

Father Involvement in the NICU: A Literature Review on Roles, Barriers, and Contributions to Infant Development and Attachment

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Abstract. Over 15 million infants each year arrive preterm and typically necessitate prolonged NICU care. While maternal involvement is well-established, father involvement remains underexplored. The aims of this study was to map and synthesize existing evidence on how fathers' involvement in NICU care affects infant developmental outcomes. A literature review was conducted following PRISMA-ScR guidelines. Literature was systematically gathered from five electronic databases using a structured PICO framework. From 625 initial records, 12 studies met the eligibility criteria and were thematically analyzed. Father involvement influenced by prematurity, length of infant hospitalization, clinical status, and healthcare support through practices such as skin-to-skin care, feeding, hygiene, and verbal interaction contributes to improved physiological outcomes in infants, strengthened emotional bonds, and increased father confidence. Fathers' active participation in NICU care contributes positively to both infant development and bonding. NICUs should implement structured policies and programs that actively encourage father involvement.

Keywords: father involvement, infant development, NICU care,

1 Introduction

The neonatal intensive care unit (NICU) environment has an essential contribution in shaping the early parent-infant relationship, particularly for preterm infants whose developmental trajectories are highly sensitive to early caregiving experiences. While maternal involvement has long been emphasized in neonatal care, emerging evidence increasingly highlights the essential contribution of fathers' active engagement in enhancing infant development and nurturing attachment of secure attachment bonds [1][2]. Nurses tend to view mothers as the main caregivers, it is often the father who first visits the newborn in the NICU, given that the mother may still be

recovering after giving birth [3]. Close contact and engagement by fathers during the neonatal period have been associated with improved autonomic regulation, reduced stress responses in infants, and strengthened paternal sensitivity. All of which are key predictors of positive cognitive and socioemotional outcomes [4][5][6][7].

Paternal involvement in NICU settings remains inconsistent and often limited by structural, cultural, and psychological barriers. Fathers frequently report feelings of exclusion, uncertainty about their role, and a lack of support from healthcare staff, which can undermine their confidence and delay the formation of early bonds with their infant [8][9][10]. These challenges are further compounded by societal expectations that prioritize maternal caregiving, as well as institutional routines that may inadvertently marginalize fathers [1]. Recent developments have highlighted the increasing awareness of the necessity to offer support for both parents equitably in neonatal care environments. Studies have begun to explore various strategies to enhance paternal involvement, such as encouraging skin-to-skin contact, engaging fathers in daily caregiving routines, and promoting their emotional connection with the infant during hospitalization[11][12]. While these interventions appear promising, the literature remains fragmented, with limited synthesis regarding their impact on developmental outcomes and attachment formation.

This review seeks to explore how fathers' involvement during NICU hospitalization contributes to infant development and the early attachment process. By synthesizing current evidence across diverse care settings, this study aims to clarify the potential of father engagement as a protective factor in neonatal care and to identify key elements that may inform future family-centered practices in the NICU.

2 Methods

2.1 Study Design, Data Sources, and Search Strategies

This literature review explored the extent and characteristics of existing literature on the active participations of fathers in neonatal intensive care unit (NICU). Literature searches were conducted across five databases: PubMed, Wiley, EBSCOhost, Cochrane Library, and ScienceDirect. Searches were limited to English-language studies published between 2010 and 2024, involving human subjects and employing qualitative, quantitative, or mixed-method designs.

A combination of controlled vocabulary and free-text terms was used to ensure comprehensive coverage. The Boolean search strategy, adapted for each database's syntax, was detailed in Appendix 1. The search aimed to identify studies examining key themes, including active and passive paternal roles in NICUs, fathers' involvement in caregiving, perceived barriers, and their contributions to infant outcomes such as bonding and development.

2.2 Selection Criteria

This study included original research studies published between 2016 and 2025 that examined fathers of preterm or hospitalized neonates in NICU settings. Eligible studies reported on paternal involvement, roles, barriers, or contributions to infant development and attachment, using qualitative, quantitative, or mixed-method designs. Only studies published in English were

considered. Studies that investigated exclusively on maternal perspectives, were not conducted in NICU or equivalent neonatal settings, or were in the form of reviews, commentaries, or editorials were excluded.

2.3 Data Extraction and Synthesis

Data were extracted using a standardized form created in Google Spreadsheet to collect key information from each included study, including author(s) and year of publication, country and setting, design and methods of the study, population characteristics, main focus or objectives, and key findings related to paternal involvement, roles, barriers, and contributions to infant development or attachment. The extracted data were analyzed using narrative synthesis. Findings were grouped thematically in alignment with the review objectives, which included (1) the involvement of fathers in the NICU, (2) barriers and enablers impacting fathers' engagement, and (3) the contributions of fathers' engagement to infant development and attachment. Descriptive summaries were used to highlight variations across study settings, designs, and contextual factors.

3 Results

3.1 Study Selection Process

The initial database search identified 625 records. After 68 duplicates were removed, 557 unique records remained for title and abstract screening. During this screening, 513 records were excluded for irrelevance, resulting in 44 articles for full-text review. However, 16 full texts were unavailable, leaving 28 articles to be evaluated for eligibility. Following full-text review, 12 studies fulfilled the inclusion criteria. Studies were excluded for several reasons included studies with interventions differing from the review focus ($n = 6$), lack of measurable outcome data ($n = 1$), protocol or review studies ($n = 5$), and studies that did not meet population criteria ($n = 4$). The final 12 included studies formed the basis for the synthesis of findings on paternal involvement in NICU settings, it shown on fig. 1

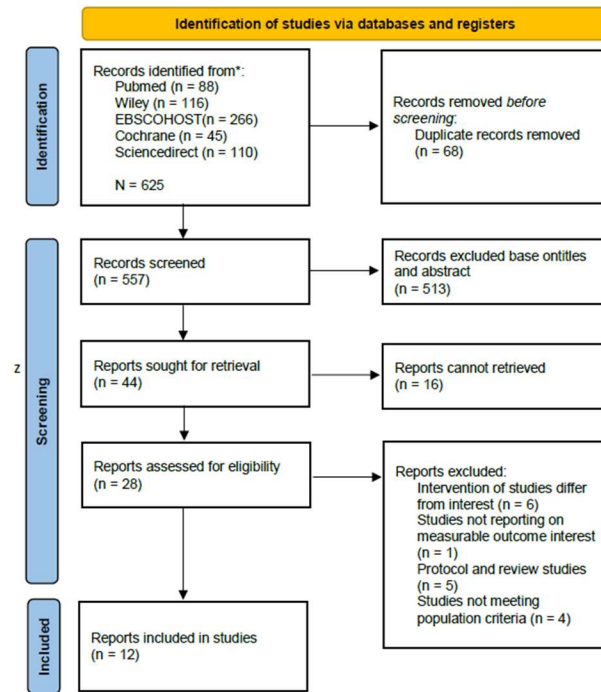


Fig. 1. PRISMA Flow Diagram

3.2 Characteristics of Included Studies

This review included 12 studies that met all inclusion criteria and addressed the roles, barriers, and impacts of paternal involvement in NICU settings. Key characteristics of each study, including study design, country, population, and main findings, are presented in Table 1.

Table 1. Study Characteristics

Author	Country	Study Design	Population	Focus Area	Intervention / Exposure	Key Findings	Conclusion
Barton, et al. (2021)	US	Qualitative study	6 fathers with NICU infants	Describe father with NICU infants live experiences	Semi-structured interview	Colaizzi's method of thematic analysis generated five key themes: Horrible Storm, Piece by Piece, "I'm the Father", The Gift of Support, and Little Fighters.	Fathers felt helpless and traumatized in the NICU; support from nurses, family, and faith helped them cope.
Clarkson, et al. (2019)	USA	Cross-sectional	94 NICU nurses	Nurse perceptions of time spent with fathers	Open-ended survey on reasons for more or less time spent with fathers	Only 17% of nurses spent most visit time with fathers, favoring those who were confident and engaged. Less time was given to quiet, dominant, or absent fathers, with interactions also influenced by maternal gatekeeping and infant condition.	Multiple factors affect nurse-father interactions in the NICU. Proactive support is needed to involve less confident or absent fathers.
Clarkson, et al. (2019)	USA	Cross-sectional study	97 fathers of infants in NICU	Elements influencing fathers' participation in neonatal intensive care	Exploratory study used survey methodology	Greater father involvement was linked to younger age, cohabitation, multiple births, kangaroo care, and delivery attendance. Frequent visitors had fewer children and infants with shorter, less severe hospital stays.	In the NICU, fathers participate in multiple ways, with their involvement shaped by specific influencing factors.
Gül, et al. (2022)	Turkey	Cross-sectional study	63 fathers of preterm infant	Aspects influencing father and infant attachment	Exploratory collected data using Father-Infant Descriptive Information Form and the Paternal-Infant Attachment Scale (PIAS)	PIAS scores were influenced by birth weight, clinical condition, NICU stay, and rehospitalization, with caregiving (like dressing the baby) linked to stronger attachment.	Father-infant attachment was low and associated with caregiving involvement, birth weight, clinical condition, and NICU stay length.
Lee, et al. (2023)	South Korea	Qualitative-descriptive study	100 fathers whose neonates had been admitted to NICU for at	Investigate perceptions of fatherhood among fathers of high-risk neonates and	Exploratory survey using self-reported questionnaire	The scores for positive and negative perceptions of fatherhood were relatively high. A positive perception of	Nurses should support fathers through education and interventions

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			least 48 hours.	their confidence regarding neonatal care.		fatherhood was found to influence fathers' confidence regarding neonatal care.	that boost confidence and positive views of fatherhood.
Lian, et al. (2020)	Singapore	Qualitative-descriptive study	15 fathers with NICU infants	Investigate coping mechanisms used by fathers of very low birth weight (VLBW) infants in the NICU	Semi-structured interview	Fathers actively sought reassurance through problem-focused coping, including seeking information, bonding for normalcy, and finding emotional support amid anxiety.	Providing fathers with information and emotional support, promoting bonding with their infant, and addressing their concerns are crucial for effective support.
Logan, et al. (2018)	Texas	Qualitative-descriptive study	7 fathers with premature infants	Gaining insight into the lived realities of fathers whose infants, born before 28 weeks, are admitted to a level III NICU	Semi-structured interview	Fathers felt like outsiders in the NICU while trying to protect their families and fulfill their roles; the first time fathers held their baby was a pivotal moment of connection.	Fathers' experiences in the NICU are multifaceted, with distinct needs that nurses should address and support throughout the process.
Meritt, et al. (2022)	Texas	Qualitative-descriptive study	28 fathers with NICU infants	Identify paternal needs after caring for a preterm infant in the NICU	Semi-structured interview	Findings highlighted three key themes: support, clarity, and acknowledgment.	Fathers of NICU infants possess specific needs which require attention to support their coping, involvement, and holistic care.
Noergaard, et al. (2017)	Denmark	Qualitative study	12 fathers of NICU infants.	Examine the emotional and informational needs of fathers during their infant's NICU stay	Ethnographic observation, individual and multiple sequential interviews, along with a focus group discussion	Fathers express a strong desire to be part of their infant's care but frequently feel torn between the hospital, work, and family responsibilities. While trying to support their partners, their own stress and need for	Fathers in NICUs seek equal parenting roles but face cultural pressures, highlighting the need for nurses to actively

Author	Country	Study Design	Population	Focus Area	Intervention / Exposure	Key Findings	Conclusion
Noergaard, et al. (2024)	Denmark	Qualitative study	11 nurses	Examine the role of nursing practices in promoting a father-friendly NICU (FF-NICU)	Focus groups conducted before and after implementation.	support are often overlooked.	support their involvement in care.
						Before implementation, emerging themes highlighted the limited involvement of fathers, emotional struggles, varying father types, and involvement levels. Implementation of FF-NICU was shaped by eight themes, including benefits for infants and families, increased father presence, impact on nursing routines, and the need for flexibility and creativity.	Successful FF-NICU implementation required perceived benefits for families and nurses, along with staff flexibility and creativity in supporting fathers.
						Two father clusters emerged: fathers-of-preterm-infants showed early, confident involvement and emotional connection; preterm fathers hesitated due to fear and were overwhelmed by medical equipment. Active involvement was more common in the first group and associated with gestational age.	Personalized support, tailored to fathers and aligned with the infant's gestational age, is essential for fathers of preterm infants.
Stefana, et al. (2018)	Italy	Mixed-method approach	20 fathers of level III NICU infants	Explore fathers' emotions throughout their infant's NICU stay	Observational ethnography, semi-structured paternal interviews, self-report surveys, and clinical information collection	Participants' experiences were captured in three main themes: detailed memory of the events, anxiety about their significant other, and challenges in managing work-life balance.	The experiences of NICU fathers are vividly remembered, highlighting their need for coping assistance.
Urbanosky, et al. (2023)	US	Qualitative-descriptive	28 fathers with discharged NICU infants	Describe father with infants in the NICU experiences	Semi-structured interview		

4 Discussions

4.1 Summary of findings and comparisons with existing literature

As synthesized in the results, the three primary patterns of paternal involvement; co-caregiver, supporter, and hesitant, that were consistently observed across the qualitative studies reviewed [13] [14][15]. These roles were dynamic and shaped by a range of factors, including personal confidence, the infant's clinical condition, sociocultural expectations, and institutional support mechanisms [16]. Paternal engagement was also influenced by internal motivations such as emotional bonding and the desire to support infant growth, as well as external motivators like encouragement from nurses or partners [17][14] [18]. Fathers who took a part in caregiving activities like as skin-to-skin contact, feeding, and holding reported increased emotional connection and competence, which in turn positively affected their infant's development [14][19].

These findings align with previous studies emphasizing the developmental benefits of early father-infant interaction. Skin-to-skin contact, in particular, is known to elevate paternal oxytocin levels and improve paternal sensitivity, leading to enhanced infant self-regulation and bonding [7][20]. However, some fathers continued to adopt more peripheral roles, reflecting enduring traditional gender norms and logistical challenges such as inflexible work schedules, consistent with earlier studies noting structural and cultural barriers to paternal inclusion in neonatal care [8][10][21]. Institutional factors, such as unit policies, nurse attitudes, and physical layout of the NICU, also played a decisive role in either facilitating or impeding father involvement. Units implementing inclusive or family-centered care practices reported higher levels of paternal satisfaction and participation, echoing the literature's growing consensus on the value of gender-sensitive neonatal policies [22] [23] [24].

4.2 Practical and Clinical Implications

To foster equitable parental involvement, NICUs should position father-infant bonding as a key component of care. Routine involvement of fathers in caregiving tasks, including feeding and skin-to-skin contact can normalize their role and strengthen early attachment. Nurses have a crucial role throughout this process by actively engaging and reinforcing fathers their value as caregivers, particularly during the vulnerable postnatal period. Training for healthcare professionals should address not only practical engagement strategies but also challenge implicit biases regarding paternal roles. Clear communication, emotional validation, and use of inclusive language can build paternal confidence and improve engagement outcomes.

Healthcare systems also need to address broader structural barriers. This includes enabling flexible visiting hours, offering access to psychosocial and logistical support such as counseling and overnight accommodations, and promoting paternity leave. Interdisciplinary collaboration with professionals including psychologists, social workers, and lactation consultants can further personalize support to diverse father populations and improve overall family well-being in the NICU.

4.3 Strengths, Limitations, and Recommendations

This review presents an extensive overview of relevant studies on paternal involvement in NICU care, offering insight into caregiving patterns, influencing factors, and institutional practices. The inclusion of studies from different cultural and healthcare contexts enhances the generalizability and depth of the findings.

However, several limitations should be noted. Many of the included studies employed qualitative or descriptive methods, which may limit the strength and generalizability of the

conclusions. Definitions of paternal involvement varied across studies, making direct comparisons challenging. Moreover, few studies examined the long-term outcomes of early paternal involvement on child development or family dynamics after discharge.

Future research should focus on longitudinal designs that assess both short- and long-term effects of father-infant bonding in the NICU. Quantitative studies with standardized tools to measure paternal engagement, psychological well-being, and infant outcomes are also needed. Additionally, the development and evaluation of structured, father-inclusive interventions across diverse NICU settings would help advance practice and policy.

5 Conclusion

This review highlights the increasing recognition of fathers as essential caregivers in the NICU, with meaningful contributions to early bonding and developmental support. Nurses and NICU staff play a central role in facilitating this involvement not only to support maternal well-being also to foster positive outcomes for the infant and strengthen family cohesion. While progress has been made toward inclusive care models, barriers persist. These include traditional gender norms, structural limitations, and institutional routines that inadvertently sideline paternal roles. Achieving a truly father-friendly NICU culture requires intentional strategies, including staff training, policy development, and infrastructure adjustments.

Ultimately, involving fathers in neonatal care is both an equity issue and a pathway to better developmental outcomes. Future studies into father experiences should continue to explore paternal experiences, assess the long-term impact of early involvement, and evaluate context-specific strategies for sustainable integration of fathers in NICU settings.

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APPENDIX

Appendix 1. Search Strategies

Database	Keywords
Pubmed	("NICU" OR "neonatal care" OR "neonatal intensive care unit") AND ("father" OR "father support" OR "paternal involvement" OR "fatherhood" OR "father-child bonding" OR "paternal engagement") AND ("development" OR "cognitive development" OR "emotional development" OR "social-emotional development" OR "attachment" OR "neonatal development" OR "infant attachment" OR "parent-child relationship" OR "early childhood development")
Wiley	("NICU" OR "neonatal care" OR "neonatal intensive care unit") AND ("father" OR "father support" OR "paternal involvement" OR "fatherhood" OR "father-child bonding" OR "paternal engagement") AND ("development" OR "cognitive development" OR "emotional development" OR "social-emotional development" OR "attachment" OR "neonatal development" OR "infant attachment" OR "parent-child relationship" OR "early childhood development")
Cochrane Library	("NICU" OR "neonatal care" OR "neonatal intensive care unit") AND ("father" OR "father support" OR "paternal involvement" OR "fatherhood" OR "father-child bonding" OR "paternal engagement") AND ("development" OR "cognitive development" OR "emotional development" OR "social-emotional development" OR "attachment" OR "neonatal development" OR "infant attachment" OR "parent-child relationship" OR "early childhood development")
Sciencedirect	("NICU" OR "neonatal intensive care unit") AND ("father support" OR "fatherhood") AND ("development" OR "cognitive development" OR "emotional development" OR "neonatal development")

EBSCOHOST	("NICU" OR "neonatal care" OR "neonatal intensive care unit") AND ("father" OR "father support" OR "paternal involvement" OR "fatherhood" OR "father-child bonding" OR "paternal engagement") AND ("development" OR "cognitive development" OR "emotional development" OR "social-emotional development" OR "attachment" OR "neonatal development" OR "infant attachment" OR "parent-child relationship" OR "early childhood development")
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