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The Effect of Father-Infant Bonding on Fathers' Attitudes Toward Participating in Childbirth and Fear of Childbirth

Esra CEVIK[1], Serap KAYNAK[2]

[1]Balikesir University, Faculty of Health Sciences, Department of Midwifery, Balikesir, Türkiye
[2]Balikesir University, Faculty of Health Sciences, Department of Nursing, Balikesir, Türkiye

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Abstract

Objective

This study aimed to examine the relationship between father-infant bonding and expectant fathers' attitudes toward birth participation as well as their birth-related fear levels.

Material and Method

This cross-sectional study was conducted between November 2023 and July 2024 at the obstetrics outpatient clinics, maternity ward, and delivery rooms of Balıkesir University Health Practice and Research Hospital. The sample consisted of 257 expectant fathers who met the inclusion criteria. Data were collected using the Sociodemographic Characteristics Form, Paternal Antenatal Attachment Scale (PAAS), Attitude Scale Towards Participation in Birth for Father Candidates (ASPBFC), and Fathers' Fear of Childbirth Scale (FFCS). Descriptive statistics, correlation analysis, univariate analyses, and linear regression were performed for statistical evaluation.

Results

The mean scores of participants were 65.15 ± 6.70 for the PAAS, 60.03 ± 17.47 for the ASPBFC, and 59.85 ± 11.51 for the FFCS. Multiple linear regression analyses identified several significant predictors of ASPBFC and FFCS scores. Lower ASPBFC scores were observed among unemployed participants, those who did not feel ready for fatherhood, and those who had not attended birth-related education, while the spouse's age was positively associated with ASPBFC. Higher PAAS and FFCS scores were associated with lower ASPBFC. For FFCS, higher scores were found among participants with higher income, those expecting a female fetus, and those who had not attended birth-related education, and FFCS increased with longer marriage duration. In contrast, higher PAAS and ASPBFC scores were associated with lower FFCS.

Conclusion

Expectant fathers in this study demonstrated low attitudes toward birth participation, moderate father-infant bonding, and high birth-related fear levels. Father-infant bonding emerged as a significant predictor for both ASPBFC and FFCS scores.

Keywords: Attitude, Father, Fear of birth

Correspondence: E.Ç. / esra.cevik@balikesir.edu.tr
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ORCID IDs of the Authors: E.C: 0000-0003-2798-9202; S.K: 0000-0001-9482-5254

Introduction

The intrapartum period represents a significant life event for both parents due to the addition of a new family member (1). For first-time fathers, this period is considered a critical transition, during which new roles and responsibilities are assumed (2). Even when fathers feel prepared, concerns related to pregnancy, childbirth, and the postpartum period may complicate the experience; some fathers may experience stress, anxiety, or depression. Perceiving childbirth as traumatic can negatively impact paternal mental health and father-infant bonding (3). Although mothers are generally viewed as the primary attachment figures, a strong father-infant bond is also essential for healthy child development (4).

Father-infant bonding has been reported to be influenced by multiple factors, including marital satisfaction, partner relationship quality, planned preg-nancy, social support, active involvement in caregiving, and psychological well-being (5, 6). The literature indicates that paternal childbirth fear has been less studied compared to maternal fear, although it can affect approximately 13% of fathers (2, 3). Considering that women increasingly expect spousal support during labor (7), fathers' attitudes toward birth participation emerge as a critical factor. While some studies report high paternal willingness to participate in birth (8), others suggest lower levels of involvement (9). These discrepancies have been attributed to health policies, hospital procedures, lack of knowledge, cultural factors, and healthcare providers' attitudes (3, 8, 9). Evidence suggests that fathers who actively participate in birth and have positive birth experiences establish stronger bonds with their infants (6, 10).

Although birth fear does not directly impair bonding, it may weaken the father-infant relationship indirectly through negative birth experiences (2). Therefore, managing father-infant bonding, birth participation, and birth fear is critical for the well-being of both fathers and infants. In Turkey, no study has examined these three concepts simultaneously. This study aims to determine the relationship between father-infant bonding, fathers' attitudes toward birth participation, and birth-related fear.

Material and Method

Place And Design of the Study

This cross-sectional study was conducted between November 2023 and July 2024 at the antenatal clinics, maternity ward, and delivery unit of Balıkesir University Health Practice and Research Hospital, involving partners of primiparous pregnant women.

Participants

The required sample size was calculated using G*Power version 3.1.9.4 for linear multiple regression analysis. As no pilot study was conducted before the study, a medium effect size ($f^2 = 0.15$) was adopted in accordance with Cohen's recommendations. With a significance level of $\alpha = 0.05$ and a statistical power of 95%, the minimum required sample size was determined to be 234 participants (11). A total of 257 fathers meeting the inclusion criteria were enrolled. Participants were ≥18 years old, able to read and understand Turkish, had no diagnosed psychological disorders, had partners without high-risk pregnancies (e.g., placenta previa, preeclampsia, eclampsia), had partners ≥37 weeks of gestation, and were expecting their first child.

Instruments

Data were collected using a Sociodemographic Characteristics Form, Paternal Antenatal Attachment Scale (PAAS), Attitude Scale Towards Participation in Birth for Father Candidates (ASPBFC), and Fathers' Fear of Childbirth Scale (FFCS).

Sociodemographic Characteristics Form

The form was prepared by researchers in line with the literature and consists of questions covering the sociodemographic characteristics of the father and mother, pregnancy planning, method of conception, sex of the fetus, and characteristics related to pregnancy (2, 7, 12, 13).

Paternal Antenatal Attachment Scale (PAAS)

Developed by Condon (1993) and adapted into Turkish by Benli and Aksoy, this 16-item, 5-point Likert scale (range 16-80) assesses fathers' emotions, attitudes, behaviors, and thoughts toward the developing fetus. Higher scores indicate stronger attachment. Two subscales, quality of attachment and time spent in attachment, are included (12, 14). Cronbach's alpha was 0.82 in this study.

Attitude Scale Towards Participation in Birth for Father Candidates (ASPBFC)

Developed by Cicek Ozdemir & Kan (2022), this 26-item, 5-point Likert scale (range 26-130) has three subscales: Positive Feelings Toward Birth Participation, Negative Feelings Toward Birth Participation, and Participation Behaviors. Higher scores indicate more positive attitudes (7). Cronbach's alpha was 0.93 in this study

Fathers' Fear of Childbirth Scale (FFCS)
Developed by Ghaffari et al. (2021) and adapted into Turkish by Calpbinici et al. (2024), this 17-item scale (range 17-85) has two subscales: fear related to the birth process and hospital-related fear. Scores are categorized as low (17-35), moderate (36-54), or high (≥55). Higher scores indicate greater birth-related anxiety (15, 16). Cronbach's alpha was 0.89 in this study.

Data Collection
Data were collected via face-to-face interviews conducted by researchers between November 2023 and July 2024. Each session lasted approximately 15-20 minutes.

Data Analysis
Data were analyzed using SPSS 25. Descriptive statistics included frequencies, percentages, means, and standard deviations. Normality of continuous variables was assessed using the Shapiro-Wilk test and skewness/kurtosis values within ±1.5. Independent samples t-test and one-way ANOVA (with Tukey HSD post hoc) were used for group comparisons. Variables that were statistically significant in bivariate analyses were entered into multiple linear regression models using the backward elimination method. In this approach, all candidate variables were initially included in the model, and predictors that did not reach statistical significance ($p > 0.05$) were sequentially removed at each step. The elimination process continued until only statistically significant variables remained in the final model. This procedure was employed to obtain a more parsimonious, interpretable, and stable regression model. Statistical significance was set at $p < 0.05$.

Ethics Committee Permission
The study was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from Balıkesir University Non-Interventional Research Ethics Committee (15.08.2023, 2023/78) and institutional permission from Balıkesir University Health Practice and Research Hospital (13.10.2023, E.305379). Written informed consent was obtained from all participants.

Results

The sociodemographic characteristics of the study sample (n = 257) are presented in Table 1. The mean age of participants was 29.92 ± 3.93 years, and the mean duration of marriage was 3.33 ± 2.89 years. Nearly half of the fathers (48.6%) had a university degree or higher, 86.8% were employed, 79.4% reported that the pregnancy was planned, 86.8% indicated natural conception, and 86.4% felt prepared for fatherhood. Regarding fetal gender, 50.6% expected a female baby, while 61.9% stated that the fetal gender did not matter to them. Only 14.4% of the participants attended childbirth education.

The mean scores of the scales were as follows: Paternal Antenatal Attachment Scale (PAAS) 65.15 ± 6.70, Attitude Scale Towards Participation in Birth for Father Candidates (ASPBFC) 60.03 ± 17.47, and Fathers' Fear of Childbirth Scale (FFCS) 59.85 ± 11.51 (Table 2).

In the research group, ASPBFC scores in bivariate analyses were lower among those who were not working ($t = 2.101$, $p = 0.037$), in those expecting a female baby ($t = -2.167$, $p = 0.031$), in those who did not feel ready for fatherhood ($t = 2.162$, $p = 0.035$), and in those who did not receive childbirth education ($t = 2.082$, $p = 0.044$). There was no statistically significant difference in terms of educational level, spouse's educational level, spouse's employment status, income, method of conception, or preferred fetal gender ($p > 0.05$) (Table 3).

In the research group, bivariate analyses showed that the FFCS score was significantly lower among high school graduates ($F = 6.600$, $p = 0.002$), those whose spouses were employed ($t = 2.436$, $p = 0.016$), those whose income was equal to or greater than their expenses ($F = 6.957$, $p = 0.001$), those whose pregnancies were unplanned ($t = -2.292$, $p = 0.009$), those expecting a girl ($t = -2.292$, $p = 0.009$), those who did not feel ready for fatherhood ($t = -3.403$, $p = 0.001$), and those who did not receive childbirth education ($t = -4.080$, $p < 0.001$). There was no statistically significant difference in terms of the partner's education level, the partner's employment status, the method of conception, or the preferred fetal gender ($p > 0.05$) (Table 3).

According to the correlation analysis, participants' ASPBFC score was negatively correlated with FFCS ($r = -0.200$, $p = 0.001$), PAAS ($r = -0.246$, $p = 0.001$), Attachment Quality ($r = -0.217$, $p < 0.001$), and Time Spent on Attachment ($r = -0.210$, $p < 0.001$). Additionally, there was a positive, weak, and significant relationship between the ASPBFC score and the partner's age ($r = 0.128$, $p = 0.040$). There was no significant relationship between the ASPBFC score and the participants' age, the partner's gestational week, or the duration of marriage ($p > 0.05$) (Table 4) .
According to the correlation analysis, there is a

Table 1 Sociodemographic Characteristics of the Study Group.

Variables	n (%) / X ± SD
Age (years)	29.92 ± 3.93
Spouse's age (years)	27.45 ± 3.82
Spouse's gestational week	37.14 ± 0.52
Marriage duration (years)	3.33 ± 2.89
Education level	
University and above	125 (48.6)
High school	108 (42.0)
Middle school and below	24 (9.3)
Spouse's education level	
University and above	121 (47.1)
High school	66 (25.7)
Middle school and below	70 (27.2)
Employment status	
Employed	223 (86.8)
Unemployed	37 (13.2)
Spouse's employment status	
Employed	87 (33.9)
Unemployed	170 (66.1)
Income	
Higher than expenses	70 (27.2)
Equal to expenses	149 (58.0)
Lower than expenses	38 (14.8)
Planned pregnancy	
Yes	204 (79.4)
No	53 (20.6)
Conception method	
Natural	223 (86.8)
Assisted reproductive techniques	34 (13.2)
Fetal gender	
Female	130 (50.6)
Male	127 (49.4)
Desired fetal gender	
Female	59 (23.0)
Male	39 (15.2)
Does not matter	159 (61.9)
Total	**257 (100.0)**

X: Mean, SD: Standard deviation.

Table 2 Scale Scores and Birth-Related Attitudes of Fathers

Variables	n (%) / X ± SD
Perceived readiness for fatherhood	
Yes	222 (86.4)
No	35 (13.6)
Attendance to birth-related education	
Yes	37 (14.4)
No	220 (85.6)
PAAS	65.15 ± 6.70
Attachment Quality	35.10 ± 3.47
Time Spent on Attachment	30.05 ± 4.28
ASPBFC	60.03 ± 17.47
Positive Attitudes Towards Participation	27.51 ± 9.08
Negative Attitudes Towards Participation	17.51 ± 7.42
Participation Actions	14.99 ± 4.04
FFCS	59.85 ± 11.51
Fear of Childbirth	42.89 ± 8.34
Hospital Fear	16.95 ± 4.96
Father's fear of childbirth	
Low	8 (3.1)
Moderate	54 (21.0)
High	195 (75.9)
Total	**257 (100.0)**

X: Mean, SD: Standard deviation. PAAS: Paternal Antenatal Attachment Scale,
ASPBFC: Attitude Scale Towards Participation in Birth for Father Candidates, FFCS: Fathers' Fear of Childbirth Scale (FFCS)

significant negative correlation between participants' FFCS score and ASPBFC ($r = -0.200$, $p = 0.001$), PAAS ($r = -0.248$, $p < 0.001$), Attachment Quality ($r = -0.220$, $p < 0.001$), and Time Spent on Attachment ($r = -0.210$, $p < 0.001$). Additionally, there was a positive, weak, and significant relationship between the FFCS score and the partner's age ($r = 0.147$, $p = 0.019$) and duration of marriage ($r = 0.181$, $p = 0.004$). There was no significant relationship between the FFCS score and the participants' age and the partner's gestational week ($p > 0.05$) (Table 4).

Variables that were found to be statistically significant in bivariate analyses for ASPBFC were included in the multiple linear regression model using the backward elimination method. In the bivariate analyses, employment status, fetal gender, spouse's age, perceived readiness for fatherhood, attendance to birth-related education, PAAS, and FFCS were found to be significant and were included in the initial model. In the final model, spouse's age, employment status, perceived readiness for fatherhood, attendance to birth-related education, PAAS, and FFCS remained statistically significant and explained 18% of the variance in ASPBFC scores ($R^2 = 0.200$, adjusted $R^2 = 0.180$, $F = 10.393$, $p < 0.001$).

According to the final model, ASPBFC scores were significantly lower among unemployed participants (ß = -5.979; 95% CI: -11.78, -0.17), those who did not perceive themselves as ready for fatherhood (ß = -7.516; 95% CI: -13.49, -1.54), and those who had not attended any birth-related education (ß = -6.711; 95% CI: -12.54, -0.88). In addition, ASPBFC scores

Table 3 ASPBFC and FFCS Scores According to Sociodemographic Characteristics of the Participants.

Variables	n	ASPBFC		FFCS	
		X ± SD	Test value, p	X ± SD	Test value, p
Education level					
University and above[a]	125	60.92 ± 18.29	F = 0.720 p = 0.488	58.03 ± 12.29	F = 6.600 p = 0.002 b > a = c
High school[b]	108	59.82 ± 16.40		62.78 ± 10.20	
Middle school and below[c]	24	56.29 ± 17.94		56.12 ± 10.21	
Spouse's education level					
University and above	121	60.43 ± 17.35	F = 0.265 p = 0.767	59.26 ± 11.68	F = 0.372 p = 0.690
High school	66	58.68 ± 18.72		60.77 ± 11.68	
Middle school and below	70	60.60 ± 17.47		60.00 ± 11.60	
Employment status					
Employed	223	60.91 ± 17.49	t = 2.101 p = 0.037	60.20 ± 11.46	t = 1.248 p = 0.213
Unemployed	37	54.20 ± 16.37		57.55 ± 11.76	
Spouse's employment status					
Employed	87	58.18 ± 15.91	t = -1.878 p = 0.062	62.27 ± 11.11	t = 2.436 p = 0.016
Unemployed	170	61.48±18.09		58.61 ± 11.55	
Income					
Higher than expenses[a]	70	62.27 ± 15.97	F = 1.418 p = 0.244	59.40 ± 10.51	F = 6.957 p = 0.001 a = b > c
Equal to expenses[b]	149	59.91 ± 17.87		61.56 ± 11.17	
Lower than expenses[c]	38	57.36 ± 20.46		53.97 ± 12.82	
Planned pregnancy					
Yes	204	59.10 ± 17.63	t = -1.668 p = 0.097	59.01 ± 11.93	t = -2.292 p = 0.009
No	53	63.58 ± 16.51		63.05 ± 9.14	
Conception method					
Natural	223	60.53 ± 17.74	t = 1.182 p = 0.238	59.57 ± 12.01	t = -0.991 p = 0.322
Assisted reproductive techniques	34	56.73 ± 15.39		61.67 ± 7.40	
Fetal gender					
Female	130	57.70 ± 15.63	t = -2.167 p = 0.031	61.51 ± 10.48	t = 2.363 p = 0.019
Male	127	62.40 ± 18.93		58.14 ± 12.30	
Desired fetal gender					
Female	59	59.61 ± 20.41	F = 0.415 p = 0.661	59.03 ± 12.82	F = 0.520 p = 0.595
Male	39	66.38 ± 20.38		61.43 ± 12.65	
Does not matter	159	59.61 ± 15.49		59.76 ± 10.73	
Perceived readiness for fatherhood					
Yes	222	60.84 ± 17.76	t = 2.162 p = 0.035	58.90 ± 11.25	t = -3.403 p = 0.001
No	35	54.88 ± 14.69		65.88 ± 11.51	
Attendance to birth-related education					
Yes	37	68.00 ± 26.47	t = 2.082 p = 0.044	51.13 ± 14.58	t = -4.080 p = 0.000
No	228	58.69 ± 15.13		61.31 ± 10.25	

X: Mean; SD: Standard deviation. t: Student's t-test; F: One-way ANOVA (post hoc: Tukey HSD). *When a statistically significant difference was detected by ANOVA, post-hoc multiple comparison analyses were performed. Superscript letters (a, b, c) indicate the category levels of the same variable. The symbols ">" and "=" represent the results of post-hoc comparisons, indicating the direction of statistically significant differences between groups.

Table 4 Correlation Analysis of Continuous Variables in the Study Group.

Values		ASPBFC	FFCS
ASPBFC	**r**	1	**-0.200**
	p		**0.001**
FFCS	**r**	**-0.200**	1
	p	**0.001**	
Age (years)	**r**	0.111	0.084
	p	0.076	0.179
Spouse's age (years)	**r**	**0.128**	**0.147**
	p	**0.040**	**0.019**
Spouse's gestational week	**r**	-0.031	-0.005
	p	0.616	0.937
Marriage duration (years)	**r**	0.034	**0.181**
	p	0.590	**0.004**
PAAS	**r**	**-0.246**	**-0.248**
	p	**0.001**	**0.000**
Attachment Quality	**r**	**-0.217**	**-0.220**
	p	**0.000**	**0.000**
Time Spent on Attachment	**r**	**-0.210**	**-0.210**
	p	**0.000**	**0.001**

PAAS: Paternal Antenatal Attachment Scale, ASPBFC: Attitude Scale Towards Participation in Birth for Father Candidates, FFCS: Fathers' Fear of Childbirth Scale (FFCS) r: Pearson's correlation coefficient.

Table 5 Examination of the Relationship Between Sociodemographic Characteristics and Scale Scores in the Research Group Using Linear Regression Analysis.

Variables	ß	Std. ß	t	p	%95. C.I.	
					Lower limit	Upper limit
ASPBFC						
Employment status	-5.979	-0.116	-2.028	**0.044**	-11.78	-0.17
Perceived readiness for fatherhood	-7.516	-0.148	-2.477	**0.014**	-13.49	-1.54
Attendance to birth-related education	-6.711	-0.135	-2.266	**0.024**	-12.54	-0.88
Spouse's age (years)	0.592	0.129	2.213	**0.028**	0.06	1.11
PAAS	-0.828	-0.318	-5.306	**0.000**	-1.13	-0.52
FFCS	-0.356	-0.234	-3.744	**0.000**	-0.54	-0.17
$R = 0.447$, $R^2 = 0.200$, Adj. $R^2 = 0.180$, $F = 10.393$, $p = 0.000$						
FFCS						
Income	2.368	0.131	2.356	**0.019**	0.38	4.34
Fetal gender	2.855	0.124	2.237	**0.026**	0.34	5.36
Attendance to birth-related education	8.044	0.246	4.374	**0.000**	4.42	11.66
Marriage duration (years)	0.612	0.154	2.791	**0.006**	0.18	1.04
PAAS	-0.490	-0.286	-4.973	**0.000**	-0.68	-0.29
ASPBFC	-0.149	-0.227	-3.854	**0.000**	-0.22	-0.07
$R = 0.502$, $R^2 = 0.252$, Adj. $R^2 = 0.234$, $F = 14.042$, $p = 0.000$						

PAAS: Paternal Antenatal Attachment Scale, ASPBFC: Attitude Scale Towards Participation in Birth for Father Candidates, FFCS: Fathers' Fear of Childbirth Scale (FFCS) For the ASPBFC model, dichotomous variables were coded as follows: employment status (employed = 0, unemployed = 1), fetal gender (male = 0, female = 1), perceived readiness for fatherhood (yes = 0, no = 1), and participation in birth-related education (yes = 0, no = 1). Spouse's age, PAAS, and FFCS were included as continuous variables. For the FFCS model, dichotomous variables were coded as follows: income status (less than expenses = 0, equal to or higher than expenses = 1), fetal gender (male = 0, female = 1), perceived readiness for fatherhood (yes = 0, no = 1), participation in birth-related education (yes = 0, no = 1), and planned pregnancy (yes = 0, no = 1). Marriage duration, spouse's age, PAAS, and ASPBFC were included as continuous variables.

increased with increasing spouse's age (ß = 0.592; 95% CI: 0.06, 1.11). Conversely, higher PAAS and FFCS scores were associated with lower ASPBFC scores (ß = -0.828; 95% CI: -1.13, -0.52 and ß = -0.356; 95% CI: -0.54, -0.17, respectively) (Table 5).

For FFCS, variables found to be statistically significant in bivariate analyses (education level, spouse's age, duration of marriage, spouse's employment status, income, planned pregnancy, fetal gender, perceived readiness for fatherhood, attendance to birth-related education, PAAS, and ASPBFC) were included in the backward multiple linear regression model. In the final model, duration of marriage, income, fetal gender, attendance to birth-related education, PAAS, and ASPBFC remained statistically significant and explained 25% of the variance in FFCS scores (R^2 = 0.252, adjusted R^2 = 0.234, F = 14.042, p < 0.001).

According to the final model, FFCS scores were higher among participants whose income was equal to or higher than their expenses (ß = 2.368; 95% CI: 0.38, 4.34), those expecting a female fetus (ß = 2.855; 95% CI: 0.34, 5.36), and those who had not attended any birth-related education (ß = 8.044; 95% CI: 4.42, 11.66). FFCS scores also increased with longer duration of marriage (ß = 0.612; 95% CI: 0.18, 1.04). In contrast, higher PAAS and ASPBFC scores were associated with lower FFCS scores (ß = -0.490; 95% CI: -0.68, -0.29 and ß = -0.149; 95% CI: -0.22, -0.07, respectively) (Table 5).

Discussion

This study examined the relationship between paternal antenatal attachment and both attitudes toward participation in birth and fear of childbirth among first-time father candidates. The overall score for attitudes toward participation in birth (ASPBFC: 60.03 ± 17.47) was generally low; however, the "Positive Feelings Toward Participation in Birth" subscale was relatively higher (27.51 ± 9.08). This finding may reflect the perception of childbirth primarily as a female experience in Turkey, and it can be associated with cultural norms as well as healthcare institutional policies (13, 17). Although fathers waiting for childbirth are encouraged to provide emotional support to the expectant mother and actively participate in the birth process (18), they are generally not allowed to enter the delivery room in public hospitals in Turkey. It is important to establish clear role definitions for fathers during childbirth and to implement supportive institutional policies. A study conducted in the United Kingdom reveals that men feel "helpless" and "useless" during the active birth process and points out a gap between policy and practice (19). These findings highlight the need to clarify fathers' roles.

According to the Fathers' Fear of Childbirth Scale, father candidates reported high levels of fear of childbirth (59.85 ± 11.51), with approximately three-quarters of participants scoring in the high-fear category (≥ 55). While mild fear of childbirth is attributed to the normal processes of pregnancy and birth, moderate fear, although difficult to manage, does not negatively affect an individual's current mental health. In contrast, severe fear of childbirth can affect expectant fathers' mental health and may significantly disrupt daily functioning as well as the father fetus bond (20). In our study, the reason for fathers having a high level of fear of childbirth may be related to the inclusion of first-time fathers in the study group. Studies have shown that men who are about to become fathers for the first time are more afraid of childbirth, similar to our findings.

According to multiple linear regression analysis, ASPBFC scores are significantly lower among non-working participants, those who do not feel ready for fatherhood, and those who have not participated in childbirth-related education. Organizing childbirth preparation classes for "birth partners" helps fathers better understand the birth process, take an active role during delivery, and develop awareness of what to expect (21). Organizing father-specific sessions as part of routine antenatal care programs may be beneficial (22).

Fathers who received childbirth education were observed to be better prepared for the birth process and reported more active participation (21, 22). Factors that hinder men's participation in childbirth include poor communication with healthcare personnel, medication use, high-risk pregnancies, cultural structures and hospital policies that exclude fathers from the birth process, lack of support, feelings of alienation and disrespect, unpreparedness, unmet expectations, medicalization of childbirth, lack of family-centered care, and fear of childbirth. Factors that facilitate men's participation in childbirth include receiving antenatal education and the use of technology with the support of midwives and nurses (18).

The study found that as the age of the spouse decreased, ASPBFC scores significantly declined. Increases in PAAS and FFCS scores were associated with a significant decrease in ASPBFC scores. This may be associated with younger mothers and fathers experiencing lower psychological preparedness for the birth process, uncertainty, and challenges related to gender roles. Interestingly, fathers with stronger

paternal-fetal attachment exhibited lower ASPBFC scores, suggesting that greater attachment could increase birth-related anxiety. This may reflect that fathers with stronger attachment perceive parenting responsibilities more seriously and contemplate the birth process more extensively (23). Similarly, the negative impact of fear of childbirth on ASPBFC scores may be related to the emotional burden of fear, which can limit fathers' engagement in the birth process (2).

ASPBFC scores showed limited associations with demographic variables; similarly, the literature indicates that fathers' attitudes toward birth participation are shaped more by cultural values, gender roles, and perceptions of fatherhood than by sociodemographic factors (24).

Fear of childbirth can negatively affect the lives of men and their families. In this study, fathers expecting a female fetus, who had not participated in childbirth-related education, and who had been married longer exhibited high levels of fear of childbirth. These findings may be associated with fathers' knowledge, sense of responsibility, and psychological preparedness (13, 25). Birth preparation programs, psychological support, and interventions that strengthen paternal antenatal attachment are essential to enhance fathers' participation in childbirth and to reduce childbirth-related fear.

This study found that fathers whose income was equal to or higher than their expenses experienced higher levels of fear of childbirth. It is stated that men often experience uncertainty due to changing relationship dynamics and increased economic responsibilities associated with pregnancy; some men also reported significant discomfort and psychological distress during this process (3). In contrast to our study, Duman and Golbasi found that fear of childbirth increased among fathers as their income level decreased (13). Similarly, Sercekus et al. found that fathers with higher economic status had higher fear of childbirth. The higher level of fear of childbirth among fathers in good economic circumstances can be explained by the influence of information of limited reliability on the internet, as a result of greater use of online information sources (26).

Increases in PAAS and ASPBFC scores were found to be associated with a significant decrease in FFCS scores. As the level of father-infant bonding and positive attitudes toward participating in childbirth increase, expectant fathers may perceive childbirth as a process requiring meaningful and active participation rather than a threatening situation. This may contribute to a reduction in childbirth fear stemming from uncertainty by strengthening perceptions of control and self-efficacy.

Strengths and Limitations

This study was conducted at a single tertiary hospital, limiting generalizability to other regions or cultural contexts. Its cross-sectional design prevents causal conclusions between paternal antenatal attachment, birth participation attitudes, and fear of childbirth. Psychosocial factors such as the quality of the relationship between partners or mental health were not evaluated. Fathers who were going to become fathers for the first time were included in the study, while fathers whose partners experienced high-risk pregnancy were excluded.

Conclusion

Participants exhibited low attitudes toward participation in childbirth, moderate levels of paternal antenatal attachment, and high levels of fear of childbirth. Paternal antenatal attachment emerged as a key determinant of both attitudes toward birth participation and fear of childbirth. The findings suggest that fathers who feel unprepared for fatherhood and those lacking childbirth education are particularly vulnerable to lower participation attitudes and higher fear levels. For this reason, healthcare professionals should actively involve expectant parents in childbirth education programs. Future research may evaluate the attitudes toward childbirth and fear of childbirth in fathers whose partners become pregnant through assisted reproductive techniques.

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Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Ethical Approval

The study was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from Balıkesir University Non-Interventional Research Ethics Committee (15.08.2023, 2023/78) and institutional permission from Balıkesir University Health Practice and Research Hospital (13.10.2023, E.305379).

Consent to Participate and Publish

Written informed consent to participate and publish form was obtained from all participants included in the study.

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Availability of Data and Materials
Data are available on request due to privacy or other restrictions.

Artificial Intelligence Statement
The authors declare that they have not used any type of generative artificial intelligence for the writing of this manuscript, nor for the creation of images, graphics, tables, or their corresponding captions.

Authors Contributions
E.C: Conceptualization and methodology, Data curation, data collection and formal analysis, writing - original draft, review & editing.

S.K: Conceptualization, data curation, investigation, writing – review & editing.

All authors meet authorship criteria and endorse the final article and all authors with authorship rights were listed as authors.

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