

Araştırma Makalesi/Research Article

## The Relationship Between Earthquake Fear and Fear of Childbirth During Pregnancy: A Cross-Sectional Study

*Gebelikte Deprem Korkusunun Doğum Korkusuyla İlişkisi: Kesitsel Bir Çalışma*

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**Abstract:** Objective: The purpose of this study was to evaluate the impact of earthquake anxiety on the birth fear in pregnant women. This was conducted through assessing the relationship between earthquake anxiety and birth expectations using the Wijma Birth Expectancy/Experience Scale (W-DEQ A) among pregnant women attending a university hospital's obstetrics clinic. Methods: This cross-sectional, analytical study included a sample of 212 pregnant women who applied to the obstetrics clinic between 01/09/2024 and 01/12/2024. Data were collected using a Personal Information Form, the Earthquake Anxiety Scale, and the Wijma Birth Expectancy/Experience Scale (W-DEQ A). Statistical analyses were performed to explore the relationship between demographic variables and psychological measures. Results: A significant difference was found between birth fear and variables such as education level, marital status, and whether the individual experienced any loss due to the earthquake ( $p<0.05$ ). Additionally, a significant difference was found between previous birth type, trimester, planned delivery method, number of children, and earthquake anxiety levels ( $p<0.05$ ). Women who had experienced loss due to the earthquake showed significantly higher levels of both birth fear and earthquake anxiety ( $p<0.05$ ). A strong positive relationship was observed between earthquake anxiety and birth fear ( $p<0.05$ ). Conclusion: The study demonstrated a significant positive relationship between earthquake anxiety and birth fear among pregnant women. Elevated anxiety levels were found to be an important factor contributing to increased birth fear. High psychological stress during pregnancy may exacerbate anxiety related to childbirth, making the birth experience more challenging. Thus, it is crucial for midwifery practice to consider anxiety levels in pregnant women and to implement strategies such as psychological support, relaxation techniques, and reassuring communication to reduce birth fear.

**Keywords:** Pregnancy, Birth fear, Earthquake anxiety.

**Öz:** Amaç: Bu çalışmanın amacı, deprem anksiyetesinin gebelerde doğum korkusu üzerindeki etkisini değerlendirmektir. Bu amaçla, gebelerin deprem anksiyetesi ile doğum beklentileri arasındaki ilişki, Wijma Doğum Beklentisi/Deneyimi Ölçeği (W-DEQ A) kullanılarak bir üniversite hastanesinin kadın doğum polikliniğine başvuran gebelerde incelenmiştir. Gereç ve Yöntem: Bu kesitsel, analitik çalışmada, 01/09/2024-01/12/2024 tarihleri arasında kadın doğum polikliniğine başvuran 212 gebe yer almıştır. Veriler, Kişisel Bilgi Formu, Deprem Anksiyetesi Ölçeği ve Wijma Doğum Beklentisi/Deneyimi Ölçeği (W-DEQ A) kullanılarak toplanmıştır. Demografik değişkenler ile psikolojik ölçütler arasındaki ilişkiyi incelemek için istatistiksel analizler yapılmıştır. Bulgular: Doğum korkusu ile eğitim durumu, medeni durum, deprem nedeniyle kayıp yaşama durumu arasında anlamlı farklılık bulunmuştur. Ayrıca, önceki doğum şekli, gebelik dönemi, planlanan doğum şekli, çocuk sayısı ve deprem anksiyetesi seviyeleri ile doğum korkusu arasında anlamlı farklar saptanmıştır. Deprem nedeniyle kayıp yaşayan gebelerde doğum korkusu ve deprem anksiyetesi seviyelerinin anlamlı derecede yüksek olduğu belirlenmiştir. Deprem anksiyetesi ile doğum korkusu arasında güçlü düzeyde, pozitif yönlü, anlamlı bir ilişki saptanmıştır ( $p<0,05$ ). Sonuç: Çalışma, deprem anksiyetesi ile doğum korkusu arasında anlamlı ve pozitif yönlü bir ilişki olduğunu göstermiştir. Artan anksiyete düzeylerinin doğum korkusunu artıran önemli bir etken olduğu belirlenmiştir. Gebelikte yüksek psikolojik stres, doğumla ilgili kaygıları derinleştirerek doğum sürecini daha zorlu hale getirebilir. Bu nedenle, ebelik pratiğinde gebelerin anksiyete düzeylerinin göz önünde bulundurulması ve

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doğum korkusunu azaltmaya yönelik psikolojik destek, rahatlatıcı teknikler ve güven verici iletişim yöntemlerinin kullanılması büyük önem taşımaktadır.

**Anahtar Kelimeler:** Gebelik, Doğum korkusu, Deprem anksiyetesi.

## **Introduction**

Natural disasters such as earthquakes, floods, and landslides, which occur outside of human control and result in physical, economic, and social losses, disrupting or halting life, are referred to as disasters. These events challenge an individual's coping mechanisms, which often prove insufficient (Kipay, 2023). All people are at risk from the impacts of disasters; however, vulnerable groups such as the elderly, children, and women are at greater risk. The depth and persistence of the losses, stress, and trauma experienced by these individuals after a disaster are particularly significant (Gökçe and Gerçek-Öter, 2023). The consequences are even more severe for women exposed to disasters during pregnancy, as they may face a range of issues such as abortion, preterm labor, infections, fetal growth restriction, low birth weight infants, breastfeeding difficulties, neonatal mortality, and psychosocial stress (Bilge and Hotun-Şahin, 2018; Hawkins et al., 2019). Several studies have focused on the impact of disaster-induced stress on maternal, fetal, and reproductive health (Menclova and Stillman, 2020; Mesrkanlou et al., 2023). Even under normal circumstances, prenatal stress has been associated with a wide range of adverse birth outcomes (Deshpande, 2016; Atasever and Çelik, 2018). The impact of disaster-induced stress on pregnant women cannot be overlooked. Disasters like earthquakes, which cause both physical and psychological changes, particularly leave pregnant women vulnerable (Harville et al., 2010; Guo et al., 2017). After an earthquake, issues such as post-traumatic stress during pregnancy, depression, increased suicide rates, preterm births, and adverse psychological developments in infants may lead to conditions like birth fear (Guo et al., 2017).

Birth fear can negatively affect psychosocial health, the birth process, and the postpartum period during pregnancy. This fear typically emerges in the third trimester, causing the woman to experience her unique and special pregnancy journey with anxiety and tension (Storksen et al., 2012). During labor, severe birth fear may increase the intensity of perceived contractions, result in ineffective contractions, and lead to prolonged labor due to these ineffective contractions (Fenwick et al., 2009). In the postpartum period, birth fear has been associated with negative psychiatric effects (such as postpartum depression and post-traumatic stress disorder), sexual dysfunctions, negative thoughts about future pregnancies, and disturbances in the mother-infant relationship (Storksen et al., 2012; Goodman et al., 2004).

## Hypotheses

**H<sub>0</sub>:** There is no relationship between earthquake anxiety and birth fear during pregnancy.

**H<sub>1</sub>:** There is a relationship between earthquake anxiety and birth fear during pregnancy.

## Methods

### Study Design

This study was conducted as a cross-sectional research to evaluate the relationship between earthquake anxiety and birth fear during pregnancy.

### Population and Sample

The population of the study consists of all pregnant women who visited the obstetrics clinic of a university hospital between 01/09/2024 and 01/12/2024. A non-probability sampling method was used for sample selection, and the sample size was determined using the G\*Power 3.1.9.7 program (Faul et al., 2007). Based on Cohen's (1988) suggestion for medium effect size, with an effect size of  $H_1=0.02$ , a confidence level of 80% (Polit and Beck, 2017), and a margin of error of 5%, the required sample size was calculated as 193 participants. After accounting for a 10% data loss, the study was completed with 212 pregnant women. A post-hoc power analysis conducted at the end of the study revealed a power of 0.83 ( $1-\beta$ : 0.83).

### Data Collection Tools

**Personal Information Form:** This form includes 24 questions regarding the socio-demographic and obstetric characteristics of the women, as well as their earthquake experiences (such as age, education level, spouse's age, spouse's occupation, spouse's education level, gestational week, duration of marriage, desire to conceive, earthquake experience, etc.). The form was developed by the researchers through a literature review (Çıtak Bilgin et al., 2018; Karataş and Ejder Apay, 2021).

**Earthquake Anxiety Scale:** Developed by Gül in 2014, this scale can be applied to measure earthquake anxiety across different age groups. It is a 5-point Likert scale consisting of 9 items and a single dimension. The response options are: strongly agree (5), agree (4), neither agree nor disagree (3), disagree (2), and strongly disagree (1). Based on the scores, anxiety levels are classified as follows: 9-21 indicates low anxiety, 22-33 indicates moderate anxiety, and 34-45 indicates high anxiety. The Cronbach's Alpha coefficient for the original scale was found to be 0.875, and in our study, it was calculated as 0.90.

**Wijma Birth Expectancy/Experience Scale (W-DEQ) A version:** This scale, developed by Klaas and Barbro Wijma, measures the fear of childbirth experienced by women. The scale

consists of 33 items. Responses are numbered from 0 to 5, with a 6-point Likert type: 0 indicating "completely" and 5 indicating "not at all." The minimum score is 0, and the maximum score is 165. As the score increases, the fear of childbirth also increases. In the initial version of the scale, no specific score range was provided, but subsequent studies established scoring ranges. W-DEQ A scores are categorized into four groups: women with low birth fear (W-DEQ score  $\leq 37$ ), moderate birth fear (W-DEQ score between 38-65), severe birth fear (W-DEQ score between 66-84), and clinically significant birth fear (W-DEQ score  $\geq 85$ ) (Wijma et al., 1998). Items 2, 3, 6, 7, 8, 11, 12, 15, 19, 20, 24, 25, 27, and 31 are reverse-scored. The Turkish adaptation, including validity and reliability assessments, was performed by Körükcü and Kukulü. The Cronbach Alpha coefficient for the Turkish version was 0.89, and the split-half reliability was 0.91. In our study, the Cronbach Alpha value was found to be 0.70.

### **Data Collection**

Data were collected through face-to-face interviews with pregnant women who applied to the obstetrics clinic between 01/09/2024 and 01/12/2024, after obtaining ethical approval and informed consent. Participants were informed about the purpose of the study, and the questionnaires were administered on a voluntary basis. Completing the questionnaire took approximately 10–15 minutes.

### **Data Analysis**

The statistical analysis of the data will be conducted using SPSS 24.0 for Windows. Descriptive statistical measures (mean, standard deviation, minimum and maximum values, and percentages) will be used. For comparisons of scale scores with variables, non-normally distributed data will be analyzed using Kruskal-Wallis H tests and Mann-Whitney U tests, while normally distributed data will be analyzed with Independent T-test and One-Way ANOVA tests. The homogeneity of the distribution of variables will be analyzed using Spearman Correlation. Statistical significance will be accepted at  $p < 0.05$ .

### **Results**

The study was conducted with a total of 212 pregnant women. Some of the sociodemographic and obstetric data of the participants are presented in Table 1.

Table 2 presents the comparison of the average scores of sociodemographic and obstetric characteristics of the pregnant women with earthquake anxiety and childbirth fear scales. A significant difference was found between the education level of the pregnant women, their relationship with their husband, and whether they experienced a loss due to the earthquake, and childbirth fear ( $p < 0.05$ ).

**Table 1:** Sociodemographic and Obstetric Characteristics of Pregnant Women

Descriptive/Obstetric Characteristics	n	%	
<b>Age Group</b>	18-27	104	49.1
	27-35	85	40.1
	35+	23	10.8
	<b>Average Age <math>\bar{X} \pm SS</math> (min-max)</b>	28.18 $\pm$ 5.01 (18-40)	
<b>Husband's Age</b>	18-27	63	29.7
	27-35	108	50.9
	35+	41	19.4
	<b>Husband's Average Age <math>\bar{X} \pm SS</math> (min-max)</b>	30.96 $\pm$ 5.23 (22-45)	
<b>Education Level</b>	Primary Education	34	16.0
	High School	97	45.8
	University and Above	81	38.2
<b>Duration of Marriage</b>	1-5 years	136	64.2
	6-10 years	45	21.2
	11 years and above	31	14.6
	<b>Average Duration of Marriage <math>\bar{X} \pm SS</math> (min-max)</b>	5.22 $\pm$ 4.92 (1-23)	
<b>Husband's Occupation</b>	Not Working	4	1.9
	Civil Servant	62	29.2
	Worker	75	35.4
	Other (Tradesman, business, etc.)	71	33.5
<b>Psychological Status</b>	Good	101	47.6
	Moderate	103	48.6
	Poor	8	3.8
<b>Perception of Economic Status</b>	Income is less than expenses	6	2.8
	Income equals expenses	74	34.9
	Income is more than expenses	132	62.3
<b>Relationship with Husband</b>	Present	20	9.4
	Absent	192	90.6
<b>People Living in the Household</b>	My Husband and I	109	51.4
	My Husband, I, and My Other Children	80	37.7
	My Husband, I, and My Husband's Family	18	8.5
	Other (Grandparents, etc.)	5	2.4
<b>Parity</b>	Primipara	95	44.8
	Multipara	117	55.2
<b>Previous Delivery Method</b>	Vaginal Birth	47	22.2
	Cesarean Section	53	25.0
	Never Given Birth	112	52.8
<b>Current Trimester</b>	First Trimester	24	11.3
	Second Trimester	61	28.8
	Third Trimester	127	59.9
<b>Presence of Any Chronic Illness</b>	Present	30	14.2
	Absent	182	85.8
<b>If present (n=30)</b>	Diabetes	4	13.3
	Hypertension	6	20.0
	Thyroid	5	16.7
	Asthma	5	16.7
	Other (infection, heart issues, etc.)	10	33.3
<b>Planned Delivery Method</b>	Vaginal Birth	123	58.0
	Cesarean Section	89	42.0
<b>Planned Number of Children</b>	1	20	9.4
	2	100	47.2
	3 or more	92	43.4
<b>Previous Earthquake Experience</b>	Yes	123	58.0
	No	89	42.0
<b>Experience of Loss Due to Earthquake</b>	Yes	16	7.5
	No	196	92.5
<b>Total</b>		<b>212</b>	<b>100.0</b>

A significant difference was found between the previous delivery method, the current trimester, planned delivery method, number of children, previous earthquake experience, and loss due to the earthquake, and earthquake anxiety ( $p < 0.05$ ). Additionally, a significant difference was found between the loss experienced due to the earthquake and both childbirth fear and earthquake anxiety ( $p < 0.05$ ).

**Table 2:** Comparison of the Average Scores of Pregnant Women's Characteristics with Earthquake Anxiety and Wijma Birth Expectancy Scales

Pregnant Women's Characteristics	Wijma Birth Expectancy/Experience Scale (W- DEQ) A Version	Earthquake Anxiety Scale
	$\bar{X} \pm SS$	$\bar{X} \pm SS$
<b>Age</b>		
18-27	77.77 $\pm$ 13.64	27.62 $\pm$ 7.18
28-35	79.29 $\pm$ 12.88	28.14 $\pm$ 7.11
36+	75.21 $\pm$ 11.18	25.65 $\pm$ 7.34
<b>F / p value</b>	0.941/0.392	1.039/0.356
<b>Husband's Age</b>		
18-27	76.98 $\pm$ 12.82	28.65 $\pm$ 6.81
28-35	78.65 $\pm$ 13.55	27.29 $\pm$ 7.00
36 +	78.39 $\pm$ 12.48	26.87 $\pm$ 8.87
<b>F / p value</b>	0.334/0.716	0.933/0.395
<b>Education Level</b>		
Primary Education <sup>a</sup>	73.47 $\pm$ 16.12	25.67 $\pm$ 7.74
High School <sup>b</sup>	77.39 $\pm$ 12.11	27.91 $\pm$ 7.30
University and Above <sup>c</sup>	80.91 $\pm$ 12.30	28.07 $\pm$ 7.19
<b>F / p value</b>	<b>4.262/0.015</b> (a<c)	1.429/0.242
<b>Marriage Duration</b>		
1-5 years	77.58 $\pm$ 12.74	27.77 $\pm$ 7.07
6-10 years	79.82 $\pm$ 14.49	27.91 $\pm$ 7.48
11 years and Above	77.93 $\pm$ 12.71	26.51 $\pm$ 8.39
<b>F / p value</b>	0.496/0.610	0.412/0.663
<b>Husband's Occupation</b>		
Not Workinga	81.00 $\pm$ 10.48	24.25 $\pm$ 8.84
Civil Servant	79.58 $\pm$ 13.63	27.91 $\pm$ 7.51
Worker	79.12 $\pm$ 11.36	27.81 $\pm$ 7.75
Other (Tradesman, business, etc.)	78.10 $\pm$ 13.09	27.33 $\pm$ 6.76
<b>F / p value</b>	1.268/0.286	0.364/0.779
<b>Psychological Status</b>		
Good	77.21 $\pm$ 11.76	26.88 $\pm$ 7.46
Moderate	79.40 $\pm$ 14.21	28.44 $\pm$ 7.16
Poor	72.62 $\pm$ 13.46	26.25 $\pm$ 7.97
<b>F / p value</b>	1.447/0.238	1.305/0.273
<b>Perception of Economic Status</b>		
Income is less than expenses	74.00 $\pm$ 16.39	21.83 $\pm$ 8.18
Income equals expenses	75.82 $\pm$ 14.19	27.52 $\pm$ 7.66
Income is more than expenses	79.57 $\pm$ 12.16	27.93 $\pm$ 7.07
<b>F / p value</b>	2.276/0.105	2.004/0.137
<b>Relationship with Husband</b>		
Present <sup>a</sup>	71.85 $\pm$ 8.31	25.05 $\pm$ 8.58
Absent <sup>b</sup>	78.76 $\pm$ 13.34	27.88 $\pm$ 7.18
<b>Z / p value</b>	<b>-2.702/0.007</b> (a<b)	-1.643/0.100

**Table 2 (Continue):** Comparison of the Average Scores of Pregnant Women's Characteristics with Earthquake Anxiety and Wijma Birth Expectancy Scales

<i>People Living in the Household</i>		
My Husband and I	77.78±12.79	27.54±7.25
My Husband, I, and My Other Children	78.91±13.27	28.05±7.36
My Husband, I, and My Husband's Family	77.83±15.38	25.55±7.93
Other (Grandparents, etc.)	73.20±9.85	29.80±7.62
<b>KW / p value</b>	2.734/0.435	1.623/0.654
<i>Parity</i>		
Primipara	77.42±12.95	27.42±7.41
Multipara	78.66±13.24	27.77±7.31
<b>t / p value</b>	0.083/0.492	0.222/0.726
<i>Previous Delivery Method</i>		
Vaginal Birth <sup>a</sup>	77.70±11.71	30.46±6.50
Cesarean Section <sup>b</sup>	79.69±14.57	25.60±7.39
Never Given Birth <sup>c</sup>	77.52±12.96	27.37±7.34
<b>F / p value</b>	0.521/0.595	<b>5.845/0.003</b> ( <i>a&gt;b, a&gt;c</i> )
<i>Current Trimester</i>		
First Trimester <sup>a</sup>	77.50±11.85	29.70±8.21
Second Trimester <sup>b</sup>	76.29±12.19	30.68±6.16
Third Trimester <sup>c</sup>	79.09±13.71	25.74±7.14
<b>F / p value</b>	0.970/0.381	<b>11.440/0.001</b> ( <i>a&gt;c, b&gt;c</i> )
<i>Presence of Any Chronic Illness</i>		
Present	76.70±12.15	26.70±7.10
Absent	78.34±13.26	27.76±7.39
<b>t / p value</b>	0.002/0.526	0.093/0.462
<i>If Present</i>		
Diabetes	69.50±4.20	29.75±7.13
Hypertension	82.50±13.54	27.33±6.25
Thyroid	82.40±15.42	30.80±7.08
Asthma	78.80±12.91	28.00±5.29
Other (infection, heart issues, etc.)	72.20±9.99	22.40±7.33
<b>F / p value</b>	1.427/0.254	1.730/0.175
<i>Planned Delivery Method</i>		
Vaginal Birth <sup>a</sup>	78.55±12.04	29.10±7.38
Cesarean Section <sup>b</sup>	77.49±14.48	25.56±6.81
<b>t / p value</b>	1.661/0.563	<b>0.723/0.001</b> ( <i>a&gt;b</i> )
<i>Planned Number of Children</i>		
1 <sup>a</sup>	78.25±11.09	24.60±8.39
2 <sup>b</sup>	77.91±14.77	27.21±7.42
3 or more <sup>c</sup>	78.29±11.60	28.71±6.86
<b>F / p value</b>	0.022/0.979	<b>2.923/0.040</b> ( <i>a&lt;c</i> )
<i>Previous Earthquake Experience</i>		
Yes <sup>a</sup>	77.74±11.25	29.04±7.14
No <sup>b</sup>	78.60±15.33	25.64±7.19
<b>t / p value</b>	4.602/0.639	<b>0.264/0.001</b> ( <i>a&gt;b</i> )
<i>Loss Due to Earthquake</i>		
Yes <sup>a</sup>	69.50±7.38	33.00±5.97
No <sup>b</sup>	78.81±13.22	27.17±7.28
<b>t / p value</b>	<b>3.896/0.006</b>	<b>1.938/0.002</b> ( <i>a&lt;b</i> )

F: One Way ANOVA Test, Z: Man Whitney U test, KW: Kruskal Wallis H Test, t: Independent Sample T test

It has been determined that there is a strong positive and statistically significant relationship between earthquake anxiety in pregnant women and the Wijma Birth Expectancy Scale ( $p>0.005$ ) (Table 3).

**Table 3:** The Relationship Between Earthquake Anxiety in Pregnant Women and the Wijma Birth Expectancy Scale

		Earthquake Anxiety Total	Wijma Birth Expectancy Scale Total
Earthquake Anxiety Total	r	1	0.624
	p		<b>0.034</b>
Wijma Birth Expectancy Scale Total	r	0.624	1
	p	<b>0.034</b>	

## Discussion

In our research results, it was observed that as the level of education increases, the fear of childbirth also increases ( $p<0.05$ ). Several studies have reported that as the level of education increases, the fear of childbirth also increases (Soysal and Işıkalan, 2020; Bilge et al., 2022). On the other hand, there are several studies showing that as the education level of pregnant women decreases, the fear of childbirth increases (Alessandra, 2013; Gao et al., 2015; Dursun and Kızıllırmak, 2021). These results suggest that the relationship between fear of childbirth and education level may vary depending on cultural, individual, and environmental factors.

In our research, it was found that those who are not related to their spouse have more fear of childbirth ( $p<0.05$ ). There is no study directly examining the effect of marital relationship status on fear of childbirth in the literature. However, there are studies showing that relationships with spouses during pregnancy and marital adjustment are related to fear of childbirth. Saisto et al. (2001) stated that low spousal support increases the fear of childbirth. In a study conducted by Güleç et al. (2014), which aimed to determine the relationship between social support (from spouses, friends, etc.) and fear of childbirth, it was reported that as the social support of pregnant women increased, their fear of childbirth decreased (Güleç et al., 2014). Although the marital relationship status has not been directly examined in the literature, the results of our research align with studies that suggest spousal support and social support levels reduce fear of childbirth.

In our study, it was found that experiencing loss due to the earthquake increases fear of childbirth ( $p<0.05$ ). The literature reports that psychological problems and stressors of women, which are among the factors contributing to fear of childbirth, increase fear of childbirth (Uçar and Gölbaşı, 2015). One study indicated that women who had previously experienced a traumatic life event experienced higher levels of fear of childbirth (Boorman et al., 2014).

Keskin Töre et al. (2024) examined the quality of life of pregnant women after the earthquake and found that those who had experienced loss due to the earthquake had a lower quality of life. They also noted that pregnant women were highly traumatized by the earthquake (Keskin Töre et al., 2024). Although there are no similar studies in the literature, it is known that individuals who experience loss after disasters such as earthquakes have increased anxiety and stress levels, and stress during pregnancy can lead to negative outcomes (Chan et al., 2012; Keskin Töre et al., 2024; Dong et al., 2013; Cheng et al., 2015). These results indicate that pregnant women who experienced loss due to the earthquake have higher fear of childbirth. This is consistent with the literature suggesting that trauma, stress, and psychological strain increase fear of childbirth.

In our research, a significant difference was found between earthquake anxiety and factors such as the pregnant women's previous birth method, trimester, planned birth method, number of children, previous experience with earthquakes, and loss due to earthquakes ( $p < 0.05$ ). There are limited studies that directly examine the impact of obstetric factors such as birth method, trimester, planned birth method, and number of children on earthquake anxiety. In a study conducted by Dilcen et al. (2024) with pregnant women and postpartum women who were exposed to earthquakes and experienced loss, they found significantly high levels of anxiety, stress, and depression (Dilcen et al., 2024). Hawkins et al. (2019) examined the relationship between exposure to earthquakes during pregnancy and the effect on preterm birth, finding that exposure to an earthquake during pregnancy had no effect on preterm birth (Hawkins et al., 2019). Wada et al. (2024) in their systematic analysis on the perinatal outcomes of earthquakes examined the effects of earthquake exposure by trimester, finding that exposure to an earthquake during the first trimester resulted in low birth weight (Wada et al., 2024). Our study contributes to the limited number of studies in the literature by revealing that obstetric characteristics such as previous birth method, trimester, planned birth method, and number of children, as well as previous experience with earthquakes and loss due to earthquakes, have a significant effect on earthquake anxiety. These findings suggest that traumatic experiences during pregnancy and individual obstetric factors may be related to increased anxiety levels following natural disasters such as earthquakes.

In our study, a significant difference was found between experiencing loss due to the earthquake and both fear of childbirth and earthquake anxiety ( $p < 0.05$ ). Uwishema (2023) noted in a study on the effects of earthquakes in Turkey on the healthcare system that the unexpected occurrence of earthquakes and disasters causes high levels of stress, anxiety, and

fear in individuals who survive and lose loved ones (Uwishema, 2023). Pregnant women are among the groups most adversely affected by natural disasters such as earthquakes (Küçükkaya and Özoğlu, 2025). The psychological issues caused by earthquakes in pregnant women can negatively affect birth outcomes (Wada et al., 2024; Fontanesi et al., 2024). While birth outcomes are influenced by many stressors, natural disasters are one of these stressors (Küçükkaya and Özoğlu, 2025). A study has shown that stress and anxiety during the prenatal period are related to fear of childbirth (Saisto et al., 2001). Additionally, stress and anxiety during pregnancy have been found to be associated with preterm labor, increased use of analgesia during labor, prolonged labor, and emergency cesarean sections (Bakshi et al., 2008). Khatri et al. (2018) stated that mental disorders are more commonly seen in pregnant women who experienced an earthquake (Khatri et al., 2018). Torche and Kleinhaus (2011) examined the effects of earthquake exposure during pregnancy on gestational age and preterm birth, finding that exposure to earthquakes during pregnancy reduces gestational duration and increases the rates of preterm birth (Torche and Kleinhaus, 2011). Tan et al. (2009), in a study examining the effects of earthquakes on pregnancy outcomes, found that pregnant women exposed to earthquakes had significantly higher rates of preterm birth and delivering babies with anomalies as a result of the stress caused by the earthquake (Tan et al., 2009). Another study indicated that as stress levels increase during pregnancy, fear of childbirth also increases (Akın and Çankaya, 2022). Our research shows that traumatic losses during pregnancy can weaken an individual's psychological resilience, deepening both their current stress levels and fears about childbirth.

In our study, a strong and positive significant relationship was found between earthquake anxiety in pregnant women and the Wijma Birth Expectancy Scale (W-DEQ) ( $p < 0.05$ ). The literature contains various studies on the relationship between anxiety levels during pregnancy and fear of childbirth. Akın and Çankaya (2022) highlighted the impact of anxiety levels during pregnancy in increasing fear of childbirth. In another study conducted by Akın and Çankaya (2022), the relationships between perceived stress, sense of coherence, and fear of childbirth were examined, and a significant positive relationship was found between perceived stress and fear of childbirth. Another study examined the relationship between spiritual well-being and fear of childbirth in pregnant women and found a weak but significant negative relationship (Yaylaoğlu & Zengin, 2023). These findings, in parallel with our study, suggest that increasing anxiety levels in pregnant women can further intensify their fears related to childbirth.

## Conclusion

In our study, a strong and significant positive relationship was found between earthquake anxiety in pregnant women and the Wijma Birth Expectancy Scale (W-DEQ) ( $p < 0.05$ ). This aligns with existing literature that highlights a connection between pregnancy-related anxiety and fear of childbirth, further confirming that higher anxiety levels intensify the fear of childbirth. These findings suggest that increased anxiety during pregnancy plays a crucial role in amplifying fear of childbirth. Elevated psychological stress in pregnant women can exacerbate their anxiety and fears, potentially making the childbirth experience more difficult. Therefore, it is essential to address anxiety levels in midwifery practice and develop strategies aimed at reducing fear of childbirth. Psychological support programs, relaxation techniques, and reassuring communication methods tailored to pregnant women are vital in managing anxiety and alleviating fear. By implementing these approaches, the birth process can be smoother and more peaceful, while also enhancing the psychological well-being of expectant mothers.

This study contributes to the growing body of literature on maternal mental health by exploring the relationship between earthquake-related loss and fear of childbirth. One of the major strengths of this study is its focus on a timely and underexplored topic, particularly among pregnant women affected by natural disasters. The use of validated measurement tools and face-to-face data collection enhanced the reliability and depth of the data. Additionally, the inclusion of women who personally experienced loss due to the earthquake provides valuable insight into a high-risk group often overlooked in standard maternal care studies.

However, several limitations should be acknowledged. The cross-sectional design of the study prevents the establishment of causal relationships between trauma and fear of childbirth. The sample was drawn from a single clinical setting, which may limit the generalizability of the findings. Moreover, self-reported measures are subject to bias, particularly in emotionally sensitive topics such as trauma and childbirth fear. Future research should consider longitudinal designs and larger, more diverse populations to strengthen the evidence base.

**Ethical Considerations:** Ethical approval was obtained from the Social and Human Sciences Ethics Committee of a state university (Decision date: 26.11.2024, Decision No: 01-52) and from the university hospital (Decision date: 23.09.2024, Decision No: 475109). The researcher explained to the pregnant women the purpose of the study and assured them that the data would be used for scientific purposes. Informed consent was obtained from all participants.

Throughout all stages of the research, the principles of the Helsinki Declaration and ethical standards were adhered to, with respect for autonomy being maintained.

**Conflict of Interest:** The authors declare no conflict of interest.

**Author Contributions:** Concept: GC, HB; Design: GC, HB; Supervision: GC, HB; Analysis and/or Interpretation: GC; Literature Review: GC, HB; Writing: GC, HB; Critical Review: GC.

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