



Seeing the Unseen: A Review on Experiences of Preterm Infants' Fathers

Abstract

Perinatal processes require change and adaptation for each member of the family. However, studies generally have focused on mothers' well-being. Nevertheless, each individual in the family affects both the experience and is affected by the experience, so each individual affects the well-being of the other. For this reason, the father should not be left out of the perinatal processes but should be considered as an individual who experiences and coordinates this process. Especially, in families with a baby at increased risk such as prematurity, the involvement of fathers has a significant role in providing support to both mothers' and babies' well-being. However, becoming a father of a premature infant is mostly related to a wide range of psychological health outcomes such as stress, anxiety, depression, and post-traumatic stress. In addition, fathers of premature babies are prone to experience emotional difficulties and concerns about the baby's and the mother's health problems, potentially leading to parental role conflicts. Therefore, this review aims to explain the common experiences of fathers after preterm delivery, particularly paternal mental health and related factors, and to explain the roles of supportive health professionals in the process.

Keywords: *Fathers of premature babies, preterm birth, neonatal intensive care unit, paternal mental health, fathers*

Burcu Kömürçü Akik¹ ,
Gözde Gökçe İşbir² 

¹Department of Psychology, Ankara University Faculty of Languages and History-Geography, Ankara, Turkey
²Department of Midwifery, Mersin University School of Health, Mersin, Turkey

Introduction

Preterm birth is a multidimensional health problem that could include severe medical complications for the newborn baby and disruption of parent-child interactions.¹ A vast amount of studies have mainly focused on mothers of preterm infants, whereas studies with fathers of preterm and/or neonatal intensive care unit (NICU) infants are often neglected.²⁻⁷ However, few studies have attempted to capture the experiences of fathers after preterm birth.⁸⁻¹³ For several fathers, preterm birth and subsequent NICU admission of their babies adversely affect the emotional experience of becoming a father.¹⁴ It is reported that fathers of preterm babies are less willing to interact physically with their infants in the NICU,¹⁵ more worried about their care,¹⁶ more tired, and less strong.¹⁷ Presumably, since their infants are more vulnerable and less responsive to social interaction, fathers have difficulties engaging with their preterm infants and to feel becoming a father.¹² Thus, in order to have a deeper understanding of what and how fathers experience having a preterm baby who is mostly included in a NICU hospitalization, we need to clarify what they face. Understanding the experiences of preterm babies' fathers is important because the consequences of these experiences could have long-term effects on the babies and mothers. Hence, this review covers the relationship between preterm birth and following paternal experiences. In addition, this review aims to explain the common experiences of fathers after preterm delivery, particularly paternal mental health and related factors, and to explain the roles of supportive health professionals in the process.

Psychological Well-Being of Premature Babies' Fathers

Similar to mothers, the psychological well-being of fathers can be affected negatively in families with risky perinatal processes. Emotional changes, parental role conflicts, stress, anxiety, depression, and post-traumatic stress symptoms may occur in fathers of families with premature birth experience. In the following sections, factors affecting the well-being of premature babies' fathers are discussed.

Fathers' Adaptation to the Paternal Role and Influencing Factors

After each childbirth, different levels of crises may occur due to the new role acquired by the parents. Pregnancy is a very valuable period for adaptation to the new role. However, earlier childbirth than expected may also disrupt the parental role development process.

Cite this article as: Kömürçü Akik B, Gökçe İşbir G. Seeing the unseen: A review on experiences of preterm infants' fathers. *J Educ Res Nurs*. 2022;19(4):478-483.

Corresponding author: Burcu Kömürçü Akik
E-mail: komurcu@ankara.edu.tr

Received: October 9, 2020
Accepted: April 24, 2021
Publication Date: December 1, 2022



Copyright@Author(s) - Available online at
www.jer-nursing.org
Content of this journal is licensed under a
Creative Commons Attribution-NonCommercial
4.0 International License.

In a study, fathers have highlighted the positive aspects of having a preterm baby in terms of the paternal role. They described preterm birth as giving them the chance to get to know their infant during the NICU stay, resulting in a stronger father–infant bond compared to their friends who have full-term babies.¹⁸ In addition, fathers seem to be more secure and more self-reliant in trying to establish a new relationship with their infants after their discharge from NICU.¹⁶ Similarly, it is reported that fathers of preterm babies have become more confident as a father over time.¹⁸ With all these role conflicts as a wage earner, partner, and father, as well as culturally shaped gender role expectations, fathers face emotional difficulties.

Following preterm birth, although it is satisfactory to meet the demands of a partner and father, the other potential sources of stress for NICU fathers are changes in their roles as a father.¹⁹ Studies showed that like mothers, fathers of NICU infants report increased stress levels and concerns due to parental role alteration,^{4,17,20–22} and younger fathers of NICU infants experience more stress in the parental role.²³ It is shown that during the NICU stay, fathers have low to moderate levels of adjustment to preterm birth and have restricted knowledge of the fatherhood role.²⁴ Fathers of preterm babies described difficulty in becoming bonded to the baby as a father, but a turning point emerged when they felt confident enough to carry the baby and build physical and eye contact.¹⁶ Lundqvist et al²⁵ suggested that fathers of preterm babies may adapt to the paternal role more slowly, and they could feel their fatherhood as a process from distance toward closeness because fathers of premature newborns have different life stressors in addition to the hospitalized baby. For example, financial difficulties and concerns about home affairs are also major stressors for fathers of premature newborns.²⁶ Consistently, a common concern reported by fathers is the difficulties relating to prioritizing roles of a family wage earner, partner, and father.^{11–13} Because, for fathers of premature infants, while their spouses and preterm babies are still in the hospital, life continues outside the hospital, and fathers often have to go back to work and take care of other children.^{1,4,27} Moreover, for fathers of premature babies who stayed in the NICU, the fear of losing their occupations, emotions of shame in their social environment, and separation from the partner and infant may be challenging to cope with the crisis triggered by prematurity itself.²⁸

On the other hand, due to making decisions for the fragile infant and giving moral support to his spouse, fathers of preterm infants have to manage their own challenges.²⁹ As a partner, fathers are expected to help their wives, to contain their negative feelings, and to think about the needs of both their wives and babies, providing them with proper support.^{12,13} Although being in a provider role constantly might be difficult, it might be concluded that most fathers are glad about such kinds of demands.¹⁶ Since new demands, such as deciding about discharge, led to more involvement in caregiving of the baby, including feelings of having responsibility and becoming a more concrete parental role for fathers.¹⁶ For this reason, family members and social support providers should be aware of the father's needs and offer proper support for fathers to increase their adaptation to their roles and maintain their psychological well-being.

Emotional Challenges

In new life experience processes, individuals can experience unpredictable emotions. Fathers of preterm infants mostly felt alienated from the fatherhood experience.¹⁶ Hugill et al³⁰ reported that some

fathers of preterm babies might protect themselves from further emotional pain by adopting pre-learned stereotypical masculine behaviors and emotional withdrawal. This process has been entitled “silent emotion work,” suggesting fathers' emotional behaviors are governed by complex conventions and expectations that are determined by culture. From a similar perspective, Schappin et al⁶ suggested that stress is presumably caused not by prematurity itself but by the traditionally different roles and expectations of mothers and fathers in Western society. On the other hand, it is found that while fathers may cope with the stressors of their baby's NICU stay by speaking to their spouses, many do not want to increase their spouse's stress by arguing about their worries and fears.² These distant behaviors might be interpreted by partners as the emotionally reserved and unsupportive appearances of fathers.¹⁴

Experiencing mixed feelings is one of the emotional reactions of fathers toward their experiences after preterm birth.³¹ Similarly, the initial moments with their preterm/NICU babies evoke a “rollercoaster of emotions” for fathers.^{5,31} Although NICU fathers experienced the birth as a shock initially, studies have demonstrated that after these first moments, fathers were ready to be involved immediately¹⁵ and experienced emotional closeness with their babies during the NICU hospitalization.²⁵

Another emotional experience of fathers who have a premature infant is associated with the control phenomenon. In a study that aims to investigate the experiences of fathers who have a baby in the NICU, it is reported that the primary experience of fathers is the lack of control over events when they had an extremely ill/preterm infant in the NICU.⁸ Similarly, during the NICU hospitalization of their infants, it is shown that most fathers have the feeling of a serious loss of emotional control when they meet with the baby.^{30,32}

Following the birth of premature infants and their hospitalization in the NICU, even in some cases, parents might witness the resuscitation of their infants.³³ The lack of preparation for parenthood, the hospitalization of the baby, the grief, and the isolation contribute to a very wide range of emotional difficulties for both parents who have preterm infants.²⁷ Shaw et al²² showed that the emotional responses of the NICU fathers are not less severe than the responses of the mothers. Besides the emotional responses of fathers to preterm birth, it is found that avoidance reactions of fathers are correlated positively with the hospitalization days of the baby and negatively correlated with the birth weight of the baby.¹⁷

It is more important that the emotions experienced by the fathers are adaptive or maladaptive, rather than positive or negative. It is usual for fathers to experience negative emotions after an unexpected childbirth experience. However, by providing emotional awareness, these emotions can be adapted to the life experience with the change and transformation of the emotions. For this purpose, emotion-focused approaches can be worked with fathers by nurses and psychologists.

Stress

Preterm birth mostly requires NICU admission of the infant immediately after birth. For this reason, it can be readily deduced that becoming the father of a preterm infant is a stressful experience in most cases. Separation from the baby is one of the most stressful events for fathers with an infant in the NICU.³³

Most studies that aim to investigate the stress related to having a preterm and/or NICU infant reported that both parents experience stress.^{4,6,7,16,17,20,33} However, the severity and the pattern of parenting stress among fathers and mothers related to having a preterm infant or NICU stay have led to controversial results.^{17,34} Consistently, a study showed that mothers of NICU infants report higher stress than fathers in the UK, whereas there were no significant differences between parents in North American samples.³⁵ In another study, it is shown that fathers perceive their children, as well as themselves as to be the source of stress, more than mothers.³⁴ Other studies also have found no differences between mothers and fathers of preterm or NICU infants in terms of stress.^{35,36} Studies show that the prevalence and severity of acute stress disorder (ASD)²¹ or subclinical ASD³⁷ are lower among fathers than mothers of NICU infants. In addition, postpartum ASD is diagnosed in 4.8% of fathers with preterm infants but in no parents with full-term infants.³⁸ Moreover, fathers of preterm babies have been more likely to have a high likelihood of depression, when they have higher relationship distress and financial difficulty meeting essential household needs,²⁶ and show signs of ASD.²² The days of hospitalization¹⁷ and prematurity of the baby¹⁰ are also related to the higher depressive symptoms in fathers of premature infants. Lastly, for fathers of NICU infants, during the transition to fatherhood, stressful factors include feelings of lack of control and the uncertainty in diagnosis and treatment of the infant.⁸

Anxiety

Following having a premature baby, anxiety is a very natural reaction for both parents. Since becoming the father of a preterm infant includes concerns for the newborn and fatherhood coming earlier than expected, fathers of preterm infants predominantly have felt unprepared for the sudden delivery.¹⁶ Becoming a father of a premature baby and occupying the NICU are also directly linked to the anxiety experienced by fathers.^{9,39} In a study, Pace et al³⁹ reported that although the levels of anxiety symptoms of fathers who have very preterm infants decreased over time, during the newborn period and at 6 months after birth, they still remain above the expected levels. Fathers with premature infants had higher anxiety scores than fathers with full-term infants and higher risk for “minor or major anxiety symptoms” 4-6 weeks postpartum.⁴⁰

Prematurity of an infant could lead to death, depending on the seriousness of prematurity and the high risk of acquiring an infection.⁴¹ It is shown that fathers are aware of the unstable nature of having a premature infant in the NICU and this gives fear and anxiety to touch the baby in case of giving his/her an infection.¹¹ Fathers of children with difficult medical states tend to minimize their engagement with these children or even escape from them.^{14,42} Similarly, for severely ill premature infants, fathers were afraid of bonding with or touching their infants.²⁹ Although not as much as mothers, fathers reported that they are scared and stressed related to the appearance of their preterm infants.¹⁷ Especially for childbirths that occurred before 32 gestation weeks, fathers experienced high levels of fear of breaking/damaging/infecting their babies.^{11,14} Similarly, compared to mothers, fathers who have an infant in NICU had significantly greater difficulty in interacting with their infant because of the child's fragility.¹⁵ Consistently with these findings, it is reported that fathers of preterm babies focus on the infant's precarious and uncertain health issues⁴³ and fathers of vulnerable infants have not felt that they know how to meet their infant's complex health needs.⁴⁴

As another factor associated with the severity of prematurity, the gestational age of infants is negatively correlated with anxiety in fathers of preterm infants.¹⁷ On the contrary, regardless of the gestational age of infants, fathers with an infant admitted to the NICU had higher anxiety scores than fathers with full-term infants and not requiring NICU admission.¹⁰ It could be stated that even if born on time, the NICU hospitalization of the baby is a worrying experience for parents and NICU hospitalization accompanying preterm birth is the most important factor that increases anxiety experienced by parents.

Depression

Understanding paternal depression following preterm birth is especially important due to potential negative effects on the transition to fatherhood and father-infant interaction. Although depression symptoms of preterm babies' fathers have been lower compared to mothers, studies demonstrated that premature infants' fathers suffered from depressive symptoms.^{9,29,33,39,40} Winter et al²⁶ found that 16.9% of fathers and 46.7% of mothers with preterm infants had a moderate to high likelihood of depression. It is found that 4% of NICU fathers had probable depression in HADS and 6% in EPDS.¹⁰ Mackley et al⁴ found that fathers of premature infants in the NICU have high rates of elevated depression during the first 35 days of their infants' hospitalization. A cohort study showed that 8.9% of fathers showed signs of depression at 9 months postpartum among families who experienced preterm birth.¹ In another study, it is found that fathers of preterm infants have significantly more depressive symptoms compared with fathers of full-term infants.¹⁹

Post-Traumatic Stress

Most of the preterm birth cases are sudden and potentially traumatic for parents. Becoming a father of a preterm infant may include differential individual responses to this traumatic and uncertain event not only immediately after the NICU admission of the infant³⁷ but also after the discharge from the hospital.¹⁹ Although fathers seem more able to cope and overcome the traumatic event of prematurity,⁴⁵ they could demonstrate high levels of post-traumatic stress (PTS) symptomatology following the preterm birth and/or NICU admission of their baby.⁴⁶

In the literature, it is seen that while some studies focus on comparing PTS symptoms experienced by fathers of premature babies with their mothers, others compare them with fathers of full-term infants. The few studies evaluating evidence of postpartum PTS in both parents report PTS symptoms in fathers of preterm infants, despite being less compared with mothers.^{17,26,37,38,47} On the other hand, in another study investigating post-traumatic stress disorder (PTSD) in parents of children hospitalized in the NICU, it is found that the severity of intrusion and arousal symptoms are more pronounced in mothers than fathers, but the incidence of PTSD has not differed in both parents.³⁵ On the contrary, in another study among parents of infants in the NICU, it is found that the prevalence of PTSD is higher in fathers than in mothers.²² In the same study, although PTSD symptoms appear in fathers much later than in mothers, it is stated that they are at greater risk than mothers 4 months after birth.²² A qualitative study that aims to evaluate parental traumas associated with preterm birth provides support to these findings with the theme named “helplessness and horror: the trauma of preterm birth.”⁴³

A study comparing PTS symptoms between fathers of preterm babies and full-term babies at 2-10 days after birth has shown that fathers of preterm infants have significantly higher traumatization scores compared to full-term fathers, especially in the subscale "avoidance."⁴⁸ Similarly, 1.4% of preterm infants' fathers meet the criteria for PTSD, while no fathers of full-term infants fulfill the criteria for PTSD.³⁹ Fathers of preterm infants show significantly higher levels of postpartum PTS symptoms in the avoidance and hyper-arousal dimensions and in the total score than fathers of full-term infants, except for the intrusion dimension.³⁸ In contrast, another study shows no significant difference in terms of PTSD between fathers who have preterm infants and full-term infants.³

Taking into consideration contributing factors to PTSD experienced by parents of preterm infants, it is found that perceived stress is one of the predictors of PTSD symptoms³⁸ and ASD symptoms were significantly correlated with PTSD.²² For fathers, moderate to severe symptoms of PTS have been related to a high likelihood of depression and economical difficulty in meeting fundamental household needs.²⁶ The severity of the prematurity level of the baby also emerges as a predisposition for fathers to exhibit PTSD symptoms.⁴⁶

Neonatal Intensive Care Unit: An Obstacle or a Facilitator for Paternal Involvement?

Fathers perceive the incubator as a barrier and the separation from their babies as a stressful experience during NICU hospitalization.⁴⁸ Some fathers have been affected by NICU experience to such an extent that they avoid the situation.⁸ The unknown procedures of the NICU and the relationships with the NICU staff are also other stressful experiences for fathers.^{4,20,28} Premature infants' fathers face unique challenges that are through innovative service development.^{32,49} However, given the experiences of fathers related to NICU, things are far beyond just a physical barrier.

Since it is considered the primary caregiver of a baby is mostly the mother, despite the fathers' desire to be equal partners in child-care,¹⁵ the active involvement of fathers in NICU practices might be restricted by organizational, cultural, and interpersonal barriers⁴⁹ as well as traditional tendencies.⁵⁰ Similarly, in another study, it is found that most part of the communication and involvement is aimed toward the mother rather than the father in the NICUs.¹¹ Some fathers reported that they have feelings of being treated as novices in terms of baby care by NICU staff⁵¹ and struggling to be recognized by staff as a partner in the family.⁵² Fathers reported being continuously excluded from the care of their preterm infants which led to a lack of caring confidence after discharge.⁴⁷ In another study, some fathers reported that they felt "being unnecessary and seen as a second class parent."² As a result, fathers, whose babies are in a NICU, proceed to report inequality in parental involvement in baby care.³²

On the other hand, besides studies revealing negative experiences of NICU fathers, a study has shown that fathers have positive image of NICU.⁴² In a study by Garten et al.² most of the fathers reported that they have been treated as mothers to take care of their babies by the NICU team. It is suggested that this positive image related to NICU has a crucial role in the experiences of NICU fathers because transmitted information given by NICU staff is perceived as having an impact on the well-being and sense of control of fathers of NICU infants.⁵³ In addition, at the onset of the baby's NICU stay, clear and easily comprehensible information boost fathers' sense of security, facilitating their involvement in the baby's care.⁵³

Moreover, in a study evaluating fathers' experiences with their preterm babies in NICU, it is shown that the opportunity to interact with their babies immediately after birth affects the emotional state of fathers positively.¹⁴ Additionally, the involvement of fathers in the care of their infants at NICU has a positive effect on infant development⁵⁴ and maintenance of family stability.¹⁰ Studies show that when fathers have the chance to get involved in the NICU process, they have a positive effect on parenting skills.^{5,53} Taken together, it is concluded that to be able to handle the care of the infant and experience a proper transition to parenthood, fathers of preterm/NICU infants necessitate nursing staff support.⁵

Approaches to the Psychological Well-Being of Premature Babies' Fathers

Childbirth and the participation of a new individual in the family are factors that can affect the psychological well-being of parents.⁵⁵ Team approaches have great importance in preserving and increasing well-being in unexpected situations such as preterm labor and having a premature baby.⁵ In line with this, the team may include mainly mother-father-infant or principal caregivers, midwife/women's health nurses and mental health nurses, neonatal nurses, neonatologists, psychologists, pediatrics, and psychiatrists when necessary. It is concluded that specific father-centered care plans may be beneficial and fathers seemed to be glad about the care that they received from NICU teams.³²

During the antenatal period, it may be recommended to perform adaptation practices during pregnancy for parents who have risk factors for early and/or unexpected termination of pregnancy. In general, medical approaches consider the mother as the target in this process to focus on her adaptation. However, it is very important to focus on the adaptation of the father in order to increase the well-being of the mother and baby. Studies show that fathers play an important role in supporting their partners⁵⁶ and promoting child development.⁵⁷ For these reasons, counseling and therapeutic procedures should be planned for fathers as well as mothers by professional healthcare team members.

The postnatal adaptation process can be achieved with steps that start earlier. It is recommended to support father-infant attachment activities (e.g., talking with the intrauterine baby, singing, touching, imagining, etc.) for the adaptation of the father during pregnancy. Father-infant bond established through such attachment behaviors is also crucial for the baby's health.⁵⁸ In addition, fathers should be supported in participating in antenatal monitoring, defining the roles to undertake in possible risk situations, participating in decisions about the baby, and encourage them to participate in antenatal training with the mother. Fathers benefit from antenatal education.⁵⁹ Antenatal education has been related to positive outcomes like a better use of antenatal care, increased initiation of breastfeeding, and also reduced risk of preterm delivery.⁶⁰ In a current review, it is concluded that fathers, as well as mothers, are more likely to have better postnatal psychological health when they attend antenatal care.⁶¹ After preterm delivery in terms of gaining adaptation, in the postnatal period, it is recommended that the father be included in all visits and care processes of the baby with the mother, to involve in the physical care process of the baby and to re-meaning of the process with the co-parent or individually.

Finally, it may be suggested that approaches should be made to the father to be aware of his own well-being. For this aim, it may be

recommended to plan motivational interviews for fathers and make emotion-oriented approaches by expert clinicians such as midwives, nurses, and pediatrics to the extent permitted by their professional training. Moreover, in necessary cases, it may be recommended that the fathers should be supported to receive support from mental health professionals in order to protect and increase mental health in perinatal processes. Consistently with these recommendations, studies show that the mental health of fathers is closely related to the father–infant relationship.^{62,63}

Conclusion

Individuals' perceptions of being a parent are affected by the culture of the society they live in or by life experiences, and these perceptions affect the perinatal process. Unexpected delivery and having a premature baby affect the well-being of fathers as well as mothers. This study was able to outline a range of difficulties experienced by fathers of premature babies. It is shown that fathers with premature babies can have adaptation problems, difficulty in coping with emotional challenges, and symptoms of stress, anxiety, depression, and PTSD related to this experience. These problems can also prevent the father from transitioning to the parental role and even cause conflicts between other roles. Protecting and increasing the well-being of fathers who have premature babies will also positively affect mother–infant well-being. For this reason, it is crucial to take appropriate approaches to support family members by the professional team in perinatal processes. Parents who are found to be at risk in terms of preterm labor in the antenatal period should be determined by midwives/women's health nurses, and approaches to increase their well-being should be planned and implemented. The midwife/women's health nurse, who provides care to the parents during the postnatal period, should monitor and evaluate the father as well as the mother and provide proper counseling in line with their needs. If the need for further therapeutic interventions and/or medication is determined, the fathers should be directed to a psychologist and/or psychiatrist and evaluated by these expert clinicians. As mentioned earlier, fathers may experience many clinically observed or sub-clinically psychological problems following preterm birth. Especially fathers who experience intense psychological distress can benefit from psychotherapies in overcoming these problems and obtaining well-being. Nevertheless, there is a great need for research evaluating the application of appropriate preventive and protective therapeutic approaches and their results to protect and increase the psychological well-being of premature babies' fathers.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – B.K.A, G.G.I.; Design – B.K.A, G.G.I.; Data Collection and/or Processing – B.K.A, G.G.I.; Analysis and/or Interpretation – B.K.A, G.G.I.; Literature Review – B.K.A.; Writing Manuscript – B.K.A, G.G.I.; Critical Review – B.K.A, G.G.I.

Declaration of Interests: The authors declare that they have no competing interest.

Funding: The authors declare that this study had received no financial support.

References

1. Carson C, Redshaw M, Gray R, Quigley MA. Risk of psychological distress in parents of preterm children in the first year: evidence from the UK Millennium Cohort Study. *BMJ Open*. 2015;5(12):e007942. [\[CrossRef\]](#)
2. Garten L, Nazary L, Metzke B, Bühner C. Pilot study of experiences and needs of 111 fathers of very low birth weight infants in a neonatal intensive care unit. *J Perinatol*. 2013;33(1):65-69. [\[CrossRef\]](#)
3. Ghorbani M, Dolatian M, Shams J, Alavi-Majd H. Anxiety, post-traumatic stress disorder and social supports among parents of premature and full-term infants. *Iran Red Crescent Med J*. 2014;16(3):e13461. [\[CrossRef\]](#)
4. Mackley AB, Locke RG, Spear ML, Joseph R. Forgotten parent: NICU paternal emotional response. *Adv Neonatal Care*. 2010;10(4):200-203. [\[CrossRef\]](#)
5. Provenzi L, Santoro E. The lived experience of fathers of preterm infants in the Neonatal Intensive Care Unit: a systematic review of qualitative studies. *J Clin Nurs*. 2015;24(13-14):1784-1794. [\[CrossRef\]](#)
6. Schappin R, Wijnroks L, Uniken Venema MMU, Jongmans MJ. Rethinking stress in parents of preterm infants: a meta-analysis. *PLoS One*. 2013;8(2):e54992. [\[CrossRef\]](#)
7. Treyvaud K. Parent and family outcomes following very preterm or very low birth weight birth: a review. *Semin Fetal Neonatal Med*. 2014;19(2):131-135. [\[CrossRef\]](#)
8. Arockiasamy V, Holsti L, Albersheim S. Fathers' experiences in the neonatal intensive care unit: a search for control. *Pediatrics*. 2008;121(2):e215-e222. [\[CrossRef\]](#)
9. Candelori C, Trumello C, Babore A, Keren M, Romanelli R. The experience of premature birth for fathers: the application of the Clinical Interview for Parents of High-Risk Infants (CLIP) to an Italian sample. *Front Psychol*. 2015;6:1444. [\[CrossRef\]](#)
10. Carter JD, Mulder RT, Bartram AF, Darlow BA. Infants in a neonatal intensive care unit: parental response. *Arch Dis Child Fetal Neonatal Ed*. 2005;90(2):F109-F113. [\[CrossRef\]](#)
11. Hollywood M, Hollywood E. The lived experiences of fathers of a premature baby on a neonatal intensive care unit. *J Neonatal Nurs*. 2011;17(1):32-40. [\[CrossRef\]](#)
12. Lindberg B, Axelsson K, Öhrling K. The birth of premature infants: experiences from the fathers' perspective. *J Neonatal Nurs*. 2007;13(4):142-149. [\[CrossRef\]](#)
13. Pohlman S. The primacy of work and fathering preterm infants: findings from an interpretive phenomenological study. *Adv Neonatal Care*. 2005;5(4):204-216. [\[CrossRef\]](#)
14. Stefana A, Padovani EM, Biban P, Lavelli M. Fathers' experiences with their preterm babies admitted to neonatal intensive care unit: a multi-method study. *J Adv Nurs*. 2018;74(5):1090-1098. [\[CrossRef\]](#)
15. Fegran L, Helseth S, Fagermoen MS. A comparison of mothers' and fathers' experiences of the attachment process in a neonatal intensive care unit. *J Clin Nurs*. 2008;17(6):810-816. [\[CrossRef\]](#)
16. Jackson K, Ternstedt BM, Schollin J. From alienation to familiarity: experiences of mothers and fathers of preterm infants. *J Adv Nurs*. 2003;43(2):120-129. [\[CrossRef\]](#)
17. Ionio C, Colombo C, Brazzoduro V, et al. Mothers and fathers in NICU: the impact of preterm birth on parental distress. *Eur J Psychol*. 2016;12(4):604-621. [\[CrossRef\]](#)
18. Lindberg B, Axelsson K, Öhrling K. Adjusting to being a father to an infant born prematurely: experiences from Swedish fathers. *Scand J Caring Sci*. 2008;22(1):79-85. [\[CrossRef\]](#)
19. Rimmerman A, Sheran H. The transition of Israeli men to fatherhood: a comparison between new fathers of pre-term/full-term infants. *Child Fam Soc Work*. 2001;6(3):261-267. [\[CrossRef\]](#)
20. Prouhet PM, Gregory MR, Russell CL, Yaeger LH. Fathers' stress in the neonatal intensive care unit: a systematic review. *Adv Neonatal Care*. 2018;18(2):105-120. [\[CrossRef\]](#)
21. Shaw RJ, Deblois T, Ikuta L, Ginzburg K, Fleisher B, Koopman C. Acute stress disorder among parents of infants in the neonatal intensive care nursery. *Psychosomatics*. 2006;47(3):206-212. [\[CrossRef\]](#)
22. Shaw RJ, Bernard RS, Deblois T, Ikuta LM, Ginzburg K, Koopman C. The relationship between acute stress disorder and posttraumatic stress disorder in the neonatal intensive care unit. *Psychosomatics*. 2009;50(2):131-137. [\[CrossRef\]](#)
23. Ichijima E, Kirk R, Hornblow A. Parental support in neonatal intensive care units: a cross-cultural comparison between New Zealand and Japan. *J Pediatr Nurs*. 2011;26(3):206-215. [\[CrossRef\]](#)

24. Provenzi L, Barello S, Fumagalli M, et al. A comparison of maternal and paternal experiences of becoming parents of a very preterm infant. *J Obstet Gynecol Neonatal Nurs.* 2016;45(4):528-541. [\[CrossRef\]](#)
25. Lundqvist P, Westas LH, Hallström I. From distance toward proximity: fathers lived experience of caring for their preterm infants. *J Pediatr Nurs.* 2007;22(6):490-497. [\[CrossRef\]](#)
26. Winter L, Colditz PB, Sanders MR, et al. Depression, posttraumatic stress and relationship distress in parents of very preterm infants. *Arch Womens Ment Health.* 2018;21(4):445-451. [\[CrossRef\]](#)
27. Whittingham K, Boyd RN, Sanders MR, Colditz P. Parenting and prematurity: understanding parent experience and preferences for support. *J Child Fam Stud.* 2014;23(6):1050-1061. [\[CrossRef\]](#)
28. Shahkolahi Z, Mahdavi Lenji Z, Jafari-Mianaei S. Challenging experiences of the fathers of the premature infants admitted in the neonatal intensive care unit (NICU). *Iran J Neonatol.* 2018;9(1):53-59. [\[CrossRef\]](#)
29. Lee TY, Lin HR, Huang TH, Hsu CH, Bartlett R. Assuring the integrity of the family: being the father of a very low birth weight infant. *J Clin Nurs.* 2009;18(4):512-519. [\[CrossRef\]](#)
30. Huggill K, Letherby G, Reid T, Lavender T. Experiences of fathers shortly after the birth of their preterm infants. *J Obstet Gynecol Neonatal Nurs.* 2013;42(6):655-663. [\[CrossRef\]](#)
31. Stacey S, Osborn M, Salkovskis P. Life is a rollercoaster... What helps parents cope with the Neonatal Intensive Care Unit (NICU)? *J Neonatal Nurs.* 2015;21(4):136-141. [\[CrossRef\]](#)
32. Walmsley R, Jones T. Are fathers supported by neonatal teams?: an exploration of the literature. *J Neonatal Nurs.* 2016;22(6):292-296. [\[CrossRef\]](#)
33. Doering LV, Dracup K, Moser D. Comparison of psychosocial adjustment of mothers and fathers of high-risk infants in the neonatal intensive care unit. *J Perinatol.* 1999;19(2):132-137. [\[CrossRef\]](#)
34. Howe TH, Sheu CF, Wang TN, Hsu YW. Parenting stress in families with very low birth weight preterm infants in early infancy. *Res Dev Disabil.* 2014;35(7):1748-1756. [\[CrossRef\]](#)
35. Franck LS, Cox S, Allen A, Winter I. Measuring neonatal intensive care unit-related parental stress. *J Adv Nurs.* 2005;49(6):608-615. [\[CrossRef\]](#)
36. Aftyka A, Rybojad B, Rozalska-Walaszek I, Rzońca P, Humeniuk E. Post-traumatic stress disorder in parents of children hospitalized in the neonatal intensive care unit (NICU): medical and demographic risk factors. *Psychiatr Danub.* 2014;26(4):347-352.
37. Kaaresen PI, Rønning JA, Ulvund SE, Dahl LB. A randomized, controlled trial of the effectiveness of an early-intervention program in reducing parenting stress after preterm birth. *Pediatrics.* 2006;118(1):e9-e19. [\[CrossRef\]](#)
38. Helle N, Barkmann C, Ehrhardt S, Bindt C. Postpartum posttraumatic and acute stress in mothers and fathers of infants with very low birth weight: Cross-sectional results from a controlled multicenter cohort study. *J Affect Disord.* 2018;235:467-473. [\[CrossRef\]](#)
39. Pace CC, Spittle AJ, Molesworth CML, et al. Evolution of depression and anxiety symptoms in parents of very preterm infants during the newborn period. *JAMA Pediatr.* 2016;170(9):863-870. [\[CrossRef\]](#)
40. Helle N, Barkmann C, Bartz-Seel J, et al. Very low birth-weight as a risk factor for postpartum depression four to six weeks postbirth in mothers and fathers: cross-sectional results from a controlled multicentre cohort study. *J Affect Disord.* 2015;180:154-161. [\[CrossRef\]](#)
41. Kenner C, Lott JW. *Comprehensive Neonatal Care: an Interdisciplinary Approach.* Amsterdam: Elsevier Health Sciences; 2007.
42. Strauss Z, Avrech Bar M, Stanger V. Fatherhood of a premature infant: "a rough roller coaster ride". *J Fam Issues.* 2019;40(8):982-1000. [\[CrossRef\]](#)
43. Lasiuk GC, Comeau T, Newburn-Cook C. Unexpected: an interpretive description of parental traumas' associated with preterm birth. *BMC Pregnancy Childbirth.* 2013;13(suppl 1):S13. [\[CrossRef\]](#)
44. Thomas J, Feeley N, Grier P. The perceived parenting self-efficacy of first-time fathers caring for very-low-birth-weight infants. *Issues Compr Pediatr Nurs.* 2009;32(4):180-199. [\[CrossRef\]](#)
45. Garel M, Bahaud M, Blondel B. Consequences for the family of a very preterm birth two months after discharge. Results of the EPIPAGE qualitative study. *Arch Pediatr.* 2004;11(11):1299-1307. [\[CrossRef\]](#)
46. Koliouli F, Gaudron CZ, Raynaud JP. Stress, coping, and post-traumatic stress disorder of French fathers of premature infants. *Newborn Infant Nurs Rev.* 2016;16(3):110-114. [\[CrossRef\]](#)
47. Aftyka A, Rybojad B, Rosa W, Wróbel A, Karakuła-Juchnowicz H. Risk factors for the development of post-traumatic stress disorder and coping strategies in mothers and fathers following infant hospitalisation in the neonatal intensive care unit. *J Clin Nurs.* 2017;26(23-24):4436-4445. [\[CrossRef\]](#)
48. Blomqvist YT, Rubertsson C, Kylberg E, Jöreskog K, Nyqvist KH. Kangaroo Mother Care helps fathers of preterm infants gain confidence in the paternal role. *J Adv Nurs.* 2012;68(9):1988-1996. [\[CrossRef\]](#)
49. Al Maghaireh DAF, Abdullah KL, Chan CM, Piaw CY, Al Kawafha MM. Systematic review of qualitative studies exploring parental experiences in the Neonatal Intensive Care Unit. *J Clin Nurs.* 2016;25(19-20):2745-2756. [\[CrossRef\]](#)
50. Noergaard B, Ammentorp J, Garne E, Fenger-Gron J, Kofoed PE, Dowling D. Fathers' stress in a neonatal intensive care unit. *Adv Neonatal Care.* 2018;18(5):413-422. [\[CrossRef\]](#)
51. Deeney K, Lohan M, Spence D, Parkes J. Experiences of fathering a baby admitted to neonatal intensive care: a critical gender analysis. *Soc Sci Med.* 2012;75(6):1106-1113. [\[CrossRef\]](#)
52. Lindberg I, Engström A. A qualitative study of new fathers' experiences of care in relation to complicated childbirth. *Sex Reprod Healthc.* 2013;4(4):147-152. [\[CrossRef\]](#)
53. Ignell Modé R, Mard E, Nyqvist KH, Blomqvist YT. Fathers' perception of information received during their infants' stay at a neonatal intensive care unit. *Sex Reprod Healthc.* 2014;5(3):131-136. [\[CrossRef\]](#)
54. Smith VC, Steelfisher GK, Salhi C, Shen LY. Coping with the neonatal intensive care unit experience: parents' strategies and views of staff support. *J Perinat Neonatal Nurs.* 2012;26(4):343-352. [\[CrossRef\]](#)
55. Ayers S, Sawyer A. The impact of birth on women's health and wellbeing. *Pathways and Barriers to Parenthood.* Berlin: Springer; 2019.
56. Hagen IH, Iversen VC, Svindseth MF. Differences and similarities between mothers and fathers of premature children: a qualitative study of parents' coping experiences in a neonatal intensive care unit. *BMC Pediatr.* 2016;16:92. [\[CrossRef\]](#)
57. Giallo R, Woolhouse H, Gartland D, Hiscock H, Brown S. The emotional-behavioural functioning of children exposed to maternal depressive symptoms across pregnancy and early childhood: a prospective Australian pregnancy cohort study. *Eur Child Adolesc Psychiatry.* 2015;24(10):1233-1244. [\[CrossRef\]](#)
58. Fisher D, Khashu M, Adama EA, et al. Fathers in neonatal units: improving infant health by supporting the baby-father bond and mother-father coparenting. *J Neonatal Nurs.* 2018;24(6):306-312. [\[CrossRef\]](#)
59. May C, Fletcher R. Preparing fathers for the transition to parenthood: recommendations for the content of antenatal education. *Midwifery.* 2013;29(5):474-478. [\[CrossRef\]](#)
60. Ickovics JR, Kershaw TS, Westdahl C, et al. Group prenatal care and perinatal outcomes: A randomized controlled trial. *Obstet Gynecol.* 2007;110(2 Pt 1):330-339. [\[CrossRef\]](#)
61. Burgess A. Fathers' roles in perinatal mental health: causes, interactions and effects. *New Digest.* 2011;53:24-29.
62. Wilson S, Durbin CE. Effects of paternal depression on fathers' parenting behaviors: a meta-analytic review. *Clin Psychol Rev.* 2010;30(2):167-180. [\[CrossRef\]](#)
63. Parfitt Y, Pike A, Ayers S. Infant developmental outcomes: a family systems perspective. *Infant Child Dev.* 2014;23(4):353-373. [\[CrossRef\]](#)