Predictors of Parenting Readiness in Fathers of High-Risk Infants in the Neonatal Intensive Care Unit

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To evaluate discharge readiness perceptions among mother–father dyads, parents of infants in the neonatal intensive care unit completed a parenting readiness survey. Fathers had more favorable perceptions than their partners. Maternal perceptions and social risk, but not infant morbidities, predicted paternal perceptions. Discharge support should focus on the mother–father dyad. *(J Pediatr 2020;217:192-5).*

Most studies focusing on mental health outcomes among parents of infants admitted to the neonatal intensive care unit (NICU) have focused on mothers.[1-5] Of the few studies focusing on fathers, limited information has been reported regarding patterns of parenting readiness among fathers in the NICU setting.[6-9] Studies to date have not directly compared mother–father dyads or examined social and neonatal predictors of parenting readiness and well-being within families of high-risk newborns. The objectives of this study were to examine discharge readiness in fathers of high-risk newborn infants and to compare readiness among mother–father pairs. We hypothesized that fathers of high-risk infants would exhibit similar perceptions of parenting readiness at the time of discharge from the NICU as their partners and that both family social risk and infant characteristics would be predictive of paternal perceptions.

Methods

Data for this study were from a prospective cohort of infants enrolled in an education and support intervention at Women and Infants Hospital, Partnering with Parents, the Medical Home and Community Providers to Improve Transition Services for High-Risk Preterm Infants in Rhode Island (transition home program [THP]).[10,11] Details of THP have been previously published.[10,11] Families of infants admitted to the NICU >5 days were recruited and enrolled in THP after the acute phase of hospitalization. Excluded from enrollment were families that did not speak English, Spanish, or Portuguese, or if the mother or infant had a terminal illness. Maternal sociodemographic information was obtained through medical record abstraction and questionnaires. Infant characteristics and morbidities were abstracted from the medical chart. A social risk score was calculated using the sum of the number of the following covariates present: history of maternal mental health disorders, child and family

services involvement, family domestic abuse, and maternal substance use. The institutional review board approved the study, and informed consent was obtained from both parents.

In the week before discharge, mothers and fathers completed the Fragile Infant Parent Readiness Evaluation (FIPRE), a quality measure of parental preparedness to care for their infant at home, developed by Health ActCHQ.[12] This self-reported questionnaire consists of 6 scales: NICU support (how informed parents felt during the NICU stay), infant well-being (how positive a parent feels about their infant's health status), parental well-being (how emotionally confident and self-competent a parent feels to care for themselves and their infant), parental comfort (degree of worry a parent feels regarding their infant's health, growth, and development), family cohesion, and personal time limitations. The NICU support, well-being, and comfort scales each contain multiple items with response options ranging from "not at all," to "a lot." The family cohesion and personal time limitation scales contain single items, with responses on a 5-point and 4-point scale, respectively. For each FIPRE scale, raw scores were transformed to a standard 0 to 100 range, with greater scores indicating more favorable parental perceptions of discharge readiness. Time impact was analyzed as a raw score.

Included in the analysis were families enrolled in THP between January 2013 and October 2015, when both mothers and fathers completed the FIPRE. Of 1816 eligible infants during that time period, 1294 (71%) were enrolled in THP, representing 1140 families. A total of 305 two-parent response families (mother–father pairs) were included in the final analysis. Mean FIPRE scale scores were calculated for each of the 6 scales, and the proportion of responses in

FIPRE	Fragile Infant Parent Readiness Evaluation
NICU	Neonatal intensive care unit
THP	Transition home program

the lowest three quarters of the possible range (scores <75) were evaluated. We chose a cutoff of 75 due to an asymmetric distribution of scale mean scores. The personal time limitation scale was categorized dichotomously ("some/a lot" or "none/a little"). For multiples, FIPRE response scores were averaged for each parent response.

To measure internal reliability, Cronbach alphas were performed for each scale. We assessed differences in parenting readiness among mothers and fathers by comparing the proportion of low (<75) vs high (≥75) scores between mothers and fathers using a paired t test (continuous variables) or McNemar test (categorical variables) in a bivariate analysis. Within family differences of mothers' and fathers' mean scores for each scale were calculated and we assessed concordance of high (≥75) and low (<75) scale scores for each mother–father pair. Logistic regression with generalized estimating equations was used to determine predictors of low (score <75) paternal FIPRE scale scores, with a separate model for each scale. Statistical analyses were conducted with SAS 9.3 (SAS Institute, Cary, North Carolina).

Results

Most infants in the study sample were late preterm or term (69%) and had a mean length of stay in the NICU of 26 ± 30 days (Table I; available at www.jpeds.com). Two-parent response families were predominately white (66%), married (59%), and had private insurance (51%). Compared with 1-parent response families, 2-parent response families were less likely to have a history of domestic violence and less likely to have lower birth weight infants.

Overall, both mothers and fathers had favorable perceptions of support received in the NICU (93% and 91% with high [≥75] scale scores, respectively), as well as infant well-being (81% and 82% with high scale scores, respectively). Of all scales, scores were lowest for both mothers and fathers in the parental comfort scale (worry about infant health and development), with more than one-third of parents scoring <75 (Table II). The greatest differences among mother–father pairs were seen in the parental well-being scale (emotional confidence), with 30% of mothers and 21% of fathers with scores <75. There was overall agreement (of either both low [<75] or both high [≥75] scale scores) in the NICU support and infant well-being scales among mother–father dyads, with 90% (N = 275) concordance of scores in the NICU support scale, and 84% (N = 256) concordance of scores in the infant well-being scale. The greatest discrepancy of scores within families were for the parental well-being scale; 19% (N = 56) of fathers had scores ≥75, whereas their partner had scores <75 (28% total discordance of scores).

Regression estimates predicting paternal discharge readiness scale scores <75 are shown in Table III. Low maternal scores predicted low paternal scores for each corresponding scale. For example, when the maternal score was <75, the odds that her partner's score was also <75 was 4.76 (95% CI 2.6-8.62) for the parental well-being scale and 4.79 (95% CI 2.49-9.22) for the parental comfort scale. Being married was associated with decreased odds of low paternal scores for the NICU support scale (OR 0.24; 95% CI 0.10-0.58) and an improved paternal perception of time limitations (OR 0.41; 95% CI 0.21-0.81). In addition, increased family social risk and Medicaid enrollment were associated with low paternal scores in perceptions of time impact (OR 1.42; 95% CI 1.06-1.91) and family cohesion (OR 4.12; 95% CI 1.56-10.89), respectively. For all scales, infant gestational age and number of neonatal morbidities (including necrotizing enterocolitis, intraventricular hemorrhage, bronchopulmonary dysplasia, and sepsis) were not associated with low paternal scores in any scale.

Discussion

In this cohort of families of high-risk infants, more than 20% of fathers reported poor perceptions of emotional confidence in caring for themselves and their infant and a high degree of worry and anxiety regarding their child's health and development. In contrast to our hypothesis, we found that fathers perceived less overall distress and better emotional confidence in caring for their fragile infant when compared with their partners during NICU discharge. In addition, maternal perceptions played a significant role in predicting her partner's perceptions of parenting readiness and well-being at the time of hospital discharge. In this study, infant characteristics, such as gestational age and neonatal morbidities, were not predictive of paternal discharge readiness perceptions.

There is a significant gap in the literature in regard to parenting readiness and emotional well-being in fathers postpartum, especially among fathers of infants in the NICU. Most studies comparing anxiety and depression symptoms among mothers and fathers of high-risk newborns have found that fathers perceive less stress and anxiety than their partners.[7,13,14] The few studies examining the role of family and infant characteristics in predicting parental distress among families of high-risk infants are inconsistent. Pace et al found that neither social nor medical factors were associated with trajectories of depression and anxiety symptoms among mothers and fathers of infants born preterm who were in the NICU.[7] However, a recent meta-analysis found that greater birth weight and gestational age were associated with smaller differences between maternal and paternal stress levels.[15] Marital status alone has been predictive of adverse pregnancy outcomes, including poor maternal mental health during early childhood.[16,17] Little information is available regarding marital status and mental health outcomes among fathers of infants in the NICU.

In contrast to the survey tools used in previous studies,[6,7,13,14] the FIPRE addresses parenting readiness and self-efficacy by assessing parental emotional well-being with statements such as "I am overwhelmed by all the new things I must learn to do to care for my baby," and "I feel uncertain about what to do once the baby is home." The construct of self-efficacy is related to a parent's belief in their ability to

Table II. FIPRE discharge readiness scores* among mother–father pairs of high-risk infants admitted to the NICU (N = 305)

Discharge readiness scale scores	Mother	Father	Within-family difference,[†] mean ± SE	P value
NICU support				
Mean ± SD	93 ± 13	92 ± 14	0.8 ± 0.7	.28
n (%) score <75	22 (7)	26 (9)	−	.53
Infant well-being				
Mean ± SD	85 ± 23	86 ± 23	−1.0 ± 1.1	.37
n (%) score <75	59 (19)	56 (18)	−	.67
Parental well-being				
Mean ± SD	80 ± 16	84 ± 14	−3.9 ± 0.8	<.001
n (%) score <75	92 (30)	64 (21)	−	.002
Parental comfort				
Mean ± SD	74 ± 24	77 ± 22	−3.8 ± 1.4	<.01
n (%) score <75	116 (38)	110 (36)	−	.54
Family cohesion, mean ± SD	87 ± 18	88 ± 18	−0.5 ± 0.9	.50
Time impact, mean ± SD	2.6 ± 1.1	2.6 ± 1.1	−0.01 ± 0.1	.84

*Greater scale scores indicate more favorable parental perceptions.
†Mother's score minus father's score (with multiples, scores were averaged within parent).

parent, and has been associated with symptoms of depression and anxiety.[18,19] Although mean differences were small, fathers in our cohort perceived overall better self-efficacy (better perceptions of parental well-being and comfort) than their partners. Notably, fathers' overall discharge and parenting readiness perceptions were predicted by the perceptions of their partner. In evaluating paternal emotional well-being, it is important to recognize the impact of maternal influence on her partner's perceptions of stress and well-being. Our findings suggest that social and emotional support targeted to the entire family unit may ameliorate discharge related distress, strengthen family–infant relationships bonding, and potentially improve neurodevelopmental outcomes in our greatest-risk infants born preterm.[20]

Strengths of this cohort study include prospectively collected data and analysis of a large group of mother–father pairs, allowing for assessment of concordance of discharge readiness perceptions, which has not been done in previous studies. The use of the FIPRE allowed for the exploration of multiple emotional constructs pertaining to perceptions of discharge readiness. This tool provided insight into some of the unique challenges faced by fathers of vulnerable infants and infants born preterm.[12]

Limitations of the present study include self-report and medical chart review to diagnose mental health disorders, as well as the unavailability of data regarding specific paternal demographics and mental health diagnoses. The analysis used in this study focused on indicators of social risk, such as marital status, maternal mental health symptoms, and family socioeconomic factors. However, our findings point to the need of prospective studies examining paternal attitudes during the transition to home and should focus on paternal mental health, paternal social risks, and previous paternal experience with parenting and the neonatal intensive care unit. In addition, data regarding family dynamic, including marital status and same-sex partners, are needed. As future studies identify interventions and educational programs aimed to alleviate the mental health burden among high-risk families, use of assessment tools designed for parents of vulnerable and chronically ill infants is important. Such tools can focus on specific facets of parental self-efficacy

Table III. Odds of low (score <75) paternal FIPRE discharge readiness scale scores, according to family and infant characteristics (N = 305)

Characteristics	FIPRE scales OR (95% CI)					
	NICU support	Infant well-being	Parental well-being	Parental comfort	Family cohesion	Time impact*
Maternal score <75[†]	**14.44 (5.30-39.37)**	**12.28 (6.44-23.43)**	**4.76 (2.60-8.62)**	**4.79 (2.49-9.22)**	**8.97 (4.13-19.48)**	**4.48 (2.65-7.58)**
Infant gestational age	1.1.04 (0.95-1.15)	0.98 (0.88-1.07)	1.07 (0.99-1.17)	0.98 (0.90-1.06)	0.95 (0.85-1.07)	1.01 (0.95-1.10)
Number of neonatal morbidities[‡]	1.0 (0.99-1.0)	1.69 (0.83-3.44)	1.54 (0.89-2.65)	1.46 (0.83-2.59)	0.71 (0.34-1.52)	1.30 (0.85-2.0)
Maternal parity >1	0.76 (0.32-1.79)	1.12 (0.58-2.16)	1.31 (0.70-2.47)	1.08 (0.62-1.87)	0.80 (0.38-1.69)	0.67 (0.40-1.13)
Married	**0.24 (0.10-0.58)**	0.66 (0.30-1.47)	0.87 (0.42-1.82)	0.64 (0.33-1.25)	0.72 (0.31-1.67)	**0.41 (0.21-0.81)**
Medicaid enrollment	0.99 (0.40-2.43)	1.22 (0.56-2.63)	1.27 (0.62-2.64)	1.29 (0.69-2.41)	**4.12 (1.56-10.89)**	0.91 (0.48-1.73)
Number of family social risks[§]	0.74 (0.44-1.26)	0.88 (0.59-1.31)	0.79 (0.53-1.18)	0.83 (0.60-1.15)	0.75 (0.52-1.09)	**1.42 (1.06-1.91)**

Values in bold indicate P value <.05. Greater scale scores indicate more favorable parental perceptions.
*Estimated effects for "some/a lot" amount of impact.
†OR for low maternal score (<75) in the corresponding scale.
‡Intraventricular hemorrhage, bronchopulmonary dysplasia, necrotizing enterocolitis, and/or sepsis.
§Maternal mental health issues, child and family services involvement, family domestic abuse, and/or maternal substance abuse.

and readiness around the time of discharge home, and can in turn, influence the development of educational programs of families in the NICU. ∎

Data Statement

Data sharing statement available at www.jpeds.com.

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Table I. Characteristics of parents who completed the FIPRE before discharge from the NICU

Characteristics	Two-parent response families (N = 305)	One-parent response families (N = 716)	P value
Maternal age, y	29.0 ± 5.7	28.6 ± 6.2	.29
Race/ethnicity			<.01
White	201 (66)	397 (55)	
Hispanic	59 (19)	169 (24)	
Black	15 (5)	89 (12)	
Other	30 (10)	61 (9)	
Parity >1	153 (50)	417 (58)	.02
Not married	123/303 (41)	414/704 (59)	<.01
Non-English speaking	52 (17)	128/715 (18)	.74
Less than high school education	31/295 (11)	103/686 (15)	.06
Public insurance	149 (49)	428 (60)	<.01
Maternal mental health disorders*	116 (38)	296/710 (42)	.28
Child and family services involvement	27 (9)	92/714 (13)	.07
History of substance abuse	34 (11)	111/711 (16)	.06
History of domestic violence	13 (4)	70/706 (10)	<.01
Social risk score†	0.6 ± 0.9	0.8 ± 1	.06
Infant gestational age, wk			<.01
<32 (early preterm)	58 (19)	187 (26)	
32-33 (moderate preterm)	42 (14)	128 (18)	
34-36 (late preterm)	110 (36)	247 (34)	
≥37 (term)	95 (31)	154 (22)	
Birth weight, g	2370 ± 970	2150 ± 850	<.01
Length of stay in NICU, d	26.0 ± 30.0	30.4 ± 33.1	<.01
Intraventricular hemorrhage (grade 3/4)	5 (2)	10 (1)	.77
Necrotizing enterocolitis‡	7 (2)	13/714 (2)	.62
Culture positive sepsis	8 (3)	16/714 (2)	.71
Bronchopulmonary dysplasia§	24 (8)	58 (8)	.90

Values expressed as mean ± SD or n (%).
*Maternal mental health disorders: documented history of depression, anxiety, bipolar disorder, any other fifth-edition *Diagnostic and Statistical Manual of Mental Health Disorders* diagnosis, or a history of receiving mental health treatment (psychotherapy or medication).
†Social risk score: Sum of the number of covariates present: maternal mental health disorders, child and family services involvement, family domestic abuse, maternal substance use.
‡Necrotizing enterocolitis: defined as Bell stage 2 of greater.
§Bronchopulmonary dysplasia: defined as oxygen requirement at 36 weeks of corrected gestational age.