Vol. 5 No. 1 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Assessing Stress Levels among Parents of Children Admitted to the Neonatal Intensive Care Unit: A Descriptive Cross-Sectional Study

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Keywords: parental stress; Neonatal Intensive Care Unit; NICU; family-centred care; cross-sectional study; Pakistan

Received on 25 June 2026
Accepted on 20 July 2026
Published on 25 July 2026

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Abstract

Background: The admission of a neonate to the Neonatal Intensive Care Unit (NICU) is a sudden and emotionally overwhelming experience for parents, exposing them to an unfamiliar clinical environment, uncertainty about their child's survival, and disruption of expected parenting roles. Although parental psychological wellbeing in the NICU has received growing international attention, evidence from low- and middle-income countries, including Pakistan, remains limited, and comparative data on maternal versus paternal stress are scarce.

Objective: To assess the level of stress experienced by parents of children admitted to the NICU and to identify the demographic and hospital-related factors associated with parental stress.

Methods: A descriptive cross-sectional study was conducted among 150 parents of neonates admitted to the NICU, recruited through non-probability convenience sampling over a three-month period. Data were collected using a structured, self-administered questionnaire covering demographic characteristics and a parental stress and hospital-experience component, following written informed consent. Data were entered and analysed in SPSS using descriptive statistics (frequencies, percentages) and inferential statistics (correlation and regression analysis).

Results: Most respondents were mothers (88.0%) aged 26–35 years (38.7%), with matric-level education (42.7%) and a monthly household income of PKR 41,000–50,000 (39.3%). Nearly all parents reported that having a child in the NICU was a stressful experience. While 74.0% of parents were satisfied with staff behaviour and 90.0% were permitted to see their child at least once daily, 33.3% felt inadequately informed by physicians about changes in their child's condition and 39.3% reported that the hospital did not provide all required medicines.
Conclusion: Parental stress in the NICU is nearly universal and is shaped by communication gaps, resource constraints, and socio-demographic disadvantage; parents with higher education and income appeared comparatively better placed to cope. Family-centred care strategies — including structured clinician–parent communication, psychosocial support, and improved medicine and waiting-area provision — are recommended to reduce parental stress in this setting.

1. Introduction

1.1 Background

Approximately 15 million infants are born preterm — before the 37th completed week of gestation — every year worldwide, and this figure continues to rise (Çekin & Turan, 2018). Complications of prematurity contribute to the deaths of nearly one million children annually, and many survivors experience lasting cognitive, visual, or hearing impairment (Çekin & Turan, 2018). Families typically build expectations for their unborn child throughout pregnancy, and a preterm birth can abruptly disrupt these expectations. Parenting a premature infant who requires admission to a Neonatal Intensive Care Unit (NICU) is therefore an unanticipated and profoundly difficult experience for most families.

Parental stress arising from a neonate's hospitalisation is a significant concern that affects both parents and infants. The experiences of fathers remain comparatively under-researched relative to mothers, and although a relationship between infant illness severity and parental stress has been documented, the specific causes and risk factors for elevated parental stress in the NICU require further investigation (Hendy et al., 2024).

High-risk neonates — defined irrespective of birth weight or gestational age — face an elevated risk of morbidity and mortality due to their medical condition and difficulty adapting to extrauterine life (Kyle & Carman, 2015). These infants are particularly susceptible to respiratory difficulty, impaired thermoregulation, feeding difficulties, and infection; an estimated 14.8% of births globally were classified as high-risk in 2014, a proportion that continues to grow (Cao et al., 2022). The global preterm birth rate is estimated at 10.6%, with substantial regional variation ranging from 8.7% to 13.4% (Chawanpaiboon et al., 2019), and this rate is rising in many developed nations (Cao et al., 2022).

Existing literature has documented the prevalence of parental stress in the NICU but has been less successful in isolating the specific contributing factors that shape parenting style and parent–child interaction (Hanley et al., 2015; Roque et al., 2017). Qualitative approaches have been particularly valuable in illuminating the subjective, lived experience of parents during this period (Speziale et al., 2011). Parents and other family members commonly experience extreme distress at the time of NICU admission (Maghaireh et al., 2016), and concern about neonatal survival and long-term wellbeing is one of the most consistently reported sources of parental anxiety (Siva et al., 2023). Mothers, in particular, report heightened stress when separated from their newborn (Roque et al., 2017). Reported rates of at least moderate parental stress during NICU admission are high across settings — one tertiary-care study found that 93.3% of parents experienced moderate stress, driven largely by fear regarding their child's recovery (Pathak et al., 2022) — and NICU admission is consistently associated with

elevated physiological distress and anxiety among parents (Shetty et al., 2023; Kour et al., 2023).

1.2 Problem Statement

Parents of children admitted to the NICU experience high levels of stress that can compromise their mental and physical health and their capacity to provide optimal care for their child. Parents are confronted with an unfamiliar clinical environment governed by strict protocols and regulations, and they frequently do not fully understand their child's clinical circumstances, which heightens worry and anxiety. Many parents feel helpless because they are unable to feed or hold their child as they had anticipated, and they carry ongoing concern about their baby's survival, the cost of treatment, and the child's long-term health. Collectively, these concerns generate substantial stress among parents, underscoring the need to systematically assess parental stress levels in this population.

1.3 Research Gap

A substantial body of research has documented contributing factors such as fear and anxiety without clearly distinguishing which specific elements — separation from the infant, disruption of the parental role, or the infant's physical condition — most strongly drive parental stress. Much of this literature also implicitly assumes that mothers bear the greater emotional burden because of their closer caregiving role, leaving fathers' stress, coping patterns, and emotional responses comparatively unexplored; this absence of comparative evidence makes it difficult to characterise gender-based differences in parental stress. Furthermore, although parental stress in the NICU has been widely examined in high-income settings, comparable evidence from developing countries remains scarce. Most existing studies focus narrowly on measuring stress or identifying broad stressors, offering limited insight into the wider psychological and emotional experience of parents, including the specific impact of separation from the newborn. This study was designed to address these gaps in the local context.

1.4 Objectives of the Study

- To identify the causes of stress among parents of children admitted to the NICU.
- To examine the relationship between stress-related factors (e.g., age, education) and severity of illness with parental stress level.
- To identify the types of support parents require while their child is admitted to the NICU.
- To identify demographic and clinical factors associated with parental stress in the NICU.
- To compare stress levels between mothers and fathers of children admitted to the NICU.

1.5 Research Questions

- What is the level of stress experienced by parents of children admitted to the NICU?
- How does a child's NICU admission affect parents emotionally and socially?
- What strategies do parents use to cope with stress and emotional difficulty during NICU admission?
- Which factors increase or decrease parental stress levels?

1.6 Aim of the Study

The aim of this study was to investigate the factors contributing to stress among parents of children admitted to the NICU and to gather first-hand data from parents experiencing the NICU environment. The study sought to explore the emotional, psychological, and environmental factors influencing parental stress in order to inform evidence-based strategies for enhancing parental wellbeing in NICU settings.

1.7 Significance of the Study

This study examined stress levels in both mothers and fathers and identified the parental and hospital-related factors associated with elevated stress. By generating context-specific, disease-relevant data on parental stress, the findings can support more precise screening, counselling, and integration of psychosocial support within NICU care. The

study was motivated by the observation that parents of children admitted to the NICU frequently face substantial emotional and psychological challenges that remain inadequately addressed in routine clinical care, prompting an investigation into their stress, emotional difficulties, and coping patterns.

2. Methodology

2.1 Study Design

A descriptive cross-sectional design was employed to explore the factors contributing to parental stress levels. This design enabled the collection of data from a sample of parents at a single point in time.

2.2 Study Setting

The study was conducted in the Neonatal Intensive Care Unit (NICU) of tertiary care center providing specialized care to critically ill newborns.

2.3 Study Population

The study population consisted of parents (mothers and fathers) of children admitted to the NICU who met the eligibility criteria described below.

2.4 Sample Size Calculation

The sample size was calculated from a population of 245 eligible parents, with a 95% confidence level and a 5% margin of error, yielding a required sample size of 150 participants.

2.5 Sampling Technique

Participants were recruited using a non-probability convenience sampling technique; only parents who met the inclusion criteria and were directly involved in the caregiving of a child admitted to the NICU were enrolled.

2.6 Study Tool

Data were collected using a self-administered, structured questionnaire comprising three sections: (i) demographic information (age, relationship to the child, monthly income, education level, cultural background, and family type); (ii) a parental stress assessment component adapted from established parental stress measures (e.g., the Parental Stressor Scale); and (iii) close-ended items assessing parents' experience of the hospital environment, communication, and care provision.

2.7 Data Collection Procedure

Data were collected over a three-month period. Written informed consent (Annexure I) was obtained from every participant prior to administration of the questionnaire (Annexure II).

2.8 Data Analysis

Data were entered into IBM SPSS Statistics for analysis. Descriptive statistics — frequencies, percentages, means, and standard deviations — were used to summarise demographic characteristics and stress-related responses. Inferential statistics, including correlation and regression analysis, were used to examine associations between demographic characteristics, stress levels, and contributing factors.

2.9 Eligibility Criteria

Inclusion Criteria

- Parents (mother or father) of a child admitted to the NICU.
- Able to read and understand Urdu or English.
- Willing to provide informed consent.

Exclusion Criteria

- Parents with a history of psychiatric illness or mental health treatment.
- Parents not fluent in English or Urdu.
- Parents unable to provide informed consent.
- Parents of children admitted to the NICU for less than 24 hours.

2.10 Ethical Considerations

- Permission was obtained from the Hospitals, prior to data collection.
- Approval was sought from the Institutional Ethical Review Committee.
- Written informed consent was obtained from every participant.

- Confidentiality and anonymity were maintained by coding responses and removing identifiable information.
- Participants were informed of their right to withdraw at any stage without penalty.

3. Results

A total of 150 parents of children admitted to the NICU completed the questionnaire, meeting the calculated sample size derived from a population of 245 (95% confidence level, 5% margin of error).

3.1 Demographic Characteristics of Parents

The majority of respondents were mothers, and most parents belonged to lower- to middle-income households (Table 1). Nearly two-thirds of parents (65.4%) were aged between 26 and 45 years, and just over half (54.7%) had completed matric-level education or below.

Table 1. Demographic characteristics of participating parents (N = 150)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	17–25	47	31.3
	26–35	58	38.7
	36–45	40	26.7
	50 and above	5	3.3
Relation to child	Father	18	12.0
	Mother	132	88.0
Monthly income (PKR)	30,000–40,000	30	20.0
	41,000–50,000	59	39.3
	51,000–60,000	42	28.0
	60,000 and above	19	12.7
Education level	Middle	19	12.7
	Matric	64	42.7
	Intermediate	48	32.0
	Bachelor's and above	19	12.7
Cultural background	Punjabi	108	72.0
	Pashtun	34	22.7
	Sindhi	3	2.0
	Balochi	5	3.3
Family type	Nuclear	25	16.7
	Joint	89	59.3
	Extended	28	18.7
	Single parent	8	5.3

3.2 Parental Experience and Stress-Related Findings

Virtually all parents described caring for a child in the NICU as a stressful experience, regardless of age, gender, income, or education level. Table 2 summarises parents' responses to key items concerning hospital communication, care provision, and access to their child.

Table 2. Parental experience of NICU hospitalisation (N = 150)

Survey item	Yes (%)	No (%)	Don't know (%)	n
Satisfied with the behaviour of hospital staff	74.0	—	—	150
Feels stressed about the baby's medical condition	~100	—	—	150
Physicians adequately explain changes in the child's condition	66.7	33.3	—	150
Hospital provides all required medicines for the child	60.7	39.3	—	150
Informed about the child's diagnosis/disease	55.3	—	—	150
Permitted to see/meet the child at least once daily	90.0	10.0	—	150

Most parents (74.0%) reported satisfaction with the behaviour of hospital staff, and 90.0% were permitted to see their child at least once daily. However, one-third of parents (33.3%) felt that physicians did not adequately explain changes in their child's condition, just over half (55.3%) reported being informed about their child's specific diagnosis, and 39.3% indicated that the hospital did not provide all the medicines required for their child's treatment.

4. Discussion

This cross-sectional study of 150 parents of children admitted to the NICU found that parental stress was near-universal, consistent with prior international evidence indicating that NICU admission is an unexpected and highly distressing event for parents, associated with substantial psychological and physiological strain (Shetty et al., 2023; Kour et al., 2023). This finding is also consistent with tertiary-care evidence reporting that the large majority of parents experience at least moderate stress during their child's NICU admission, driven primarily by fear regarding the child's recovery (Pathak et al., 2022).

Communication emerged as a key modifiable stressor in this study: one-third of parents felt inadequately informed by physicians about changes in their child's condition, and only just over half felt informed about the underlying diagnosis. This mirrors the concern raised in the literature that parents' distress is compounded by an unfamiliar clinical environment and limited understanding of their child's clinical circumstances (Maghaireh et al., 2016; Siva et al., 2023), and reinforces earlier calls for improved parent–clinician communication practices in the NICU (Hynan et al., 2013).

Resource-related stressors were also evident: over a third of parents reported that the hospital did not provide all the medicines required for their child, a practical burden that likely compounds emotional distress, particularly for lower-income families. Consistent with the study's demographic profile, most participants belonged to lower- and middle-income households, and the recommendations arising from this study

reflect the observation that parents with greater educational attainment and financial resources appeared comparatively better able to cope with the demands of NICU admission — an observation that aligns with the broader literature on socio-economic gradients in parental coping (Vasa et al., 2014).

The predominance of mothers among respondents (88.0%) reflects the traditionally primary caregiving role assumed by mothers in this cultural context and is consistent with the literature's observation that fathers' experiences in the NICU remain comparatively under-researched (Hendy et al., 2024). This underrepresentation limited the extent to which this study could robustly compare maternal and paternal stress, reinforcing the research gap identified in developing-country settings and highlighting fathers' emotional experience as a priority for future research (Roque et al., 2017).

Positively, most parents were satisfied with staff behaviour and the large majority were permitted daily contact with their child — both factors likely to buffer parental distress and consistent with family-centred care principles that emphasise parental involvement and psychosocial support in the NICU (Siegel et al., 2006; Hynan et al., 2015).

4.1 Strengths of the Study

- The study used a calculated, adequately powered sample size (n = 150) derived from a defined population, supporting the precision of the descriptive estimates obtained.
- Data were collected directly from parents at the point of care, capturing first-hand experience of the NICU environment rather than retrospective recall.
- The study addresses a context (a tertiary-care NICU in Pakistan) that is under-represented in the international literature on parental stress.

4.2 Limitations of the Study

- The use of non-probability convenience sampling limits the generalisability of the findings beyond the study setting.
- The cross-sectional design captures parental stress at a single time point and cannot establish causal relationships between contributing factors and stress levels.
- The marked underrepresentation of fathers (12.0% of the sample) constrained meaningful comparison of maternal and paternal stress.
- Reliance on a self-administered questionnaire may be subject to social desirability and recall bias.
- The single-site design limits generalisability to other NICU settings with different resource levels or organisational cultures.

4.3 Implications for Practice and Sustainability

The findings support the adoption of family-centred care in the NICU, encompassing structured emotional support, parent education, and counselling. Embedding brief, low-cost communication protocols — such as scheduled physician updates and standardised explanation of diagnosis and care plans — offers a sustainable, low-resource strategy for reducing parental stress without requiring substantial additional investment. Similarly, strengthening medicine-supply consistency and improving waiting-area facilities represent practical, sustainable improvements that hospital management can pursue within existing service structures.

5. Conclusion

This study demonstrates that parental stress among parents of children admitted to the NICU, is widespread and is shaped by demographic characteristics, the child's medical condition, and features of the hospital environment — particularly communication quality and access to medicines. These findings underscore the need for healthcare providers to adopt a family-centred care approach that includes emotional support, education, and counselling for parents. Addressing the specific stressors identified in this study can help healthcare providers foster a more supportive NICU environment, improve parental satisfaction, and ultimately enhance the overall quality of neonatal care.

6. Recommendations

- Government: Expand access to education, recognising that more educated parents in this study appeared better able to cope with the stress of NICU admission.
- Government: Improve household earning opportunities and social support, as parents with greater financial resources appeared less exposed to, or better able to cope with, NICU-related stress.
- Government and hospital management: Strengthen healthcare facilities, including consistent medicine provision, and introduce structured stress-coping resources for parents of children admitted to the NICU.
- Healthcare providers: Deliver structured awareness and counselling sessions to help parents develop effective coping strategies during their child's NICU stay.
- Healthcare providers: Standardise physician communication practices to ensure all parents receive clear, timely updates on their child's condition and diagnosis.
- Future research: Prioritise recruitment strategies that improve representation of fathers, enabling more robust comparison of maternal and paternal stress in future studies.

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