

Perceptions of fatherhood and confidence regarding neonatal care among fathers of high-risk neonates in South Korea: a descriptive study

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Purpose: The purpose of this study was to investigate perceptions of fatherhood among fathers of high-risk neonates and their confidence regarding neonatal care. **Methods:** A study was conducted of 100 fathers whose neonates had been admitted to a neonatal intensive care unit (NICU) for at least 48 hours. Perceptions of fatherhood, neonatal characteristics, and fathers' confidence regarding neonatal care were measured using a self-reported questionnaire. The survey took approximately 10 minutes to complete and was completed anonymously. The factors that affected fathers' confidence regarding neonatal care were analyzed using multiple regression. **Results:** The scores for positive and negative perceptions of fatherhood were relatively high at 4.27 and 3.42 out of 5 points, respectively. A positive perception of fatherhood was found to influence fathers' confidence regarding neonatal care. **Conclusion:** NICU nurses should encourage fathers to effectively perform their parenting roles by implementing educational programs and interventions to promote positive perceptions of fatherhood and fathers' confidence regarding neonatal care after discharge.

Key words: Father-child relations; Infant, newborn; Child care; Intensive care units, neonatal

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INTRODUCTION

High-risk neonates are more likely than low-risk neonates to experience adverse outcomes or develop severe or acute disease, and they often require admittance to a neonatal intensive care unit (NICU) [1]. The experience of having a high-risk neonate in the NICU can be extremely challenging and stressful for both mothers and fathers [2]. Since parents are solely responsible for their child's care once the high-risk neonate is discharged, parents of high-risk neonates should possess confidence when practicing neonatal care to allow them to best care for their child. After the child is discharged from the NICU, parents' confidence regarding their neonatal care abilities is the most prominent factor that influences the outcomes of high-risk neonates, with a significant impact on the overall well-being of the family [3]. Confidence helps parents care for high-risk neonates, who require complex healthcare management following discharge. Hence, it is important for parents to develop skills and strategies to balance their lives

with their child's health and developmental needs [2,4].

Parenting confidence refers to the degree to which a parent believes in his or her ability to perform various parenting behaviors adequately, and it is an essential component for parents to successfully fulfill their roles [4]. Greater parenting confidence corresponds to a greater ability in parents to recognize and perform their roles and responsibilities [4]. During the post-birth period, the psychosocial and physical needs of neonates change rapidly, and parents must quickly develop their parenting skills to meet these changing needs [5]. Changes in social structures in recent years have led to a greater emphasis on the need for fathers to be involved in parenting, highlighting the impact of fathers on the development and well-being of children [6]. Paternal involvement in the care of neonates not only improves mothers' physical and psychological health, but also affects the weight gain, sleep quality, and psychosocial behaviors of high-risk neonates and typically leads to a shorter hospitalization [7,8]. As a result, paternal confidence in one's ability to provide neonatal care and

actively participate in neonatal care is crucial for mothers in the postpartum period and throughout child-rearing [5]. Unfortunately, however, fathers of high-risk neonates admitted to the NICU often experience fear, uncertainty, nervousness, anxiety, and a general lack of confidence concerning neonatal care [2]. Parents who feel more confident in their roles are more likely to successfully undertake parenting activities and recognize their effectiveness in their parenting roles [4]. Given the advantages of paternal participation in parenting, fathers with a low degree of parenting confidence require additional support and education [2].

Men tend to develop an understanding of their parental role once they become fathers [9]. Through the experience of new fatherhood, male begin to perceive themselves as a father figure, accept their parenting roles as a father, attempt to become an involved parent, and begin to take responsibility and develop confidence in neonatal care [10]. However, fathers of high-risk neonates admitted to the NICU experience separation from their children at the beginning of their lives, with limited visiting hours and few opportunities to practice neonatal care, and they cannot spend as much time with their children as mothers. All of these factors delay the opportunity to experience fatherhood and hinder the development of a bond between fathers and children [11]. In addition, parents tend to experience stress and psychological difficulty in response to the serious health conditions of their children and long-term hospitalization [12]. All these stressful events may negatively affect fathers' perceptions of fatherhood [3], which can inhibit fathers' development of a bond with their children and the feeling of responsibility and confidence in neonatal care [13]. These factors highlight the importance of fathers' confidence in the care of neonates [5].

New fathers must develop a new psychological identity as they adapt to their roles [14] and must prepare to become fathers, be recognized as fathers, and form family bonds [9,15]. At the same time, however, fathers often feel emotionally vulnerable, worry about the health of their wives and children, experience anxiety about being unable to help their families, and feel as though they are not good fathers [16-18]. The complexities and demands of fatherhood, which usually entail a mixture of positive and negative emotions, may lead to an increased risk of paternal stress, anxiety, and depression [19,20]. However, this stressful period is a normal and important component of the process of becoming a father [21], through which fathers learn to cope with stress, adapt to their new lives, seek ways to be a good father, overcome the anxiety of fatherhood, and solidify their experiences of fatherhood [13, 16,18,19,22]. However, the relationships between the perception of fatherhood and fathers' confidence in neonatal care has rarely been studied.

This study investigated the perceptions of fathers of high-risk neonates who experienced stress due to their child's hospitalization in a NICU and evaluated their confidence in their ability to provide adequate neonatal care. In addition, through an analysis of the impact of the effect of perceptions of fatherhood on fathers' confidence regarding neonatal care, we attempted to collect evidence to support the need for education on proper neonatal care tailored to fathers' perceived parenting ability.

METHODS

Ethics statement: This study was approved by the Institutional Review Board (IRB) of the Catholic University Medical Center (CMC) (No. KC18QESI0695). Informed consent was obtained from all participants.

1. Study Design

This study was a descriptive research. It was performed to identify the effect of the perception of fathers and the characteristics of high-risk neonates in the NICU on fathers' confidence regarding neonatal care. This study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines [23].

2. Participants

The participants in this study were 100 fathers of high-risk neonates who stayed in the NICU of C University Hospital S for at least 48 hours; the fathers understood the purpose of the study and agreed to participate. The minimum sample size to conduct a regression analysis was calculated using G*Power (version 3.1.9.2) with a medium effect of .15, a significance level of .05, a power of .80, and five predictors (perception of fatherhood, birth weight, gestational age, length of hospitalization, and surgery after admission). The minimum required sample size was 92 participants, then questionnaire was distributed to 100 fathers of high-risk neonate considering dropout rate 10%. The survey was ultimately completed by 100 people.

3. Measurements

1) General characteristics

The father's characteristics measured in this study were age, education, religion, family type, planned pregnancy, and trust in medical staff. The neonatal characteristics measured in this study were sex, birth weight, gestational age, hospitalization length, diagnosis, and feeding methods. We also collected data on whether ventilation care, incubator care, and surgery were required.

2) Perceptions of fatherhood

Perceptions of fatherhood were assessed using a 28-question measurement tool developed by Song and Han to measure the perceptions of fatherhood of fathers [24]. The fathers were asked to respond to each question using a 5-point Likert scale with responses ranging from 5 points for "always" to 1 point for "never." The questionnaires contained 12 questions to assess the respondents' positive perceptions of fatherhood and 16 questions to assess the respondents' negative perceptions of fatherhood. The positive perceptions of fatherhood were ranged from 12 to 60 points, and the negative perceptions were from 16 to 80 points. The individual averages for both negative and positive perceptions were calculated for analysis. A higher score indicated a greater degree of the corresponding perception. In Song and Han's study [24], Cronbach's α for positive perceptions of fatherhood was .80 and .86 for negative perceptions of fatherhood. In the present study, Cronbach's α for positive perceptions of fatherhood was .82, while it was .84 for negative perceptions of fatherhood.

3) Fathers' confidence regarding neonatal care

Fathers' confidence regarding neonatal care was measured using a neonatal care confidence measurement tool developed by Lim and Yoo [25]. Eighteen items were used to assess fathers' confidence regarding neonatal care related to bathing, umbilical cord management, vaccination, changing diapers, soothing, and burping. A 5-point Likert scale was used, with 5 points indicating "always" and 1 point indicating "never." A higher score indicated a higher degree of knowledge, and total possible scores ranged from 18 to 90 points. In Lim and Yoo's study [25], Cronbach's α was .92, and it was the same in the present study.

4. Data Collection

Data were collected from February to March 2019 after obtaining permission from the nursing departments at C University Hospital S. The researcher personally explained the purpose and content of the study, distributed the questionnaires to the fathers who provided informed consent, and collected the completed questionnaires. The survey was administered 48 hours after the neonate entered the NICU, and it took approximately 10 minutes to complete. The survey was completed anonymously, and a total of 100 questionnaires were collected. No questionnaires were excluded due to omissions or incomplete responses.

5. Data Analysis

The collected data were analyzed using SPSS (version 21.0;

IBM Corp.), and the specific statistical methods were as follows. The general characteristics of the fathers of high-risk neonates and their confidence regarding neonatal care were analyzed using descriptive statistics, t-test, and ANOVA with a post-hoc test (Scheffé test). The relationships between positive and negative perceptions of fatherhood and fathers' confidence regarding neonatal care were analyzed using Pearson's correlation coefficients. The factors that affected the fathers' confidence in neonatal care were analyzed using multiple regression.

6. Ethical Considerations

Before being asked to complete consent forms, the participants were informed that their personal information would be protected, that their confidentiality would be maintained, that the data would be used for research purposes only, and that they could withdraw from the study at any point. Numbers on the questionnaires were used to identify the participants without any personal information to ensure anonymity. The participants were given the contact information of the institutional review board to direct any inquiries not resolved by the researchers, concerns, complaints, or questions about their rights, and the participants who completed the questionnaire were given a gift.

RESULTS

1. Fathers' Confidence Regarding Neonatal Care According to Their General Characteristics

Seventy-eight fathers (78.0%) were in their 30s, and 22 (22.0%) were in their 40s or older. A total of 63 fathers (63.0%) had a college-level education, while 29 had completed graduate school or higher (29.0%) and eight had completed high school only (8.0%). Ninety-six of the participants (96.0%) had a nuclear family structure, and 82 (82.0%) had children resulting from a planned pregnancy. Sixteen fathers (16.0%) had a low degree of trust in the medical personnel at the NICU, 43 (43.0%) had a moderate degree of trust, and 41 (41.0%) had a high degree of trust. Most responded that their trust in medical personnel was positive. No significant difference in fathers' confidence regarding neonatal care was observed according to the general characteristics of the fathers (Table 1).

2. Fathers' Confidence Regarding Neonatal Care According to the Characteristics of the High-Risk Neonates

Most of the high-risk neonates included in this study were boys (boys: n=58, 58.0%; girls: n=42, 42.0%). The neonates'

Table 1. Differences in Fathers' Confidence in Neonatal Care According to the General Characteristics of the Participants (N=100)

Variables	Categories	n (%)	Confidence (points)	t or F	p
			M±SD		
Age (year)	30-39	78 (78.0)	66.64±12.09	1.26	.210
	≥40	22 (22.0)	62.95±12.08		
Education	≤ High school	8 (8.0)	69.25±8.17	0.34	.710
	College	63 (63.0)	65.48±12.15		
	≥ Graduate school	29 (29.0)	65.66±13.13		
Religion	None	41 (41.0)	65.71±13.34	0.15	.932
	Protestant	31 (31.0)	65.06±13.42		
	Catholic	22 (22.0)	67.27±9.44		
	Buddhist	6 (6.0)	65.33±4.22		
Family type	Nuclear family	96 (96.0)	65.54±12.24	-1.17	.246
	Extended family	4 (4.0)	72.75±6.18		
Planned pregnancy	Yes	82 (82.0)	64.96±12.66	-1.98	.056
	No	18 (18.0)	69.78±8.46		
Trust in medical staff	Low	16 (16.0)	64.56±8.74	2.27	.109
	Moderate	43 (43.0)	63.42±12.06		
	High	41 (41.0)	68.85±12.88		

M, mean; SD, standard deviation.

birth weights ranged from 600 to 4,200 g. The gestational age ranged from 177 to 286 days, and the hospitalization length ranged from 2 to 142 days. A survey of the conditions that required the neonates to stay in the NICU revealed that 47 (47.0%) had respiratory distress syndrome, 20 (20.0%) were premature, six (6.0%) would soon undergo surgery, and 15 (15.0%) required surgery after hospitalization. Forty-nine (49.0%) neonates needed ventilators, and 79 (79.0%) were treated in incubators. Most of the neonates were fed using a feeding tube (n=44, 44.0%) or were bottle-fed (n=42, 42.0%), while only two (2.0%) had to fast.

The fathers' confidence regarding neonatal care varied according to their newborns' weight ($r=.31, p=.001$), gestational age ($r=.37, p<.001$), and hospitalization length ($r=-.40, p<.001$). In addition, when neonates required surgery, fathers demonstrated a significantly lower degree of confidence regarding neonatal care (56.60 points) than fathers whose newborns did not undergo surgery after hospitalization (67.46 points; $t=-3.36, p=.001$) (Table 2).

3. Relationship between Perceptions of Fatherhood and Fathers' Confidence Regarding Neonatal Care

The average score for respondents' positive perceptions of fatherhood was 4.27 out of 5 points, while the average score for their negative perceptions of fatherhood was 3.42 points. The average score for fathers' confidence regarding neonatal care was 65.83 points. A significant positive correlation be-

tween positive perceptions of fatherhood and fathers' confidence regarding neonatal care was observed ($r=.32, p=.001$) (Table 3).

4. Factors Influencing Fathers' Confidence Providing Neonatal Care

After identifying birth weight, gestational age, hospitalization length, and the need for surgery after admission as factors that significantly impacted fathers' confidence regarding neonatal care, we entered these four variables as independent variables in a multiple regression analysis to examine the effects of the perceptions of fatherhood on fathers' confidence providing neonatal care. The variance inflation factor was less than 10 (1.05-2.54), and the tolerance was greater than 0.1 (.39-.95), which confirmed the absence of multicollinearity. The Durbin-Watson statistic was close to 2, at 1.91, confirming the absence of autocorrelation among the independent variables. The regression results indicated that a positive perception of fatherhood ($\beta=.25, p=.009$) predicted higher fathers' confidence regarding neonatal care, which explained 26% of the variance (Table 4).

DISCUSSION

The results of this study indicated that positive perceptions of fatherhood could significantly predict fathers' confidence regarding neonatal care. One's perception of fatherhood is an

Table 2. Differences in Fathers' Confidence in Neonatal Care According to the Characteristics of High-risk Neonates (N=100)

Variables	Categories	n (%) or range	Confidence (points)		t or r or F	p
			M	±SD		
Sex	Male	58 (58.0)	67.14	±10.84	1.27	.207
	Female	42 (42.0)	64.02	±13.62		
Birth weight (g)		600-4,200			.31	.001
Gestational age (days)		177-286			.37	< .001
Hospitalization length (days)		2-142			-.40	< .001
Diagnosis	Prematurity	20 (20.0)	66.60	±12.04	1.64	.184
	RDS	47 (47.0)	63.19	±13.09		
	MAS/pneumonia	15 (15.0)	68.50	±11.24		
	Other	18 (18.0)	69.87	±8.66		
Planned surgery	Yes	6 (6.0)	65.50	±9.31	-0.06	.946
	No	94 (94.0)	65.85	±12.32		
Surgery after admission	Yes	15 (15.0)	56.60	±12.41	-3.36	.001
	No	85 (85.0)	67.46	±11.38		
Ventilation care	Yes	49 (49.0)	64.86	±13.99	-0.78	.438
	No	51 (51.0)	66.76	±10.06		
Incubator care	Yes	79 (79.0)	65.10	±12.64	-1.16	.246
	No	21 (21.0)	68.57	±9.71		
Feeding method	Fasting	2 (2.0)	64.50	±16.26	0.19	.902
	Tube feeding	44 (44.0)	65.73	±14.05		
	Mixed feeding	12 (12.0)	63.67	±12.57		
	Oral feeding	42 (42.0)	66.62	±9.84		

M, mean; MAS, meconium aspiration syndrome; RDS, respiratory distress syndrome; SD, standard deviation.

Table 3. Correlation between Perceptions of Fatherhood and Fathers' Confidence in Neonatal Care (N=100)

Variables	Categories	M±SD (points)	Perceptions of fatherhood	
			Positive	Negative
			r (p)	r (p)
Confidence in neonatal care		65.83±12.12	.32 (.001)	.02 (.843)
Perceptions of fatherhood	Positive	4.27±0.49		.12 (.218)
	Negative	3.42±0.65		-

M, mean; SD, standard deviation.

Table 4. Factors Affecting Fathers' Confidence in Neonatal Care (N=100)

Variables	B	SE	β	t	p
(Constant)	12.87	22.63		0.57	.571
Positive perception of fatherhood	6.08	2.27	.25	2.69	.009
Birth weight	-1.08	2.93	-.08	-0.37	.714
Gestational age	0.10	0.10	.24	1.06	.293
Hospitalization length	-0.10	0.07	-.18	-1.39	.169
Surgery after admission (no) ^{a)}	2.92	4.11	.09	0.71	.479

R²=0.26, Durbin-Watson=1.91, F=6.07, p < .001

^{a)}Dummy variables (Ref. yes); SE, standard error.

essential part of an individual's decision-making process and leads to distinct actions, behaviors, and attitudes. For example, if a father believes that feeding a child is the mother's job, he may not undertake any behaviors or attitudes to support the child's need for nutrition. Thus, positive perceptions of fatherhood impact how involved fathers are in raising and supporting their children and positively carrying out their responsibilities [4,6]. Positive perceptions of fatherhood have been found to be significantly influenced by psychological satisfaction due to the intimate relationship between fathers and their children, the feeling of satisfaction and stability as a father, positive interaction with children, and the feeling of responsibility and pride as a father [15,26,27]. Promoting positive perceptions of fatherhood would help fathers be better able to meet their children's needs. Ultimately, positive perceptions of fatherhood can lead to the development of fathers' confidence in neonatal care, enabling fathers to find pleasure in their active participation in their children's lives and their contributions to raising their children [4,6]. As many previous studies have suggested [2,4,11,12,28], NICU nurses should make it easy for the fathers of high-risk neonates to regularly see their children and be involved in caregiving activities in the NICU so that they develop an attachment beginning in the early stages of the child's life and promote a positive perception of fatherhood. In addition, researchers have argued that communication with healthcare providers can help the fathers of high-risk newborns improve their parenting skills by giving them a sense of control and fostering better coping skills [29]. NICU nurses should communicate in-depth with fathers of high-risk neonates in order to increase fathers' sense of control and emphasize a family-centered approach.

In our study, contrary to our expectations, the mean score for fathers' confidence regarding neonatal care among the fathers of high-risk neonates was 65.83 points, which was higher than that reported in previous studies on the fathers of healthy neonates [25,30]. Compared to conventional notions of fatherhood, modern fatherhood requires active participation in childcare, and fathers increasingly prefer to actively participate in childcare [6,10,11,15]. Unlike in the past, modern fathers often attend various educational sessions such as prenatal classes, seek information on the internet, and actively work to improve their ability to cope with stress and support their family in addition to applying their existing skills and knowledge [5,6,9,15]. As previous studies have shown, fathers of high-risk neonates face many stressful situations, but they have shown positive development in terms of their perception of fatherhood due to their ability to persevere and endure difficult situations [11,12,28].

Therefore, we speculate that this unexpected result arose due to social and personal changes that have encouraged

modern fathers to participate in childcare, which affect their overall fathers' confidence regarding neonatal care. Other positive factors (such as education and other support systems for fathers) may have also increased their confidence regarding neonatal care.

Many previous studies have demonstrated the importance of reducing stress, such as anxiety, among parents of high-risk neonates and improving self-efficacy, building parenting confidence, and seeking positive experiences of fatherhood through early interventions by nurses, including psychosocial support and parental education programs [2,12,31]. Thus, NICU nurses should help to cultivate a positive perception of fatherhood among fathers of high-risk neonates. In addition, NICU nurses should help educate fathers to enable them to recognize and perform their roles to support the well-being of their families based on their positive perception of fatherhood.

In our study, the mean score for positive perceptions of fatherhood was 4.27 points out of 5, while it was 3.42 points for negative perceptions of fatherhood. This high score for positive perceptions of fatherhood supports the findings of qualitative studies that the fathers of high-risk neonates face psychological conflicts as they witness their child receive many different treatments but can still view the situation positively and reduce their stress through their belief in the child's recovery and through the emotional support, encouragement, and consolation of family members, friends, and other parents of neonates admitted to the NICU [2,11].

The average score for negative perceptions of fatherhood was still high and was likely affected by fathers' stress as they witnessed their children undergo medical treatment after admission to the NICU and their relative inability to express their emotions, potentially shaped by social prejudice against premature babies [28]. Therefore, healthcare personnel should routinely provide information on the status of high-risk neonates to their fathers, including the types of medical treatments and care their children require, along with adequate emotional support tailored to the psychological stress experienced by fathers of high-risk neonates. Nursing interventions that promote positive perceptions of fatherhood should also be offered [12,28].

The convenience sampling method was used to recruit fathers at a single university hospital in a single region, and the sample size was too small to ensure the generalizability of the findings. Thus, repeat studies are needed in various healthcare facility settings on a national level to examine fathers' perceived ideas about fatherhood and their confidence regarding neonatal care. The length of hospitalization and severity of child's disease varied too much in this study, therefore, repeat studies that assess controlled length of hospitalization and severity of child's disease as independent varia-

bles are needed. In addition, future studies that assess other independent variables, such as if fathers had previous experience with premature babies, whether fathers visited the NICU, maternal characteristics, and socioeconomic factors should be conducted.

CONCLUSION

Fathers are increasingly taking on more parenting roles, which increases their burden within their family and highlights the need to examine the situations faced by male when they become fathers. Understanding the perceptions of fatherhood among fathers of high-risk neonates admitted to the NICU is relevant and meaningful. Based on our results, subsequent studies should be conducted to develop and assess supportive care methods and educational intervention programs that foster positive perceptions of fatherhood among fathers of high-risk neonates admitted to the NICU and boost their confidence regarding neonatal care after discharge.

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Authors' contribution

Conceptualization: all authors; Data collection, Formal analysis: Jin Won Lee; Writing-original draft: all authors; Writing-review and editing: all authors; Final approval of published version: all authors.

Conflict of interest

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Data availability

Please contact the corresponding author for data availability.

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