

## Original Research

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**Corresponding author:**

Hacer Yalniz Dilcen;  
Email: [hdilcen@bartin.edu.tr](mailto:hdilcen@bartin.edu.tr).

# Determinants of Psychosocial Health Status in Pregnant and Postpartum Women Experiencing Earthquake in Turkey

Hacer Yalniz Dilcen PhD<sup>1</sup> , Yeliz Çakır Koçak PhD<sup>1</sup>, Güleser Ada MSc<sup>1</sup>, Feyza Demir Bozkurt MSc<sup>2</sup> and Hanifi Dülger PhD<sup>1</sup>

<sup>1</sup>Department of Midwifery, Faculty of Health Science, Bartın University, Ağdacı Campus, Bartın, Turkey and

<sup>2</sup>Department of Nursing, Faculty of Health Science, Bartın University, Ağdacı Campus, Bartın, Turkey

### Abstract

**Objective:** It is well known that natural disasters such as earthquakes negatively affect physical and mental health by exposing people to excessive stress. The aim of this study was to investigate determinants of psychosocial health status among the pregnant and postpartum women who experienced earthquake in Türkiye.

**Methods:** Pregnant and postpartum women ( $n = 125$ ) living in tent cities in the Kahramanmaraş region formed the study sample. Data were collected between February 20 and 26, 2023, through face-to-face interviews. The instruments used for data collection were the Introductory Form, the Depression Anxiety Stress Scale, the Traumatic Childbirth Perception Scale, and the Post-Traumatic Stress Disorder–Short Scale.

**Results:** A moderate positive relationship was found between stress and posttraumatic stress and traumatic childbirth perception in pregnant and postpartum women, and a high positive relationship was found between anxiety and depression. A high level of relationship was found between anxiety and stress and depression.

**Conclusions:** It is seen that the psychosocial health of pregnant and postpartum women, who belong to the risk group in the earthquake zone, is at high risk. Psychological support is urgently needed to preserve and improve their psychosocial health.

Pregnancy and childbirth are significant phenomena for women, accompanied by various physiological and emotional changes.<sup>1</sup> These changes can heighten susceptibility to emotional distress and mental health challenges, including anxiety and depression.<sup>2</sup> Psychosocial health pertains to individuals' well-being concerning psychological and social aspects of life.<sup>3,4</sup> The psychosocial well-being of women during pregnancy and the postpartum period is influenced by various factors, such as their educational attainment, socioeconomic status, previous pregnancy and childbirth experiences, number of children, planned pregnancy, marital relationship, family members' attitudes toward pregnant women, the mother's history of mental illnesses, positive and negative role models in the environment, lack of accurate and sufficient information about pregnancy, low self-esteem, social isolation, perceived social support, and natural disasters such as earthquakes, floods, avalanches, and fires.<sup>5–9</sup>

Turkey is globally considered as one of the “at high-risk” countries for earthquake. It is known that approximately every 5 y, a major earthquake occurs in Turkey, leading to massive loss of lives and property.<sup>10</sup> The earthquake epicentered in Kahramanmaraş on February 6, 2023 caused significant destruction and massive loss of lives in an area encompassing 108,812 km<sup>2</sup>, involving 11 provinces in Türkiye and the neighboring country, Syria. On February 6, 2023, earthquakes with magnitudes of 7.7 and 7.6 occurred on the same day, resulting in the loss of 50,783 lives and injuries of 115,353 individuals.<sup>11</sup> Earthquakes, classified among the most stressful natural phenomena, directly impact the mental health of women during pregnancy and the postpartum period. A study has revealed that women's health deteriorates more significantly than men's after an earthquake.<sup>12,13</sup>

During pregnancy and the postpartum period, women's psychological reactions to earthquake can negatively affect themselves and their infants, leading to outcomes such as suicide and premature birth.<sup>14,15</sup> The effects on mental health can prolong through the postpartum period. Pregnant and postpartum women during an earthquake may experience fear, anxiety, and trauma due to the natural phenomenon's sudden and unpredictable nature. These experiences can increase stress levels, adversely affecting the women's mental well-being.<sup>16,17</sup>

Studies have reported a range of mental disorders in earthquake survivors, including post-traumatic stress disorder (PTSD), major depression, social anxiety disorder, and dysthymic disorder.<sup>18–22</sup> A relation between stress and mental disorders in pregnant and postpartum

women has also been determined.<sup>23,24</sup> However, despite some evidence indicating a relationship between stress and mental disorders in pregnant and postpartum women, it remains uncertain whether psychological disorders are more prevalent after earthquakes. There is a need to understand the impact of earthquake on the mental health of pregnant and postpartum women. In this context, appropriate interventions can be designed to better assist pregnant and postpartum women in surviving such significant disasters.

Following an earthquake, assessing the psychosocial health status of pregnant and postpartum women requires a comprehensive approach. This study seeks to assess depression, anxiety, stress, posttraumatic stress disorder, and perceptions of traumatic childbirth in pregnant and postpartum women affected by the earthquakes.

## Method

### Study Design

This research is a descriptive cross-sectional study conducted between the 14th and 21st day after the earthquake (February 20-26, 2023) in Turkey.

### Sampling Strategy

The sample consisted of pregnant and postpartum women who experienced the 2 major earthquake and who were housed in tent cities in Elbistan and Afşin, the neighborhood of Kahramanmaraş, the epicenter of the earthquake, and gave their consent to participate in the study.

### Data Collection

Approximately 2600 tents were visited during the data collection. Face-to-face interviews were conducted with pregnant and postpartum women in the tents visited. In addition to social support, women also received psychological support from the research team after the earthquake. A total of 125 women, including postpartum (22) and pregnant (103) women, made up the study sample. The inclusion criteria for the study comprised pregnant and postpartum women aged 18 and above who provided consent, had experienced 2 major earthquakes, and were still residing in the area. Individuals diagnosed with mental health disorders, those who did not provide consent, and pregnant and postpartum women under the age of 18 were not included in the study. Pregnant and postpartum women residing in tent camps were assigned through individual visits to the tents. Follow-up assessments were conducted for pregnant and postpartum women identified by the midwives involved in the research. Data were collected from participants who met the inclusion criteria during the follow-up. Informed consent was obtained during data collection. As part of the study, team members were given a 1-h psychoeducation on therapeutic communication skills and points to consider before data collection by the coordinator, who has clinical studies and research on the subject. Data were collected using therapeutic communication skills in face-to-face interviews with pregnant and postpartum women. The instruments used for data collection were the Introductory Form, the Depression Anxiety Stress Scale (DASS), the Traumatic Childbirth Perception Scale (TCPS), and the Posttraumatic Stress Disorder (PTSD)–Short Scale.

**Table 1.** Sociodemographic and obstetric characteristics of pregnant and postpartum women

Features		N (%)	%
Region	Elbistan	74	59.2
	Afşin	51	40.8
Citizen	Turkey	105	84.0
	Syria	20	16
Educational status	Illiterate	7	5.6
	Primary education	69	55.2
	High school	33	24.6
	University and above	16	12.8
Marital status	Married	125	100
Age (y)	18-26	58	46.4
	27-35	50	40.0
	36 and over	17	13.6
Chronic disease status	Yes	15	12.0
	No	110	88.0
No. of children	0	31	24.8
	1 or 2	56	44.8
	3 and above	38	30.4
Pregnancy and postpartum status	Pregnancy	103	82.4
	Postpartum	22	17.6
No. of pregnancies	1	38	30.4
	2	26	20.8
	3	20	16.4
	4 and above	41	32.8
Gestational week	1st trimester (1-12 weeks)	17	13.6
	2nd trimester (13-26 weeks)	41	32.8
	3rd trimester (27-40 weeks)	45	36.0
Problem status in previous pregnancies	Yes	39	31.2
	No	86	68.8
Abortus	Yes	19	15.6
	No	106	84.8
Curettage	Yes	14	11.2
	No	111	88.8
Stillbirth	Yes	6	4.8
	No	119	95.2
Birth type	Vaginal birth	55	64.7
	Cesarean section	30	35.2
Perception of traumatic birth	Very low	25	20.0
	Low	35	28.0
	Middle	32	25.6
	High	26	20.8
	Very high	7	5.6

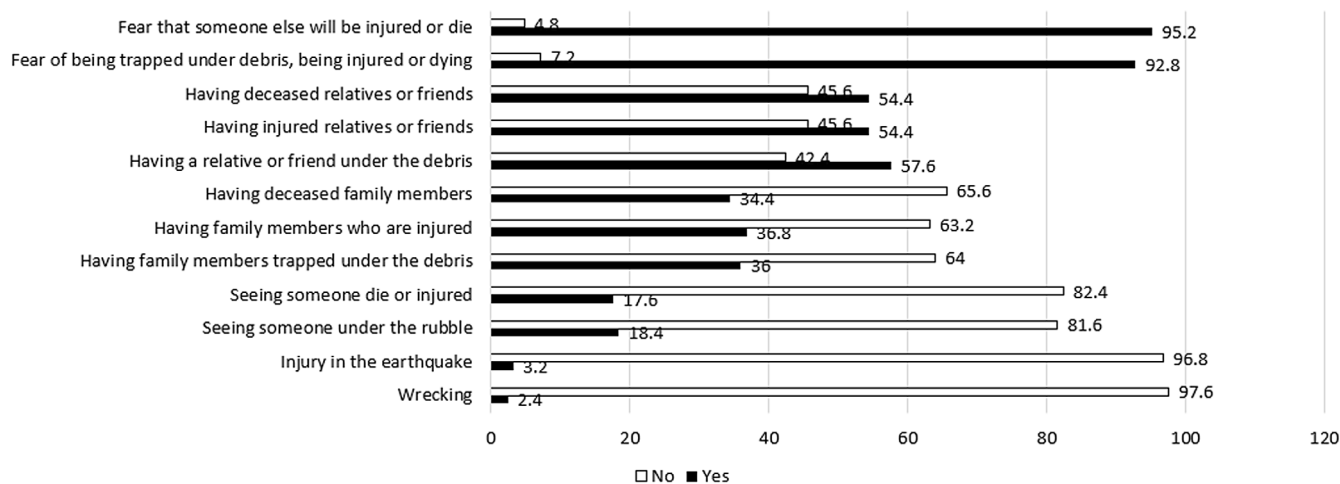
### Introductory form

A 25-question Introductory Form was prepared to determine sociodemographic and obstetric characteristics (13 questions) and earthquake exposure (12 questions), which were prepared by the research team based on the literature.<sup>25-30</sup>

### Post-Traumatic Stress Disorder-Short Scale (PTSD-Short Scale)

The Turkish validity and reliability study of the scale was performed by Evren *et al.* The PTSD-Short Scale is a brief scale that is consistent with the DSM-5 interval criterion for diagnosis of PTSD symptoms in the past 7 d. The items of the questionnaire

## The state of pregnant and postpartum affected by earthquake



**Figure 1.** The state of pregnant and postpartum women affected by earthquake.

were adapted to address childbirth as a traumatizing event. This is a 5-point Likert-type scale with 9 items. Each item is scored between 1 = none and 5 = extreme. The total scale score ranges between 9 and 45. A higher score indicates a higher likelihood of PTSD (a cutoff score of 24). Evren et al. found the Cronbach's alpha reliability coefficient of the scale to be 0.87.<sup>31</sup> In this study, Cronbach's alpha internal consistency coefficients were determined as 0.83.

#### Depression Anxiety Stress Scale (DAS-21)

The DASS, developed by Lovibond and Lovibond (1995), is a 4-point Likert-type scale.<sup>32</sup> Henry and Crawford (2005) converted the scale into a 21-item short form.<sup>33</sup> The 21-item short form of the scale, DAS-21, was adapted into Turkish by Sariçam (2018).<sup>34</sup> As a result of the scale evaluation, a separate total score is obtained for depression, anxiety, and stress. Scale scores; 0-4 points normal, 5-6 points mild, 7-10 points moderate, 11-13 points advanced, 14 and above points referred to very severe depression; 0-3 points normal, 4-5 points mild, 6-7 points moderate, 8-9 points advanced, 10 and above points showed very advanced anxiety; 0-7 points are normal, 8-9 points are mild, 10-12 points are moderate, 13-16 points are advanced, 17 and above points are very advanced stress. Cronbach's alpha value was found as  $\alpha = 0.87$  for depression subscale,  $\alpha = 0.85$  for anxiety subscale, and  $\alpha = 0.81$  for stress subscale.<sup>34</sup> In this study, Cronbach's alpha internal consistency coefficients were determined as 0.86, 0.81, and 0.83 for depression anxiety and stress sub-dimensions, respectively.

#### Traumatic Childbirth Perception Scale (TCPS)

This 13-item scale was developed by Yalınz et al. (2016) to determine the traumatic childbirth perceptions of women. Each item is scored between 0 (positive opinion) and 10 (negative opinion). The total scale score ranges between 0 and 130. A total scale score of 0-26 indicates very low, 27-52 low, 53-78 moderate, 79-104 high, and 105-130 very high levels of traumatic childbirth perceptions. This scale was administered 4 times during the postpartum period, aiming to determine whether there was a change in the women's traumatic childbirth perceptions after giving birth. Yalınz et al. found the Cronbach's alpha internal consistency coefficient of the scale to be 0.89.<sup>35</sup> In this study,

Cronbach's alpha internal consistency coefficients were determined as 0.88.

#### Data Analysis

The SPSS 25.0 program was used for data analysis. The normal distribution of data was assessed by kurtosis and skewness analysis (+1.5, -1.5). Parametric tests (percentage, mean, Pearson correlation analysis, Independent samples t-test, 1-way analysis of variance [ANOVA]) were performed for normally distributed data. In the analysis of the variables Region and Post Traumatic Stress Condition, Independent Samples t-test was used for binary variables, and 1-way ANOVA was used for variables with 3 categories. Pearson correlation analysis was conducted to identify relationships between the variables. Correlation coefficients were interpreted as: 0 = no relationship, 0.01-0.29 = low level relationship, 0.30-0.70 = moderate relationship, 0.71-0.99 = high level relationship, and 1.00 = perfect relationship.<sup>36</sup> The reliability of the measurement tools in the study was assessed using the Cronbach's alpha test.

#### Ethical Considerations

Ethics committee approval (E-23688910-050.01.04-2300017060) was obtained for the collection of research data. Institutional approvals (E-12240456-952.03.10-2300017422) were obtained for conducting the fieldwork. At the beginning of the study, a consent question was included at the top of the online form so that participants could read the informational text and provide consent to participate in the study. In face-to-face interviews, participants were informed about the study, and verbal consent was obtained; subsequently, participants were marked in the Google Form. Participants who gave consent to participate in the study were enrolled in the study. After data collection, the bags created to meet the urgent needs of pregnant women, postpartum women, and infants, referred to by the research team as "Smile Bags", were distributed to the women on a voluntary basis.

#### Results

The study sample consisted of a total of 125 women, including pregnant (103) and postpartum (22) women. Of pregnant and

postpartum women who experienced earthquakes, 59.2% ( $n = 74$ ) were in Elbistan and 40.8% ( $n=51$ ) were in Afşin; 84% ( $n = 105$ ) were Turkish citizens, 16% ( $n = 20$ ) were Syrians; 46.4% ( $n = 58$ ) were between the ages of 18-26; 55.2% ( $n = 69$ ) were primary school graduates, and 12% ( $n = 15$ ) had a chronic disease. All the participants were married, while 96% ( $n = 120$ ) received spousal support. When the obstetric characteristics of the participants were analyzed, 36% ( $n = 45$ ) were in the third trimester, 32.8% ( $n = 41$ ) were multigravida, 68.8% ( $n = 86$ ) had no problems in previous pregnancies, and 44.8% ( $n = 56$ ) had 1 or 2 living children. The mean gestational week of pregnant women was  $21.09 \pm 11.82$ . Given the last delivery methods of participants who gave birth, 64.7% ( $n = 55$ ) of them had a normal delivery and 35.2% ( $n = 30$ ) had a cesarean section (Table 1).

Given the earthquake exposure conditions, almost all pregnant and postpartum women stated that they or their relatives did not get trapped under rubble, while a family member of 36% ( $n = 45$ ) of them, and relatives or friends of 57.6% ( $n = 72$ ) of them got trapped under rubble. Additionally, 18.4% ( $n = 23$ ) of the participants saw someone under the rubble, 17.6% ( $n = 22$ ) saw that someone died or was injured due to the earthquake. A total of 36.8% of the participants had an injured family member, 54.4% ( $n = 68$ ) had an injured relative or friend, 34.4% ( $n = 43$ ) had a deceased family member, and 54.4% ( $n = 58$ ) had a deceased relative or friend. While 92.8% ( $n = 116$ ) of the women participating in the study stated that they were afraid that they would be trapped under the rubble, be injured, or die, 95.2% ( $n = 119$ ) of them reported that they were afraid that someone else would be trapped under the rubble, injured, or killed (Figure 1).

The mean score of the women on the PTSD scale was  $21.96 \pm 7.44$  (min. 2; max. 36). The range of scores on the PTSD scale is from 0-36, 24 points or higher scores were considered a significant value for PTSD. 47.6% ( $n = 59$ ) scored below 24 on the PTSD scale, 52.8% ( $n = 66$ ) of them scored above 24, which is a significant value for PTSD (Table 2).

The mean score of the TCPS was  $55.53 \pm 30.42$  (min. 3; max. 121). Of the subscales of the DASS, the scores for depression, anxiety, and stress subscales were  $10.22 \pm 5.81$  (min. 0; max. 21),  $9.98 \pm 5.29$  (min. 0; max. 21), and  $9.90 \pm 5.17$  (min. 0; max. 20) points, respectively (Table 2).

Given participants' levels of stress, anxiety, and depression according to total scores on the DAS scale, the prevalence of stress was 66.4%, the prevalence of anxiety was 88%, and the prevalence of mild, moderate, severe, and very severe depression was 80% (Table 3).

Given the differences by the regions where the participants live, stress ( $P = 0.002$ ), depression ( $P = 0.002$ ), and traumatic childbirth perception ( $P = 0.048$ ) levels were found to be significantly higher (Table 4). It was determined that the number of children ( $P = 0.006$ ), depression ( $P = 0.001$ ), anxiety ( $P = 0.004$ ), stress ( $P = 0.003$ ), and TCPS ( $P < 0.001$ ) levels were significantly higher in the participants with posttraumatic stress (Table 4).

It was found that PTSD, depression, anxiety, stress, and TCPS were significantly and positively correlated in pregnant and postpartum women according to Pearson correlation analysis. Participants were found to have a moderate positive relationship between stress, which is a subscale of the DAS-21 scale, and PTSD and TCPS, and a high level of positive correlation between anxiety and depression. A moderate positive relationship was found between PTSD and other variables and between TCPS and other variables, and a high positive relationship was found between anxiety and stress and depression (Table 5).

**Table 2.** Determination of post-traumatic stress, depression, anxiety, stress, and traumatic birth perception of pregnant and post-traumatic births

Scales	Mean $\pm$ SD	Min-max	Skewness	Kurtosis
PTSD	21.96 $\pm$ 7.44	2-36	-.341	-.572
TCPS	55.53 $\pm$ 30.42	3-121	.152	-.925
Depression	10.22 $\pm$ 5.81	0-21	.091	-.143
Anxiety	9.98 $\pm$ 5.29	0-21	.067	-.875
Stress	9.90 $\pm$ 5.17	0-20	.112	-.962

Abbreviations: PTSD, post-traumatic stress disorder; TCPS, Traumatic Childbirth Perception Scale.

**Table 3.** Depression, anxiety and stress levels of pregnant and postpartum women ( $n = 125$ )

	Depression $n$ (%)	Anxiety $n$ (%)	Stress $n$ (%)
Normal	25 (20)	15 (12)	42 (33.6)
Light	17 (13.6)	15 (12)	19 (15.2)
Moderate	22 (17.6)	14 (11.2)	21 (16.8)
Advanced	20 (16)	15 (12)	31 (24.8)
Very advanced	41 (32.8)	66 (52.8)	12 (9.6)

## Discussion

The psychological well-being of women plays an important role for pregnant women, mothers, and babies. Protecting the health of pregnant women carrying future generations in their bodies and nurturing mothers and babies after natural disasters such as earthquakes is crucial both individually and socially. This research was conducted to investigate the effects of these severe earthquakes, which occurred repeatedly in Turkey and were called the "Disaster of the Century" with their widespread destructive effects, on the mental health of pregnant and postpartum women, to identify the problems and to develop suggestions.

In this study, conducted using the DASS-21, it was found that 80% of participants suffered from mild to severe depression, 88% from anxiety, and 66.4% from stress. In the systematic review and meta-analysis that evaluated a total of 28 studies and 8974 participants, carried out by Cénat et al. (2020) to determine PTSD, depression, anxiety, and other mental health problems following the 2010 earthquake in Haiti, it was reported that the prevalence of depression was 32.16% (23.60-42.11%), the prevalence of anxiety was 20.49% (15.74-26.24%), and the prevalence of posttraumatic stress was 28.44% (17.68-42.37%).<sup>37</sup> Various studies conducted in Japan and China evaluating pregnant women who have recently experienced an earthquake reveal that the stress prevalence of women varies between 4% and 40.8%, and the prevalence of depression varies between 7.1% and 35.2%.<sup>17,38,39</sup> In a study conducted with another group after the earthquake, approximately 58.3%, 16.8%, and 32.1% of adolescents reported the clinical symptoms of PTSD, depression and anxiety, respectively.<sup>40</sup> In a study conducted by Wang et al. (2020) using DASS-21 to evaluate the psychological responses and related factors in the population in the early stage of the coronavirus disease 2019 (COVID-19\_ epidemic in China, it was reported that the prevalence of stress, anxiety, and depression was 32.1, 36.4%, and 30%, respectively.<sup>41</sup> When compared with the literature, it is seen that the prevalence of depression, anxiety, and stress in this study was higher than in other studies. This difference is thought to be due to several



**Table 4.** Examination of the differences in perception of depression, anxiety, stress, post-traumatic stress, and traumatic birth according to the region of the participants

		Region				Post-traumatic stress condition			
		Elbistan		Afşin		Avaliable		Unavaliable	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Nationality	Turkish citizen	62	59.0	43	41.0	48	45.7	57	54.3
	Syrian	12	60.0	8	40.0	11	55.0	9	45.0
	Test value	$\chi^2$	0.070			$\chi^2$	0.580		
		<i>P</i>	0.937			<i>P</i>	0.302		
The current situation	Pregnant	58	56.3	45	43.7	47	54.4	56	45.6
	Postpartum	16	72.7	6	27.3	12	54.5	10	45.5
	Test value	$\chi^2$	2.023			$\chi^2$	0.578		
		<i>P</i>	0.117			<i>P</i>	0.299		
Pregnancy trimester	1st	12	70.6	5	29.4	8	47.1	9	52.9
	2nd	20	48.8	21	51.2	17	41.5	24	58.5
	3rd	26	57.8	19	42.2	22	48.9	23	51.1
	Test value	$\chi^2$	2.39			$\chi^2$	1.069		
		<i>P</i>	0.302			<i>P</i>	0.781		
State of giving birth	Yes	55	64.7	30	35.3	37	43.5	48	56.5
	No	19	47.5	21	52.5	29	72.5	11	27.5
	Test value	$\chi^2$	3.33			$\chi^2$	9.16		
		<i>P</i>	0.052			<i>P</i>	<b>0.002</b>		
No. of children	0	15	48.4	16	51.6	7	22.6	24	77.4
	1-2	32	57.1	24	42.9	30	53.6	26	46.4
	3 or more	27	71.1	11	28.9	22	57.9	16	42.1
	Test value	$\chi^2$	3.80			$\chi^2$	10.19		
		<i>P</i>	0.149			<i>P</i>	<b>0.006</b>		
Stress	Avaliable	57	68.7	26	31.3	47	56.6	36	43.4
	Unavaliable	17	40.5	25	59.5	12	28.6	30	71.4
	Test value	$\chi^2$	9.181			$\chi^2$	8.80		
		<i>P</i>	<b>0.002</b>			<i>P</i>	<b>0.003</b>		
Depression	Avaliable	66	66.0	34	34.0	57	57	43	43
	Unavaliable	8	32.0	17	68.0	2	8	23	92
	Test value	$\chi^2$	9.572			$\chi^2$	19.26		
		<i>P</i>	<b>0.002</b>			<i>P</i>	<b>0.001</b>		
Anxiety	Avaliable	68	61.8	42	38.2	57	51.8	53	48.2
	Unavaliable	6	40.0	9	60.0	2	13.3	13	86.7
	Test value	$\chi^2$	2.602			$\chi^2$	7.845		
		<i>P</i>	0.092			<i>P</i>	<b>0.004</b>		
Perception of traumatic birth	Low	30	50.0	30	50.0	37	61.7	23	38.3
	Middle	19	59.4	13	40.6	24	68.8	10	31.3
	High	25	75.8	8	24.2	7	21.2	26	78.8
	Test value	$\chi^2$	6.069			$\chi^2$	18.37		
		<i>P</i>	<b>0.048</b>			<i>P</i>	<b>0.001</b>		

Note: "X<sup>2</sup>" denotes chi-squared tests. Bold font indicates statistical significance.

**Table 5.** Relationship between pregnant and post-traumatic stress, depression, anxiety, stress, and perception of traumatic birth

	Post-traumatic stress	Stress	Depression	Anxiety
Stress	.499			
Depression	.487	.814		
Anxiety	.481	.788	.793	
Perception of traumatic birth	.333	.391	.393	.492

Significance: *P* < 0.001.

reasons: pregnant women being on the 14<sup>th</sup> d after the earthquake; experiencing psychological, biological, and physiological changes during pregnancy; and experiencing a process of adaptation to motherhood in the postpartum period.

Women’s childbirth perception, personal characteristics, delivery experience, social and cultural environment, and factors related to natural disasters such as earthquakes, floods, and fires are influenced by social variables.<sup>35</sup> Traumatic experiences are quite common in society. Epidemiological studies show that approximately 80% of people experience a traumatic event at some moment in their lives.<sup>41</sup> In this study, a relationship between TCPS

and stress was found. Aslantekin Özçoban *et al.* (2021), revealed that the traumatic childbirth perception increased with increasing stress level.<sup>42</sup> In this study, we found a moderate relationship between TCP and PTSD. Women with TCP are more likely to have PTSD. Studies have found that PTSD increases the risk of depression in postpartum women. In addition, another study found a negative relationship between PTSD and breastfeeding.<sup>43</sup>

In the literature, there are findings showing that TCP and prepartum stress and anxiety are associated with poor emotional and cognitive development, as well as increased risk of hyperactivity, anxiety, and latency in infants.<sup>44</sup> In addition, Dekel *et al.* reported that a traumatic or stressful childbirth experience may impair maternal bonding.<sup>45</sup> A moderate relationship was found between PTSD and depression in pregnant and postpartum women exposed to the earthquake. In a related study, it was found that PTSD was associated with depression and increased the rate of postpartum depression.<sup>46</sup> Yalniz Dilcen *et al.*, on the other hand, found a negative relationship between TCP and PTSD.<sup>47</sup>

In this study, spousal support was found to be quite high in pregnant and postpartum women. Khatri *et al.* (2018) reported that spousal support was high among pregnant women after the Nepal earthquake.<sup>17</sup> The most important indicator of mental health among pregnant and postpartum women who have experienced an earthquake is the definition of a close partner relationship. Women become increasingly dependent on their husbands during pregnancy and in the postpartum period. This situation aggravates during natural disasters such as earthquakes and is consistent with the study findings.

## Conclusions and Recommendations

In this study, it was found that pregnant and postpartum women in the Elbistan and Afşin districts, affected by the earthquake, exhibited significantly elevated levels of depression, anxiety, stress, and post-traumatic stress. The research findings revealed associations between depression, stress, anxiety, PTSD, and TCP symptoms among pregnant and postpartum women, indicating that these variables influenced PTSD. The study emphasizes the significance of recognizing not only the physical but also the psychosocial aspects of health in the context of earthquake.

Earthquakes profoundly impact psychologically vulnerable groups, particularly pregnant and postpartum women. In disaster scenarios such as earthquakes, early detection and intervention for psychosocial health are crucial to safeguard and enhance the well-being of pregnant and postpartum women. Within this context, it is vital to assess broader samples of women at various time intervals to evaluate stress, anxiety, depression, and perceptions of traumatic childbirth.

## Limitations

This field study has some limitations. The first limitation is that the data collection process was carried out only in tent cities in the Elbistan and Afşin districts of Kahramanmaraş Province. A limitation is that the sample could not be selected because pregnant and puerperant women left the earthquake zone. The second limitation is the fact that individuals have not yet formed a perception of reality, because data collection was carried out on the 14th and 21st days after the earthquake. One of the limitations of the research findings is the risk of remembering the trauma-related experiences in the future, even years after the traumatic events, and that depression, stress, and PTSD levels may change due to this

reason. The third limitation of the study is that, given the use of cross-sectional data, the pre-earthquake stress, anxiety, and depressive symptom levels among the participants could not be measured.

Despite these limitations, the study has demonstrated an understanding of stress, anxiety, depression, and PTSD symptoms in terms of associated modifiable psychosocial factors and the relationship to TCP. Longitudinal studies may be considered to further investigate the relationship between depression, anxiety, stress, PTSD, and TCP that may occur after large earthquakes.

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**Author contributions.** H.Y.D., H.D., and G.D. contributed to conceptualization and data analysis of this study and prepared the initial draft of the manuscript. H.Y.D., Y.Ç.K., H.D., G.A., and F.D.B. collected the data for this study. H.Y.D., H.D., G.A., and Y.Ç.K., as well as F.D.B. provided overall guidance regarding the conception of the work and interpretation of the findings. All authors revised the manuscript critically. All authors have read and approved the submitted manuscript.

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