkey between 2021 and December 2022. The study was carried out with 116 mothers meeting the sample inclusion criteria. The study data were collected using the "Question Form," the "State and Trait Anxiety Scale," and the "Connor-Davidson Resilience Scale." The data were interpreted using percentage, mean, Pearson correlation, and multiple regression analysis.

Results: It was found that the mean STAI-S total score of the mothers was 46.74 ± 13.34 and the mean CD-RISC total score was 70.05 ± 17.63 . A statistically significant negative correlation was determined between the anxiety and resilience levels of the mothers of the babies who came for examination. It was determined as a result of multiple regression that birth weight and state anxiety had a statistically significant effect on resilience level.

Conclusions: As anxiety levels increased during retinopathy procedures for premature babies, the resilience levels of mothers decreased.

Keywords: Anxiety, resilience, premature, retinopathy of prematurity.

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INTRODUCTION

Retinopathy of prematurity (ROP) is a vasoproliferative disorder of the retina [1]. It is a serious complication induced by preterm birth causing visual impairment in premature babies [2]. In children, it has become the leading cause of blindness, accounting for 6-18% of blindness [3-5]. Parallel to the developments in neonatal care, the increased chance of survival of preterm babies with a much smaller gestational age and birth weight has increased the incidence of ROP [6-8]. Even though ROP's incidence has gradually decreased in developed countries, it remains high in the middle- and low-income countries [9-10]. The development of advanced ROP has been reported in infants up to 34 weeks of age in developing countries and in Turkey [8,9,11].

In accordance with screening guidelines, all babies under 1500 g or under 32 weeks of gestation should receive retinal screening [4,8]. Also, high-risk babies should undergo weekly eye examinations [12]. In the ROP examination, the retinal layer is assessed by dilation of the pupils under topical anesthesia, and the procedure is painful. Infants experience stress and pain during and after the ROP procedure [12,14-16]. In both the short and long term, pain may cause physiological imbalances and stressful reactions in infants [17].

A family's involvement in routine newborn care can improve both the health of the infant and the well-being of the parents [18]. Parents are key partners in providing timely ROP care to premature babies [19]. Even though parents' knowledge and awareness of ROP examinations are important, mothers experience significant stress when their babies suffer [20]. Recently, researchers have suggested that parents should be involved in painful interventions for premature infants with a family-centered approach and greater involvement in their infant's care [20-22]. On the other hand, parents may find it difficult to deal with the use of a speculum, bright light, globe manipulation, and hearing an infant's loud cry during an ROP examination. In addition, the healthcare staff's negligence of the infant's cry during the procedure may result in a sense of helplessness, increased state anxiety levels in parents, and failure to fulfill their parental responsibilities [23]. Parenting a baby with health problems is stressful for parents, and preterm

parents are highly susceptible to anxiety and depression [24,25]. Additionally, a premature baby with a blinding eye disease or ROP screening raises parental anxiety and increases psychological pressure [26].

A limited number of studies have been conducted with parents of premature infants with ROP examinations in the literature. A study reported that parents of premature babies who were examined for ROP had low resilience, high anxiety, and depression levels. A positive relationship was found between parental coping styles and social support in the same study [26]. Another study reported high levels of anxiety among mothers who had infants diagnosed with ROP [27]. However, the study by Özyurt et al. [28] found that having a baby with ROP did not significantly affect mothers' anxiety levels. Similarly, although parents, especially mothers, who participated in ROP screening examinations of their babies showed a slight increase in anxiety levels, this increase was not significant [20].

Anxiety and depression may negatively affect the mother's ability to meet the infant's needs by impairing cognitive functions and decision-making processes [29,30]. Researchers have previously studied the anxiety level of parents of infants with ROP, but there is insufficient evidence demonstrating the relationship between anxiety and resilience [20,26,28]. However, a lack of adequate research has been conducted to determine the emotional reactions experienced by mothers during ROP examinations. On the basis of this information, the effect of anxiety on the resilience level of mothers whose babies were examined for ROP was investigated in this study.

MATERIAL AND METHOD

Type of Study, Place, and Time of Conduct

This study employed a descriptive, cross-sectional, and correlational research design. It was performed between December 2021 and December 2022 in the Prematurity Retinopathy examination unit of the Eye Polyclinic of a university hospital in eastern Turkey. Every Wednesday afternoon, an ophthalmologist and nurse examined children for Retinopathy of Prematurity in the unit reserved for these examinations, and an average of four children were examined each week. The infants in the examination process

were taken to the examination unit alone and the mothers were kept in the waiting room.

Population and Sample/Study Group

The population of the study consisted of the mothers of babies who came to the ROP examination unit of the Eye Polyclinic of a university hospital in eastern Turkey between December 2021 and December 2022. The sample group is those who bring their baby for ROP examination within the specified date range, have a baby whose gestational age is greater than or equal to 28 weeks and less than 37 weeks, are 18 years old and over, are open to communication at a level that can understand the questions, can speak and understand Turkish, have no physical and mental disabilities, consisted of mothers who volunteered to participate in the study. In the posthoc power analysis using the G-Power 3.1.9.4 program to determine that the sample size is sufficient in the research, according to the correlation: Point biserial model (the values used in this study; relationship between anxiety and resilience ($r=-.193$) effect size of 0.439, 0.05 significance level. and the power of the study was determined to be 99%. These values indicate that the sample size is at the desired level [31].

Data Collection Tools

Question Form: On this form prepared by the researchers, there were 6 questions about the mothers' socio-demographic characteristics, including age, educational level, employment status, and income level, as well as 11 questions regarding their obstetric history and retinopathy of prematurity examination.

State and Trait Anxiety Inventory: This inventory was developed by Spielberger et al. [32] for evaluating state and trait anxiety levels and then adapted to Turkish by Öner and Le Compte [33]. A total of 20 questions were included in each of the two subunits, state anxiety, and trait anxiety. The subscale consisting of 20 items analyzing the state anxiety was used in this study. According to the state anxiety inventory, individuals were rated according to their degree of anxiety as (1) Not at all, (2) A little, (3) Somewhat, and (4) Very much so. In the state anxiety inventory, articles 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20 were scored in reverse. The remaining items measured the anxiety directly. Cronbach alpha value

was found to be 0.94 on the original inventory. In this study, the Cronbach alpha value of the inventory was determined to be 0.90 [32].

Connor - Davidson Resilience Scale (CD-RISC): The scale was developed by Connor and Davidson [34] and adapted to Turkish by Kararmak [35]. There were 25 items on the scale, each with a five-Likert rating between 0 (not true at all) and 4 (true nearly all of the time). The scale consisted of three subdimensions as tenacity and personal competence (Article 1, 5, 10, 11, 12, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25), tolerance of negative effect (Article 4, 6, 7, 8, 13, 14), and spiritual influence (Article 2, 3, 9, 20). The scale scores ranged from 0-100. There were no reverse-scored items. A high score on the scale indicated the individual to have a high level of psychological resilience. The Cronbach alpha value for the original version of the scale was determined to be 0.89. In this study, it was determined to be 0.91 [34].

Ethical Principles of the Study

The 26/11/2021 dated and 09/09 numbered ethics committee approval was obtained from the Human Research Ethics Committee, and institutional permission was obtained from the hospital where the study was conducted. Participating mothers were informed about the study and assured that they were free to participate or not and that they could withdraw from the study at any time. The mothers who agreed to participate in the study were primarily informed that their personal information would not be disclosed to others and would not be used for any other purpose. Then, verbal and written consent was obtained. A commitment to the Helsinki Declaration of Human Rights was observed throughout the study to protect individual rights.

Data Collection

Before the examination, mothers of babies who visited the ROP examination unit of Erzincan Mengücek Gazi Training and Research Hospital Eye Polyclinic were informed about the study after obtaining the necessary institutional permissions from the Human Research Ethics Committee and the hospital management. Afterward, written and verbal consent was obtained.

During the examination, the questionnaire including the “Question Form,” “State and Trait Anxiety Scale,” and “Connor-Davidson Resilience Scale” prepared by the researchers was performed on the mothers in the waiting room.

Data Analysis and Interpretation

SPSS 25.0 package software was used for the statistical analysis of the data. In order to interpret the data, percentages, means, Pearson correlations, and multiple regression analyses were used. The level of statistical significance was regarded to be 0.05 in all tests. In order to obtain statistical results, the Shao method was used to assess the conformity of the data to normal distribution. As a result, the Skewness value was 0.163, the Kurtosis value was -0.655, and the data had a normal distribution between -3 and +3.

Limitations of the Study

This study had some limitations. In the first place, the study sample consisted of mothers who applied to a hospital in the Eastern Anatolia region of Turkey due to the cross-sectional nature of the study. The results of the study cannot be generalized to all mothers due to the living conditions and socio-cultural structure of the region. A study with a larger sample size, including people from different cultures,

was necessary. Secondly, due to the small number of patients visiting the hospital where the study was conducted, the study had a small sample size. Third, the scales used to collect study data based on self-report. It should be noted that mothers could have concealed their true feelings. Fourth, the study included some findings regarding state anxiety levels in mothers of infants who were examined for retinopathy of prematurity. Additionally, the limited number of studies on this subject in the literature limited the discussion. In this process, there could be other excluded physical, environmental, psycho-spiritual, and socio-cultural parameters that affected the emotional states of mothers. It was important to keep this in mind when interpreting the study's results.

RESULTS

The distribution related to the descriptive characteristics of the mothers included in the study was presented in Table 1. Among the mothers, 64.7% were aged 25-34, 40.5% had a university degree or higher, 80.2% were unemployed, 54.3% had incomes equal to their expenses, and 36.2% had two children. In addition, it was determined that the mean age of the mothers was 28.96 ± 5.03 and the mean number of children was 2.15 ± 1.12 .

Table 1. Distribution of Descriptive Characteristics of Mothers

		n	%
Age (28.96 ± 5.03)	18-24 years	22	19
	25-34 years	75	64.7
	35 years and older	19	16.4
Educational Status	Illiterate	5	4.3
	primary school	24	20.7
	High school	40	34.5
	University and Above	47	40.5
Family Type	Nuclear family	93	80.2
	Extended family	23	19.8
Working Status	Working	26	22.4
	Not working	90	77.6
Income Status	Income Less Than Expenses	46	39.7
	Income Equal to Expense	63	54.3
	Income More Than Expenses	7	6.0
Number of Child (2.15 ± 1.12)	1	38	32.8
	2	42	36.2
	3	23	19.8
	4 and above	13	11.2

The distribution of obstetrical characteristics of mothers and descriptive characteristics of infants was presented in Table 2. It was determined that 81.9% of the mothers had a planned pregnancy, 58.6% had a male infant, 72.4% had a birth week between 33-37, 64.7% of the infants weighed between 1501-2500 grams, 83.6% were hospitalized for 0-30 days in the neonatal intensive care unit, 56.9% had social support, 54.3% had no history of preterm birth, and 85.3% of infants had no other health problems. 64.7% of the mothers did not know about the examination

for retinopathy of prematurity, 58.5% of those who knew received information from their physicians, and 67.2% had their first examination for retinopathy of prematurity. In addition, it was also determined that the average week of the birth of the mothers was 33.58 ± 2.41 , the average birth weight of the infants was 2061 ± 504.03 grams, the infants were hospitalized in the neonatal intensive care unit for an average of 17.43 ± 17.93 days, and the mean number of premature retinopathy was $1.99 \pm 2.23/1-14$.

Table 2. Distribution of Mothers in Obstetrics and Descriptive Characteristics of Babies

		n	%
Planned Pregnancy Status	Yes	95	81.9
	No	21	18.1
Baby's Gender	Women	48	41.4
	Man	68	58.6
Birth Week (33.58 ± 2.41)	28.32. Weeks	32	27.6
	33.-37. Weeks	84	72.4
Birth Weight (2061 ± 504.03)	≤ 1500 gr	22	19.0
	1501-2500 gr	75	64.7
	≥ 2501 gr	19	16.4
Length of Stay in the Neonatal Intensive Care Unit (17.43 ± 17.93)	0-30 Day	97	83.6
	31-60 Day	15	12.9
	61 Days and above	4	3.4
Social Support Presence	Yes	66	56.9
	No	50	43.1
Premature Birth History	Yes	53	45.7
	No	63	54.3
Another Health Problem	Yes	17	14.7
	No	99	85.3
Retinopathy of Prematurity Examination Information	Yes	41	35.3
	No	75	64.7
*Where Did She Get Her Retinopathy of Prematurity Examination Information	Doctor	24	58.5
	Nurse	13	31.7
	Social media	4	9.8
Number of Examination for Retinopathy of Prematurity ($1.99 \pm 2.23/1-14$)	1. Inspection	78	67.2
	2. Inspection and above	38	32.8

** Those Who Have Knowledge of Retinopathy of Prematurity Examination*

A summary of the mothers' mean scores for STAI-S, CD-RISC, and the sub-dimensions were presented in Table 3. The mean STAI-S total score was found to be 46.74 ± 13.34 . CD-RISC total score average was 70.05 ± 17.63 , tenacity and personal

competence sub-dimension score was 44.10 ± 11.47 , tolerance of negative affect sub-dimensional score was 14.24 ± 5.41 and spiritual influences sub-dimensional score was 11.70 ± 2.87 .

Table 3. Mean Scores of the Mothers from the STAI-S, CD-RISC and Sub-Dimensional Scales

Scale Scores	Mean±SD	Min	Max
CD-RISC Total Score	70.05±17.63	17	100
Tenacity and personal competence	44.10±11.47	10	60
Tolerance of negative affect	14.24±5.41	1	24
Spiritual influences	11.70±2.87	2	16
STAI-S Total Score	46.74±13.34	23	76

CD-RISC: Connor-Davidson Resilience Scale
STAI-S: State Anxiety Scale

In Table 4, Pearson correlation results were presented for the relationship between the STAI-S and CD-RISC scores of the parents and the mean scores of the subdimensions.

Table 4. The Relationship Between Mothers' STAI-S, CD-RISC, and Sub-Dimensional Scales

CD-RISC Score	STAI-S Total Score
Tenacity and personal competence	-0.209*
Tolerance of negative affect	-0.176
Spiritual influences	-0.016
Total Score	-0.193*

* $p < 0.05$ STAI-S: State Anxiety Scale
CD-RISC: Connor-Davidson Resilience Scale

tenacity and personal competence ($r=-0.209$; $p<0.05$) and a very weak ($r<0.20$) negative relationship between anxiety and resilience ($r=-.193$; $p<0.05$) (Figure 1).

It was revealed that there was a negative and weak ($0.20 \leq r \leq 0.40$) relationship between anxiety and

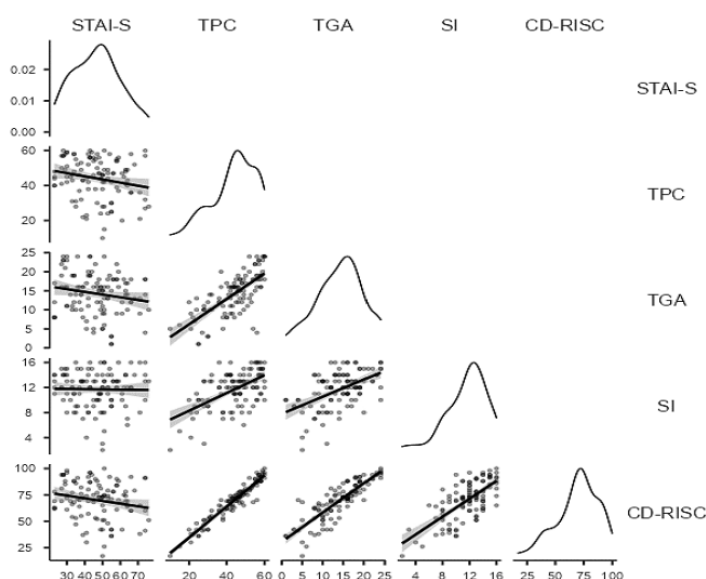


Figure 1. Scale Relationships

Based on Table 5 presenting the results of the regression analysis, the model established was noted to be statistically significant when the significance level associated with the F value was considered ($F=4.690$; $p<0.05$). Beta coefficient values, t values, and significance levels of the independent variable

revealed that birth weight and state anxiety were effective variables on resilience level ($t=-2.682$, $p<0.05$; $t=-2.412$, $p<0.05$). Birth weight and state anxiety explained 13.8% of the change in resilience (Adjusted $R^2=0.138$).

Table 5. Multiple Regression Results on the Effect of Descriptive Characteristics and STAI-S on CD-RISC (n=116)

	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics		95% CI for Coefficients	
	B	Std. Error	Beta			Tolerance	VIF	Lower Limit	Upper Limit
Constant	133.695	44.838		2.982	0.004*			44.837	222.553
Birth Week	-0.579	1.381	-0.079	-0.419	0.676	0.209	4.784	-3.316	2.158
Birth Weight	-0.013	0.005	-0.382	-2.682	0.008*	0.370	2.704	-0.023	-0.003
Length of Stay in the Neonatal Intensive Care Unit	0.013	0.177	0.013	0.071	0.943	0.232	4.312	-0.338	0.363
Number of Examination for Retinopathy of Prematurity	-1.637	0.928	-0.207	-1.765	0.080	0.543	1.840	-3.476	0.201
STAI-S Total Score	-0.292	0.121	-0.221	-2.412	0.018*	0.894	1.119	-0.532	-0.052

STAI-S: State Anxiety Scale *Dependent Variables: CD-RISC* *CD-RISC: Connor-Davidson Resilience Scale*
DW: 1.779 *R²:0.176* *Adjusted R²:0.138* *F:4.690* **p:0.000*

DISCUSSION

A mother-baby relationship is crucially shaped by the postpartum interaction between the mother and the newborn. The interaction begins during the prenatal period and continues through the time of delivery and postpartum [36]. An infant with a health problem may create additional stress within the family [24]. Families of preterm infants experience difficult consequences, and the process of neonatal intensive care creates stressful experiences for parents because they cannot have the family they desire [37]. This study was carried out to evaluate the effect of anxiety on the resilience level of mothers of babies who came for the examination for retinopathy of prematurity. Whereas there were many studies on premature mothers in the literature, studies on mothers who came for ROP examination were limited.

In this study, the mean STAI-S total score of the mothers was determined to be 46.74±13 [35]. In studies in the literature, results such as 39.4±9.1 [20], 35.31±9.38 [38], 45.13±9.45 [39], 40.17±10.80 [40] were obtained, and the data seemed to be coherent with the literature. It was determined that CD-RISC total score average was 70.05±17.63, the tenacity and personal competence sub-Dimension score was 44.10±11.47, the tolerance of negative affect sub-dimension score was 14.24±5.41 and the spiritual influences sub-dimensional score was 11.70±2.87.

No studies on preterm mothers were found in the literature, but the mean score of this scale on another sample was consistent with this study [41].

It was found in this study that there was a negative and weak relationship between anxiety and tenacity and personal competence, and a very weak and negative relationship between anxiety and resilience, according to the relationship between parental STAI-S, CD-RISC scales and the mean scores of the sub-dimensions. In the study carried out by Salehnezhad et al [42] on the effect of education based on the health belief model on improving anxiety in mothers of infants with retinopathy of prematurity, the authors noted that self-efficacy increased and anxiety levels decreased as a result of the education. Xie et al. [26] found that mothers of premature babies with retinopathy of prematurity had a low level of resilience and a high level of anxiety and depression, as determined in their study on resilience, anxiety, depression, coping styles, and relationships. Mothers who had infants with retinopathy of prematurity were found to have high anxiety and depression levels in a study conducted by Duman et al.[27]. Similarly, in the study of Özyurt et al. [28], maternal depression and state anxiety levels were found to be high in mothers of premature babies with ROP. Duman et al. [27] found that the mother's depression and anxiety levels were affected by the lack of social support and the level of retinopathy of prematurity.

There were findings in the literature indicating that resilience was associated with social support and coping mechanisms [26,42-44]. It seemed that these findings were in accordance with the literature since social support was correlated with stress and anxiety. Based on the regression analysis, state anxiety was noticed to be an effective variable in predicting resilience levels and the results were consistent with studies in the literature.

Based on the results of regression analysis in this study, it was determined that birth weight and state anxiety were effective variables influencing resilience levels. According to Xie et al. [26], rural living was one of the risk factors affecting resilience. Further, this study revealed that Chinese mothers' resilience levels were lower than those of American mothers. It was considered that the reason for this could vary due to a number of factors such as the culture of the families, the place and conditions they lived in, the mother's support, the mother's depression and anxiety level, and the baby's ROP degree [26,45,46]. Accordingly, the fact that birth weight was associated with many factors such as mothers' resilience, quality of life, anxiety, etc. was supported by the literature [37,47].

CONCLUSION AND RECOMMENDATIONS

As a result of the research, parents' anxiety was negatively and weakly correlated with tenacity and personal competence, and negatively and very weakly correlated with resilience. To sum up, mothers' resilience levels decreased during the retinopathy procedure of their premature infants as their anxiety levels increased. In addition, birth weight and state anxiety were efficient on the level of resilience.

In addition to regular follow-up of the baby after birth, these results suggest that for both the mental health of the mother and the healthy development of the baby, health personnel may consider evaluating the psychological state of the mother, taking care of parents of premature babies undergoing ROP exams, and providing them with social support and treatment to improve their negative psychological state.

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