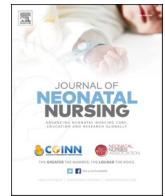




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## Fear of birth among Iranian fathers of full-term and preterm neonates: A cross-sectional study

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### ABSTRACT

**Background:** Pregnancy, childbirth, and parenting can cause different emotional reactions in fathers, in addition to mothers, including fear of childbirth.

**Purpose:** To compares the fear of childbirth among fathers of preterm and term infants.

**Study design:** This cross-sectional study included 157 fathers with preterm neonates (below 37 weeks) and 314 with term neonates (above 37 weeks) in Tabriz, Iran. The instruments used for data collection included socio-demographic and obstetric characteristics and paternal fear of childbirth questionnaires. The data were analyzed using a general linear model.

**Results:** There was a statistically significant difference between the two groups regarding the total score of fear of childbirth ( $p < 0.001$ ). Also, a multivariate general linear model with adjusted socio-demographic and obstetric characteristics found no significant difference in the fear of childbirth between the fathers of term and preterm neonates. There was a statistically significant association between a father's fear of birthing and his wife's gestational age and parity, with men who had primiparous women and premature infants reporting the greatest levels of anxiety.

**Conclusion:** This study found that first-time fathers whose spouses are primiparous and whose gestational ages are short tend to fear childbirth more. Providing support and interventions during the prenatal period is essential for reducing this anxiety.

## 1. Introduction

Fathers may experience various emotions related to pregnancy, childbirth, and parenting, including fear of childbirth (Schumacher et al., 2008). Fear of childbirth is defined as the unpleasant feeling of the risks following invasive interventions and their side effects during childbirth, including physical damage to the pregnant mother and her child, painful birth, the woman's inability to give vaginal birth or support the spouse, disrespectful behaviors of health providers, and financial problems (Ghaffari et al., 2021; Johansson et al., 2014). The dimensions of fear of childbirth in fathers are categorized into three areas: fear of the newborn's health (diseases, abnormalities, and

impairments), fear of the spouse's health or death (intolerance of childbirth pain, and fear of unnecessary interventions), and fear relating to their reactions and behaviors (Moran et al., 2021).

Even when desired and planned, becoming a father can be a challenging transition to parenthood for some fathers, negatively affecting their mental health, leading to stress, anxiety, and depression (Leach et al., 2016). Additionally, fear of childbirth in fathers may affect the child's attachment patterns, emotional and cognitive growth, the couple's marital relationship, the father's ability to support the spouse, and lead to unpleasant experience of pregnancy and childbirth (Johansson et al., 2014).

Various factors, including age, economic status, method of birth, and

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gestational age at birth, may potentially influence a father's level of concern regarding childbirth (Serçekuş et al., 2020). When parents experience childbirth as a challenging event, it can have an impact on their mental well-being (Bastos et al., 2015).

Most fathers report feeling helpless and overwhelmed by the preterm delivery of their child or their child's admission to the neonatal intensive care unit (Serçekuş et al., 2020). The World Health Organization (WHO) reports that 11.1% of the world's 135 million births are premature neonates, with more than 60% occurring in Africa and Asia (Arockiasamy et al., 2008). The prevalence of preterm birth in Iran is about 10% (Blencowe et al., 2012).

Preterm birth and related complications are a major source of concern in prenatal care, generating stress and trauma for parents (Sharifi et al., 2017). Parents and infants are usually separated during delivery, and if the birth is sudden or unexpected, the infant is sent to the neonatal ward (Forcada-Guex et al., 2011). It has been observed that fathers may experience similar psychological reactions as mothers. However, men may prioritize their partner's and newborn's needs over their own and may not express their stress (Redshaw, 2008). Following a preterm birth, parents are more likely to endure prolonged distress, depression, and post-traumatic stress symptoms (Ireland et al., 2016).

Given the distress and post-traumatic stress symptoms in fathers of preterm infants (Ireland et al., 2016) and the lack of studies comparing the fear of childbirth in fathers of preterm and term infants in Iran, this study was designed and carried out.

## 2. Methods

### 2.1. Study design

The present cross-sectional study employed a descriptive-analytical approach to compare the fear of childbirth among fathers whose wives had preterm or full-term labours.

### 2.2. Study participants

The study population consisted of the expectant husbands of hospitalized women with preterm (below 37 weeks) and term (above 37 weeks) pregnancies in Tabriz educational hospitals, including Taleghani, Al-Zahra, and 29 Bahman. Inclusion criteria were residence in Tabriz and its suburbs, gestational age between 26 and 36 weeks and six days for the preterm group, and gestational age between 37 weeks and 41 weeks and six days for the term group. Exclusion criteria were inability to complete the questionnaires (due to mental retardation), multiple pregnancies, and known abnormalities in the newborn.

### 2.3. Study setting

Participants were recruited from the educational, referral, and specialized hospitals, including Al-Zahra, Taleghani, and 29 Bahman in Tabriz, Iran. The hospitals included are tertiary care facilities.

### 2.4. Sample size

Based on the results of the study by (Rashidi et al., 2023), and considering  $3.48 \pm 14.1$  (mean  $\pm$  SD), using a significance level of 5% ( $\alpha = 0.05$ ), and a power of 90%, the sample size was calculated to be 130 fathers. After allowing for 20% attrition, the final sample size was calculated as 157. The sample size for the term group was twice that for the preterm group, so it was considered 314.

### 2.5. Recruitment

The researcher attended the hospitals daily to examine and sample the participants regarding inclusion criteria. Eligible participants were informed about the study's objectives and method. After obtaining

written informed consent, participants completed the paternal fear of childbirth questionnaire through an interview method used by the researcher.

### 2.6. Data collection instruments

Data collection tools in this study included socio-demographic and obstetric checklists and a paternal fear of childbirth questionnaire.

### 2.7. Socio-demographic and obstetric questionnaire

This questionnaire contains age, marriage age, educational level, work status, income, marital status, and the wife's gestational age.

### 2.8. Paternal fear of childbirth questionnaire

Ghaffari et al. developed this questionnaire to assess fathers' fear of childbirth in two domains: fear of the childbirth process with 12 questions (questions 1–12) and fear of the hospital with five questions (questions 13–17). The questions are scored on a five-point Likert scale. The total score ranges from 17 to 85, while the domains range from 12 to 60 and 5 to 25, respectively. The higher the score, the greater the fear. In addition, scores of 17–35, 36 to 54, and 55 or higher indicate low, moderate, and severe fear, respectively. The Cronbach's alpha of the questionnaire has been reported to be more than 0.7 (Ghaffari et al., 2021).

### 2.9. Data analysis

Data were analyzed using SPSS Version 24.0 for Windows software (IBM Inc., Armonk, NY, USA). Qualitative data were reported as frequency (percentage), and quantitative data were reported as mean (SD: standard deviation). The study conducted a univariate analysis to compare the socio-demographic and obstetric characteristics, as well as paternal fear of childbirth, between preterm and term groups. This was achieved through statistical tests such as the independent samples *t*-test, chi-square for trend, Fisher's exact test, and chi-square. In the next step, variables with *p*-values less than 0.1 were entered into a general linear model, and the effect of these variables was adjusted to compare the fear of childbirth between the two groups.

## 3. Results

A total of 157 fathers with preterm infants and 314 fathers with term infants were included in the study between March 12 and August 22, 2022. The mean (SD) age of the fathers in the preterm and term groups was 33.5 (5.3) and 32.7 (5.2) years, respectively. There was a statistically significant difference between the two groups in terms of education ( $p = 0.004$ ) and occupation ( $p = 0.030$ ), but no significant difference was observed in terms of income level ( $p > 0.05$ ) (Table 1).

The mean (SD) gestational age in the preterm and term groups was 34.5 (2.4) and 39.1 (0.9) weeks, respectively. There was a statistically significant difference between the two groups in terms of their women's parity ( $p < 0.001$ ), history of preterm labour ( $p < 0.001$ ), pregnancy complications ( $p = 0.009$ ), NICU admission ( $p < 0.001$ ), and baby weight ( $p < 0.001$ ). There was no statistically significant difference between the two groups in terms of place of birth, woman's postpartum complications, woman's admission to the intensive care unit, and baby sex ( $p > 0.05$ ) (Table 2).

The mean (SD) of the overall fear of childbirth score among preterm and term groups was 50.1 (10.1) and 46.2 (8.7), respectively. The two groups were significantly different regarding the overall fear of childbirth score ( $p < 0.001$ ). The mean (SD) of paternal fear of birth domain scores in preterm and term groups were 37.5 (7.9) and 35.6 (7.3), respectively, indicating a statistically significant difference between the two groups ( $p = 0.015$ ). The mean (SD) of paternal fear of hospital

**Table 1**

Socio-demographic characteristics by fathers with preterm (n = 157) and term (n = 314) neonate.

Characteristics	Preterm (n = 157)	Term (n = 314)	p
<b>Age (years), Mean (SD)</b>	33.5 (6.2)	32.7 (5.7)	0.168 <sup>a</sup>
<b>Educational level</b>			<b>0.004<sup>b</sup></b>
Illiterate or elementary	24 (15.3)	71 (22.6)	
Secondary or high school	59 (37.6)	128 (40.7)	
Diploma	46 (29.3)	87 (27.7)	
Academic	28 (17.8)	28 (8.9)	
<b>Occupation</b>			<b>0.030<sup>d</sup></b>
Employee	8 (5.1)	11 (3.5)	
Worker	11 (7.0)	48 (15.3)	
Self-employed	138 (87.9)	255 (81.2)	
<b>Income adequacy</b>			<b>0.052<sup>b</sup></b>
Inadequate	12 (7.6)	43 (13.7)	
Relatively adequate	132 (84.1)	252 (80.3)	
Completely adequate	13 (8.3)	19 (6.1)	

The data indicate frequency (percent). P < 0.05 indicates significance difference.

<sup>c</sup> Fisher's Exact.

<sup>a</sup> Independent-Samples T Test.

<sup>b</sup> Chi-square for trend.

<sup>d</sup> Chi-square.

**Table 2**

Birth characteristics by fathers with preterm (n = 157) and term (n = 314) neonate.

Characteristics	Preterm (n = 157)	Term (n = 314)	p
<b>Gestational age (Weeks), Mean (SD)</b>	34.5 (2.4)	39.1 (0.9)	<0.001 <sup>a</sup>
<b>Parity</b>			<0.001 <sup>b</sup>
1	70 (44.6)	90 (28.7)	
2	45 (28.7)	149 (47.5)	
3+	42 (26.7)	75 (23.8)	
<b>History of preterm neonate</b>	39 (24.8)	6 (1.9)	<0.001 <sup>b</sup>
<b>Maternal complications during pregnancy<sup>c</sup></b>	65 (41.4)	91 (29.0)	0.009 <sup>b</sup>
<b>Place of birth</b>			1.00 <sup>b</sup>
Teaching university	130 (82.8)	261 (83.1)	
Organizational university	27 (17.2)	53 (16.9)	
<b>Maternal postpartum complication</b>	0	5 (1.6)	0.157 <sup>c</sup>
<b>Maternal ICU admission<sup>d</sup></b>	4 (2.5)	7 (2.2)	1.000 <sup>c</sup>
<b>NICU admission<sup>e</sup></b>	87 (55.4)	25 (8.0)	<0.001 <sup>b</sup>
<b>Baby weight (g)</b>	2462.2 (577.5)	3279.1 (392.3)	<0.001 <sup>a</sup>
<b>Baby sex (female)</b>	63 (40.1)	151 (48.1)	0.116 <sup>b</sup>

<sup>a</sup> Independent-Samples T Test; <sup>b</sup> Chi-square; <sup>c</sup> Complications: Hypertension, diabetes, thyroid disorders, cardiovascular disease, sexual transmitted disease, thrombosis. The data indicate frequency (percent). P < 0.05 indicates significance difference; <sup>c</sup> Fisher's Exact; <sup>d</sup> Intensive Care Unit; <sup>e</sup> Neonatal Intensive Care Unit.

domain scores among the preterm and term groups were 12.6 (4.4) and 10.5 (3.8), respectively, indicating a statistically significant difference between the two groups (p < 0.001) (Table 3).

In addition, the frequency (percent) of mild, moderate, and severe fear of childbirth in fathers of the preterm group was 14 (8.9%), 89 (56.7%), and 54 (34.4%), respectively, and in the fathers of the term group was 36 (11.5%), 223 (71.0%), and 55 (17.5%), indicating a statistically significant difference between the two groups (p < 0.001) (Table 3).

The results of a multivariate general linear model with adjusted socio-demographic and obstetric characteristics showed no significant difference between the fear of childbirth of fathers in term and preterm groups [OR (95% CI) = 0.64 (-2.67 to 3.96); p = 0.702]. However, there was a significant statistical correlation between paternal fear of childbirth and gestational age, such that with increasing gestational age,

**Table 3**

Comparison of paternal fear of childbirth among fathers with preterm (n = 157) and term (n = 314) neonate.

Variable	Preterm N = 157	Term N = 314	P-value
	Mean (SD)		
<b>Father Fear</b>			
Father Fear of Birth (12–60)	37.5 (7.9)	35.6 (7.3)	0.015 <sup>a</sup>
Father Fear of Hospital (5–25)	12.6 (4.4)	10.5 (3.8)	<0.001 <sup>a</sup>
Total score (17–85)	50.1 (10.1)	46.2 (8.7)	<0.001 <sup>a</sup>
<b>Severity of Fear</b>	N (%)		<0.001 <sup>b</sup>
Mild Fear	14 (8.9)	36 (11.5)	
Moderate Fear	89 (56.7)	223 (71.0)	
Sever Fear	54 (34.4)	55 (17.5)	

<sup>a</sup> Independent T- Test.

<sup>b</sup> Chi-square Test.

the fear of childbirth decreased [-0.70 (-1.40 to -0.01); P = 0.045]. Additionally, fathers whose spouses were primiparous reported significantly higher levels of fear of childbirth compared with fathers whose spouses were parity three [5.06 (0.91–9.21); P = 0.017] (Table 4).

#### 4. Discussion

This study is the first to compare paternal fear of childbirth among fathers of preterm and term infants. According to the multivariate analysis, there was no statistically significant difference in fear of childbirth between the two groups of fathers with preterm and term infants. However, there was a statistically significant correlation between fear of childbirth, gestational age, and parity. As gestational age and parity increased, fathers' fear of childbirth decreased.

Based on multivariate analysis, there was no statistically significant difference in fear of childbirth between the two groups of fathers with preterm and term infants. This study's results are inconsistent with an observational study in Spain and a descriptive study in Australia (Cajiao-Nieto et al., 2021; Inglis et al., 2016). We hypothesized that fathers with preterm infants would have more fear of childbirth due to the unexpected onset of labour, stress related to the lack of control over the situation, and critical conditions. The reasons for the insignificant difference after adjusting the confounding variables are as follows: 1. This study evaluated fear of childbirth, while the studies mentioned above assessed anxiety, depression, and the mental states of fathers. 2. In educational hospitals in Iran, preterm labours are typically managed by

**Table 4**

Comparison of paternal fear of childbirth among fathers with preterm (n = 157) and term (n = 314) neonate by adjusting of confounders factors.

Variable	OR (95% CI) <sup>a</sup>	P-value
<b>Group (Reference: Term neonate)</b>		
Preterm	0.64 (-2.67 to 3.96)	0.70
<b>Educational level (Ref: Academic)</b>		
Illiterate or elementary	-2.62 (-6.38 to 1.13)	0.17
Secondary or high school	-2.68 (-5.90 to 0.54)	0.10
Diploma	-0.95 (-4.16 to 2.25)	0.55
<b>Occupation (Ref: Self-employed)</b>		
Employee	-1.27 (-6.15 to 3.59)	0.60
Worker	2.41 (-0.59 to 5.42)	0.11
<b>Gestational age</b>	-0.70 (-1.40 to -0.01)	0.04
<b>Parity of mother (Ref: 3)</b>		
1	5.06 (0.91–9.21)	0.01
2	1.88 (-2.10 to 5.88)	0.35
<b>History of preterm neonate (Ref: Yes)</b>		
No	-3.05 (-6.85 to 0.75)	0.11
<b>Maternal postpartum complication (Ref: Yes)</b>		
No	-1.31 (-3.28 to 0.65)	0.19
<b>NICU admission (Ref: Yes)</b>		
No	1.36 (-1.31 to 4.03)	0.31
<b>Baby weight</b>	-9.92 (-0.00 to 0.00)	0.93

<sup>a</sup> Odds Ratio (95% Confidence Interval).

a specialist physician or expert midwife, with students not present during the process. This may increase maternal satisfaction with childbirth and reduce stress and fear among fathers. 3. The effect of confounding variables has been adjusted in this study. Therefore, although there was a significant difference between preterm and term groups in the univariate analysis, no significant difference was observed after adjusting the effect of these variables. 4. Completing questionnaires in a hospital environment and almost in the peripartum period, which is close to the birth of a high-risk infant, could be another reason. Fathers, especially those with preterm infants who need medical care, may focus more on their infant's health than their fear of childbirth. They may feel uncomfortable expressing their fear because they think how they answer the questions will affect the quality of care provided by caregivers (several questions directly refer to caregivers).

This study found that with increasing gestational age, the paternal fear of childbirth decreased, which is consistent with a descriptive study conducted in Australia. Some men lose their parental responsibilities after going through a traumatic birth experience like a preterm birth because they are too overwhelmed by their own lack of resilience and their worries for the health of their spouse and child (Elmir and Schmied, 2022). A cross-sectional study in Iran found that maternal distress lessens as pregnancy progresses (Keramat et al., 2021).

Our study showed that fathers whose spouses were primiparous reported significantly higher levels of fear of childbirth than fathers whose spouses were parity 3. A cohort study in Sweden found that men with primiparous wives experienced more fear than men whose wives were parity three, which is consistent with the findings of this study (Hildingsson et al., 2014). The elevated fear of childbirth may be due to the fathers' lack of experience with childbirth and their paternal role. Most first-time fathers have little information about pregnancy and childbirth, leading to increased fear and unpreparedness (Deave et al., 2008). In a comparative observational study in Switzerland, fathers waiting for their first child had higher anxiety levels than fathers with several children (Daire et al., 2022).

#### 4.1. Strengths and limitations

One of the limitations of the present study was the limited access to fathers. For the reason that most fathers could not attend the hospital during office hours to complete the questionnaires. Therefore, the researcher attempted to visit the hospital for sampling as much as possible in the evening. Another limitation of the study was that fathers were only selected from educational hospitals and one organizational hospital. However, advanced NICU equipment is frequently accessible in these hospitals, and most women at risk of preterm labor tend to refer to these hospitals due to the absence of insurance coverage at other hospitals in the event of neonatal hospitalization. However, regarding fathers whose spouses had term labor, the results may not be generalizable to all of them because this group can also choose private hospitals that were not included in this study. Conducting the study for the first time in Iran, using a standard instrument, and comparing the preterm group with the term group are this study's strengths.

## 5. Conclusion

This study showed that fear of childbirth is higher among fathers with primiparous and low gestational age wives. It is necessary to design and implement interventions to reduce the fear of childbirth among fathers, especially first-time fathers, during the prenatal period. Similar studies should be conducted in other communities with different cultural and clinical backgrounds. Health providers, managers, and policymakers can use the results of this study to improve services for fathers.

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## Availability of data and materials

The datasets used and analyzed during the current study available from the corresponding author on reasonable request.

## Authors' contributions

MM and SGH contributed to the design of the study. ZN, PJ, MM and SGH contributed to the implementation and analysis plan. ZN, MM, PJ, AKH, MR, NA and SGH has written the first draft of this manuscript and all authors have critically read the text and contributed with inputs and revisions, and all authors read and approved the final manuscript.

## Ethics approval and consent to participate

All methods were carried out following the Helsinki Declaration. The study has been approved by the Ethics Committee of Tabriz University of Medical Sciences, Tabriz, Iran (Code: IR.TBZMED.REC.1400.1200). Written informed consent was obtained from all participants. The researcher explained the informed consent form in their native language for illiterate women, and collected their biometrics. Also, informed consent from a legal guardian was taken for illiterate participants.

## Consent for publication

Not applicable.

## Declaration of competing interest

The authors report no conflict of interest.

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