

PARENTAL ANXIETY DURING NEONATAL INTENSIVE CARE UNIT HOSPITALIZATION AND ITS ASSOCIATION WITH INFANT LENGTH OF STAY: A CROSS-SECTIONAL STUDY

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Abstract

Hospitalization of infants in the Neonatal Intensive Care Unit (NICU) may contribute to parental anxiety due to uncertainty about infant conditions, separation, and limited involvement in care. This study aimed to determine parental anxiety levels during NICU hospitalization and analyze their association with infant length of stay at RSD Tidore Kepulauan. A cross-sectional study was conducted among 30 parents of infants hospitalized in the NICU. Data were collected using a structured questionnaire, and parental anxiety was assessed using the Hamilton Anxiety Rating Scale (HARS). Infant length of stay was categorized as ≤ 3 days and ≥ 4 days. Data were analyzed using univariate analysis and the Chi-square test. Most respondents were mothers (73.3%), aged 25–35 years (53.3%), and had infants hospitalized for ≥ 4 days (73.3%). Anxiety levels varied, with 46.7% experiencing no anxiety, while others reported mild to very severe anxiety. The Chi-square test showed no significant association between parental anxiety and infant length of stay ($p=0.946$). Parental anxiety during NICU hospitalization was influenced by various factors beyond hospitalization duration. Family-centered care and psychological support are needed to improve parental adaptation during NICU care.

Keywords: Parental anxiety; Neonatal Intensive Care Unit; Infant length of stay; Hamilton Anxiety Rating Scale; Family-centered care.

Introduction

The Neonatal Intensive Care Unit (NICU) provides specialized care for newborns who require intensive monitoring and medical intervention due to conditions such as prematurity, low birth weight, respiratory distress, infection, congenital abnormalities, and other neonatal complications. Although advances in neonatal care have significantly improved survival outcomes, NICU hospitalization remains a challenging experience not only for infants but also for their parents. The NICU environment, characterized by advanced medical equipment, complex treatment procedures, uncertainty regarding infant recovery, and separation between parents and infants, may contribute to significant emotional distress among families ^{[1], [2]}. Parents of infants admitted to the NICU frequently experience psychological responses such as fear, worry, helplessness, stress, and anxiety. The unexpected transition from normal postpartum expectations to an intensive care environment may disrupt the parental adaptation process. Parents may experience difficulties in establishing early bonding, providing direct care, and participating in decision-making related to their infant's treatment. Previous evidence indicates that parents of NICU infants are at increased risk of experiencing anxiety and psychological distress due to uncertainty about their infant's health status, concerns about prognosis, and limited

control over the care process ^[3]. The emotional burden experienced by parents may persist throughout hospitalization and can influence their psychological adjustment during the transition to parenthood.

Parental anxiety represents an important aspect of neonatal care because parents play an essential role in supporting infant development, recovery, and early parent–infant interaction. High levels of anxiety may affect parental confidence, emotional adjustment, coping ability, and involvement in infant care. Psychological distress among parents may also influence the quality of parent–infant bonding and participation in family-centered care. Therefore, identifying and managing parental anxiety is an essential component of neonatal care to support both infant outcomes and parental well-being ^{[4], [5]}. Several factors may contribute to anxiety among parents of NICU infants, including infant clinical condition, perceived severity of illness, uncertainty regarding prognosis, social support, coping mechanisms, and communication with healthcare providers. Among these factors, the length of infant hospitalization has been considered an important factor that may influence parental psychological responses. A prolonged NICU stay may increase parents' exposure to stressful experiences, including continuous concerns about infant recovery, repeated medical interventions, emotional burden, and delayed transition to home care ^[2].

The association between infant length of stay and parental anxiety remains unclear. Longer hospitalization may increase anxiety due to prolonged uncertainty, stress exposure, and concerns about infant outcomes. However, parental anxiety is also influenced by psychological and social factors, including coping strategies, information received, family support, and involvement in infant care. These factors may lead to different anxiety responses among parents despite similar hospitalization durations ^[4]. Recent evidence demonstrates that anxiety and psychological distress are common among parents of infants admitted to neonatal units. A systematic review and meta-analysis by ^[3] reported a substantial prevalence of anxiety and post-traumatic stress symptoms among parents following neonatal admission, emphasizing the need for routine psychological assessment and supportive interventions during neonatal hospitalization. However, previous studies have predominantly focused on maternal anxiety or parents treated in tertiary healthcare settings, while evidence regarding parental anxiety in regional NICU settings remains limited.

In Indonesia, particularly in regional healthcare facilities, parental psychological experiences during NICU hospitalization may be influenced by variations in healthcare resources, family support, cultural factors, and access to neonatal services. These factors highlight the importance of assessing parental anxiety in different healthcare settings to develop appropriate nursing strategies and family-centered interventions. Assessment of parental anxiety using standardized instruments such as the Hamilton Anxiety Rating Scale (HARS) is important to identify anxiety severity and understand parental psychological needs. Early identification enables healthcare providers to provide appropriate education, emotional support, and interventions to improve parental adaptation during NICU hospitalization. Family-centered care recognizes parents as active partners in neonatal care. Nurses play an essential role through therapeutic communication, providing information about infant conditions, facilitating parental involvement, and addressing emotional concerns. Adequate support and parental participation may reduce psychological distress and improve adjustment during NICU care.

Understanding the relationship between infant length of stay and parental anxiety provides important evidence for developing targeted interventions. This study aimed to assess parental anxiety during NICU hospitalization, describe parental and infant characteristics, and analyze the association between infant length of stay and parental anxiety at RSD Tidore Kepulauan. The findings are expected to support evidence-based neonatal nursing practice and strengthen family-centered care.

Method

Data Sources and Study Design

This study employed an analytical observational study design with a cross-sectional approach to investigate the relationship between parental anxiety levels and the length of infant hospitalization in the Neonatal Intensive Care Unit (NICU) at RSD Tidore Kepulauan. The study was conducted using primary data collected directly from parents of infants who were undergoing NICU treatment. Data collection was performed through structured interviews and questionnaire administration to assess parental characteristics and anxiety levels. The anxiety level of parents was measured using the Hamilton Anxiety Rating Scale (HARS), while infant characteristics and hospitalization duration were obtained through parental information and medical record documentation. The study was conducted at the NICU unit of RSD Tidore Kepulauan in 2026. The research focused on identifying the psychological response of parents during the period of infant hospitalization and examining whether the duration of NICU care was associated with parental anxiety levels.

Study Population

The study population consisted of parents of infants who were treated in the NICU at RSD Tidore Kepulauan. The study population included biological parents who accompanied and participated in the care process of infants during NICU hospitalization. A total of 30 respondents were included in this study. The respondents consisted of mothers and fathers whose infants met the study criteria and were willing to participate in the research. Participants were eligible for inclusion if they were parents (either mothers or fathers) of infants admitted to the NICU at RSD Tidore Kepulauan during the study period. Eligible participants were those who were directly involved in accompanying their infants during hospitalization, were willing to participate in the study and provide informed consent, and were able to communicate effectively and complete the study questionnaire. In addition, only parents whose infants were receiving NICU care during the data collection period were included in the study. Parents were excluded if they were unable to complete the questionnaire due to physical or psychological conditions, withdrew from the study during the data collection process, or submitted incomplete questionnaire responses. These criteria were applied to ensure the completeness and reliability of the data collected.

Variables and Measurements

The study variables consisted of a dependent variable and several independent variables. The dependent variable was parental anxiety level, which was measured using the Hamilton Anxiety Rating Scale (HARS). The HARS is a standardized instrument comprising 14 items that assess psychological and somatic symptoms of anxiety. Each item is scored from 0 to 4, resulting in a total score ranging from 0 to 56. Anxiety levels were categorized as no anxiety (<14), mild anxiety (14–20), moderate anxiety (21–27), severe anxiety (28–41), and very severe anxiety (42–56). Anxiety assessments were conducted directly with parents during their infant's NICU hospitalization. The primary independent variable was infant hospitalization duration in the NICU, categorized as ≤ 3 days and ≥ 4 days. Additional descriptive variables included parental characteristics (age, sex, relationship with the infant, educational level, and number of children) and infant characteristics (age and sex). Data were collected through parent questionnaires and supported by information obtained from medical records.

Statistical Analysis

Data analysis was performed using IBM SPSS Statistics version 25. The analysis consisted of univariate and bivariate analyses. Univariate analysis was conducted to describe the characteristics of respondents, infant characteristics, parental anxiety levels, and hospitalization duration. The results were presented as frequency distributions and percentages. Bivariate analysis was performed to examine the relationship between parental anxiety level and infant hospitalization duration. The Chi-

square test was used to determine the association between categorical variables. The significance level was set at p-value <0.05, with a 95% confidence interval. The results of statistical testing were interpreted based on the p-value obtained. A p-value <0.05 indicated a statistically significant relationship between variables, whereas a p-value ≥ 0.05 indicated no statistically significant relationship

Results

Table 1 presents the demographic characteristics of 30 parents whose infants were admitted to the NICU at RSD Tidore Kepulauan. Most respondents were aged 25–35 years (53.3%), followed by those aged <25 years (26.7%) and >36 years (20.0%). Female respondents predominated (73.3%), and most participants were mothers (73.3%), reflecting the central role of mothers in infant care, breastfeeding, and emotional support during NICU hospitalization. Regarding educational background, the majority had completed senior high school (53.3%), while smaller proportions had Diploma III (16.7%), undergraduate (13.3%), junior high school (10.0%), and elementary school education (6.7%). Most respondents had 1–3 children (76.7%), whereas 23.3% had more than three children. These findings indicate that the typical respondent was a mother aged 25–35 years with a senior high school education and 1–3 children. Such demographic characteristics provide important contextual information for understanding parental experiences and psychological responses during their infant's NICU admission.

Table 1 Demographic Characteristics of Parents

Variable	Category	Frequency (n)	Percentage (%)
Parental Age	<25 years	8	26,7
	25-35 years	16	53,3
	>36 years	6	20,0
Parental Sex	Male	8	26,7
	Female	22	73,3
Relationship with Infant	Father	8	26,7
	Mother	22	73,3
Highest Education Level	Elementary School	2	6,7
	Junior High School	3	10,0
	Senior High School	16	53,3
	Diploma (D3)	5	16,7
	Bachelor's Degree (S1)	4	13,3
Number of Children	1-3 Children	23	76,7
	> 3 Children	7	23,3
Total Respondents		30	100,0

Source: Primary Data from RSD Tidore Kepulauan, 2026

Table 2 presents the characteristics of 30 infants admitted to the NICU at RSD Tidore Kepulauan. Most infants were aged 4-6 days (63.3%), followed by 1–3 days (26.7%) and 8–28 days (10.0%), indicating that the majority were in the early neonatal period, a critical stage that often requires intensive monitoring and specialized care. Female infants accounted for 66.7% of the sample, while male infants represented 33.3%. Although female infants were more prevalent in this study, NICU admission is generally determined by clinical conditions rather than sex. Regarding hospitalization duration, most infants stayed in the NICU for ≥ 4 days (73.3%), whereas 26.7% were hospitalized for ≤ 3 days. A longer length of stay may reflect the need for continued observation, stabilization, and management of neonatal health conditions. Overall, most NICU patients were aged 4–6 days, female, and hospitalized for ≥ 4

days. These characteristics provide important clinical context for understanding parental psychological responses during NICU admission.

Table 2. Infant Characteristics and Length of NICU Stay

Variable	Category	Frequency (n)	Percentage (%)
Infant Age	1-3 Days	8	26,7
	4-8 Days	19	63,3
	8-28 Days		10,0
Infant Sex	Male	10	33,3
	Female	20	66,7
Infant Length of Stay	< 3 Days	8	26,7
	> 4 Days	22	73,3
Total		30	100

Source: Primary Data from RSD Tidore Kepulauan, 2026

Table 3 presents the distribution of anxiety levels among 30 parents of infants treated in the NICU at RSD Tidore Kepulauan. The largest proportion of respondents reported no anxiety (46.7%), followed by severe anxiety (23.3%), moderate anxiety (16.7%), mild anxiety (10.0%), and very severe anxiety (3.3%). Although nearly half of the respondents did not experience anxiety, more than half reported varying levels of anxiety, ranging from mild to very severe. These findings suggest that NICU hospitalization can be a significant psychological stressor for parents. Factors such as uncertainty regarding the infant's condition, exposure to the intensive care environment, medical procedures, and concerns about recovery may contribute to increased anxiety. The relatively high proportion of severe anxiety highlights the emotional burden experienced by some parents during their infant's hospitalization. Variations in anxiety levels may be influenced by individual coping abilities, previous parenting experience, understanding of the infant's condition, and the availability of family and social support. Overall, these findings emphasize the importance of providing psychological support and clear communication to help reduce parental anxiety and promote family involvement in NICU care.

Table 3. Frequency Distribution of Respondents Based on Parental Anxiety Levels in the NICU at RSD Tidore Kepulauan

Anxiety Level	Frequency (n)	Percentage
No Anxiety (<14)	14	46,7
Mild Anxiety (14-20)	3	10,0
Moderate Anxiety (21-27)	5	16,7
Severe Anxiety (28-41)	7	23,3
Very Severe Anxiety (42-56)	1	3,3
Total	30	100

Source: Primary Data from RSD Tidore Kepulauan, 2026

Table 4 shows the relationship between parental anxiety levels and the length of infant hospitalization in the NICU at RSD Tidore Kepulauan. Most infants were hospitalized for ≥ 4 days (73.3%), while 26.7% had a length of stay of ≤ 3 days. Parents of infants with longer hospitalization periods were distributed across all anxiety categories, including no anxiety, mild, moderate, severe, and very severe anxiety. Chi-square analysis demonstrated no statistically significant association between parental anxiety level and infant hospitalization duration ($p = 0.946$). This finding suggests that the length of NICU stay was not directly related to parental anxiety in this study. The absence of a significant relationship indicates that parental anxiety is likely influenced by multiple factors beyond hospitalization duration, such as perceptions of the infant's condition, coping abilities, family support,

previous parenting experience, and communication with healthcare providers. Although prolonged hospitalization may increase exposure to stressful situations, anxiety responses varied considerably among parents with similar lengths of stay. These findings highlight the importance of individualized psychosocial support and effective communication throughout the NICU hospitalization period.

Table 4. Association Between Parental Anxiety Levels and Infant Length of Stay in the NICU at RSD Tidore Kepulauan

Anxiety Level	Infant Length of Stay		Total	<i>p-value</i>
	≤ 3 Days n (%)	≥ 4 Days n (%)		
No Anxiety (<14)	3 (21.4%)	11 (78.6%)	14 (100%)	0,946
Mild Anxiety (14-20)	1 (33.3%)	2 (66.7%)	3 (100%)	
Moderate Anxiety (21-27)	2 (40.0%)	3 (60.0%)	5 (100%)	
Severe Anxiety (28-41)	2 (28.6%)	5 (71.4%)	7 (100%)	
Very Severe Anxiety (42-56)	0 (0.0%)	1 (100%)	1 (100%)	
Total	8 (26.7%)	22 (73.3%)	100%	

Source: Primary Data from RSD Tidore Kepulauan, 2026

Discussion

This study identified the demographic characteristics of parents whose infants were treated in the NICU at RSD Tidore Kepulauan. The majority of respondents were mothers, aged 25–35 years, with a high school education level and having 1–3 children. The predominance of mothers as respondents reflects the important role of mothers as primary caregivers and the greater involvement of mothers during neonatal hospitalization. Mothers are often more directly involved in breastfeeding, emotional bonding, and observing changes in the infant's condition, which may influence their psychological responses during NICU care. Previous studies have reported that mothers tend to experience greater psychological involvement during neonatal hospitalization because they are commonly the primary caregivers and are more frequently exposed to concerns regarding infant health outcomes and caregiving responsibilities [6], [7].

Parents of infants admitted to the NICU commonly experience emotional distress because NICU hospitalization represents an unexpected and stressful situation. The unfamiliar environment, complex medical equipment, uncertainty regarding infant recovery, and limitations in direct caregiving activities may contribute to parental worry and anxiety. Previous research has demonstrated that parents of NICU infants experience increased levels of stress, anxiety, and emotional burden due to uncertainty, fear of complications, and feelings of helplessness when they cannot fully participate in infant care [3], [8]. In this study, most infants were in the early neonatal period and required hospitalization for ≥4 days. Longer hospitalization in the NICU is commonly associated with neonatal conditions requiring close monitoring and intensive management. The duration of treatment may vary depending on gestational age, birth weight, neonatal diagnosis, severity of illness, response to therapy, and stabilization process. Previous findings indicate that neonatal clinical characteristics are important determinants of length of NICU stay, as infants requiring more intensive treatment generally require longer hospitalization periods [9], [10].

The findings showed that most parents experienced no anxiety, while some parents experienced mild, moderate, severe, and very severe anxiety. Although almost half of the respondents were categorized as having no anxiety, the presence of moderate to severe anxiety among several parents demonstrates that NICU hospitalization remains a psychologically challenging experience. Similar findings have been reported in previous studies, which showed that parents of NICU infants may experience varying psychological responses depending on their coping abilities, social support, and

understanding of the infant's condition ^{[11], [12]}. These findings differ from several previous studies reporting that most parents of NICU infants experience anxiety during hospitalization. A study conducted among mothers in NICU settings found a high prevalence of anxiety symptoms among participants. Differences between studies may be influenced by variations in infant clinical conditions, parental coping abilities, social support systems, education level, healthcare environment, and communication between healthcare providers and families ^[9]. These factors may explain why some parents in the present study demonstrated lower anxiety levels despite their infants requiring intensive care.

The presence of parents without anxiety in this study may indicate that some parents developed effective coping mechanisms, received adequate information regarding their infant's condition, or adapted to the NICU environment. Parental adaptation during neonatal hospitalization is influenced by psychological readiness, previous parenting experience, family support, and the quality of interaction with healthcare professionals. Recent studies have emphasized that adaptive coping strategies, emotional support, and parental involvement in infant care are associated with improved psychological adjustment and reduced anxiety among NICU parents ^[13]. The results of this study demonstrated that there was no statistically significant relationship between parental anxiety levels and the duration of infant hospitalization in the NICU ($p=0.946$). This finding indicates that longer hospitalization duration alone was not associated with increased parental anxiety levels. The result suggests that parental anxiety is a complex psychological response influenced by multiple factors rather than being determined solely by the length of hospitalization.

This finding differs from previous research conducted in NICU settings, which reported a significant association between infant hospitalization duration and maternal anxiety. The difference may occur because anxiety is a multidimensional psychological response influenced by perception of illness severity, parental coping strategies, social support, financial concerns, previous experiences, and communication with healthcare providers rather than hospitalization duration alone ^[3]. Parents with infants hospitalized for ≥ 4 days in this study were found across different anxiety categories, including parents without anxiety and parents experiencing severe anxiety. This suggests that the duration of hospitalization does not consistently predict parental psychological responses. Some parents may adapt over time through increased understanding of their infant's condition and interaction with healthcare providers, while others may experience persistent anxiety due to uncertainty regarding prognosis or fear of complications ^{[13], [14], [15]}. The NICU environment itself may become a major stressor regardless of hospitalization duration. The presence of medical equipment, restricted visitation, separation between parents and infants, and uncertainty about treatment outcomes may increase emotional burden. Previous research highlights that parental anxiety during neonatal intensive care is associated with uncertainty, limited control, and concerns about infant survival and development ^{[1], [3]}. Therefore, interventions addressing parental emotional needs should not only focus on hospitalization duration but also consider individual psychological factors, family resources, and the quality of healthcare communication.

This study has several limitations. First, the sample size was relatively small, involving 30 respondents from a single NICU setting, which may limit the generalizability of the findings to other hospitals or populations. Second, this study focused primarily on hospitalization duration as the independent variable. Other factors that may influence parental anxiety, including infant diagnosis, severity of illness, socioeconomic status, social support, coping mechanisms, parental attachment, and quality of communication with healthcare providers, were not analyzed. Third, anxiety assessment was conducted at one point during hospitalization; therefore, the study may not fully capture the dynamic psychological adaptation process experienced by parents throughout the NICU journey. The findings of this study have important implications for neonatal nursing practice. Healthcare providers, particularly NICU nurses, should recognize that parental anxiety may occur regardless of the length of infant hospitalization. Therefore, routine psychological assessment of parents should become part of

family-centered NICU care. Healthcare providers should provide clear information regarding infant conditions, treatment procedures, and expected outcomes to reduce uncertainty and improve parental confidence. Emotional support, therapeutic communication, and opportunities for parental involvement in infant care may help parents develop adaptive coping strategies and improve their adjustment during NICU hospitalization^[13]. For nursing education and clinical practice development, these findings emphasize the importance of integrating psychosocial care into neonatal nursing interventions. Future research should consider additional variables such as coping mechanisms, social support, parental attachment, and family-centered interventions to better understand factors influencing parental anxiety.

Conclusion

This study concludes that hospitalization of infants in the Neonatal Intensive Care Unit (NICU) represents a situation that may affect the psychological condition of parents, particularly in relation to anxiety responses. The findings showed that parents of infants treated in the NICU experienced varying levels of anxiety, ranging from no anxiety to very severe anxiety. Although most respondents were categorized as having no anxiety, a proportion of parents experienced mild, moderate, and severe anxiety, indicating that NICU hospitalization remains a challenging emotional experience for some families. The characteristics of respondents demonstrated that the majority of participants were mothers aged 25–35 years, with a senior high school education level and having 1–3 children. Meanwhile, most infants treated in the NICU were in the early neonatal period and required hospitalization for four days or longer. These characteristics provide important contextual information regarding parental experiences and adaptation during neonatal intensive care. The statistical analysis revealed that there was no significant relationship between parental anxiety level and the length of infant hospitalization in the NICU at RSD Tidore Kepulauan. This finding indicates that the duration of hospitalization alone does not determine the level of anxiety experienced by parents. Parental anxiety is likely influenced by multiple factors, including perception of the infant's health condition, coping ability, family support, previous experiences, understanding of medical information, and communication with healthcare providers. The results emphasize the importance of implementing family-centered care approaches in NICU settings. Healthcare professionals, especially neonatal nurses, should not only focus on the clinical management of infants but also recognize and address parental psychological needs. Early identification of anxiety, effective communication, emotional support, and active involvement of parents in infant care may help improve parental adaptation and strengthen the parent–infant relationship during hospitalization. Future research is recommended to explore additional factors associated with parental anxiety during NICU hospitalization, such as coping mechanisms, social support, parental attachment, socioeconomic factors, and the severity of neonatal illness. Studies with larger sample sizes and longitudinal designs are also needed to better understand changes in parental anxiety throughout the NICU care process.

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