

# The relationship between perceived stress, uncertainty emotions and hopelessness regarding pandemics in pregnant women

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## Abstract

The objective of this study was to determine the emotional reactions of pregnant women towards the pandemic and to increase awareness of healthcare professionals on this subject. In this descriptive, cross-sectional, and correlational study, an online questionnaire was applied to 375 pregnant women ( $n = 375$ ). Data were collected with pregnant information form, Intolerance of Uncertainty Scale and Beck Hopelessness Scale. The mean age of the pregnant women was  $29.495 \pm 4.301$ , and the mean gestational week was  $27.469 \pm 7.971$ . Pregnant women's levels of perceived stress and intolerance to uncertainty were high. There was a moderate positive correlation between stress and uncertainty levels of the women who stated that they experienced mild hopelessness. It is recommended to identify risky groups and provide the necessary psychological support by health professionals during the pandemic.

## KEYWORDS

hopelessness, pandemic, perceived stress, pregnant women, uncertainty

## 1 | INTRODUCTION

As of February 9, 2020 the World Health Organization (WHO) reported more than 166 million cases and 3,459,996 deaths since the first case from the novel coronavirus disease that was named as "COVID-19" on May 24, 2021 (WHO, 2020a). COVID-19 has been recorded as a serious type of infection that results in mortality by showing symptoms such as fever, weakness, cough, dyspnea, and generalized pneumonia (WHO, 2020b). Different

data have been obtained about which age group this viral infection, which has serious side effects, affects more (WHO, 2020a, 2020b). Whereas at the beginning of the epidemic, elderly individuals have been reported to be more susceptible to this infection, recent data have shown that it may have negative effects in all age groups. There is evidence that especially presence of a chronic disease or unhealthy habits such as smoking worsens the prognosis (ROCG, 2020; WHO, 2020b).

Some physical and immunological changes experienced during pregnancy cause pregnant women to be more affected by respiratory system infections (ROCG, 2020). In this regard, pregnant women who are among the vulnerable populations are accepted to be at a higher risk of contracting infectious diseases during an epidemic (C. Wang et al., 2020). In recent studies, it has been shown that especially pregnant women in the third trimester become more seriously infected by COVID-19 than nonpregnant women and are treated in intensive care units (ROCG, 2021). Symptoms, complications, and insufficient spontaneous breathing during infection may produce adverse outcomes on both maternal and fetal health. Findings that indicate fetal hypoxia, preterm delivery, or COVID-19 support this argument (Nuffield Department of Population Health, 2020).

Studies investigating psychological dimensions as well as biological impacts of the pandemic have shown that more than half of the population experienced mood disorders (Wang et al., 2020). These studies have reported that there is evidence that emotional problems such as worry, anxiety, and depression are experienced more frequently by pregnant women compared to other people (Durankus & Aksu 2020; Saccone et al., 2020). It is thought that pregnant women experience fear and anxiety due to fear of getting an infection, negative effects of birth plans, and probability of damage to pregnancy and baby (Gao et al., 2020; Wang et al., 2020). However, studies with a high level of evidence have indicated that maternal psychosocial stress experienced in the prenatal period increases maternal inflammation, causes hormonal changes, and is involved in the etiopathogenesis of fetal neurodevelopmental disorders (Wang et al., 2020). Based on the fact that psychological problems occurring during pregnancy affect fetal and maternal health so negatively, it was thought that the unpredictability of the pandemic and restrictions such as the quarantine periods experienced affect the pregnant population emotionally.

The objective of this study was to evaluate perceived stress, emotional reaction in the uncertainty process, and hopelessness about the future in pregnant women during the COVID-19 pandemic and to raise awareness of health professionals. The lack of adequate research in the literature on this subject is important for the originality of this study.

## 2 | METHODS

### 2.1 | Study design

The population of this descriptive, cross-sectional, and correlational study consisted of all pregnant women in the 18–49 age range who were living in Turkey. A total of 379 pregnant women were included in the research conducted via social media between July 20, 2020 and November 20, 2020. During the examination of the data, 4 pregnant women found to live abroad were excluded from the sample, and the study was completed with 375 pregnant women ( $n = 375$ ). Because of the pandemic measures, data collected through Google forms that are internet-based survey software were transferred to the statistical program and analyzed.

#### Inclusion criteria

- Being literate,
- Living in Turkey,
- Being in the 18–49 age range,
- Accepting participation in the study.

### Exclusion criteria

- Experiencing a risky pregnancy requiring hospitalization,
- Not living in Turkey,
- Being aged under 18 years and over 49 years,
- Not filling the questionnaire forms.

## 2.2 | Study questions

1. What is the level of stress perceived by pregnant women towards the pandemic?
2. What is the level of uncertainty feelings experienced by pregnant women about the pandemic?
3. What is the level of hopelessness feelings experienced by pregnant women about the pandemic?
4. Is there a relationship between the feelings of stress and uncertainty perceived by pregnant women and their level of hopelessness about the pandemic?

## 2.3 | Data collection tools

Data were collected using the pregnant information form, Perceived Stress Scale (PSS), Intolerance of Uncertainty Scale (IUS), and Beck Hopelessness Scale (BHS).

1. *Pregnant Information Form*: It is a form consisting of 22 questions thought to be necessary for research of pregnant women including sociodemographic and obstetric data. The questions were prepared by the researcher in line with the relevant literature (Gao et al., 2020; Hantsoo et al., 2019; Madigan et al., 2018; Manzari et al., 2019; Wang et al., 2020).
- 2- *PSS*: The Turkish validity and reliability study of the scale developed by Cohen et al. (1983) was made by Eskin et al. (2013). The scale consists of 14 items and has a 5-Likert construction. Seven items of the scale that include positive statements are scored in reverse (0 = never, 4 = very often). Maximum 56 and minimum 0 points can be obtained from the scale. High scores obtained from the scale indicate a high-stress perception (Eskin et al., 2013). The Cronbach's alpha value of the scale is 0.66 and the coefficient was calculated as 0.74 in this study.
3. *IUS*: The scale was developed by Freeston et al. (1994) and includes 27 items evaluated with the 5-Likert type (1 = "very much unlike me," 5 = "very much like me"). Turkish validity and reliability study of the scale was conducted by Sari and Dag (2009). It has four subscales as "uncertainty is stressful and distressing," "negative self-assessment about uncertainty" "uncertainty keeps someone from acting," "disturbing thoughts about the uncertainty of future." The total score that can be obtained from the scale varies between 27 and 135 points. As the scores obtained from the scale increase, the level of intolerance to uncertainty also increases (Sari & Dag, 2009). The Cronbach's alpha value of the scale is 0.88 and the coefficient was calculated as 0.97 in this study.
- 4- *BHS*: The Turkish validity and reliability study of the scale developed by Beck (1974) was made by Seber (1991). The scale consists of 20 items and has 11 "yes" and 9 "no" answer keys. Among these, 1 point is obtained from each "yes" response given to questions 2, 4, 7, 9, 11, 12, 14, 16, 17, 18, and 20, and each "no" response given to questions 1, 3, 5, 6, 8, 10, 13, 15 and 19. The opposite answers are calculated as 0 points. The scale has three factors as "feelings about the future (1, 6, 13, 15, 19)", "loss of motivation (2, 3, 9, 11, 12, 16, 17, 20) and future expectations (4, 7, 8, 14, 18). High scores from the scale show a high level of hopelessness (Seber, 1991). The Cronbach's alpha value of the scale is 0.86 and the coefficient was calculated as 0.85 in this study.

## 2.4 | Data evaluation

Data obtained were evaluated with SPSS (Statistical Package for the Social Sciences) 21.0 package software. Descriptive statistics (number, percentage, mean, standard deviation, median), Mann–Whitney *U*, and Kruskal–Wallis tests were used in the analyses. The results were evaluated at a 95% confidence interval and  $p < 0.05$  significance level. The relationship between the data was tested with Spearman's correlation and multivariate linear regression analyses.

## 2.5 | Ethical considerations

The study protocol was approved by the Amasya University Non-interventional Clinical Research Ethics Committee and the Turkish Republic Ministry of Health, Health Services General Directorate. The study, for which the necessary permissions were obtained for the use of the scales, was carried out in accordance with the ethical principles of the Declaration of Helsinki.

## 2.6 | Study limitations

The study was conducted in a certain period of time using social networks and included only pregnant women, creating a limitation for the generalizability of the results to all populations.

# 3 | RESULTS

## 3.1 | Sociodemographic and obstetric results

It was found that the mean age of all participant pregnant women was  $29.496 \pm 4.301$  (min = 20 max = 44) years, 60.0% were high school graduates and 51.2% were not working. The mean number of pregnancies was  $1.597 \pm .892$  (min = 1 max = 5), the mean number of living children was  $0.352 \pm 0.593$  (min = 0 max = 4) and the mean gestational week was  $27.469 \pm 7.971$  (min = 10 max = 39). It was found that 92.8% of the pregnant women conceived spontaneously and 79.5% had planned pregnancy. Of all pregnant women, 72.5% reported that they had no health problems during their pregnancy and 87.7% had no history of psychiatric treatment (Table 1).

Table 2 shows the current emotional status of pregnant women regarding the COVID-19 and their levels of exposure to the pandemic in detail.

## 3.2 | Results of the scales

The mean total scores received by the pregnant women from the PSS, IUS, and Hopelessness were 27.104 ( $\pm 6.328$ ), 74.058 ( $\pm 26.023$ ), and 4.629 ( $\pm 4.188$ ) points. Subgroups and mean scores of the scales are given in Table 3.

No significant correlation was found between the factors such as pregnant women's mean age, working status, number of pregnancies, number of living children, pregnancy being planned, and gestational week and their psychological reactions. Distribution of total mean scores of the scales on the other independent variables were shown in Table 4.

**TABLE 1** Distribution of pregnant women's demographic and obstetric data

Variable	n	%	Mean ± SD	Min-max
Age			29.496 ± 4.301	20-44
Level of education for pregnant women				
≤High school	74	19.7		
Graduate	225	60.0		
Postgraduate	76	20.3		
Working status				
Working	183	48.8		
Not working	192	51.2		
Number of pregnancy			1.597 ± 0.892	1-5
Number of living children			0.352 ± 0.593	0-4
Gestational week			27.469 ± 7.971	10-39
Planned pregnancy				
Yes	298	79.5		
No	77	20.5		
Types of conception				
Spontaneous	348	92.8		
With assisted reproductive technology	27	7.2		
Having risk factor in pregnancy				
Yes	103	27.5		
No	272	72.5		
Previous or current psychological treatment				
Yes	46	12.3		
No	329	87.7		
Total	375	100		

### 3.2.1 | Results of the PSS

The women who conceived spontaneously ( $p = 0.024$ ) and those with a history of receiving psychiatric treatment ( $p = 0.002$ ) were found to experience more stress compared to the others. Among the pregnant women who stated that the pandemic affected their pregnancy ( $p = 0.000$ ), baby ( $p = 0.000$ ), and psychology ( $p = 0.000$ ), as the level of exposure increased the stress level also increased ( $p = 0.000$ ). Global measures taken against the pandemic were found to create negative emotional outcomes on the pregnant women ( $p = 0.000$ ) causing severe stress ( $p = 0.000$ ) and increasing levels of exposure ( $p = 0.000$ ). A significant correlation ( $p = 0.000$ ) was found between the levels of exposure and perceived stress of the pregnant women who reported that the pandemic created uncertainty ( $p = 0.000$ ) and caused hopelessness about the future. The perceived stress levels were high in pregnant women who did not know how to act when it was declared that the pandemic is over ( $X = 30.294 \pm 5.000$ ;  $p = 0.000$ ).

**TABLE 2** Responses of pregnant women towards pandemia

	<i>n</i>	%
Pandemic affects my pregnancy negatively		
Yes	217	57.9
No	158	42.1
Pandemic affects my baby negatively		
Yes	175	46.7
No	200	53.3
Pandemic affects my psychology negatively		
Yes	257	68.5
No	118	31.5
How much has the pandemic affected your psychology?		
Very much/much	127	33.9
Some	119	31.7
Indecisive	11	2.9
Never	118	31.5
The pandemic measures affected my psychology		
Yes	233	62.1
No	142	37.9
How much have the measures taken against the pandemic affected your psychology?		
Very much/much	102	27.1
Some	121	32.3
Indecisive	10	2.7
Never	142	37.9
The pandemic made me stress		
Yes	279	74.4
No	96	25.6
How much stress has the pandemic caused?		
Very often/often	123	32.8
Sometimes	147	39.2
Indecisive	9	2.4
Never	96	25.6
Pandemic caused feelings of uncertainty		
Yes	286	76.3
No	89	23.7
How much the pandemic caused feelings of uncertainty?		
Very often/often	117	31.3
Sometimes	155	41.3

**TABLE 2** (Continued)

	<i>n</i>	%
Indecisive	14	3.7
Never	89	23.7
Pandemic caused feelings of hopelessness		
Yes	232	61.9
No	143	38.1
How much the pandemic caused feelings of hopelessness?		
Very often/often	101	26.9
Sometimes	125	33.3
Indecisive	6	1.7
Never	143	38.1
When the epidemic is announced to end,		
I will feel completely relaxed and safe	75	20.0
I will continue to be cautious	192	51.2
I don't know how to behave	34	9.1
I won't believe that this epidemic won't end for long	74	19.7

**TABLE 3** Distribution of the total mean scores of the scales

Subgroups	<i>X</i>	<i>SD</i> (±)	Min-max
Perceived Stress Scale	27.104	6.328	5-45
Intolerance of Uncertainty Scale	74.058	26.023	27-135
Uncertainty is stressful and distressing,	25.775	9.211	9-45
Negative self-assessment about uncertainty	22.594	8.866	9-45
Uncertainty keeps someone from acting	14.658	5.207	5-25
Disturbing thoughts about the uncertainty of future	11.029	4.456	4-20
Beck Hopelessness Scale	4.629	4.188	0-19
Feelings about the future	0.965	1.429	0-5
Loss of motivation	1.602	1.813	0-8
Expectations about the future	1.664	1.389	0-5

### 3.2.2 | Results of the IUS

It was found that the levels of intolerance to uncertainty increased ( $p = 0.033$ ), and uncertainty caused stress (Graduate  $X = 26.555 \pm 9.078$ , postgraduate  $X = 26.500 \pm 8.931$   $p = 0.008$ ) and kept from acting (Graduate  $X = 15.182 \pm 5.061$ , postgraduate  $X = 14.815 \pm 4.832$   $p = 0.004$ ) in pregnant women with an education level of university or higher. The women who conceived spontaneously ( $p = 0.033$ ) and reported to experience a health problem during pregnancy ( $p = 0.004$ ) received high points from all subscales ( $p < 0.05$ ) and their levels of intolerance to uncertainty were high. The levels of intolerance to uncertainty ( $p = 0.000$ ) and all subscales ( $p \leq 0.001$ )

**TABLE 4** Distribution of total mean scores of the scales on the independent variables

Variables	PSS		IUS		BHS	
	$X \pm SD$	$Z^a/X^{2b} p$	$X \pm SD$	$Z^a/X^{2b} p$	$X \pm SD$	$Z^a/X^{2b} p$
Level of education for pregnant women						
≤High school	28.648 ± 5.991	4.844 0.089 <sup>b</sup>	67.081 ± 27.019	<b>6.806</b> <b>0.033<sup>b</sup></b>	4.675 ± 3.708	0.663 0.718 <sup>b</sup>
Graduate	26.737 ± 6.028		75.826 ± 25.617		4.466 ± 4.087	
Postgraduate	26.684 ± 7.299		75.618 ± 25.430		5.065 ± 4.891	
Types of conception						
Spontaneous	27.330 ± 6.261	<b>-2.224</b> <b>0.024<sup>a</sup></b>	74.853 ± 26.126	<b>-2.133</b> <b>0.033<sup>a</sup></b>	4.750 ± 4.253	-1.768 0.077 <sup>a</sup>
With assisted reprod. tech.	24.185 ± 6.581		63.814 ± 22.681		3.074 ± 2.854	
Having risk factor in pregnancy						
Yes	27.592 ± 5.992	-0.764 0.445 <sup>a</sup>	79.466 ± 21.911	<b>-2.859</b> <b>0.004<sup>a</sup></b>	4.601 ± 3.815	-0.464 0.643 <sup>a</sup>
No	26.919 ± 6.451		72.011 ± 27.177		4.639 ± 4.328	
Pre. or current psycho. treatment						
Yes	29.869 ± 6.628	<b>-3.094</b> <b>0.002<sup>a</sup></b>	86.304 ± 17.157	<b>-3.922</b> <b>0.000<sup>a</sup></b>	4.847 ± 4.278	-0.487 0.626 <sup>a</sup>
No	26.717 ± 6.197		72.346 ± 26.605		4.598 ± 4.181	
Pandemic affects my pregnancy negatively						
Yes	29.027 ± 5.750	<b>-7.394</b> <b>0.000<sup>a</sup></b>	78.046 ± 24.898	<b>-3.233</b> <b>0.001<sup>a</sup></b>	5.479 ± 4.472	<b>-4.920</b> <b>0.000<sup>a</sup></b>
No	24.462 ± 6.145		68.582 ± 26.612		3.462 ± 3.450	
Pandemic affects my baby negatively						
Yes	28.514 ± 6.123	<b>-4.522</b> <b>0.000<sup>a</sup></b>	78.137 ± 26.233	<b>-2.534</b> <b>0.011<sup>a</sup></b>	5.462 ± 4.547	<b>-3.653</b> <b>0.000<sup>a</sup></b>
No	25.870 ± 6.260		70.490 ± 25.369		3.900 ± 3.707	
Pandemic affects my psychology negatively						
Yes	28.469 ± 6.081	<b>-6.534</b> <b>0.000<sup>a</sup></b>	77.470 ± 24.934	<b>-3.559</b> <b>0.000<sup>a</sup></b>	5.101 ± 4.464	<b>-2.994</b> <b>0.003<sup>a</sup></b>
No	24.076 ± 5.795		66.627 ± 26.892		3.601 ± 3.302	
How much has the pandemic affected your psychology?						
Very much/much	29.881 ± 6.019	<b>70.882</b> <b>0.000<sup>b</sup></b>	83.299 ± 25.562	<b>29.662</b> <b>0.000<sup>b</sup></b>	5.984 ± 4.735	<b>28.986</b> <b>0.000<sup>b</sup></b>
Some	26.865 ± 5.869		72.974 ± 23.237		4.033 ± 4.081	
Indecisive	30.090 ± 4.989		58.818 ± 16.011		6.454 ± 2.381	
Never	24.076 ± 5.795		66.627 ± 26.892		3.601 ± 3.302	
The pandemic measures affected my psychology						
Yes	28.253 ± 6.063	<b>-4.410</b> <b>0.000<sup>a</sup></b>	76.180 ± 25.147	<b>-2.131</b> <b>0.033<sup>a</sup></b>	5.128 ± 4.471	<b>-2.757</b> <b>0.006<sup>a</sup></b>
No	25.218 ± 6.321		70.577 ± 27.132		3.809 ± 3.542	

TABLE 4 (Continued)

Variables	PSS		IUS		BHS	
	X ± SD	Z <sup>a</sup> /X <sup>2b</sup> p	X ± SD	Z <sup>a</sup> /X <sup>2b</sup> p	X ± SD	Z <sup>a</sup> /X <sup>2b</sup> p
How much have the measures taken against the pandemic affected your psychology?						
Very much/much	30.019 ± 6.288	<b>34.151</b> 0.000 <sup>b</sup>	79.656 ± 25.004	<b>13.641</b> 0.003 <sup>b</sup>	6.166 ± 4.707	<b>23.494</b> 0.000 <sup>b</sup>
Some	26.809 ± 5.467		74.966 ± 24.810		4.165 ± 4.156	
Indecisive	27.700 ± 6.464		55.400 ± 21.019		6.200 ± 3.224	
Never	25.218 ± 6.321		70.577 ± 27.132		3.809 ± 3.542	
The pandemic made me stress						
Yes	28.616 ± 5.467	<b>-7.730</b> 0.000 <sup>a</sup>	77.412 ± 25.861	<b>-4.084</b> 0.000 <sup>a</sup>	5.150 ± 4.366	<b>-4.430</b> 0.000 <sup>a</sup>
No	22.708 ± 6.628		64.312 ± 24.082		3.114 ± 3.188	
How much stress has the pandemic caused?						
Very often/often	30.544 ± 5.196	<b>91.314</b> 0.000 <sup>b</sup>	82.081 ± 27.283	<b>38.508</b> 0.000 <sup>b</sup>	6.300 ± 4.915	<b>36.197</b> 0.000 <sup>a</sup>
Sometimes	26.823 ± 5.235		75.666 ± 23.423		4.108 ± 3.664	
Indecisive	31.555 ± 8.81		42.111 ± 9.171		6.444 ± 2.603	
Never	22.708 ± 6.628		64.312 ± 24.082		3.114 ± 3.188	
Pandemic caused feelings of uncertainty						
Yes	28.342 ± 5.798	<b>-6.860</b> 0.000 <sup>a</sup>	76.230 ± 25.731	<b>-2.471</b> 0.013 <sup>a</sup>	5.000 ± 4.331	<b>-3.238</b> 0.001 <sup>a</sup>
No	23.123 ± 6.347		67.078 ± 25.871		3.438 ± 3.450	
How much the pandemic caused feelings of uncertainty?						
Very often/often	30.837 ± 5.606	<b>84.150</b> 0.000 <sup>b</sup>	86.068 ± 25.882	<b>39.209</b> 0.000 <sup>b</sup>	6.359 ± 4.964	<b>29.740</b> 0.000 <sup>b</sup>
Sometimes	26.471 ± 5.284		71.090 ± 23.061		3.941 ± 3.607	
Indecisive	28.214 ± 5.294		50.928 ± 19.028		5.357 ± 2.677	
Never	23.123 ± 6.347		67.078 ± 25.871		3.438 ± 3.450	
Pandemic caused feelings of hopelessness						
Yes	28.750 ± 5.902	<b>-6.633</b> 0.000 <sup>a</sup>	80.357 ± 25.204	<b>-5.760</b> 0.000 <sup>a</sup>	5.482 ± 4.456	<b>-5.478</b> 0.000 <sup>a</sup>
No	24.433 ± 6.098		63.839 ± 24.089		3.244 ± 3.282	
How much the pandemic caused feelings of hopelessness?						
Very often/often	30.920 ± 5.663	<b>65.777</b> 0.000 <sup>b</sup>	86.524 ± 25.270	<b>54.153</b> 0.000 <sup>b</sup>	6.732 ± 4.808	<b>43.305</b> 0.000 <sup>b</sup>
Sometimes	27.048 ± 5.638		77.264 ± 23.353		4.496 ± 3.895	
Indecisive	27.666 ± 3.265		41.000 ± 13.638		5.000 ± 4.774	
Never	24.443 ± 6.098		63.839 ± 24.089		3.244 ± 3.282	

(Continues)

TABLE 4 (Continued)

Variables	PSS		IUS		BHS	
	$X \pm SD$	$Z^a/X^{2b}$ $p$	$X \pm SD$	$Z^a/X^{2b}$ $p$	$X \pm SD$	$Z^a/X^{2b}$ $p$
When the epidemic is announced to end,						
I will feel completely relaxed and safe	26.720 $\pm$ 6.150	<b>23.670</b> <b>0.000<sup>b</sup></b>	65.106 $\pm$ 22.292	<b>15.807</b> <b>0.001<sup>b</sup></b>	3.933 $\pm$ 3.272	<b>33.279</b> <b>0.000<sup>b</sup></b>
I will continue to be cautious	25.921 $\pm$ 6.472		75.187 $\pm$ 26.172		3.921 $\pm$ 4.058	
I don't know how to behave	30.294 $\pm$ 5.000		72.235 $\pm$ 23.373		5.088 $\pm$ 2.767	
I won't believe that this epidemic won't end for long	29.094 $\pm$ 5.772		81.040 $\pm$ 28.108		6.959 $\pm$ 5.005	

Note: Significant results are shown in bold type ( $p < 0.05$ ).

Abbreviations: BHS, Beck Hopelessness Scale; IUS, Intolerance of Uncertainty Scale; PSS, Perceived Stress Scale.

<sup>a</sup>Mann-Whitney  $U$  test.

<sup>b</sup>Kruskal-Wallis test.

were significantly increased in the pregnant women who received psychiatric support. The pregnant women who thought that their pregnancy ( $p = 0.001$ ), the baby ( $p = 0.011$ ), and psychology ( $p = 0.000$ ) were affected negatively by the COVID-19 pandemic received high scores from all subgroups of the scale ( $p < 0.05$ ). As the severity of psychological exposure increased, the women were seen to be more intolerant to uncertainty ( $p = 0.000$ ). The pregnant women stated that measures taken against the pandemic increased their intolerance ( $p = 0.000$ ) and that uncertainty upset them ( $X = 26.828 \pm 8.939$ ,  $p = 0.003$ ). It was found that as the severity of these emotions increased, the pregnant women were affected more negatively ( $p < 0.05$ ). As the level of exposure increased, the mean total and subscale scores increased in the pregnant women ( $p = 0.000$ ) who reported that the pandemic caused stress ( $p = 0.000$ ) and uncertainty ( $p = 0.013$ ), creating hopelessness ( $p = 0.000$ ).

The levels of intolerance to uncertainty was high ( $X = 81.040 \pm 28.108$ ,  $p = 0.001$ ) and all subscales were negatively influenced ( $p < 0.05$ ) in the women who thought that the outbreak will continue even if it is declared that the pandemic is over.

### 3.2.3 | Results of the BHS

It was concluded that obstetric, medical, and sociodemographic characteristics had no effect on hopelessness levels ( $p < 0.05$ ). The mean total score and subscale scores received from the Hopelessness Scale were higher in the pregnant women who thought that the pandemic affected their pregnancy ( $p = 0.000$ ) and the baby ( $p = 0.000$ ) negatively. It was found that women who thought that the pandemic affected their psychology were more hopeless ( $p = 0.003$ ), experienced negative emotions about the future ( $X = 1.175 \pm 1.537$ ,  $p = 0.000$ ), and had no expectation ( $X = 1.786 \pm 1.462$ ,  $p = 0.032$ ). As the severity of psychological exposure increased, hopelessness emotions increased and higher scores were received from the subscales ( $p < 0.05$ ). It was found that the pregnant women who thought that the measures taken affected their psychology were hopeless ( $p = 0.006$ ), experienced negative emotions about the future ( $X = 1.107 \pm 1.483$ ,  $p = 0.007$ ), had no expectation ( $X = 1.841 \pm 1.415$ ,  $p = 0.001$ ) and the mean scores increased with the severity of exposure ( $p = 0.000$ ). The Hopelessness Scale ( $p = 0.000$ ) and total subscale scores ( $p \leq 0.001$ ) were higher, and hopelessness levels increased with the severity of exposure in the pregnant women who thought that the pandemic caused stress ( $p = 0.000$ ). Significant results were obtained in all subdimensions of the scale in the pregnant women who stated that they experienced uncertainty and hopelessness emotions ( $p < 0.05$ ). Hopelessness levels were high ( $X = 6.959 \pm 5.005$ ,  $p = 0.000$ ) and all subscale scores were

negatively affected ( $p < 0.05$ ) in the pregnant women who thought that the outbreak will continue even if it is declared that the pandemic is over.

### 3.2.4 | Results of the correlations between the scales

The correlations between the scales were examined with Spearman's correlation analysis. There was a moderate positive correlation between perceived stress ( $r = 0.468$ ,  $p = 0.000$ ), intolerance to uncertainty ( $r = 0.243$ ,  $p = 0.000$ ), and hopelessness ( $r = 0.240$ ,  $p = 0.000$ ) variables. A multivariate regression analysis was performed to predict the dependent variables using the independent variables. As a result of the analysis, a significant regression model was found ( $F [2,372] = 61.542$ ,  $p < 0.001$ ) and the independent variables explained 25% of the variance in the dependent variables ( $R_{adj}^2 = 0.245$ ).

## 4 | DISCUSSION

Pregnancy is defined as a life period that increases emotional fluctuations and sensitivity to stress in women. Therefore, it is predicted that global health problems causing biological and negative psychological impacts such as pandemics affect pregnant women more profoundly (Hossain et al., 2020; Preis, Mahaffey, Heiselman et al., 2020; Zhang & Ma 2020). Stress experienced in the prenatal period may cause several obstetric complications such as fetal abnormalities, low birth weight, and preterm delivery. Comprehensive studies are needed on this issue to determine the risky groups to protect both maternal and fetal health (Hossain et al., 2020). In this study conducted for this purpose, emotional reactions of pregnant women towards pandemic were examined.

In this study, It was found that the stress levels perceived by pregnant women due to the pandemic are high, the type of conception, a history of psychiatric treatment, and the emotional exposure state increases the stress. In a study with 286 pregnant women on anxiety and fears, anxiety levels were reported to be higher in those who thought that coronavirus will affect the baby (Hossain et al., 2020). In an online study conducted by reaching 788 pregnant women via social media, it was found that pregnant women experience moderate levels of anxiety and that anxiety levels increase in advanced age and risky pregnancies. It was concluded that factors such as gestational week, number of pregnancies, pregnancy being planned, and the type of conception do not affect stress levels (Preis, Mahaffey, Heiselman et al., 2020). In a study investigating changes created by COVID-19 on psychological reactions and lifestyle in pregnant women ( $n = 560$ ) it was found that women experienced stress due to home/working life and financial concerns, and especially those in the first trimester were affected more negatively (Zhang & Ma 2020). In a study by Nodoushan et al. (2020) about mental health and stress in pregnant women during the COVID-19 pandemic ( $n = 560$ ), it was found that pregnant women were generally stressful and stress levels were correlated with education level and working status. It has been stated that factors such as socioeconomic status and age had no effect on stress. In a study conducted to develop a stress scale in pregnancy during pandemics, 4451 pregnant women were included. As a result of the research, stress levels were found to be higher in primipara pregnant women in the second trimester (Preis, Mahaffey, Lobel et al., 2020). In another study from Iran with 205 pregnant women, it was found that variables such as the number of pregnancies, education level of the spouse, income level, spouse support, and marital life satisfaction affected stress levels. It was stated that variables such as age or education level of the pregnant women had no effect on stress levels (Effati-Daryani et al., 2020). In a study including 859 women (pregnant women = 544), it was found that depression and anxiety levels were higher among the nonpregnant women, and sociodemographic differences had no effect (Zhou et al., 2020). Again in a study with 503 pregnant women, effects of the COVID-19 pandemic on depression and stress were investigated, and it was found that the mean perceived stress score was high, similar to our study ( $27.104 \pm 6.328$ ). It was reported that stress level increases in parallel with pregnant women's age and gestational week

(Medina-Jimenez et al., 2020). In a study by Wang and Tang (2020) from China on 4788 women and men aged between 11 and 98 years, it was observed that 44.8% of the participants experienced stress and showed depressive symptoms due to the pandemic, and these rates increased in elderly and nonworking individuals (Wang & Tang 2020). Similar to our results, it has been found in the literature that people and especially pregnant women experience an increase in emotional problems and stress levels due to the pandemic. It is thought that factors affecting stress levels show variability among studies due to sociocultural structures and multidemographic characteristics of the groups included.

Although intolerance is an inevitable part of daily life, unprecedented events such as the COVID-19 pandemic are difficult situations to deal with. Factors such as international responses to pandemics and regional variabilities in infection rates may cause people to lose their ability to tolerate uncertainty (Matvienko-Sikar et al., 2020; Sabanci Baransel, 2020; Sahin & Kabakci 2020). The emergence of new information about the effects of the pandemic on pregnant women and fetuses every day is disturbing for pregnant women, leading to high levels of uncertainty (Matvienko-Sikar et al., 2020; Sahin & Kabakci, 2020). In our study, it was found that pregnant women had high levels of intolerance to uncertainty, and education level, type of conception, presence of risk in pregnancy, and emotionally negative exposure to the pandemic increased intolerance levels. In a study from Turkey with 427 pregnant women about the COVID-19 pandemic, factors such as the number of pregnancies and parity were shown to affect the levels of intolerance to uncertainty. The total mean score of IUS in that study ( $71.59 \pm 13.69$ ) was very similar to our result ( $74.058 \pm 26.02$ ). The pandemic period was found to increase intolerance to uncertainty, causing more anxiety/stress (Sabanci Baransel, 2020). In a study with pregnant women before ( $n = 210$ ) and after ( $n = 235$ ) the pandemic, the levels of stress and intolerance to uncertainty were reported to increase during the pandemic (Matvienko-Sikar et al., 2020). In a qualitative study with 15 pregnant women on the pandemic experience, the outbreak was found to create anxiety, uncertainty, and fear (Sahin & Kabakci 2020). In a study from the United Kingdom about coping with the COVID-19 pandemic ( $n = 842$ ), among the participants, those in the vulnerable group were shown to experience anxiety and depression, had trouble coping with uncertainty, and had increased mental health problems (Rettie & Daniels, 2020). In a study investigating the effects of the COVID-19 pandemics on intolerance to certainty, anxiety, and depression ( $n = 3805$ ), women were found to be more depressive and intolerant to uncertainty. In addition, stress levels increased in individuals who experienced uncertainty (del Valle et al., 2020). In a study from Brazil investigating the effects of the pandemics on a sample of 924 participants aged between 18 and 72 years, it was reported that excessive intolerance to uncertainty has significant negative effects on mental health (Seco Ferreira et al., 2020). In a study by Linde and Siqueira (2018) with women at the time of zika virus outbreak, the participants were reported to experience uncertainty and lack of confidence. In a systematic review, evidence was presented that infectious disease outbreaks cause negative emotional states and feelings of uncertainty in pregnant women (Brooks et al., 2020). The literature indicates that factors such as isolation, quarantine, prolonged hospital treatments and uncertain future experienced during endemics bring along some mental problems. In this respect, it is pointed out that there is a serious decrease in the tolerance levels of people. The increased intolerance to uncertainty experiences by pregnant women included in our study overlap with this hypothesis.

The thought of losing a loved one, work or financial losses due to global economic troubles cause feelings of hopelessness in individuals. Studies have found that anxiety and concerns about the future are more common in pregnant and puerperal women that are a vulnerable group in terms of mental morbidity (Gildner et al., 2020; López-Morales et al., 2021). In this respect, it is emphasized that the feeling of hopelessness in pregnant women due to the pandemic may be normal, but should not reach pathological dimensions. In our study mild hopelessness. In a study proposing that hopelessness is associated with depression, the COVID-19 pandemic was found to cause depressive symptoms, leading to hopelessness in pregnant women (Gildner et al., 2020). In a study including 204 women (102 = pregnant, 102 = nonpregnant) and investigating the effect of the COVID-19 pandemic on mental health, it was stated that that psychogenic effects such as a decrease in the positive emotions, depression, and anxiety that may cause hopelessness for the future were observed especially in pregnant women

(López-Morales et al., 2021). In another study investigating the effect of the COVID-19 pandemic on perinatal mental health ( $n = 288$ ), it was found that pregnant women showed high levels of anxiety and depression during the pandemic and this situation was independent from the factors such as pregnancy complications. However, the rates of anxiety and worry decreased as the education level increased (Farrell et al., 2020). In a study by Akgor et al. (2021) conducted to understand the psychological reactions of pregnant women ( $n = 297$ ) to the pandemic, it was found that the pregnant women experienced high anxiety levels and showed depressive symptoms because they thought the coronavirus will adversely affect their pregnancy and baby. They even stated that they were worried about the possibility of infection to their baby during and after birth (Akgor et al. 2021). In the study by Wang and Tang (2020), it was found that 34.8% of the participants felt hopeless due to the pandemic, and that factors such as female gender, advanced age, low income, and nonworking status increased hopelessness. In a study from England with 450 persons, it was concluded that almost all participants experienced stress, anxiety, and disappointment due to the pandemics and 11.9% were hopeless about the future since they could not cope with this situation (Madjunkov et al. 2020). Our results are consistent with those of the previous studies.

The results of our study support the literature, because many studies conducted about the relationship of perceived stress and intolerance to uncertainty and the levels of hopelessness show similarity with our study (Bakioglu et al. 2020; Demirtas & Yildiz, 2019; Lebel et al., 2020; del Valle et al., 2020).

## 5 | CONCLUSION

Novel coronavirus disease has affected the whole world and become a serious public health problem with its widespread transmission rate. In addition to many neurological and cardiogenic medical complications, it has also caused psychological problems. Since especially the pregnancy period is a process in which emotional balance may be impaired with the experienced physical and hormonal changes, pregnant women have been characterized as a risky group. According to the results of this study, it was confirmed that pregnant women experience an increase in the levels of stress and uncertainty, their expectations about the future decrease, and these women are individuals who need to be carefully evaluated psychologically.

It is known that stress experienced in the prenatal period may increase the risk of neurodevelopmental disorders as well as obstetric complications such as preterm delivery and stillbirth. In this respect, mental health, as well as physical health, should be emphasized. It is recommended that pregnant women should be provided with the necessary routine psychological support and during the pandemic process and interventions should be made to protect mental health. It is thought that the levels of uncertainty, stress, and anxiety that are inherent in the pandemic will somewhat decrease with continuous and accurate education provided to pregnant women by healthcare professionals.

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## CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## PEER REVIEW

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