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Research Article

Parental Role Beliefs and Neonatal Intensive Care Unit–Related Stress Among Turkish Parents: A Comparative Cross-Sectional Study

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What is already known on this topic?

- *For parents expecting a healthy baby during pregnancy, the NICU experience is a source of intense stress. This experience directly affects parents' attitudes toward the infant, the attachment process, and psychosocial adaptation to their roles.*
- *Previous studies have evaluated the parents with preterm infants in the NICU in terms of stress, anxiety, depression, post-traumatic stress disorder, and parent-infant attachment levels.*

What does this study add to this topic?

- *This study is the first to be conducted simultaneously to determine and compare stress levels, parental role beliefs, and associated factors among the mothers and fathers of preterm infants hospitalized in a NICU.*
- *The findings suggest that interventions aimed at increasing family-centered care practices to reduce parental stressors and strengthen parents' belief in their caregiving roles.*

What are the implications for practice?

- *The results highlight the importance of incorporating strategies to increase family-centered care practices in the NICU process.*

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Abstract

AIM: This study was conducted to determine and compare stress levels, parental role beliefs, and their associated factors among the parents of preterm infants hospitalized in a neonatal intensive care unit in İstanbul, Türkiye.

METHODS: This descriptive, cross-sectional, comparative study was carried out between April 2023 and April 2024 with both parents of 120 preterm infants hospitalized in the level-3 neonatal intensive care unit of a university hospital in İstanbul, Türkiye. Data were collected using sociodemographic information forms, the Parental Stressor Scale:neonatal intensive care unit, and the neonatal intensive care unit Parental Beliefs Scale.

RESULTS: Both mothers and fathers of preterm infants hospitalized in the neonatal intensive care unit reported moderate levels of stress and parental role beliefs. On the Parental Stressor Scale:neonatal intensive care unit scale, Parental Role Alterations subscale scores were significantly higher among mothers compared to fathers ($p = .001$). In contrast, Parental Role Confidence subscale and total neonatal intensive care unit-Parental Beliefs Scale scores were higher among fathers ($p = .001$). Parental Stressor Scale:neonatal intensive care unit and neonatal intensive care unit-Parental Beliefs Scale scores were not correlated ($p > .05$). Neonatal intensive care unit-Parental Beliefs Scale scores were positively associated with maternal age ≥35 years among mothers and with lower birth weight ($p = .021$), lower gestational age at birth ($p = .026$), and greater subjective financial well-being ($p = .004$) among fathers.

CONCLUSION: No significant relationship between parental stress and role belief scores was observed in this study. Maternal age, subjective financial well-being, and infant birth weight and gestational age were factors affecting parental belief scores in the neonatal intensive care unit setting. Family-centered care practices are needed to reduce parents' stress and strengthen their caregiving role beliefs.

Keywords: Belief, levels, NICU, parents, preterm, stress

Introduction

Preterm birth (before 37 weeks' gestation, regardless of birth weight) constitutes approximately 9.9% of all births globally (World Health Organization, 2023). This rate was reported as 12.9% in Türkiye (Turkish Ministry of Health, 2023). Preterm infants have an increased risk of respiratory, cardiovascular, gastrointestinal, and neurological diseases due to anatomical and physiological immaturity (Zivaljevic et al., 2024). This increases the need for postnatal medical support, often requiring continuous and advanced follow-up in the neonatal intensive care unit (NICU) (Norman, 2022).

For parents expecting a healthy baby during pregnancy, the NICU experience is a source of intense stress (van Wyk et al., 2024). This stress can be caused by multiple factors, including the

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complex and highly technological nature of the NICU (Kawafha et al., 2024) and the weak, fragile appearance of premature neonates (Siva et al., 2024). Moreover, preterm infant care in the NICU is managed primarily by health professionals, with limited parental involvement (Zhao et al., 2024), resulting in inadequate parent-infant interaction (Siva et al., 2023) and infant care skills (Pineda et al., 2018), which are additional stressors for parents during the neonatal intensive care process (Bua et al., 2024; van Wyk et al., 2024). These stressors can cause parents to have altered role perceptions and weakened role beliefs (van Wyk et al., 2024), leading to various difficulties in home care post-discharge and potentially resulting in NICU readmissions due to various health problems (Aykanat Girgin and Cimete, 2017; Li et al., 2024).

Parenting roles are altered for the parents of preterm infants in the NICU because of their limited participation in care, uncertainty about the clinical status of their infant, and inability to establish adequate communication with healthcare professionals (Melnyk et al., 2014; Özdemir and Alemdar, 2019). This experience directly affects parents' attitudes toward the infant (Rusu et al., 2025), the attachment process (Rio et al., 2022), and psychosocial adaptation to their roles (Rusu et al., 2025; Zhao et al., 2024). Considering the multidimensional impact of NICU treatment on parent-infant attachment and the contribution of parenting role beliefs to preterm infants' development (Melnyk et al., 2014; Rusu et al., 2025), it is necessary to comprehensively evaluate parents' stress levels, parental role beliefs, and their associated factors.

Previous studies in the literature have evaluated the parents of premature neonates in NICUs in terms of depression, anxiety, stress (Bua et al., 2024; van Wyk et al., 2024), parent-infant attachment levels (Li et al., 2024; Worrall et al., 2024), and posttraumatic stress disorder (Schecter et al., 2020). However, only two studies are known addressing role beliefs among these parents (Alemdar et al., 2025; Rio et al., 2022). One of these studies examined the parenting role beliefs of mothers with preterm infants in the NICU (Alemdar et al., 2025), while the other only examined the parenting role beliefs of fathers (Rio et al., 2022). In this context, evaluating beliefs about parenting roles in both mothers and fathers, taking into account the cultural context, is an important requirement in terms of strengthening family-centered care practices. Based on this need, the present study was conducted to determine and compare stress levels, parental role beliefs, and associated factors among both parents of preterm infants hospitalized in a NICU in Türkiye, thereby filling this important gap in the literature and making an evidence-based contribution to family-centered care practices.

Research Questions

1. Do parental stress levels and parental role beliefs differ between the mothers and fathers of preterm infants in the NICU?
2. Do clinical and demographic characteristics affect stress levels and parental role beliefs in the mothers and fathers of preterm infants in the NICU?
3. Is there a relationship between stress levels and parental role beliefs in the mothers and fathers of preterm infants in the NICU?

Methods

Design and Setting

A descriptive, cross-sectional, comparative study was carried out.

Sample

This study was carried out between April 2023 and April 2024 in the evel-3 NICU of a university hospital in İstanbul, Turkiye. Power analysis was performed using G*Power 3.1.9.2. For an estimated effect size of 0.58 and significance level of 0.05, it is determined that a sample of 240 parents (120 mothers and 120 fathers) would provide 95% power in the detection of significant differences. This indicated adequate sample size and power (≥ 0.80) (Malone et al., 2016). Simple random sampling was used until the necessary sample size was recruited.

Sampling criteria pertaining to the preterm infants were as follows: 1) born between 28 and 37 weeks' gestation, 2) birth weight less than 2500 grams, 3) singleton pregnancy, and 4) admitted to the NICU 4–8 days before study inclusion. The parents of preterm infants with any severe neurological and genetic problems (e.g., level 3–4 intracranial hemorrhage, periventricular leukomalacia, Down syndrome) were excluded from the study.

Sampling criteria pertaining to the parents were as follows: 1) having a preterm infant meeting the aforementioned criteria, 2) being 18 years of age or older, 3) being literate in Turkish, and 4) agreeing to participate in the study and signing the parental consent form. Parents with a history of NICU admission in a previous child and those with any cognitive, speech, or hearing impairment were excluded.

Data Collection Tools

Infant Information Form

A form was prepared for this study in line with the literature (Melnyk et al., 2014; Özdemir and Alemdar, 2019; Rio et al., 2022) to collect information about the preterm infants. It consisted of six open-ended and one multiple-choice question regarding sex, birth weight, gestational age at birth, Apgar score at 1 minute, medical diagnosis/diagnoses, and postnatal age and weight at the time of the study.

Parent Information Form

Created in line with the literature (Melnyk et al., 2014; Özdemir and Alemdar, 2019; Rio et al., 2022; Turan and Başsakal, 2006), this form consisted of a total of 12 questions in two sections, one for the mother and the other for the father. Each section contained six questions: age, education level, employment status, subjective financial well-being (adequacy of income relative to expenses), history of major stress events in the last 12 months, and how often they visited their infant in the NICU.

Parental Stressor Scale: Neonatal Intensive Care Unit

The Parental Stressor Scale: neonatal intensive care unit (PSS:NICU) is a validated measure of parents' perceived stress related to the NICU (Miles et al., 1993; Turan and Başsakal, 2006). This self-reported scale consists of 34 items in three subscales: Parental Role Alterations, Infant Appearance and

Behaviors, and Sights and Sounds of the NICU. Parents score each item from 1 to 5 ("not stressful" to "extremely stressful"). An item average of 3.0–3.4 is interpreted as moderately stressful and scores above 3.4 are regarded as highly stressful. Scores can be analyzed using two different evaluation methods. The first evaluation is based only on the stress levels stated by the parent for situations they have experienced, while any items they have not experienced are left blank. In the second evaluation method, situations never experienced by the parents are assumed to not be a source of stress and are scored 1. The validity and reliability of the Turkish version of the scale were demonstrated by Turan and Başbakkal (2006), who reported a Cronbach alpha coefficient of .90 (Turan and Başbakkal, 2006). In this study, the value was .94 for mothers and .97 for fathers.

NICU Parental Beliefs Scale

This assessment tool was developed to evaluate parents' role beliefs related to their preterm infant in the NICU and has demonstrated validity and reliability (Melnyk et al., 2014; Özdemir and Alemdar, 2019). It consists of 18 items in three subscales: Parent-Baby Interaction, Parental Role Confidence, and Knowledge of Infant Characteristics and Behaviors in the NICU (referred to hereafter as "Knowledge of the NICU"). Parents score the items from 1 to 5 ("strongly disagree" to "strongly agree"). The total score ranges between 18 and 90, with high scores reflecting more positive parenting beliefs. In the validity and reliability study conducted in Türkiye, the scale's Cronbach alpha coefficient was .90 (Özdemir and Alemdar, 2019). In this study, the value was .89 for mothers and .92 for fathers.

Data Collection

Parents of neonates in the NICU where the study was conducted have daily visitation rights. Considering the possibility that work obligations may limit fathers' ability to visit the NICU, interviews were scheduled in advance to allow fathers to arrange leave and be present in the NICU at the specified time. This ensured equal and complete participation by both parents during data collection. Parents who met the sampling criteria were met during NICU visits and informed about the study purpose and procedure. Verbal and written consent was obtained from the parents. Information about the preterm infant was recorded by the researchers on the preterm infant information form based on NICU medical records. Data pertaining to the parents were collected via self-report using the parent information form, PSS:NICU, and NICU Parental Beliefs Scale (NICU-PBS). Parents completed the forms in separate waiting rooms to avoid influencing each other's responses and allow uninterrupted communication. Each parent completed the data collection forms in about 15–20 minutes.

Statistical Analysis

Collected data were analyzed using IBM SPSS Statistics, version 26 (SPSS Inc.; Chicago, IL, USA). The distribution of continuous data was assessed using the Shapiro–Wilk test and box plots. All variables were analyzed using appropriate descriptive statistics. Continuous data showed normal distribution and were compared using student's *t*-test (two groups) and one-way ANOVA with post-hoc Bonferroni correction (three or more groups). Results were evaluated with 95% CI and a significance level of $p < .05$ (Şencan, 2005).

Ethical Considerations

Ethical clearance for the study was granted by the institutional review board of Zeynep Kamil Women and Children Diseases Training and Research Hospital İn İstanbul, Türkiye (13.04.2023/370). All participants provided written informed consent, and the study adhered to the tenets set forth in the Declaration of Helsinki. Clinical trial registration was not applicable for this study.

Results

Sample Characteristics

A total of 240 parents of 120 preterm infants were included. Gestational age at birth ranged from 28 to 37 weeks with a mean of 32.82 ± 2.44 weeks, and 51.7% (n = 62) of the infants were female. The mean birth weight was 1795.00 ± 502.00 g (range: 690–2500 g). The most common medical diagnoses were respiratory distress (85.0%; n = 102) and intrauterine growth retardation (13.3%; n = 16). The mean Apgar score at 1 minute was 6.69 ± 1.33. At study inclusion, the infants' mean postnatal age was 33.60 ± 2.79 weeks and their mean body weight was 1697.44 ± 487.67 g (Table 1).

Table 1.
Descriptive and Clinical Characteristics of the Participants' Infants (N = 120)

		n (%)
Sex	Female	62 (51.7)
	Male	58 (48.3)
Gestational age at birth (weeks)	Mean ± SD	32.82 ± 2.44
	Median (range)	33 (28–37)
Birth weight (grams)	Mean ± SD	1795.0 ± 502.00
	Median (range)	1895 (690–2500)
Medical diagnosis*	Respiratory distress	102 (85.0)
	Intrauterine growth restriction	16 (13.3)
	Hyperbilirubinemia	2 (1.7)
	Transient tachypnea of the newborn	6 (5.0)
	Fetal distress	3 (2.5)
	Hypoglycemia	2 (1.7)
	Meconium aspiration syndrome	2 (1.7)
	Ventricular septal defect	3 (2.5)
	Oligohydramnios	2 (1.7)
	Congenital cystic lung	1 (0.8)
APGAR score at 1 min	Mean ± SD	6.69 ± 1.33
	Median (range)	7 (2-9)
Postnatal age (weeks)	Mean ± SD	33.60 ± 2.79
	Median (range)	34.3 (16.6–37.9)
Weight at time of study (grams)	Mean ± SD	1697.44 ± 487.67
	Median (range)	1747.5 (750–2700)

*Infants could have more than one diagnosis.

Of the participating mothers, 32.5% (n = 39) were between the ages of 25–29 years, 28.3% (n = 34) were high school graduates, 22.5% (n = 27) were employed, 49.2% (n = 59) had moderate subjective financial well-being, 33.3% (n = 40) had a history of major stress within the previous year, and 88.2% (n = 106) visited their infant once a week in the NICU. Among fathers, 44.2% (n = 53) were 35 years old or older, 30.8% (n = 37) were high school graduates, 96.7% (n = 116) were employed, 52.5% (n = 63) had moderate subjective financial well-being, 31.7% (n = 38) had a history of major stress within the previous year, and 93.4% (n = 112) visited their infants twice a week in the NICU (Table 2).

Comparison of Parents' Parental Stressor Scale: Neonatal Intensive Care Unit and NICU Parental Beliefs Scale Scores

The PSS:NICU and NICU-PBS total and subscale scores of the parents included in the sample are compared in Table 3. The mean PSS:NICU total score was 3.02 ± 0.91 for mothers and 2.86 ± 1.14 for fathers. For both mothers and fathers, the highest mean subscale score in the PSS:NICU was for Parental Role Alterations (mothers: 3.47 ± 1.09; fathers: 3.11 ± 1.24), and the lowest mean score was in the Sights and Sounds subscale (mothers: 2.60 ± 1.07; fathers: 2.51 ± 1.28). There was no difference between parents in mean Sights and Sounds, Infant Appearance and Behaviors, or total scores ($p > .05$), whereas Parental Role Alterations subscale scores were higher among mothers ($p = .001$; Table 3).

Table 2.
Descriptive Characteristics of the Participating Parents (N = 240)

		Mothers, n (%)	Fathers, n (%)
Age (years)	15-24	19 (15.8)	4 (3.3)
	25-29	39 (32.5)	29 (24.2)
	30-34	35 (29.2)	34 (28.3)
	≥35	27 (22.5)	53 (44.2)
Education level	Primary school	26 (21.7)	23 (19.2)
	Secondary school	33 (27.5)	29 (24.2)
	High school	34 (28.3)	37 (30.8)
	University	27 (22.5)	31 (25.8)
Employment status	Employed	27 (22.5)	116 (96.7)
	Unemployed	93 (77.5)	4 (3.3)
Subjective financial status	Income more than expenses	48 (40.00)	45 (37.5)
	Income equal to expenses	59 (49.2)	63 (52.5)
	Income less than expenses	13 (10.8)	12 (10)
Stressful life event in last year	Yes	40 (33.3)	38 (31.7)
	No	80 (66.7)	82 (68.3)
Frequency of NICU visitation	Every day	4 (3.4)	1 (0.8)
	Every other day (4 times/week)	4 (3.4)	7 (5.8)
	Twice a week	6 (5.0)	112 (93.4)
	Once a week	106 (88.2)	0 (0.0)

Note: NICU = Neonatal intensive care unit.

The mean NICU-PBS total score was 66.36 ± 12.43 for mothers and 67.69 ± 15.38 for fathers. For both mothers and fathers, the highest mean subscale score in the NICU-PBS was for Parent-Baby Interaction (mothers: 29.36 ± 6.29; fathers: 28.34 ± 7.43) and the lowest mean score was for Knowledge of the NICU (mothers: 11.48 ± 2.74; fathers: 11.04 ± 2.83). The parents' mean Parent-Infant Interaction and Knowledge of the NICU subscale scores did not differ significantly ($p > .05$), while Parental Role Confidence subscale and total scores were higher among fathers ($p = .001$; Table 3).

Main Stressors for Parents on the Parental Stressor Scale: Neonatal Intensive Care Unit

The ten PSS:NICU items most frequently reported as very and extremely stressful are shown in Table 4. For mothers, the top three items considered very or extremely stressful were "being separated from my baby" (76.8%), "not being able to hold my baby when I want" (73.3%), and "not being able to feed my baby" (72.5%), all of which are in the Parental Role Alterations subscale. For fathers, the most stressful item was "seeing my baby stop breathing" (61.7%) in the Infant Appearance and Behaviors subscale, followed by the Parental Role Alterations items "being separated from my baby" and "not being able to hold my baby when I want" (60.8% and 59.1%) (Table 4).

Comparison of Parents' NICU Parental Beliefs Scale Scores According to Clinical and Sociodemographic Characteristics

Maternal NICU-PBS subscale and total scores showed no significant differences when compared according to the infant's sex, gestational age, and birth weight or the mother's education level, subjective financial well-being, and frequency of NICU visitation ($p > .05$). When the mothers' NICU-PBS scores were compared according to their age, there was a significant difference in Knowledge of the NICU subscale score ($p = .046$). Pairwise comparisons showed that mothers aged 15–24 years had significantly lower scores in this domain compared to mothers aged 35 and over ($p = .009$). Maternal age was not associated with any other significant differences in NICU-PBS subscale or total scores ($p < .05$; Table 5).

Fathers' NICU-PBS subscale and total scores did not differ significantly in relation to infant sex, paternal age and education level, or frequency of NICU visitation ($p > .05$). However, infant birth weight was weakly negatively correlated with the other subscales and total score ($r = -.202$, $p = .027$; $r = -.200$, $p = .028$; $r = -0.211$, $p = .021$). There were also weak negative correlations between gestational age and Parental Role Confidence subscale score ($r = -.187$, $p = .041$) and NICU-PBS total score ($r = -.203$, $p = .026$). Similarly, fathers' subjective financial well-being was associated with significant differences in Parental Role Confidence ($p = .004$) and NICU-PBS total scores ($p = .009$), with significantly lower scores reported by those with lower financial well-being ($p = .040$; $p = .017$).

Relationship Between Parental Parental Stressor Scale: Neonatal Intensive Care Unit and NICU Parental Beliefs Scale Scores

When the relationships between the parents' PSS:NICU and NICU-PBS subscale and total scores were examined, inverse

Table 3.
Comparison of Parents' PSS:NICU and NICU-PBS Scores (N = 240)

			Mother	Father	*p*	Difference
PSS:NICU	Sights and sounds	Mean ± SD	2.60 ± 1.07	2.51 ± 1.28	[a].442	0.08 ± 1.16
		Median (range)	2.6 (0–5)	2.7 (0–5)		0 (−4–3.5)
	Infant's appearance and behaviors	Mean ± SD	3.01 ± 1.37	2.95 ± 1.41	[b].646	0.05 ± 1.29
		Median (range)	3.2 (0–5)	3.2 (0–5)		0 (−4.2–4)
	Parental role alteration	Mean ± SD	3.47 ± 1.09	3.11 ± 1.24	**[b].001***	0.35 ± 1.14
		Median (range)	3.6 (0–5)	3.1 (0–5)		0.1 (−3.1–4.3)
	Total PSS:NICU	Mean ± SD	3.02 ± 0.91	2.86 ± 1.14	[a].066	0.16 ± 0.96
		Median (range)	3.2 (0.7–5)	3 (0–5)		0.0 (−3.1–3.4)
NICU-PBS	Parental role confidence	Mean ± SD	25.53 ± 5.61	28.31 ± 6.72	***[b].001****	−2.82 ± 6.81
		Median (range)	25.5 (7–35)	29 (8–40)		−4 (-18–26)
	Parent-baby interaction	Mean ± SD	29.36 ± 6.29	28.34 ± 7.43	[b].194	1.05 ± 7.03
		Median (range)	30 (8–40)	29.5 (8–40)		0 (−18–32)
	Knowledge of the NICU	Mean ± SD	11.48 ± 2.74	11.04 ±2.83	[b].216	0.43 ± 3.13
		Median (range)	12 (3–15)	12 (3–15)		0 (−7–12)
	Total NICU-PBS	Mean ± SD	66.36 ± 12.43	67.69 ± 15.38	**[a].001***	−1.33 ± 14.72
		Median (range)	67 (18–90)	70 (19–95)		

[a]Paired-samples *t* test.
[b]Wilcoxon signed-rank test.
**p* < .01 *p<.01
Note: NICU-PBS = NICU Parental Beliefs Scale; PSS:NICU = Parental Stressor Scale: Neonatal Intensive Care Unit.

but statistically nonsignificant relationships were observed (*p* > .05).

Discussion

Admission to the NICU and the associated increase in parental stress interferes with the parents' active caregiving role and may have negative effects on their perceptions and beliefs about this role (Alemdar et al., 2025; Melnyk et al., 2014; Özdemir and Alemdar, 2019). Parents' internalization of caretaking responsibility and their perceived competency in this role directly affect not only their psychological adjustment process but also the quality of the parent-infant bond (van Wyk et al., 2024). In family-centered care, determining parental role beliefs and their relationship with stress levels is important in terms of creating a NICU and discharge plan consistent with the parents'

Table 4.
PSS:NICU Top 10 Highest Scoring Parental Stress Factors in the NICU (N = 240)

PSS:NICU Subscale		Mothers, n (%)	Fathers, n (%)
Parental role alteration	Being separated from my baby	92 (76.8)	73 (60.8)
	Not being able to hold my baby when I want to	88 (73.3)	71 (59.1)
	Not being able to feed my baby	87 (72.5)	57 (47.5)
	Not having alone time with my baby	64 (53.4)	50 (41.6)
	Feeling helpless about how to help my baby during this time	71 (59.1)	56 (46.7)
	Being unable to care for my baby (e.g., diaper changing, bathing)	77 (64.2)	56 (46.7)
	Being unable and feeling helpless to protect my baby from pain and painful interventions	76 (63.4)	66 (55)
Infant's appearance and behaviors	Seeing my baby in pain/suffering	78 (65.0)	70 (58.3)
	Seeing my baby stop breathing	68 (56.7)	74 (61.7)
	Seeing sudden color changes in my baby (e.g., looking pale or bruised)	63 (52.5)	66 (55.0)

Note: Only the items rated as "very stressful" or "extremely stressful" by the highest proportion of parents are included.
Note: PSS:NICU = Parental Stressor Scale: Neonatal Intensive Care Unit.

needs, enhancing parenting role beliefs, and improving the quality of care (Aykanat Girgin and Cimete, 2017; Li et al., 2024). This study identified and compared stress levels, parental role beliefs, and associated factors among the parents of preterm infants admitted to a NICU in İstanbul, Türkiye. .

The parents in this study had moderate stress levels, with no significant difference in stress scores except for the Parental Role Alterations subscale. Although mothers tended to have higher stress scores in general, this difference was highly statistically significant for Parental Role Alterations scores ($p = .001$; Table 3). Consistently, this subscale included the three items evaluated by mothers as most stressful, which involved being separated from their infant, not being able to hold their infant when they wanted, and being unable to feed their infant (Table 4). This shows that compared to fathers, mothers are more affected by the change in parental role, feel a greater need for physical contact with their infants, and find the lack thereof more stressful (Al Maghaireh et al., 2016; Siva et al., 2024; Stovall et al., 2025). Additionally, both parents scored high on the Parental Role Alterations and Infant Appearance and Behaviors subscales in the PSS:NICU. Other studies in the literature have also reported that mothers and fathers have the highest stress scores in these two subscales (Al Maghaireh et al., 2016; Moon et al., 2021). Similarly, in their study including 150 parents with preterm infants in the NICU, Konukbay et al. (2024) observed no significant difference between parental PSS:NICU subscale and total scores but reported that the highest stress scores were in the Parental Role Alterations and Infant Appearance and Behaviors subscales. These findings are largely consistent with this study, with the main difference being that the mothers in this study experienced more stress related to parental role alterations compared to fathers.

The parents in this study also had moderate NICU-PBS scores. Scores on the Knowledge of the NICU and Parent-Baby Interaction subscales tended to be higher among mothers, although the differences did not reach statistical significance, while fathers had significantly higher Parental Role Confidence and NICU-PBS total scores. This may be related to the mothers having higher stress related to parental role alterations and feeling inadequate in their parenting role (Aykanat Girgin and Cimete, 2017). Additionally, consistent with the findings, the literature indicates that fathers who actively participate in the NICU process in line with family-centered care practices had higher levels of parental role confidence, and support from neonatal nurses is a facilitating factor in this (Hearn et al., 2020; Rio et al., 2022). In a study of 120 mothers conducted by Alemdar et al. (2025) and another study by Rio et al. (2022) including 70 fathers, mean NICU-PBS total scores were 71.12 ± 9.04 and 68.44 ± 10.29, respectively. The higher mean NICU-PBS scores reported in these studies compared to the results may be related to various factors, including the sociocultural context of parenting role beliefs, the family-centered care approaches implemented in the health system, and parental levels of participation in the clinical process. However, parents in the current study scored highest in the Parent-Baby Interaction subscale of the NICU-PBS and lowest in the Knowledge of the NICU subscale (Table 3). This suggests that parents think that they are still able to interact with their infants despite NICU conditions but do not think they have adequate knowledge about infants' behaviors and characteristics in the NICU. This finding emphasizes the need for parents to receive straightforward, understandable, and regular updates about their infant's health status and be clearly informed about the characteristics and behaviors of infants in the NICU from the first day of admission, in line with the family-centered care approach (Aykanat Girgin and Cimete, 2017; Kim et al., 2025; Stovall et al., 2025).

In this study, the infant's sex, gestational age, and birth weight and the mother's education level, subjective financial well-being, and frequency of NICU visitation were not associated with statistical differences in maternal NICU-PBS scores (Table 5). This finding showed that parenting role beliefs were not affected by the infants' degree of prematurity, sex, or maternal demographic characteristics. Parents' ability to regularly visit their infants in the NICU is generally considered a basic requirement for them to assume parenting roles and support the development of secure attachment with the infant (Powers et al., 2022). However, the frequency of NICU visitation was not associated with parenting role beliefs in mothers or fathers in this study. As stated previously in the literature, this result suggests that the frequency of visits alone is not a sufficient indicator by which to determine parents' role beliefs (Hearn et al., 2020; Rio et al., 2022). However, although it was not significant for either group, it is determined that mothers and fathers who visited daily had higher NICU-PBS subscale and total scores compared to those who visited less frequently (Tables 5 and 6). Despite the lack of statistical significance, this finding suggests that visiting infants in the NICU every day positively impacts parents' role confidence, interactions with their infant, and knowledge about the NICU environment (Jannes et al., 2020; Pineda et al., 2018; Powers et al., 2022). Parental age is an important variable that influences attitudes toward the care of premature infants and the knowledge and skills related to parenting roles, especially for mothers (Neri et al., 2017). The fact that mothers aged 35 and over scored higher in the Knowledge of the NICU subscale in this study shows that the emotional maturity and knowledge accumulation that occurs with age positively impacted their role beliefs related to this domain. Similarly, it has been stated in the literature that older parents have better access to and stronger internalization of information about high-risk infant care (Guades and Canavarro, 2015; Neri et al., 2017).

Unlike with mothers, smaller gestational age and birth weight were associated with higher NICU-PBS total and subscale scores among fathers in this study (Table 6). At lower gestational age and birth weight, the infant's degree of prematurity increases (Zivaljevic et al., 2024), and their greater care needs lead to fathers assuming more responsibility in this process, thereby increasing parental role beliefs. In addition, it is determined in this study that fathers' stress was mostly related to their infant's appearance and behaviors and their perceptions of their parental role (Table 4). This suggests that fathers experience an increase in stress levels, being especially affected by their infant's clinical appearance, and that this stress shapes and strengthens their perceptions of the parental role by prompting them to take more responsibility. However, the variables of infant sex, paternal education level, and the frequency of NICU visitation did not affect the fathers' role beliefs (Table 6).

Table 5.
Evaluation of Mothers' NICU-PBS Scores According to Clinical and Sociodemographic Characteristics (N = 120)

		Parental Role Confidence		Parent-Baby Interaction		Knowledge of NICU		NICU-PBS Total	
Mother/Infant		**Mean ± SD**	**Median (Range)**	**Mean ± SD**	**Median (Range)**	**Mean ± SD**	**Median (Range)**	**Mean ± SD**	**Median (Range)**
Birth weight	r	.010≠		.002ǂ		−.032ǂ		.002≠	
	p	.914		.980		.731		.983	
Gestational age at birth	r	−.020≠		.011ǂ		−.031ǂ		−.028≠	
	p	.830		.907		.733		.758	
Infant sex	Female (n = 62)	25.73 ± 5.57	25 (13–35)	29.39 ± 5.84	29.5 (14–40)	11.68 ± 2.82	12 (3–15)	66.79 ± 11.72	66 (34–89)
	Male (n = 58)	25.31 ± 5.68	26 (7–35)	29.33 ± 6.8	32 (8–40)	11.26 ± 2.67	12 (3–15)	65.90 ± 13.24	68.5 (18–90)
	p	[a].687		[b].487		[b].343		[a].696	
Age	15-24 years (n = 19)	25.09 ± 6.77	27 (7–35)	28.40 ± 8.22	30 (17–40)	10.59 ± 2.79	10 (6–15)	65.09 ± 16.27	70 (18–89)
	25–29 years (n = 39)	25.1 ± 5.3	25 (15–35)	29.64 ± 5.91	29 (8–40)	11.60 ± 3.34	13 (3–15)	65.33 ± 11.32	66 (46–90)
	30–34 years (n = 35)	26.16 ± 4.45	26 (17–33)	30.16 ± 4.92	30 (18–40)	11.68 ± 2.06	12 (8–15)	68.00 ± 10.05	69 (45–88)
	≥35 years (n = 27)	26.26 ± 5.27	25 (16–35)	29.63 ± 4.81	31 (18–40)	12.44 ± 1.83	12 (9–15)	68.33 ± 9.70	66 (51–88)
	p	[c].772		[d].951		**[d].046***		[c].588	
Education	Primary school (n = 26)	25.04 ± 5.81	25 (14–35)	28.67 ± 6.31	30 (17–40)	11.48 ± 2.36	12 (6–15)	66.85 ± 11.55	64 (34–90)
	Secondary school (n = 33)	23.85 ± 5	24 (15–34)	30.21 ± 5.64	30 (18–40)	11.00 ± 2.87	12 (3–15)	65.06 ± 11.26	65 (45–89)
	High school (n = 34)	26.09 ± 6.29	26.5 (7–35)	28.53 ± 7.43	29.5 (8–40)	11.74 ± 2.98	12 (3–15)	66.35 ± 15.07	66.5 (18–89)
	University (n = 27)	27.33 ± 4.77	28 (15–35)	30.08 ± 5.54	31 (14–40)	11.73 ± 2.71	12 (6–15)	67.48 ± 11.47	71 (46–89)
	p	[c].096		[d].825		[d].584		[c].894	
Subjective financial status	Income more than expenses (n = 48)	26.02 ± 5.71	26.5 (7–35)	29.10 ± 6.10	30 (8–40)	11.46 ± 2.89	12 (3–15)	66.58 ± 12.37	69 (18–88)
	Income equal to expenses (n = 59)	25.49 ± 5.63	25 (14–35)	29.51 ± 6.85	31 (9–40)	11.58 ± 2.76	12 (5–15)	66.58 ± 13.39	65 (28–90)
	Income less than expenses (n = 13)	23.85 ± 5.16	24 (15–31)	29.62 ± 4.44	31 (21–39)	10.08 ± 2.25	12 (7–15)	64.54 ± 7.95	63 (53–82)
	p	[d].356		[d].939		[d].683		[d].614	
Frequency of NICU visitation	Every day (n = 4)	28.33 ± 4.59	29 (20–34)	32.33 ± 4.84	31 (27–40)	13.33 ± 1.63	13.5 (11–15)	74.00 ± 9.21	72.5 (62–89)
	Every other day (n = 4)	21.25 ± 3.77	21 (17–26)	28.50 ± 2.65	28 (26–32)	11.00 ± 1.41	11.5 (9–12)	60.75 ± 6.29	58.5 (56–70)
	Twice a week (n = 6)	26.75 ± 5.25	29 (19–30)	29.25 ± 4.86	31.5 (22–32)	10.00 ± 1.83	10 (8–12)	66.00 ± 10.80	70.5 (50–73)
	One a week (n = 106)	25.48 ± 5.68	25 (7–35)	29.23 ± 6.51	30 (8–40)	11.44 ± 2.82	12 (3–15)	66.15 ± 12.73	66 (18–90)
	p	[b].200		[b].315		[b].100		[b].122	

*Pearson correlation analysis.
ǂSpearman correlation analysis.
[a]Student's *t* test.
[b]Mann-Whitney *U*-test.
[c]One-way ANOVA.
[d]Kruskal–Wallis test **p* < .05 *p<.05
Note: NICU-PBS = NICU Parental Beliefs Scale.

Table 6..
Evaluation of Fathers' NICU-PBS Scores According to Clinical and Sociodemographic Characteristics (N = 120)

		Parental Role Confidence		Parent-Baby Interaction		Knowledge of NICU		NICU-PBS Total	
Father/Infant		**Mean ± SD**	**Median (Range)**	**Mean ± SD**	**Median (Range)**	**Mean ± SD**	**Median (Range)**	**Mean ± SD**	**Median (Range)**
Birth weight	r	−.202		−.200		−.110		−.211	
	p	**.027***		**.028***		.232		**.021***	
Gestational age at birth	r	−.187		−.172		−.081		−.203	
	p	**.041***		.060		.378		**.026***	
Infant sex	Female (n = 62)	29.15 ± 7.59	30.5 (8–40)	28.16 ± 7.51	28.5 (8–40)	11.18 ± 3.03	12 (3–15)	68.48 ± 16.98	71 (19–95)
	Male (n = 58)	27.48 ± 7.22	29 (8–38)	28.47 ± 5.81	29 (8–40)	10.90 ± 2.61	12 (3–15)	66.84 ± 13.56	69 (19–90)
	p	[b].182		[a].805		[b].449		[a].562	
Age	15–24 years (n = 4)	27.40 ± 7.87	28 (8–40)	26.92 ± 7.32	28 (8–40)	10.81 ± 3.11	12 (3–15)	65.13 ± 16.70	67 (19–95)
	25–29 years (n = 29)	30.83 ± 4.08	31 (23–40)	29.59 ± 4.36	30 (23–40)	11.03 ± 2.38	12 (6–15)	71.45 ± 8.71	72 (56–95)
	29–34 years (n = 34)	27.41 ± 8.49	30.5 (8–40)	29.35 ± 7.10	31 (8–40)	11.24 ± 2.80	12 (3–15)	68.00 ± 17.08	73.5 (19–95)
	≥35 years (n= 53)	30.75 ± 8.54	33 (19–38)	28.50 ± 8.23	29 (18–38)	12.50 ± 2.38	12.5 (10–15)	71.75 ± 18.79	74.5 (47–91)
	p	[d].206		[c].126		[d].924		[c].201	
Education	Primary school (n = 23)	26.48 ± 7.73	29 (8–37)	27.09 ± 6.41	28 (8–36)	10.65 ± 2.93	11 (3–15)	64.22 ± 15.84	68 (19–86)
	Secondary school (n = 29)	28.14 ± 7.24	30 (14–40)	28.48 ± 6.20	29 (16–40)	11.72 ± 2.05	12 (6–15)	68.34 ± 13.68	72 (36–95)
	High school (n = 37)	29.22 ± 8.41	32 (8–40)	29.32 ± 7.99	30 (8–40)	11.16 ±3.43	12 (3–15)	69.70 ± 18.33	74 (19–95)
	University (n = 31)	28.87 ± 6.10	31 (8–40)	27.84 ± 5.80	27 (8–40)	10.55 ± 2.55	11 (3–15)	67.26 ± 12.70	70 (19–95)
	p	[d].359		[c].625		[d].253		[c].602	
Subjective financial status	Income more than expenses (n = 45)	31.17 ± 2.92	31 (25–35)	30.00 ± 4.29	31.5 (22–36)	11.92 ± 1.56	12 (9–15)	73.08 ± 6.82	74 (63–86)
	Income equal to expenses (n = 63)	30.31 ± 6.77	31 (8–39)	29.24 ± 6.41	30 (9–40)	11.44 ± 2.69	12 (3–15)	71.00 ± 14.37	73 (20–94)
	Income less than expenses (n = 12)	26.40 ± 7.98	28 (8–40)	27.32 ± 7.21	28 (8–40)	10.59 ± 3.05	11 (3–15)	64.30 ± 16.55	66 (19–95)
	p	**[d].004****		[d].207		[d].207		**[d].009****	
Frequency of NICU visitation	Every day (n = 1)	29.00 ± 0.00	29 (29–29)	28.44 ± 6.59	29 (8–40)	12.00 ± 0.00	12 (12–12)	67.96 ± 15.1	70 (19–95)
	Every other day (n = 7)	26.57 ± 9.47	27 (8–37)	26.71± 9.34	27 (8–36)	10.43 ± 4.12	11 (3–15)	63.71 ± 21.31	67 (19–86)
	Twice a week (n = 112)	28.45 ± 7.35	30 (8–40)	25.00 ± 0.00	25 (25–25)	11.07 ± 2.76	12 (3–15)	66.00 ± 0.00	66 (66–66)
	p	[b].534		[b].575		[b].873		[b].709	

*Pearson correlation analysis.
‡Spearman correlation analysis.
[a]Student's *t* test.
[b]Mann-Whitney *U*-test.
[c]One-way ANOVA.
[d]Kruskal–Wallis test
**p* < .05. *p<.05
***p< .01. **p<.01*
Note: NICU-PBS = NICU Parental Beliefs Scale.

A noteworthy finding of the study is that stress and parental belief scores were not significantly related. Although previous studies have suggested parental stress may have a role in decreasing parental beliefs in the NICU (Özdemir and Alemdar, 2019; Alemdar et al., 2025), the findings indicate an absence of direct correlation between these two constructs. The complex mechanisms of parenting role beliefs and stressors in the NICU setting may have been influenced by several variables, such as the sociocultural context, the family-centered care approaches of the health system, and the parent's level of involvement in the clinical process. Future studies should consider these variables to further investigate parents' roles and how they are impacted by such factors.

Study Limitations

The strength of this study is that it objectively evaluated and compared the stress levels and parenting role beliefs of mothers and fathers with preterm infants in the NICU. However, there are several important limitations of this study: 1) its basis on a single center, 2) the reliance on parents' self-reported data, 3) the inability to infer causality due to the cross-sectional design, and 4) potential confounders such as NICU family-centered care practices, nursing support, duration of NICU visits, and nurse-parent communication. Multicenter studies that take these factors into account should be conducted.

Conclusion and Recommendations

This study contributes to the understanding of parental stress and parenting role beliefs among the parents of preterm infants admitted to the NICU and explores the interrelatedness of these constructs. The findings indicate that both mothers and fathers of preterm infants hospitalized in the NICU reported moderate stress levels and moderately positive parental role beliefs. Notably, mothers appeared to be more significantly affected by alterations in the parental role during the NICU stay compared to fathers. Levels of stress related to the infant's appearance and behavior and parental role alterations were particularly elevated in both parents. However, fathers had higher scores for parental role confidence and total parental beliefs. Among the subscales for parental beliefs, both parents had the lowest mean scores for knowledge of infant characteristics and behaviors in the NICU. Furthermore, maternal parental role beliefs were positively associated with maternal age ≥35 years, while paternal role beliefs were positively influenced by lower birth weight and gestational age and higher subjective financial well-being. Notably, no significant relationship between stress levels and parental role belief scores was observed, suggesting that these constructs may not directly correlate within the NICU context.

Based on the findings, it can be concluded that providing support to reduce mothers' stress related to the change in their parenting role and strengthening their beliefs about their parenting role is an important requirement in the clinical care process. Moreover, both parents' knowledge should be increased by informing them about the NICU environment, the medical devices used, and the health status of their infant, and parents should be encouraged to make physical and emotional contact with their infants in the NICU setting. This support may be especially important for younger mothers and fathers.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

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