

Psychological Impact On Parents Of Neonates Admitted To Neonatal Intensive Care Unit

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ABSTRACT

Background:Parents of neonates admitted to the NICU often experience heightened psychological distress, including anxiety, depression, and feelings of helplessness. Understanding these impacts is crucial for developing effective support systems to improve parental well-being and coping mechanisms.

Objective:To assess the psychological impact on parents of children admitted to the neonatal intensive care unit.

Materials & Methods: This study aimed to assess the mental health of 219 parents whose newborns were admitted to the NICU at Chettinad Hospital and Research Institute in Chengalpattu. We employed a cross-sectional study design. To evaluate the parents' mental health, we utilized the Hamilton Anxiety Rating Scale, Hamilton Depression Rating Scale, and Impact of Event Scale-Revised. Qualitative factors will be presented as proportions, while quantitative variables will be expressed using mean, standard deviation, median, and interquartile range. All data analysis will be conducted using SPSS version 21.

Results: This study included children with a mean age of 3 ± 1.5 days. The parents' mean ages were 24 ± 2.8 years for mothers and 29 ± 1.7 years for fathers. A significant proportion of parents experienced anxiety, with 72% showing signs of anxiety. Additionally, 13% of participants were found to be suffering from depression, and 20% of parents have a significant chance of suffering from post-traumatic stress disorder.

Conclusion:The NICU improves neonatal survival but often leaves parents feeling neglected, leading to anxiety (72%), depression (13%), and PTSD (20%). Counselling, transparent communication, and involving parents in care can reduce stress. Government-backed insurance schemes could ease financial and psychological burdens

Keywords: NICU, Parental Stress, Parental Depression, Parental Anxiety, Post-traumatic stress disorder

1. INTRODUCTION

A neonatal intensive care unit (NICU) offers integrated and specialized services to deliver comprehensive medical care to sick and preterm neonates who require advanced monitoring, interventions, and specialized treatments. These units are staffed by highly trained neonatologists, nurses, respiratory therapists, and other healthcare professionals who work collaboratively to ensure the best possible outcomes for these vulnerable newborns. With the introduction of NICUs, even premature babies now have a higher chance of survival, leading to a decrease in the infant mortality rate. The chances of survival for very sick newborns have increased. While NICUs are essential for improving how many babies live and their future health, having a baby in the NICU can be a very emotionally difficult experience for parents.¹

Parents often find it emotionally shattering and highly stressful when their baby needs care in the NICU. Childbirth is usually a happy event, representing fresh starts and optimism. However, when a neonate requires NICU admission, parents are suddenly thrust into a world of medical complexity, uncertainty, and emotional turmoil. Witnessing their fragile newborn hooked up to monitors, multiple pricks, and life-supporting machines can be an alarming and deeply unsettling experience. Parents often grapple with intense feelings of helplessness, anxiety, guilt, and profound sadness. The uncertainty surrounding

their baby's health status, prognosis, and overall chances of recovery only amplifies their stress levels, leaving them emotionally exhausted and mentally drained.²

Research has consistently indicated that parents of infants admitted to the NICU are at a significantly increased risk of developing various psychological distress symptoms, including depression, anxiety, and post-traumatic stress disorder (PTSD). The ongoing and relentless worry about their baby's well-being, coupled with the physical separation from their child due to hospital restrictions, creates an environment of emotional distress. Parents often feel powerless and isolated, unable to provide the direct care and comfort that they long to give their newborn. Furthermore, the unfamiliar and highly technical medical terminology, complex procedures, and the constant barrage of new information from healthcare professionals can exacerbate parental distress. Many parents struggle to comprehend the intricacies of their baby's condition and treatment plan, leaving them feeling overwhelmed and unsure about the future.^{2,3}

The psychological impact of NICU admission extends far beyond the immediate postpartum period, with numerous parents experiencing long-term emotional repercussions that persist well into their child's early years and beyond. The stress and trauma associated with a prolonged NICU stay can place significant strain on marital relationships, disrupt family dynamics, and create difficulties in parent-infant bonding. The overwhelming emotions parents experience—ranging from guilt and fear to sadness and frustration—can negatively affect their ability to fully engage in their parental role. Furthermore, unresolved emotional distress and ongoing anxiety about their child's health and development can have far-reaching effects, influencing parental mental health and family functioning for years after NICU discharge.⁴

Additionally, studies suggest that parental mental health challenges stemming from the NICU experience can indirectly impact the long-term developmental outcomes of their child. Parents who experience severe stress or PTSD may struggle with responsiveness, caregiving, and attachment, which are crucial elements of healthy infant development. Consequently, understanding and addressing the psychological burden on NICU parents is essential not only for their well-being but also for the long-term emotional and developmental health of their children.⁴

Given the profound emotional and psychological consequences associated with NICU admission, continued research on the mental health impact on parents is of utmost importance. Investigating these effects can help healthcare providers develop targeted interventions to alleviate parental distress, enhance emotional resilience, and provide psychological support. By addressing this critical gap in knowledge, researchers can contribute to the development of evidence-based interventions that prioritize family-centered care, inform healthcare policy and clinical practice, and promote a more compassionate and supportive approach to caring for NICU families.

2. MATERIALS AND METHODS

Utilizing a cross-sectional design, this research examined the psychological well-being of parents with infants in the Neonatal Intensive Care Unit (NICU). The study measured levels of anxiety, depression, and PTSD in these parents and explored potential factors influencing these outcomes. The data collection phase of this study spanned three months, from May 2024 to July 2024.

The mental health of parents with newborns in the NICU at Chettinad Hospital and Research Institute, Chengalpattu, was evaluated in this study. The study population comprised parents whose infants had been hospitalized in the NICU for at least 48 hours. To ensure uniformity in responses and reduce confounding variables, only one parent per child was included in the study. Additionally, parents with pre-existing psychiatric conditions or those with prior NICU experience due to an older child's admission were excluded from participation to eliminate potential biases in psychological assessment.

The study's required sample size was calculated using the standard formula $n = 4pq/l2$. Based on a previous study by Reem Malouf et al.⁵ that found a 41.9% prevalence of anxiety in parents of infants in the NICU, and incorporating a 10% margin of error and a 10% adjustment for potential non-response, the resulting sample size was 107 participants. Participants were recruited using a convenient sampling approach, where researchers selected those who were easily accessible and willing to take part.

To collect comprehensive and structured data, the study utilized a questionnaire composed of three distinct sections. Section 1 gathered essential details regarding the child, including gestational age, birth weight, duration of NICU stay, and medical complications. Section 2 focused on parental demographics, socioeconomic status, and psychological history, providing a contextual background for analysis. Section 3 was dedicated to assessing the psychological impact on parents through validated mental health scales. The Hamilton Anxiety Rating Scale (HAM-A) was used to assess the degree of anxiety, with scores of 17 or less indicating mild anxiety, 18 to 24 suggesting moderate anxiety, and 25 to 30 indicating severe anxiety. Similarly, the Hamilton Depression Rating Scale (HAM-D) categorized depression levels as absent (0–6), mild (7–17), moderate (18–24), or severe (above 24). The Impact of Event Scale-Revised (IES-R), a 22-question survey, was administered to evaluate post-traumatic stress disorder (PTSD) symptoms. On this scale, a score above 24 was considered a clinical concern for PTSD, while a score exceeding 33 suggested a likely PTSD diagnosis. Furthermore, scores of 37 or higher were linked to a notable weakening of the immune system, a condition that could persist for up to ten years after the traumatic event.

The statistical analysis for this study involved the representation of qualitative variables in terms of proportions and percentages, while quantitative variables were expressed using mean, standard deviation, median, and interquartile range. The collected data was meticulously analyzed using SPSS version 21 to ensure accuracy, reliability, and validity in findings. This analytical approach provided a robust framework for understanding the psychological impact on parents, identifying significant risk factors, and suggesting targeted interventions to support NICU families effectively.

3. RESULTS

On average, the participants in the study were 3 days old, with a typical age range of 1.5 to 4.5 days. About 57% of the neonates were female and 43% were male. The study included both term and pre-term neonates. Among them, 129 neonates (59%) were preterm, while the remaining 90 neonates (41%) were term. Table 1 highlights the frequency of various causes of NICU admissions. IUGR (Intrauterine Growth Restriction) is the most common cause, accounting for 35% of cases, followed by Neonatal Jaundice at 25%. Birth Asphyxia contributes to 18% of admissions, while both Hypoglycemia and Respiratory Distress each account for 11%.

Table 1: Frequency distribution of causes of NICU admission among neonates (n=219)

Cause	Frequency
Birth Asphyxia	39 (18%)
Hypoglycemia	24 (11%)
IUGR	77 (35%)
Neonatal Jaundice	55 (25%)
Respiratory Distress	24 (11%)

Out of the 219 participants in the study, 178 (81.3%) were mothers of newborns, while 41 (18.7%) were fathers. The average age of the mothers involved in the study was 24 years, with a measure of spread (standard deviation) of 2.8 years. For the fathers, the mean age was 29 years, and the standard deviation was 1.7 years. The employment status of parents revealed distinct trends. Unemployment is seen more among mothers. Only a few parents were employed in professional work, nine among the mothers and 18 among the fathers. For semi-professional roles, 68 fathers and 28 mothers were recorded. Among skilled workers, there were 42 fathers and 26 mothers. Semi-skilled roles were more common, with 34 fathers and 25 mothers. Lastly, 55 fathers and 27 mothers were employed in unskilled jobs.

According to the Hamilton anxiety rating scale, 158 parents (72%) were Anxious. Table 2 presents the distribution of anxiety levels among the participants. The majority (108) of individuals experienced moderate anxiety, followed by mild anxiety (74). A smaller group (37) reported severe anxiety. This suggests that while moderate anxiety is the most prevalent, there is a significant proportion of individuals experiencing milder anxiety, with a lesser but notable number facing severe anxiety. The findings indicate that interventions focusing on moderate anxiety might be most effective, but addressing severe anxiety should also be a priority.

Table 2: Frequency distribution of Anxiety level among parents (n=219)

Anxiety level	Frequency
Mild	74 (33.8%)
Moderate	108 (49.3%)
Severe	37 (16.9%)

Table 3 presents the association between parental gender and anxiety levels. The data indicates that the number of mothers in each anxiety category is noticeably higher than that of fathers. However, the P-value suggests that this difference is not statistically significant.

Table 3: Association between Anxiety and Parent's gender (n=219)

Anxiety level	Gender		P value
	Female	Male	
Mild	61	13	0.949
Moderate	87	21	
Severe	30	7	

28 participants (13%) were found to be suffering from depression using the Hamilton depression rating scale. Table 3 shows the frequency distribution of depression levels among parents. It indicates that moderate depression is the most common level of depression among the parents in this sample. Although severe depression is less prevalent, it still represents a significant concern.

Table 4: Frequency distribution of depression among parents (n=28)

Depression level	Frequency
Mild	10 (35.7%)
Moderate	14 (50.0%)
Severe	4 (14.3%)

Table 5 presents the association between depression levels and the gender of the participant's parents. While depression, across all severity levels, was more frequently observed among mothers than fathers, the statistical analysis indicates no significant difference between the two groups.

Table 5: Association between Depression and Parent's gender (n=28)

Depression level	Gender		P value
	Female	Male	
Mild	8	2	0.892
Moderate	10	4	
Severe	3	1	

Through the Impact of Event scale, it was estimated that 44 parents (20%) have a significant chance of suffering from post-traumatic stress disorder, and according to the IES-r scale 3.7% of the parents will probably have PTSD and 2.3% of the parents will have immune-suppression in the future.

Table6: Frequency distribution of the IES-r scores among parents (n=219)

Score	Frequency
Less than 24	175 (80.0%)
24 - 32	31 (14.0 %)
33 - 36	8 (3.7 %)
37 & more	5 (2.3 %)

Table 7 presents the association between PTSD and the gender of the participant's parents. The results indicate that more mothers (37) have PTSD compared to fathers (7). However, the high P-value suggests that this difference may not be statistically significant.

Table 7: Association between PTSD and Parent's gender (n=28)

PTSD	Gender		P value
	Female	Male	
Present	37	7	0.592
Absent	141	34	

4. DISCUSSION

The current study involved interviewing the parents of 219 neonates admitted to a tertiary care teaching hospital's NICU. The primary objective of these interviews was to assess the prevalence of three significant psychological conditions: anxiety, depression, and PTSD. By focusing on this vulnerable group, the study aimed to explore the mental health challenges faced by parents during the stressful period of their infant's NICU admission.

The average age of the newborns in this study was 3 days, with a standard deviation of 1.5 days, with a slightly higher proportion of female neonates (57%) than males (43%). While this gender breakdown is typical, it emphasizes the necessity of further research into potential gender-related influences on parental psychological burden. The clinical profile of NICU admissions revealed that Intrauterine Growth Restriction (IUGR) was the leading cause, accounting for 35% of cases. This was followed by Neonatal Jaundice (25%), Birth Asphyxia (18%), Hypoglycemia (11%), and Respiratory Distress (11%). The predominance of IUGR and jaundice reflects common neonatal health challenges requiring intensive care in this population.

Hamilton Anxiety Rating Scale, a widely used clinician-administered tool to assess the severity of anxiety symptoms, was used to determine anxiety among the parents. It evaluates both psychological (e.g., anxious mood, tension) and somatic symptoms of anxiety, such as restlessness, fatigue, and cardiovascular symptoms. This study's finding of 72% of parents experiencing anxiety during their child's NICU admission is supported by previous research. Notably, Shetty et al.⁶ systematic review and meta-analysis found anxiety in 97.1% of mothers and 96.6% of fathers in similar situations, and Deshwali et al.⁷ reported 66.2% anxiety among mothers of preterm NICU infants. A systematic review and meta-analysis by Malouf R et al.⁵ also revealed that 41.9% of parents had anxiety when their children were in the NICU.

Using the Hamilton Depression Rating Scale, the study found that 13% of parents experienced depression, ranging from mild to severe. Previous research has reported even higher prevalence rates. Asha P. Shetty et al.⁶ found that 91.5% of mothers and 85.6% of fathers of NICU-admitted neonates experienced depression. Akanksha Deshwali et al.⁷ reported a 45.4% prevalence of depression among parents.

Healthcare providers use the Impact of Event Scale-Revised (IES-R) to measure how much distress someone experiences after a traumatic event. In the current study, findings revealed that 20% of parents were likely suffering from post-traumatic stress disorder (PTSD). Malouf et al.⁵ reported that 39.9% of parents experienced PTSD within the first month after childbirth, with prevalence remaining as high as 27.1% even after one year. Similarly, Rodríguez-Rey et al.⁸ observed a comparable PTSD prevalence of 23% among their study participants at a six-month interval.

The following observations were made while exploring the correlation between the gender of parents and the presence of three specific mental health conditions: anxiety, depression, and PTSD. In all cases, mothers exhibited higher reported levels of anxiety, depression, and PTSD compared to fathers. The data indicate a tendency for mothers to report greater mental health struggles; however, we found no statistically significant evidence that parental gender, in itself, influences the probability of experiencing anxiety, depression, or PTSD. Similarly, a trend of higher mental health challenges was observed among parents of pre-term infants compared to their counterparts. However, no significant association was found, suggesting the need for further studies with a larger sample size.

Limitations:

- The single-site design of this study could limit how well its results can be applied to all parents with neonates in the NICU.
- Selection bias is a potential concern, as parents who voluntarily participated may have different psychological experiences compared to those who chose not to participate, leading to a non-representative sample.
- The reliance on self-reported questionnaires and interviews introduces the possibility of response biases, including social desirability bias and underreporting of emotional distress.
- Furthermore, as a cross-sectional study, the findings offer only a snapshot of the psychological impact at a specific moment in time, rather than capturing changes in parents' psychological states throughout their NICU journey or post-

discharge.

- Another limitation is the study's focus on specific psychological outcomes, such as anxiety and depression, without considering other influential factors like coping mechanisms, social support, or the impact on parental relationships.
- Excluding parents with pre-existing mental health conditions also restricts our knowledge of how these conditions interact with the stress of having a baby in the NICU, leading to a limited viewpoint.

Despite its constraints, the research yields useful information about the mental struggles of parents in the NICU and suggests avenues for further study.

5. CONCLUSION

The NICU has improved neonatal survival and reduced mortality rates. However, parents of admitted neonates often feel neglected, leading to psychological distress. This study found that 72% of parents experienced anxiety, 13% suffered from depression, and 20% had post-traumatic stress disorder. Providing professional counselling, such as cognitive-behavioural and trauma-focused therapy, can help parents cope. Regular, transparent communication about the baby's condition and involving parents in care activities can reduce stress. Financial strain also contributes to distress, and government-backed insurance schemes could offer both financial and mental relief. Implementing these strategies can help support NICU parents. Higher rates of anxiety, depression, and PTSD were seen in mothers and parents of preterm infants, but the lack of statistical significance indicates a need for larger studies to confirm this trend.

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