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COVID-19 Related Trauma, Stress and Depression in Pregnant Women

Gebelerde COVID-19 İlişkili Travma, Stres ve Depresyon

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ABSTRACT

Introduction: Pregnancy, a particular time for women, has been marred by fear, anxiety, and uncertainty with the COVID-19 pandemic. In this global pandemic, literature highlighted the importance of psychological effects on people, especially in a vulnerable population. This study was conducted to investigate the psychological effects of the COVID-19 pandemic on traumatic anxiety, depression, and stress in pregnant women.
Methods: This was a cross-sectional and descriptive study, and 360 pregnant women were analyzed between September 2020 and February 2021. The collected data were evaluated by the Impact of Event Scale-Revised (IES-R) and the Depression Anxiety Stress (DASS-21) scale.
Results: This study found that the prevalence of anxiety, depression, and stress in pregnant during the pandemic was 64.8%, 59.9%, and 43.2%, respectively. The depression and anxiety levels and IES-R score of pregnant women were moderate.
Conclusion: Therefore, steps must be taken to enhance the mental strength of pregnant by developing the necessary and suitable consultation strategies during the pandemic.

ÖZET

Giriş: Kadınlar için özel bir dönem olan gebelik, COVID-19 salgını ile korku, endişe ve belirsizlikle gölgelendi. Bu küresel salgında literatür, özellikle savunmasız bir popülasyonda insanlar üzerindeki psikolojik etkilerin önemini vurguladı. Bu çalışma, COVID-19 pandemisinin gebelerde travmatik anksiyete, depresyon ve strese yönelik psikolojik etkilerini incelemek amacıyla yapılmıştır.
Yöntem: Kesitsel tanımlayıcı olan bir çalışma olarak yürütülen bu çalışmada, araştırma verileri, Eylül 2020-Şubat 2021 tarihleri arasında 360 gebe kadına ulaşılmıştır. Araştırma da verilerinin toplanmasında Olayların Etkisi Ölçeği-Revize Edilmiş (IES-R) ve Depresyon Anksiyete Stres (DASS-21) ölçeği kullanılmıştır.
Bulgular: Çalışmada, pandemi sırasında gebelerin anksiyete, depresyon ve stres prevalansının sırasıyla %64.8; %59.9 ve %43.2 olduğu saptanmıştır. Gebe kadınların, depresyon ve anksiyete ile IES-R seviyelerinin orta düzeyde psikolojik olarak etkilendiklerini göstermektedir.
Sonuç: Pandemi sürecinde, gerekli ve uygun danışmanlık stratejileri geliştirilerek gebelerin ruhsal sağlıklarının iyileştirilmesi yönünde adımlar atılmalıdır.

1. Introduction

Coronavirus (COVID-19) is a new systemic inflammatory disease caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). The World Health Organization declared it an International Public Health Emergency on January 30, 2020, as a result of its rapid and gradual global spread (1,2). To date, a severe acute respiratory syndrome caused by COVID-19 has affected many countries and regions worldwide, with 529.410.287 confirmed cases and 6.296.771 deaths (3). Although the pandemic affected the entire society, it caused more anxiety among certain groups (4,5). It is found that women who are pregnant, are in the postpartum period, have a miscarriage, have been subjected to violence by their partners,

or are at high risk for mental health problems (4). Pregnancy is a unique period of immunological and physiological changes that can affect the psychological state of women. Thus, together with the fear of short- and long-term effects of SARS-CoV-2 infection on both themselves and their infants and the uncertainty, the pathophysiology of SARS-CoV-2 infection during pregnancy, exacerbates the psychological distress and mood changes in pregnant women (6,7). The studies showed that pregnant women have a more significant increase in depression, anxiety, and negative affects compared with non-pregnant women (6,8). During the pandemic, as part of infection prevention strategies, unprecedented restrictions are

being implemented globally, resulting in restriction of personal and social freedom (9). Measures implemented to prevent viral transmission, in particular, might have indirect negative effects on pregnant women. Financial problems brought on by the massive disruption of health systems and reduced access to food and interruptions in prenatal care in low- and moderate-income countries resulted in significant concern among pregnant women regarding their own health and the health of the fetus (6,8). Moreover, quarantine and restrictions, alterations in daily routines, changes in social life, loss of freedom, the effect of social isolation, and problems related to health and financial issues are associated with psychological distress, depression, anxiety, stress, more severe symptoms that increased during the COVID-19 pandemic, and have a worrisome effect on the mental status of the society (6,9,10).

In particular, it is important for healthcare professionals to know what to do in perinatal periods for the protection of maternal-fetal health in this process. However, health professionals pay less attention to the emotional and psychological problems of the pregnant woman in the prenatal period and generally focus on the physical health of the fetus (11,12). Moreover, it is another important problem that most of the women do not inform their healthcare professionals about their anxiety, emotional distress, and depression before pregnancy and that healthcare professionals cannot help them in this regard. For this reason, it is a vital issue that pregnant women with psychological distress cannot be diagnosed and helped to cope with their distress (11,12). In this process, in addition to clinical management, it has been determined that social support mechanisms are of great importance in the anxieties of pregnant women and puerperants about the birth period and their babies and they require nurse-assisted pregnancy follow-up (13,14). The effects of psychological health during pregnancy on short- and long-term maternal and fetal health have been well established in the literature (11,12,15,16). However, considering the history of humanity is going through one of the most stressful processes with the COVID-19 pandemic and protecting the psychosocial health of pregnant women during this period is of direct importance for maternal and infant health during pregnancy and postpartum. For this purpose, determining the psychological impact levels of pregnant women will be effective in creating initiatives for health professionals to increase both maternal and fetal health. This study aimed by revealing the anxiety, traumatic stress, and depression levels of pregnant women during the period when the pandemic was not entirely over but controlled socialization was taking place.

2. Methods

2.1. Study design

The study has a cross-sectional and descriptive model to investigate the psychological effect of COVID-19 on traumatic stress, depression, and anxiety in pregnant women.

2.2. Population and sample

The study population consisted of pregnant women who were socially isolated during the COVID-19 pandemic in all over Turkey. The study sample was calculated using sample size calculation formula in single-group rational data based on the rate of Internet use among women (68.9%) according to the 2019 results of the Turkish Statistical Institute (TUIK) Household Technologies Usage Study, and it was found that there must be at least 329 pregnant women in the study sample (17,18). The sample was calculated automatically with the formula specified by the program (Sample size n = [DEFF*N p(1-p)]/ [(d²/Z21-α/2*(N-1)+p*(1-p)] (18). The online research brochure was distributed to doctors, nurses, midwives, doulas, birthing educators, and academics who were contacted by researchers via social media sites (Facebook, Instagram, Twitter, etc.), online pregnancy preparation class groups, and online pregnancy support/information groups. The data were collected from the pregnant women who agreed to participate in the study between September 1, 2020 and February 1, 2021 with a questionnaire sent online via the link (https://forms.gle/keSVgXANU8Tn5uVY9). At the end of the study, a total of 360 pregnant women, which was greater than the target sample size, were contacted via the snowball sampling method.

2.3. Data collection

Considering the situations caused by the COVID-19 pandemic, the research questionnaire was applied online. A research promotion brochure generated online was sent via social media platforms (Facebook, Instagram, Twitter, etc.) to online pregnancy preparation class groups, and online pregnancy support/information groups. Physicians, nurses, midwives, doulas, childbirth preparation educators, and academicians were contacted by the researchers. The data were collected using the questionnaire form sent online via a link (https://forms.gle/keSVgXANU8Tn5uVY9) to the pregnant women who accepted participation in the study between September 01, 2020 and February 01, 2021. The study included pregnant women aged ≥ 18 years, who were literate and Internet users, agreed to participate in the study, and who didn't have risky pregnancy at the time. The pregnant women who did not voluntarily participate in the study and did not fill the online questionnaire completely were excluded.

Personal Information Form: The Impact of Event Scale-Revised (IES-R), and Depression Anxiety Stress Scale (DASS-21) were used to collect data.

Personal Information Form: In this form, there were 15 questions on participants' age, marital status, family income level, smoking/drinking status, and obstetric characteristics and 20 questions on COVID-19.

The Impact of Event Scale-Revised (IES-R): The first version of the scale was developed by Horowitz et al. to screen for the severity of post-traumatic stress disorder (PTSD) symptoms. Then, the third dimension (7 questions), which included the cluster of hyperarousal symptoms, was added by Weiss and Marmar, and the scale became a screening tool comprising 22 questions (19,20). The validity and reliability studies of the Turkish version of the revised form were performed by Çorapçıoğlu, Yargıç, Geyran, and Kocabaşoğlu (2006) with two groups aged between 18 and 65 years and with and without PTSD diagnosis. The scale contains 22 questions, in which the severity of the symptoms in the last 7 days is scored between 0 and 4. An increase in the total score on the scale means that the individual experiences more PTSD symptoms. The best cut-off point for the IES-R was 33 points. High validity and reliability levels were reported for the Turkish version of the scale (21). The Cronbach's alpha coefficient of the original scale was 0.93, whereas it was calculated as 0.96 in this study (21).

Depression Anxiety Stress Scale (DASS-21): DASS-21 was generated by selecting certain items in DASS-42 by Lovibond to shorten the application time (22). In studies conducted with different societies, clinical groups, cultural and ethnic groups, both the original, 42-item version of DASS, and the short, 21-item, 4-point Likert-type (Never, sometimes, often, always), versions of DASS were found to be reliable and valid scales for measuring depression, anxiety, and stress levels. In the study, all 21-item measures with the three sub-dimensions of stress, anxiety, and depression were utilized (22,23). Increases in depression, stress, and anxiety are correlated with higher evaluation scale scores. For the depression subscale, normal symptoms are indicated by scores 0–4; mild by scores 5–6; moderate by scores 7–10; severe by scores 11–13 and extremely severe by scores of 14 or more. For the anxiety subscale, normal symptoms are indicated by scores of 0–3; mild by scores of 4–5; moderate by scores of 6–7; severe by scores of 8–9; and extremely severe by scores of 10 or more. For the stress scale, normal symptoms are indicated by scores 0–7; mild by scores 8–9; moderate by scores 10–12; severe by scores 13–16; and extremely severe by scores of 17 or more (22,23). Cronbach's alpha validity

coefficient of the Turkish version was 0.87 whereas it was calculated as 0.97 in this study (23).

2.4. Ethical considerations

The documents (informed consent forms, advertisements and flyers) of the study were evaluated by the Sinop University Institutional Review Board (IRB-2011077-25 May 2020), and ethics committee approval was obtained. Institutional review board guidelines were considered in the informed consent procedure. The necessary permissions were obtained from the COVID-19 Scientific Research Evaluation Commission of the Ministry of Health. Permission was obtained for the scales used in the study. Before starting the study, the participants were informed about the purpose of the study, and their informed consent was obtained. After the participant who obtained the questionnaire read the online informed consent form, clicking on the "I consent and agree to participate in the survey" tab, questionnaire continued with their consents.

2.5. Data analysis

Sociodemographic characteristics, obstetric history, stress anxiety, and depression of the participants were defined with descriptive statistics such as standard deviations, percentages, means, and frequencies. The relationship between stress, anxiety, and depression levels and the effect of trauma was revealed by the Pearson correlation test. The affecting factors were analyzed by one-way ANOVA, independent t-test, binary logistic regression, and multiple linear regression. The analysis was made by SPSS version 25.0.

3. Results

The mean age of pregnant women was 28.38 ± 4.87 years. Of the participants, 96.4% were married, 54.7% were university graduates, 87.8% had nuclear family, 25% worked in the private sector, 46% had a moderate level of income, and 54% lived in a metropolis. It was found that 13% of pregnant women were smoking, 6% were drinking alcohol, and 14% had a chronic illness. The mean gestational age was 22.89 ± 10.96 weeks, the ratio of pregnant women in the third trimester was 41%, 78% had planned pregnancy, the mean number of surviving children was 1.34 ± 1.05, and 77.2% attended their regular follow-up visits during the pregnancy (Table 1,2).

When the factors affecting DASS-21 were analyzed, it was found that DASS-21 mean scores were significantly higher if the participant was divorced, was a high school graduate, had a broken family, defined her economic situation as bad, had a chronic disease, had unplanned pregnancy, had not been able to attend

antenatal follow-up visits during the pandemic, and had COVID-19 infection (p < 0.05) (Table 1,2).The IES-R scale mean scores were significantly higher if the participant was divorced, was a high school graduate, had a broken family, had a chronic disease, had an unplanned pregnancy, had not been able to attend antenatal follow-up visits during the pandemic, had COVID-19 infection, and was in the second trimester (p < 0.05) (Table 1,2).

Table 1. Sociodemographic characteristics of pregnant women

Variables	n	%	IES-R			DASS-21		
			Mean±SD	t/F	P	Mean±SD	t/F	p
Marital status								
Married	347	96.4	32.76±20.32	9.274	0.000	21.20±17.01	6.308	0.002
Single	7	1.9	37.20±9.01			34.57±9.12		
Divorced	6	1.7	71.8±18.25			41.83±23.65		
Educational Level								
Primary school	28	7.8	29.36±24.11	4.115	0.007	22.42±21.23	7.285	0.000
High school	94	26.1	38.42±24.61			28.22±20.01		
University	197	54.7	33.33±18.50			20.65±15.81		
Graduate	41	11.4	23.7±15.71			13.68±10.08		
Family Type								
Nuclear family	316	87.8	32.8±19.93	7.062	0.001	21.19±16.85	6.734	0.001
Extended family	35	9.7	32.14±23.05			22.66±17.35		
Broken family	9	2.5	60.12±23.49			43.5±21.11		
Perceptions of family income status								
Bad (Income<Expense)	128	35.6	31.01±18.52	3.448	0.033	17.91±14.85	12.784	0.000
Medium (Income=Expense)	164	45.5	37.74±23.89			28.16±20.13		
Good (Income>Expense)	68	18.9	31.89±18.30			19.73±13.16		
Presence of Chronic Diseases								
Yes	49	13.6	40.08±18.32	2.596	0.012	30.06±17.77	3.482	0.001
No	311	86.4	32.29±20.95			20.45±16.84		
Work type								
Housewife	79	21.9	30.55±17.75	0.934	0.459	18.65±15.15	1.013	0.410
Officer	77	21.4	35.13±21.95			23.42±18.30		
Health Professional	51	14.2	36.9±22.03			24.16±17.78		
Private sector	91	25.3	34.81±21.37			22.91±18.63		
Unemployed	20	5.6	28.11±15.87			17.83±14.98		
Employee	42	11.7	31.21±22.58			21.31±16		
Alcohol drinking status								
Yes	21	5.8	28.35±18.12	-1.189	0.249	15.77±16.02	-1.654	0.114
No	339	94.2	33.78±20.87			22.23±17.33		
Smoking status								
Yes	48	13.3	30.26±20.52	1.072	0.344	20.78±17.89	.881	0.415
No, I have never drunk.	215	59.7	33.09±21.39			21.16±17.57		
No, I left.	97	26.9	35.83±19.36			23.94±16.40		

IES-R: Impact of Event Scale-Revised, DASS-21: Depression Anxiety Stress Scale, t: Independent t-test, F: One-way ANOVA, SD: Standard Deviation.

Table 2. Pregnancy characteristics of women

Variables	n	%	IES-R			DASS-21		
			Mean±SD	t/F	p	Mean±SD	t/F	p
Having a Pregnancy Planned								
Yes	279	77.5	19.14±1.24	-2.379	0.018	20.38±16.17	-2.944	0.003
No	81	22.5	25.18±3.12			27.11±20.02		
Regular Follow-up								
Yes	278	77.2	30.45±18.42	14.265	0.000	19.30±15.38	13.779	0.000
Yes, but had not been able to attend antenatal all follow-up visits	60	16.7	40.60±22.25			28.59±19.14		
No I couldn't go.	22	6.1	52.55±29.40			35.31±23.65		
Trimester								
1st trimester	89	24.7	27.65±18.40	4.023	0.019	19.80±15.34	1.353	0.260
2nd trimester	123	33.2	36.50±21.69			23.92±17.93		
3rd trimester	148	41.1	34.49±20.76			21.37±17.70		

Table 2. Pregnancy characteristics of women (continued)

Variables	n	%	IES-R			DASS-21		
			Mean±SD	t/F	p	Mean±SD	t/F	p
Be Infected with Covid -19 Infection								
Have had infected	55	15.3	46.24±22.6	9.468	0.000	34.18±15.92	13.882	0.000
Has infected one of my family members	53	14.7	31.47±16.77			20.84±12.68		
Has infected one of relatives or acquaintances	122	33.9	32.28±11.75			20.85±9.86		
No	105	36.1	28.29±9.34			16.59±9.91		

IES-R: Impact of Event Scale-Revised, DASS-21: Depression Anxiety Stress Scale, t: independent t-test F: One-way ANOVA, SD: Standard Deviation.

Scores in the DASS-21 scale are classified into five categories, from normal to extremely severe. The frequency table of the participants according to this classification is presented in Figure 1. In this study, the anxiety, depression, and stress prevalence rates were 64.8%, 59.9%, and 43.2%, respectively.
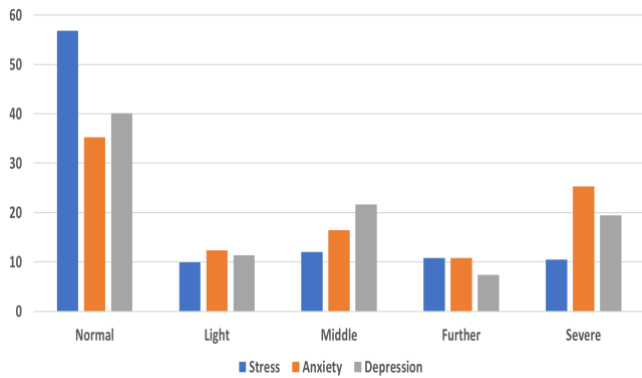

Figure 1. Stress, anxiety and depression frequencies of the participants according to the DASS-21 Scale

In the correlation analysis between scales, it was found that there was a positive and remarkably significant correlation between depressions, anxiety, stress, and IES-R mean scores in pregnant women ($p < 0.01$). Of the pregnant women participating in the study, 15.3% stated that they have had COVID-19 infection. DASS-21 scale depression mean score was 7.39 ± 6.3, anxiety mean score was 6.73 ± 5.81, and stress mean score was 6.73 ± 5.93. According to the scale threshold values, depression and anxiety levels were moderate, and stress level was mild. The mean IES-R score was 33.47 ± 8.81 (Table 3).

Table 3. Average DASS-21 and IES-R score of pregnant women

	n	Min-Max	Mean ± SD
Depression	360	0.00±21.00	7.39± 6.29*
Anxiety	360	0.00±21.00	6.73± 5.81*
Stress	360	0.00±21.00	8.75± 5.93**
DASS-21	360	0.00±63.00	21.87± 10.30
IES-R	360	0.00±88.00	33.47± 8.81*

*moderate, **mild, DASS-21: Depression Anxiety Stress Scale, IES-R: Impact of Event Scale-Revised, SD: Standard Deviation.

According to the binary logistic regression model, the best predictor variables for depression were identified as education level, presence of any chronic disease, knowledge level on COVID-19, probability of being infected, level of avoidance from being infected, level of believing something bad will happen to the infant due to COVID-19, and social support level during COVID-19 (Table 4). According to this model, it can be said that chronic illness as the most affecting factor will cause an increase of 1.05 units in the depression value. Independent variables explained 34.3% of the dependent variables in the model.

According to the binary logistic regression model, the best predictor variables for anxiety were identified as not being able to attend antenatal follow-up visits during the pandemic, experiencing sleep problems, lack of appetite or overeating, knowledge level on COVID-19, probability of being infected, and level of believing something bad will happen to the infant due to COVID-19 (Table 4). According to this model, it can be said that not having regular pregnancy follow-up, which is the most affecting factor, will cause an increase of 1.13 units in the anxiety value. Independent variables explained 30.7% of the dependent variables in the model.

According to the binary logistic regression model, the best predictor variables were identified as experiencing sleep problems, lack of appetite or overeating, probability of being infected, getting infected with Covid-19, and social support level during COVID-19 (Table 4). According to this model, it can be said that having the Covid-19 infection as the most affecting factor will cause a decrease of 1.08 units in the stress value. Independent variables explained 34.4% of the dependent variables in the model.

Table 4. Significant predictors of depression, anxiety, and stress on forward binary logistic regression

Independent variables	Beta	S.E	p	Odds ratio	95% CI	
					Lower	Upper
Depression						
Constant	2.199	1.048	.036	9.016		
Educational status (Reference: Primary education)			.026			
High school	.091	.681	.894	1.095	.288	4.165
License	1.302	.508	.010	3.678	1.360	9.947
Graduate	.481	.441	.275	1.617	.682	3.837
Income (Reference: Bad)			.078			
Middle	-.672	.370	.069	.511	.247	1.054
Good	-.062	.388	.873	.940	.439	2.012
Diagnosed chronic disease (Reference: No)	1.057	.445	.018	2.877	1.203	6.880
Level of knowledge about Covid-19	-.316	.093	.001	.729	.608	.875
Level of avoidance of being infected with coronavirus	.132	.061	.031	1.142	1.012	1.287
Level of being infected with Covid-19	-.216	.065	.001	.806	.710	.916
Level believing something bad will happen to the infant due to COVID-19	.198	.062	.001	1.219	1.079	1.377
Social support level in the coronavirus process	-.127	.058	.029	.881	.786	.987
X^2= 93.895 p=.000 R^2=0.343						
Anxiety						
Constant	-2.195	1.030	.033	.111		
Regular antenatal check-ups in this pregnancy (reference: Yes, regular)			.160			
Yes, but irregular	.448	.649	.490	1.564	.438	5.583
No	1.134	.731	.121	3.108	.742	13.019
Level of sleep problems	.454	.172	.008	1.575	1.125	2.205
Level of lack of appetite or overeating	.476	.171	.005	1.609	1.150	2.250
Level of knowledge about Covid-19	-.279	.088	.002	.757	.637	.900
Level of being infected with Covid-19	.129	.054	.016	1.138	1.024	1.264
Level believing something bad will happen to the infant due to COVID-19	.186	.060	.002	1.205	1.071	1.355
X^2=81.895 p=.000 R^2=0.307						
Stress						
Constant	-2.695	.774	.000	.068		
Level of sleep problems	.745	.166	.000	2.107	1.523	2.916
Level of lack of appetite or overeating	.485	.169	.004	1.624	1.167	2.259
Level of being infected with Covid-19	.160	.057	.005	1.174	1.049	1.312
Getting infected with Covid-19 (Reference: No)	-1.089	.361	.003	.337	.166	.684
Social support level in the coronavirus process	-.119	.054	.026	.888	.799	.986
X^2=95.883 p=.000 R^2=0.344						

Beta: Regression Coefficient; SE: Standard Error; CI: Confidence Interval

The variables predicting IES were evaluated using multiple regression analysis (Table 5). It was found that experiencing sleep problems, feeling terrified, level of COVID-19-related depression, level of anxiety that something bad will happen to the infant due to COVID-19 during the pandemic, level of being infected with Covid-19, and level of lack of antenatal controls in this pregnancy explained 47.9% of the impact of the event (p < 0.001). According to this model, it can be said that the level of being infected with Covid-19, as the most affecting factor, will cause an increase of 8.42 units in the IES-R value.

Table 5. Multiple linear regression analysis results for the prediction of IES-R

Variables	B	S.E	β	t	p
Constant	-18.993	3.877		-4.899	.000
Level of sleep problems	3.559	1.068	.160	3.332	.001
Level of feeling terrified in the pandemic process	5.094	1.238	.213	4.114	.000
Level of feeling depressive due to the coronavirus	2.176	.455	.277	4.782	.000
Level of believing something bad will happen to the infant due to COVID-19	1.018	.433	.116	2.353	.019
Level of being infected with Covid-19	8.429	2.358	.155	3.574	.000
Level of lack of antenatal controls in this pregnancy	6.274	1.570	.172	3.995	.000
R=.692 R^2= .479 F= 45.447 p<0.001					

B: Unstandardized Regression Coefficient; SE: Standard Error; β: Standardized Regression Coefficient

4. Discussion

Increases in pregnancy complications (preeclampsia, preterm birth, low birth weight) are closely related to the stress and anxiety levels of the mother (15,16). Although the effects and complications of COVID-19 infection on pregnancy have been studied rapidly, there was limited knowledge of how pregnant women were affected psychologically during the start of the pandemic (2,8,24-27). A

study on the psychological state of pregnant women in the early stages of COVID-19 in China revealed that the prevalence of perceived stress, depression, and anxiety was high at 89.1%, 18.1%, and 45.9%, respectively (28). A Canadian study on 1,987 pregnant women conducted by Lebel, MacKinnon, Bagshawe, Tomfohr-Madsen, and Giesbrecht, (2020) showed that symptoms of depression and anxiety were 37% and 56.6%, respectively (29). According to our findings, pregnant women experienced high prevalence rates of anxiety, depression, and stress during COVID-19, with respective ratios of 64.8%, 59.9%, and 43.2%, which may indicate the pandemic's severe effects on mental health. Because, a systematic review before the pandemic declared the global incidence of perinatal depression and anxiety as 12% and 22%, respectively (30). This phenomenon suggested that calculating the prevalence of anxiety and depression should be evaluated by taking into account the rates reported in the pre-pandemic pregnant female population. In the light of these results, the prevalence of anxiety and depression in pregnant women has increased significantly after the global spread of COVID-19, and therefore, increased psychological distress which poses a risk to both maternal and infant health.

The global effects of COVID-19 on human psychology vary depending on the individual's social and cultural characteristics, socioeconomic conditions, psychological well-being, and personal characteristics (31,32,33). In the study, in terms of the factors affecting maternal mental status, it was found that mean DASS-21 and IES-R scale scores significantly increased if the participant was divorced, was a high school graduate, had low economic status, and had a chronic disease ($p < 0.05$). Similar to our study, a study performed in India reported that education level, monthly income, being married, and having a history of illness were the factors related to the anxiety level of pregnant women (31). Cao et al. (2020) reported that living in the city rather than the rural areas, living together with a family, and having a stable and regular income as a family was protective factors for individuals during the COVID-19 pandemic (34). Variables such as the inadequacy of basic needs, safety, shelter, food, incomplete or inaccurate information about the process, prolonged quarantine, feeling left out in terms of social support, experiencing financial losses during the pandemic, undergoing the COVID-19 symptoms, or having contact with COVID-19-positive individuals, and fear of themselves or their close ones getting infected make individuals more at risk psychologically during the pandemic (33,35-38). According to the logistic regression model used in the study in parallel with the literature, the best predictor variables for

depression were identified as education level, presence of any chronic disease, knowledge level on COVID-19, probability of being infected, level of avoidance from being infected, level of concern related infant health due to COVID-19, and social support level during COVID-19. In this context, uncertainties about the subject, material and moral (lack of social support, etc.) inadequacies of individuals, negative thoughts, and concerns about their babies cause more psychological effects on individuals.

During the pandemic, pregnant women have anxiety both due to the increased risk of transmission if they go to the hospital and the risk of not obtaining information on their own health and the health of the fetus if they do not visit the hospital (33). Our results showed that although the risk of infection is much higher in the hospital, the majority of pregnant women (77.2%) regularly attended their pregnancy follow-up visits. Moreover, those who did not attend their pregnancy follow-up visits (6.1%) were more psychologically affected than those who did. It can be argued that anxiety regarding fetal health, which we identified as the predictor of depression and anxiety, might be effective in motivating pregnant women to attend their pregnancy follow-up visits. In addition to these concerns, if the pregnancy is unplanned, it is obvious that the psychological effects on the mother will be greater. There are various studies indicating that unplanned or unwanted pregnancy leads to anxiety, depression, and distress (11,12). Our study found that those with unwanted pregnancy had a statistically significantly higher DASS-21 and IES mean scores than those with planned and wanted pregnancy (p<0.005). In addition to the pandemic concerns, it is believed that the woman's unplanned and unwanted pregnancy has increased her concerns about pregnancy and the postpartum period. The COVID-19 outbreak, caused by a new virus, has led to a process dominated by obscurity. In this period, the lack of information about how this virus will affect the pregnant women and their babies and the anxiety of infecting the baby have been considered as factors that can increase the negative mood of the mothers (31,33). Particularly, the psychological status of mothers after contracting COVID-19 is a result that comes to the fore in our study. Ayaz et al. (2020) showed that the depression and anxiety scores were significantly higher in infected pregnant women (39). Similarly, our results revealed that the mean IES-R and DASS-21 scores were significantly higher if the participant was infected with COVID-19. This phenomenon suggested that after pregnant women recovered from this period, the traumatic effect of this period on them continued, and psychologically, they remained in a negative mood.

Intense fear and helplessness as a result of traumatic stress, death or threat of death, serious injury, or threat to the physical integrity of the case itself or those around it cause a serious and often chronic mental disorder called post-traumatic stress disorder in individuals. PTSD has been reported in pregnant women after the Covid-like SARS epidemic in the past (40). This study revealed that there was a strong, positive, and remarkably significant correlation between depression, anxiety, stress, and IES-R mean scores and the overall mean IES-R score. Similar to our study, the results of the study by Zhang and Ma (2020) and Saccone et al. (2020) indicated that pregnant women had a moderate to severe psychological effect during the COVID-19 pandemic with a mean IES score (10,41). Considering this study was performed during the normalization period at the end of the first peak, it can be observed that the mental health of pregnant women will be affected more as the pandemic leads to traumatic effects and experiences. In this context, it is believed that planning the news and briefings regarding the pandemic as accurate, transparent, far from exaggeration, and without causing panic among people might be effective in the positive management of this status.

In our study, the variables predicting the impact of events were identified as sleep problems, feeling terrified, level of COVID-19-related depression, level of anxiety that something bad will happen to the infant due to COVID-19 during the pandemic, level of being infected with Covid-19, level of lack of antenatal controls in this pregnancy, and status of undergoing COVID-19. Previous studies demonstrated that the prevalence of infectious diseases may increase the anxiety, depression, and stress levels among the general population (40). A study performed in Hong Kong during the SARS outbreak found that individuals' mental health deteriorated and they felt high levels of despair, terror, and anxiety. Moreover, post-traumatic signs were observed in some of these individuals (16%) and a significant portion (40%) of these individuals had an increased level of perceived stress in the family or professional environment after the pandemic (40). The global mood became fear and uncertainty. This uncertainty and negative emotions felt for the infant, herself, and her relatives due to the anxiety create an intense strain, and this causes a negative effect on sleep quality (42). Thus, the effects and reflection of the COVID-19 pandemic on pregnant women's current and future mental health must not be overlooked. In line with antenatal care services and taking pandemic conditions into account, it is important to provide psychological support and interventions to pregnant women with timely and appropriate support.

4.1. Limitations

Due to the pandemic, study data were collected through online platforms. The results of the study cannot represent all pregnant women and groups in the society, due to the limitations of online studies and difficulties in accessing uneducated groups with a low socioeconomic level. Another limitation of the study is the inability to adopt an interventional approach or provide guidance for pregnant women with depressive and traumatic stress symptoms based on the findings obtained as a result of the study.

5. Conclusion

The study emphasized the importance of psychological evaluation of pregnant women by drawing attention to the psychological reflections on pregnant women during the pandemic process. Our results revealed that pregnant women experienced moderate anxiety, depression, and traumatic stress during the pandemic process, and especially those who had COVID-19 were more affected by this process. Considering all the findings, it is clear that special additional support is required for pregnant women during epidemic periods. For this purpose, it is obvious that psychological support and counseling services should be provided in the prenatal period and the healthy continuation of antenatal services. In line with the antenatal care services of pregnant women, considering the pandemic conditions, timely and appropriate psychological support and interventions are important for mother and baby health. In particular, nurses should identify and monitor the psychosocial problems of pregnant women related to the pandemic, provide psychosocial support and teach methods of coping with the problems. Birth preparation trainings conducted by midwives/nurses for pregnant women should be disseminated online to contribute to the maintenance of psychological health in emergencies such as the pandemic process, and methods such as tele-health and tele-nursing should be integrated into the health system at the point of making necessary follow-ups and consultations.

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Authorship Contribution:

ÖG: Study design, data collection, data analysis, manuscript writing.

RÖ: Study design, data collection, data analysis, manuscript writing.

OK: Study design, manuscript writing.

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