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Impact of the COVID-19 Pandemic on Anxiety and Depression Levels in Pregnant Women

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Abstract

Objective: Our objectives in this study are to understand the impact of COVID-19 pandemic on mental health during pregnancy and to determine the levels of depression, stress, and anxiety, to evaluate the knowledge, attitudes and behaviors of pregnant women about COVID-19 infection during the pandemic period, to be able to provide evidence-based data to all authorities involved in the prevention of depression and anxiety caused by the COVID-19 pandemic. Our secondary objective is to determine pregnant women's risk and protective factors regarding the levels of anxiety and depression symptoms during the COVID-19 outbreak.

Methods: Beck Anxiety Inventory (BAI) and Beck Depression Inventory (BDI) questionnaires were applied to pregnant women to assess depression and anxiety. The same questionnaire was previously applied to pregnant participants for another study before the pandemic. In addition, the same questionnaire was applied to the pregnant participants during the pandemic process. The questionnaire was applied face-to-face to pregnant women admitted to the hospital, while those who could not come to the hospital were given a link to the electronic version of the questionnaire.

Results: A total of 1,527 participants were included in the study. Participants were divided into two groups as pre-pandemic and pandemic-period. Demographic data were similar, while BMI values were significantly higher in the pandemic group (p:0.002). Gravida values were also significantly higher in the pre-pandemic group. The BAI and BDI scores of the group in the pandemic were 21.50±12.15 and 23.61±11.03, respectively, and the BAI and BDI scores of the pre-pandemic group were 12.70±11.78 and 12.33±9.39, respectively. The BAI and BDI scores were significantly higher in the pandemic-period group than in the pre-pandemic group.

Conclusion: BDI and BAI scores increased in pregnant women during the pandemic. It is possible to improve the psychological conditions of pregnant women and prevent complications by recognizing the psychological conditions of pregnant women, provide information and emotional support, and provide other psychological interventions to help them recover.

Keywords: COVID-19, Pregnancy, Depression, Anxiety, Pandemic

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COVID-19 Pandemisinin Gebelerdeki Anksiyete ve Depresyon Düzeylerine Etkisi

Öz

Amaç: Bu çalışmadaki primer amaçlarımız COVID-19'un gebelikteki ruh sağlığı üzerindeki etkisini anlamak ve depresyon, stres, anksiyete semptomlarının düzeylerini belirlemek, pandemi dönemindeki gebelerin COVID-19 hakkındaki bilgi, tutum ve davranışlarını değerlendirmek, COVID-19'un neden olduğu depresyonun ve anksiyetenin önlenmesine görevli olan tüm yetkililerin kanıta dayalı veriler elde etmesine yardımcı olmaktır. Sekonder amacımız ise gebelerin COVID-19 salgını sırasında depresyon ve anksiyete açısından risk ve koruyucu faktörleri belirlemektir.

Yöntemler: Gebelere depresyon ve anksiyete semptomlarının düzeylerini değerlendirmek için Beck anksiyete skalası (BAI) ile Beck Depresyon skalası (BDI) anketleri uygulandı. Aynı anket, pandemi öncesinde başka bir çalışma için gebe katılımcılara daha önce uygulanmıştı. Ek olarak pandemi sürecinde gebe olan katılımcılara da aynı anket uygulandı. Bu anket hastaneye başvuran gebelere yüz-yüze uygulanırken, hastaneye gelemeyenlere anketin elektronik versiyonuna bir bağlantı sağlandı. Hastaların demografik verileri, anket skorları birbiri ile karşılaştırıldı.

Bulgular: Çalışmaya toplam 1527 katılımcı dahil edildi. Katılımcılar pandemiden önce ve pandemi sürecinde olmak üzere 2 gruba ayrıldı. Katılımcıların yaş, meslek dağılımları, eğitim durumları ve aylık gelirleri benzer bulunurken (sırasıyla p: 0.957, p: 0.981, p: 0.764, p: 0.957), BMI değerleri pandemi sürecindeki grupta anlamlı daha yüksekti (p: 0.002). Gravida değerleri de pandemi öncesindeki grupta anlamlı olarak daha yüksekti (<0.001). Pandemi sürecindeki grubun BAI ile BDI ölçekleri sırasıyla 21.50 ± 12.15 ve 23.61 ± 11.03, pandemi öncesi grubun BAI ve BDI skorları sırasıyla 12.70± 11.78 ve 12.33± 9.39 idi. BAI ve BDI skorları pandemi sürecindeki grupta pandemi öncesi gruba göre anlamlı olarak daha yüksekti (sırasıyla p<0.001 ve p<0.001).

Sonuç: Pandemi sürecindeki gebelerde BDI ve BAI skorlarının arttığı bulundu. Gebelerin psikolojik durumlarını iyileştirmek, gebelerin psikolojik durumlarını tanıyarak komplikasyonları önlemek, bilgi ve duygusal destek sağlamak ve diğer psikolojik müdahaleleri sağlamak ve iyileşmesine yardımcı olmak mümkündür.

Anahtar kelimeler: COVID-19, Gebelik, Depresyon, Anksiyete, Pandemi.

INTRODUCTION

The coronavirus disease (COVID-19) first appeared in Wuhan City, Hubei Province, China, in 2019. Covid-19 was detected at the end of December 2019[1] and spread to all regions of China by January 30, 2020. The World Health Organization (WHO) then declared the COVID-19 epidemic a global emergency that threatened international public health[2] and declared the COVID-19 pandemic a pandemic on March 11, 2020[3]. Approximately 2,778,619 deaths and 126,890,643 confirmed cases of COVID-19 have been reported worldwide[4]. A total of 3,240,577 cases of COVID-19 were seen in Turkey, while 31,230 deaths were reported[5]. Every day, news about COVID-19, the new number of cases, and new restrictions and measures to control the disease are announced in the world press. This situation affects all countries in terms of health and psychologically and economically. Quarantine measures and curfews affect people psychologically and impact unemployment, forcing many businesses to close.

Pregnancy is an important process in which psychological distress leads to negative consequences for both mother and fetus. During epidemic periods, women are more prone to anxiety and depression than men[6,7], and therefore pregnant women may be affected more by the COVID-19 pandemic. Social distancing recommended by governments worldwide can be especially difficult in pregnancy because social support has a well-known role in buffering the negative effects of stress[8,9]. The studies on the psychological effects of the SARS outbreak on pregnant women in 2003 showed that their mental health was affected and they experienced high levels of anxiety and anxiety of infection[10]. Moreover, it has been reported that new and threatening daily and hourly reports on the pandemic and its uncertainty create a psychological burden on

pregnant women and increase their anxiety levels[10,11]. Psychological care of pregnant women should not be neglected, as these psychological effects during pregnancy can cause damage to both the mother and the fetus because the symptoms of anxiety and depression if highly and continuously exposed during pregnancy can cause an increase postpartum infection[11], abortus, preterm birth, low birth weight fetus, low Apgar scores, preeclampsia, and cesarean delivery rates[12]. It can also cause delayed neuropsychiatric development in children born to these mothers[13].

As a result, given the effects of psychological disorders during pregnancy on the mother and fetus, improving the mental state of pregnant women exposed to stress and anxiety, correcting the factors that can cause this mental burden and preventing complications that may occur in this way, informing pregnant women in detail and providing them with emotional support can help them recover and feel safe. Therefore, our primary objectives in this study are: 1) to understand the impact of COVID-19 pandemic on mental health during pregnancy and to determine the depression, stress, and anxiety levels, 2) to evaluate the knowledge, attitudes and behaviors of pregnant women about COVID-19 infection during the pandemic period, 3) To be able to provide evidence-based data to all authorities involved in the prevention of depression and anxiety caused by the COVID-19 pandemic. Our secondary objective is to determine pregnant women's risk and protective factors in terms of depression and anxiety symptoms during the COVID-19 outbreak.

METHOD

Study Design

The Beck Anxiety Inventory (BAI) and Beck Depression Inventory (BDI) were applied to participants who applied to the pregnancy outpatient clinic at Gazi University Faculty of Medicine between November 2020 and March 2021 and volunteered to participate in the study.

In the pre-pandemic group, which was the control group, the data of another study that was prepared for another scientific study before the pandemic but was not published were used. In the interviews conducted before the pandemic, the questionnaires of all participants were filled with the face-to-face interviews with a doctor, respecting their privacy.

A request to participate in the study was posted on the social media groups to create the study group and a link was given to the electronic version of the questionnaire. Pregnant participants who volunteered to participate in this online questionnaire and pregnant participants who applied to our clinic during the pandemic period were included in the study group. Although the face-to-face interviews could not be made with online participants, face-to-face interviews were held in patients who applied to our clinic.

Informed consent from all participants (written from those who came to the hospital, verbal consent from those who filled out the online questionnaires) and approval from the ethics committee of our hospital (ethics committee no: 2020/ 677) were obtained. In addition, the local institutional administration board approved the study (No: 2020-10-05T19_24_21).

A 3-part questionnaire was applied to the pre-pandemic group. The first part consisted of demographic information, the second part consisted of BDI and the third part consisted of BAI. The pandemic-period group was given a questionnaire consisting of 4 sections. The first part consisted of demographic information the second part consisted of a mini-survey with four questions about COVID-19 and the psychological impact of COVID-19[14], the third

part consisted of BDI and the fourth part consisted of BAI.

Participants

Pregnant women who were between the ages of 18-45 who were willing to participate in the questionnaire, and who could read and write Turkish, regardless of their gestational weeks, were included in the study. The participants who had systemic disease or psychiatric illness, who used psychiatric drugs, (mental examinations could not be performed to online and face-to-face participants, and also, patient statements were taken as the basis when questioning the diagnoses of participants with psychiatric diseases and who were using psychiatric drugs), who had chromosomal anomalies or major anomalies in their fetuses, participants whose birth had started, who were suspected of birth or hospitalized for any obstetric causes, those with hyperemesis gravidarum and multiple pregnancies were excluded from the study. In addition, participants who are currently positive for COVID-19, who tested positive for COVID-19, or who lived with someone suspected of having COVID-19 were not included in the evaluation during the pandemic.

The demographic data of all participants such as age, gravity, parity, body-mass index (BMI) were recorded. In addition, the educational status, occupational groups and income levels of all participants were recorded. The official minimum wage (approximately $386, [As of April 2021, $1 was TL8.36]) was used to distinguish between low (less than the minimum wage), medium (minimum wage-TL5000), and high income (more than TL5000). The demographic data, BAI, and BDI scores of pregnant women before and during the pandemic were compared. The demographic data, BAI, and BDI scores of pregnant women before and during the pandemic were compared. Additionally, the effects of the demographic data of patients in the pandemic group on anxiety and depression levels were compared.

Mini-survey on COVID-19

Participants completed a questionnaire assessing the impact of the COVID-19 pandemic on their pregnancies, the level of knowledge of pregnant women about COVID-19, the psychological impact of COVID-19, and the effects of social isolation. This survey used the mini-survey used by Durankuş et al[14]. A total of 4 items were included in the survey: item 1 was "Do you think the COVID-19 pandemic can affect your pregnancy process? It was a (Yes/No) question; "no" with "0" point, and "yes" with "1" point. Item 2 is "Define your level of knowledge of the COVID-19 pandemic by giving a score between 0 and 10 ("0" "I have no idea", "10" "I have full knowledge about it")." Item 3 was "Indicate the effect of the COVID-19 pandemic on your psychological health by giving a score between 0 and 10 (0=none, 10=definitely)". Item 4 was "Indicate the effect of pandemic-related social isolation on your psychological health by giving a score between 0 and 10 (0 =none, 10=definitely)".

The Beck Depression Inventory (BDI)

The Beck Depression Inventory was developed to measure the risk of depression, the level of depressive symptoms, and the change in severity in adults. It was adopted to Turkish by Hisli and the limit value of the scale was determined as 17[15]. The BDI consists of a total of 21 items. Patients rate each symptom on the four-point Likert scale, which increases in severity from 0 ("no") to 3 ("severe"). The total score is an arithmetic sum of ratings between 0 and 63 across all[21] symptoms scored on the scale. As stated in the literature, according to the scores obtained from the responses of the patients, <10 points were classified as normal, 10-16 points as mild mental distress, 17-20 points as borderline clinical depression, 21-30 points as moderate depression, 31-40 as severe

depression, >41 points as very severe depression[16]. The first 13 items were associated with affective symptoms and the last eight items with somatic symptoms.

The Beck Anxiety Inventory (BAI)

The BAI is the scale of self-evaluation developed by Beck et al.[17] that assesses the severity of clinical anxiety symptoms experienced by individuals in the previous month. It is a Likert-type scale consisting of 21 items, scored between 0-3. The total score is an arithmetic sum of ratings between 0 and 63 across all[21] symptoms scored on the scale. A high global score indicates considerable concern. The questionnaire was adapted to Turkish by Ulusoy et al[18]. Scores obtained from the responses of the patients were classified as follows; <10 points, normal; 10-18 points, mild anxiety; 19-29 points, moderate anxiety; 30-63 points, severe anxiety[19].

Statistical Evaluation

The distribution of the data was evaluated by the Kolmogorov-Smirnov test. In addition to descriptive statistical methods (mean, standard deviation) in the evaluation of normally distributed data, an independent samples t-test was used in the comparison of binary groups and One Way ANOVA test was used in the analysis of groups three and above. The inter-group analysis of categorical/discrete variables was done by Chi-square test. The Statistical Package for Social Sciences 26.0 (SPSS Inc.; Chicago, IL, USA) software was used for the statistical analysis of the study. The results were evaluated at a significance level of $p<0.05$.

Power analysis and Sample size

Based on the mean (mean=3.79) and standard deviation value (SD=3.17) in the DASS-21 anxiety subscale that was used in the study conducted by Effati-Daryani F. et al. in 2020 to determine the status of depression, stress, anxiety, and their predictors in pregnant women during the COVID-19 epidemic, in the present study, it was determined that there may be a difference of at least 10% between the values of the COVID-19 patient group and the control group, with an effect size of α error = 0.05, 1-ß error (power) = 0.8 and d = 0.112, the calculated sampling size was 494 people 20. In this context, it was determined that at least 247 people were sufficient for the patient and control group, and a sampling consisting of at least 300 per group was selected, taking into account the social differences (20%). G Power Statistics Program version 3.1.9.4 (Universität Düsseldorf, Germany) was used for the analyzes[21]. Cronbach's alpha or internal consistency reliability coefficients for mini-survey was 0.812, for BAI was 0.933, for BDI was 0.890.

RESULTS

A total of 1463 people were contacted with the online questionnaires, and a total of 465 people who applied to our hospital were contacted. Among these patients, a total of 1.560 pregnant women completed all the questionnaires. The participants were divided into two groups as pre-pandemic and pandemic-period. The BAI and BDI questionnaires were applied to 321 participants before the pandemic. A total of 12 patients were excluded from the study since 3 of them had multiple pregnancies, 5 had psychiatric diseases, and 4 had chromosomal anomalies, and 309 were included in the pre-pandemic group. A total of 1.239 patients participated in the pandemic group. Eight participants had suspected COVID contact, 4 had COVID positive, 3 had chromosomal anomaly in their fetuses, 3 had major anomaly in their fetuses, and 3 had multiple pregnancies, and were excluded from the study. A total of 1.218 patients were included in the pandemic group. As a result, a total of 1527 patients, 1218 in the pandemic period and 309 in the pre-pandemic period, were included in the study.

Table-1 lists demographic data for both groups. Participants' age, occupational distribution,

educational status, and monthly income were similar (p:0.957, p:0.981, p:0.764, p:0.957, respectively), while BMI values were significantly higher in the pandemic group (p:0.002). The gestational week in which the survey was conducted was 35.71±4.31 in the pre-pandemic group, while it was 21.49±10.01 in the pandemic group, and these week-related values were significantly higher in the pre-pandemic group (p<0.001). Gravida values were also significantly higher in the pre-pandemic group (<0.001).

Table I: Comparison of the Demographic Data of the Pre-Pandemic Group and the Pandemic Group

		Pre-pandemic group (n=309)	**Pandemic Group(n=1218)**	**P-value**
Age (years) (mean±SD)		29.61±6.27	29.63 ± 4.74	0.957*
BMI (kg/m^2) (mean±SD)		24.50 ± 10.76	27.01± 12.96	**0.002***
Gestational week (mean± SD)		35.71± 4.31	21.49 ±10.01	**<0.001***
(n,%)	1st trimester	3 (0.9)	379 (31.1)	**<0.001****
	2nd trimester	24 (7.7)	487 (40)	
	28-32 weeks	41 (13.3)	111 (9.1)	
	32-36 weeks	50 (16.2)	87 (7.1)	
	>36 weeks	191 (61.8)	154 (12.6)	
Gravida (mean±SD)		2.38 ± 1.56	1.87 ± 1.12	**<0.001***
Parity (n,%)	Nulliparous	122 (39.5)	586 (48.1)	**0.004**[a]**
	Multiparous	187 (60.5)	632 (51.9)	
Profession (n,%)	Housewife	146 (47.2)	567 (46.6)	0.981**
	Civil servant	115 (37.2)	474 (38.9)	
	Worker	34 (11)	128 (10.5)	
	Part-time employee	6 (1.9)	21 (1.7)	
	Employer/business owner	8 (2.6)	28 (2.3)	
Education status (n,%)	None	0 (0)	3 (0.2)	0.764**
	Primary	11 (3.6)	44 (3.6)	
	Secondary	38 (12.3)	126 (10.3)	
	High	68 (22.0)	269 (22.1)	
	Associate degree	32 (10.4)	114 (9.4)	
	University	105 (34)	396 (32.5)	
	Master's degree	28 (9.1)	144 (11.8)	
	Doctorate	27 (8.7)	122 (10)	
Monthly income (n,%)	Low (Less than minimum wage)	14 (4.5)	51 (4.2)	0.957**
	Minimum wage	60 (19.4)	256 (21)	
	Medium (Minimum wage-5000 TL)	86 (27.8)	326 (26.9)	
	High (more than 5000 TL)	149 (8.2)	585 (48.3)	

BMI: body mass index,SD: standard deviation
**T-test in independent groups*
*** Chi-Square Test (a Fisher's Exact Test)*

In Table-2, the BAI and BDI scores of both groups are compared. The BAI and BDI scores of the group in the pandemic group were 21.50±12.15 and 23.61±11.03, respectively, and the BAI and BDI scores of the pre-pandemic group were 12.70±11.78 and 12.33±9.39, respectively. The BAI and BDI scores were significantly higher in

the pandemic-period group than in the pre-pandemic group (p<0.001 and p<0.001, respectively). In addition, the total score of the 4-item questionnaire, which evaluated the pregnant women's level of knowledge about COVID-19, the psychological impact of COVID-19, and the effects of social isolation, was 22.47±6.70 (min:0 - max:31). 82.1% of the participants thought that the COVID-19 pandemic affected the duration of pregnancy. Besides, their level of knowledge about the COVID-19 pandemic was 7.31±2.28, the impact score of the COVID-19 pandemic on their psychological health was 7.33±3.0, and the impact score of pandemic-related social isolation on their psychological health was 7.08±3.13.

Table II: Comparison of the Pandemic Group's BAI and BDI scores of COVID-19 knowledge level, Psychological Impact of COVID-19, and Effects of Social Isolation

			Pandemic group (n=1218) (mean±SD)	Pre-pandemic group (n=309) (mean± SD)	P-value
A. Pregnant women's level of knowledge about COVID-19. Psychological impact of COVID-19 and effects of social isolation			22.47 ±6.70	N/A	N/A
A1. Do you think the COVID-19 pandemic affects your pregnancy process (n,%)	**Yes (1 point)**	**N:1001 (82.1)**	0.82 ± 0.38	N/A	N/A
	No (0 point)	**N: 217 (17.8)**			
A2. The level of knowledge you have regarding the COVID-19 pandemic (0-10 points)			7.31±2.28	N/A	N/A
A3. Do you think the COVID-19 pandemic has affected your psychological health? (0-10 points)			7.33±3.06		
A4. Do you think that pandemic-related social isolation has affected your psychological health? (0-10 points)			7.08 ± 3.13		
Beck anxiety inventory			21.50 ± 12.15	12.70± 11.78	**<0.001***
Beck depression inventory			23.61 ± 11.03	12.33± 9.39	**<0.001***

**T test in independent groups*
BAI: Beck Anxiety InventoryBDI: Beck Depression Inventory, SD: standard deviation

In Table-3, the relations between the demographic data of the group in the pandemic process and BAI and BDI anxiety levels were evaluated. The BAI and BDI scores according to age were not significant in age<30 and age≥30 age groups ((p=0.747 and p=0.086, respectively). The BAI and BDI scores according to BMI were BMI <30 kg/m2 and BMI≥30 kg/m2 and were not significant (p=0.634 and p=0.318, respectively). It was also determined that the parity numbers did not significantly affect the BAI and BDI scores (p>0.05). The BAI scores were at the highest levels in employers/workplace owners, and lowest in part-time employees. It was found that BDI scores were the highest in housewives and part-time workers, and the lowest in workers and employers/business owners (p=0.663 and p=0.210, respectively); however, the results were not statistically significant. It was found that the BAI scores were at the lowest levels in those who did not have any education level, the scores increased as the educational levels increased (up to high school), and the BAI and BDI scores were generally at the highest levels in those who had doctorate education, but the results were not significant (p=0.330 and p=0.959, respectively). It was also determined that the BAI and BDI scores of those with a monthly income of minimum wage and below were generally higher, and the low scores of the high-income group did not cause any

significance (p=0.539 and p=0.127, respectively). The BAI and BDI scores were generally at the highest levels in those with 1st trimester pregnancy, but the differences were not statistically significant (p=0.172 and p=0.144, respectively).

Table III: The Relationship between the Demographic Data of the Pandemic Group and their BAI and BDI Scores

	BAI **N: 1218**	**p-value**	***BDI*** **N: 1218**	**p-value**
Age (mean±SD)				
<30 (n=592)	21.62 ± 12.76	0.747*	24.17 ± 11.31	0.086*
≥30 (n=626)	21.39 ± 11.76		23.09 ± 10.73	
BMI (kg/m²) (mean± SD)				
<30 (n=962)	21.59 ± 12.47	0.634*	23.46 ± 10.92	0.318*
≥30 (n=254)	21.18 ± 11.42		24.24 ± 11.43	
Parity (mean±SD)				
Nullipar(n=586)	21.91 ± 12.40	0.265*	23.92 ± 11.47	0.348*
Multipar (n=632)	21.12 ± 12.11		23.33 ± 10.60	
Profession				
Housewife (n=567)	21.68 ± 12.62	0.663**	24.18 ± 11.24	0.210**
Civil servant (n=474)	21.28 ± 11.47		23.48 ± 11.06	
Worker (n=128)	21.49 ± 13.43		21.86 ± 10.44	
Employer/business owner (n=28)	23.85 ± 13.51		21.67 ± 8.72	
Part-time employee (n=21)	18.71 ± 9.94		24.61 ± 10.03	
Education status				
None (n=3)	17.00 ± 9.64	0.330**	18.66 ± 7.37	0.959**
Primary (n=44)	20.75 ± 12.23		23.97 ± 12.27	
Secondary (n=126)	22.79 ± 13.97		23.38 ±10.95	
High (n=269)	22.17 ± 13.23		23.84 ± 11.01	
Associate degree (n=114)	19.94 ± 11.27		23.42 ± 12.39	
University (n=396)	21.31 ± 11.48		23.66 ± 10.25	
Master's degree (n=144)	20.09 ± 10.82		22.85 ± 11.16	
Doctorate (n=122)	22.81 ± 12.98		24.30 ± 11.84	
Monthly income				
Low (n=51)	22.54 ± 14.12	0.539**	23.11 ± 10.65	0.127**
Minimum wage (n=250)	22.23 ± 12.68		24.73 ± 11.44	
Medium (n=326)	21.71 ± 12.67		24.17 ± 10.94	
High (n=585)	21.04 ± 11.63		22.93 ± 10.91	
Gestational week				
1.trimester	22.20 ± 12.16	0.172**	24.65 ± 11.70	0.144**
2.trimester	21.85 ± 12.41		23.23 ± 10.43	
28-32 weeks	19.50 ± 12.11		22.72 ± 10.82	
32-36 weeks	19.86 ± 11.49		21.90 ± 10.47	
>36 weeks	21.04 ± 12.37		23.88 ± 11.47	

BAI: Beck Anxiety Inventory, BDI: Beck Depression Inventory, BMI: body mass index, SD: standard deviation
** Independent samples T Test*
*** One Way ANOVA test (Post hoc:aBonferroni)*

DISCUSSION

This study evaluated two cohorts of pregnant women from the general population using the same scales, one during the COVID-19 pandemic and the other before the COVID-19 pandemic. Both scales that were used in this study allow us to have information on the level of anxiety or depression symptoms. As a result of the study conducted during the COVID-19 pandemic, the BAI scores and BDI scores of the pandemic-period pregnant women were found to be higher than pre-pandemic pregnant women, as expected. When the BAI and BDI scores were evaluated with different sociodemographic variables, sociodemographic factors did not affect these scores.

Previous research in the literature has shown that global pandemics and natural disasters have an important psychosocial effect on humans[22]. Anxiety and fear about their own health or the health of their loved ones are the typical responses of individuals to a global pandemic. Anger, frustration, and boredom are the most frequent feelings in society due to uncertainty about when life will return to "normal". In such cases with over-stress and increased loneliness, some people may experience depression or post-traumatic stress disorder symptoms. Initial reports from pregnant cohorts worldwide reported high symptoms of depression and anxiety in pregnant women during the COVID-19 pandemic[23]. The first warnings about the psychological health of pregnant women came from Iran[24], one of the countries affected most by the pandemic, and the same study underlined the need for psychological support for pregnant women during the COVID-19 pandemic. Depression is a common complication during normal pregnancy and in the postpartum process[25], and the WHO has stated this rate as 10%. This condition occurs at a higher prevalence in developing countries and reaches 15.6% in pregnancy and 19.8% in the postpartum period[14]. According to the questionnaires used in this study, the BDI and BAI scores were found to be very high in pregnant women during the pandemic. In addition, 82.1% of the pregnant women in the pandemic reported that the COVID-19 pandemic affected their pregnancy progression. Moreover, the ratings for the effects of psychological and social isolation of the COVID-19 pandemic were found to be quite high.

A study evaluating depression and anxiety symptoms' levels in the COVID-19 pandemic using two separate groups as pre-pandemic and pandemic groups reported that pregnant women during the COVID-19 pandemic had higher levels of stress, anxiety, and depression than pre-COVID-19 pregnant women[26]. This result was similar to the results of our study. Similarly, in another study conducted by Durankus et al., reported that more than one-third of the pregnant women had above-the-normal BAI and BDI scores during the COVID 19 pandemic 14, which was also consistent with the findings of our study.

In a study conducted by Lee et al during the SARS outbreak in 2006, the anxiety symptoms' levels of pregnant women in the pre-SARS and during-SARS period were compared, and the anxiety symptoms' levels of pregnant women during the SARS outbreak were found to be slightly higher, while there was not a significant difference between the depression symptoms' levels of the two groups[27]. In the study conducted by Lee et al., the reason why the BAI or BDI scores of pregnant women were found to be as high as expected during the SARS outbreak is probably that the SARS epidemic did not spread worldwide as much as the COVID-19 pandemic, did not last as long as the COVID-19 pandemic, and its economic and psychological consequences were not as devastating as the COVID-19 pandemic. It is known that psychological issues, exposure to high stress, high levels of depression and anxiety are seen in

pregnant women not only during epidemics/pandemics but also after natural disasters or situations that cause great stress until now[28].

In a study on the general population[29], there was a statistically significant and reverse relation between the educational levels and depression, anxiety, and symptoms' levels. The levels of depression, anxiety, and stress symptoms' levels decreased as the level of education increased. However, the results were inconsistent with the results of our study. Although not significant, it was found that the BAI and BDI scores were at the lowest levels in those with no educational levels, and as the educational levels increased, so did the scores (up to high school), and were generally at the highest levels in those with doctorate levels. In the study conducted by Effati-Daryani et al., a significant relationship was found between spouse's job and BDI scores[20]. According to the results of the study, the BDI scores were higher in women whose spouses owned their working places compared to those with employee spouses. It was reported in the study of Salmalian et al. that there was a significant relationship between spouse's job and prenatal and postpartum BDI scores. BDI scores were higher in women whose spouses had lower-paid jobs[30]. In our study, although the occupational group of the spouses was not looked at, the effect of the pregnant women's own occupations and the average income of the family on BDI and BAI scores were evaluated. The differences in occupational, income, and educational levels were not significant in determining the BDI and BAI scores of the pandemic group. The COVID-19 pandemic has become a global health problem, and since there are many transfers of information about COVID-19-related news, the number of cases, vaccination or precautions in all countries every day, all people at all levels of education, in every professional group and with different incomes have had an almost optimal level of knowledge. Probably, for this reason, we found no significant difference between sociodemographic differences and BDI and BAI scores.

In the study conducted by Effati-Daryani et al., the BAI scores of women with a first and second pregnancy were found to be significantly lower than those with a third or later pregnancy. In the study conducted by Dunkel Schetter et al., it was found that women with first pregnancy have high BAI scores[20]. In our study, BAI and BDI scores of pregnant women were not found to be associated with the number of parity, and trimester. This may be because they are more informed when they contact health institutions during the COVID-19 pandemic, or they themselves have easier access to information through mass media such as smartphones, social media, the internet, and so on.

A study conducted between June and July 2020 found a high BDI scores rate of 57% due to the pandemic[31], which was even higher than previously reported studies on the COVID-19 pandemic (March-April 2020) (between 25% and 37%)[32]. BAI and BDI scores were found to be higher in our study than in previous studies, probably because it could not be conducted in a later period. Therefore, as the COVID-19 pandemic drags on, there is a strong need for urgent and continuous mental health support for pregnant women. As the pandemic and social distancing measures continue, we estimate that pregnant women will be subjected to intense anxiety and depression. Previous studies conducted during other epidemic periods also show that a longer period of quarantine is associated with more severe psychological distress[33].

This study has important clinical implications. First, this research highlights that pregnant women need more psychological and social support. As the pandemic period lengthens, the levels of anxiety and depression symptoms

continue to increase in pregnant women. In addition, according to the results of the mini-survey we applied, most pregnant women suffered from secondary findings of COVID-19 (the effect of COVID-19 pandemic on psychological health, the effect of social isolation on psychological health), and psychological effects were probably linked to these secondary findings. Secondly, the need for this social and psychological support needs to be recognized and supported by healthcare professionals. Therefore, it is an urgent need to raise the awareness of clinicians for high levels of anxiety and depression, to provide appropriate training to healthcare professionals (primary care physicians, midwives and obstetricians) to assess perinatal depression and anxiety and to raise awareness about the provision of social support for pregnant women. Additionally, one of the strengths of this study is that the pandemic population is also the pre-pandemic population. In this way, the difference between the two periods can be better understood. In addition our study shows the effects of the COVID-19 pandemic on the depression and anxiety levels of pregnant women. Because a pregnant woman's response to the pandemic and her coping skills are inevitably affected by multiple psychological and social factors. More data is urgently needed to provide detailed information and psychological support to pregnant women. Our results highlight the need to provide urgent psychosocial support to the pregnant population during this crisis. Otherwise, adverse events may occur during pregnancy and therefore affect the well-being of both the mother and the fetus. Therefore, the results of our study can be used to improve the ability of pregnant women to cope with mental distress and to cope with the long-term mental health effects of the COVID-19 pandemic. We believe that our study will make a serious contribution to the literature in this way. In addition, we believe that this study will enable health authorities to realize that pregnant women need good counseling so that they can cope with the mental burdens of the pandemic process more easily.

There are some limitations to this study. First, the surveys applied to a part of the pandemic group were conducted using online surveys considering the health and safety regulations. Although this makes it safer and allows us to reach a wider participant population, clinical outcomes could have been different if the surveys had been conducted face-to-face. Because it is important to conduct mental interviews during the diagnosis process of mental diseases, and no mental interviews were conducted with the participants in our study. Secondly, we were unable to distinguish whether depression, which is already a pregnancy complication, was caused by the epidemic or was pregnancy-related. However, we tried to strengthen this weak point by using a pre-pandemic control group. We also excluded conditions such as known psychiatric disorders or fetal anomaly and chromosome disorder, which increase the levels of anxiety and depression symptoms for this reason. Third, an average of 30% of the participants in the study were university graduates and participants had high levels of education. Therefore, the awareness of accessing health services and a high level of knowledge may have influenced these results. In addition, there was a significant difference between the gestational weeks of the pandemic group and the pre-pandemic group. The levels of anxiety and depression symptoms may vary towards the end of pregnancy or early on the pregnancy. Our results may also have been affected by this. However, to clarify this situation better, we examined BAI and BDI scores of the pandemic group in all trimesters within themselves but found no significant difference.

Further studies are still needed to understand whether pregnant women with lower incomes,

lower education levels, or struggling with higher socioeconomic burdens, or pregnant women living in areas where the risk of COVID-19 varies experience more levels of anxiety and depression symptoms.

CONCLUSION

It was found that BDI and BAI scores increased in pregnant women during the pandemic. Given the potential negative psychological sequelae of psychological, health, and financial uncertainty along with social isolation, there is an urgent need to determine the prevalence of psychological distress among pregnant women during this pandemic and to identify protective factors so that targeted interventions can be applied quickly. Social support can alleviate the symptoms of anxiety and depression in pregnant women. To improve the psychological conditions of pregnant women, who are a special group of patients and need to be approached with caution, understanding their psychological situation, preventing complications resulting from this condition, and providing information and emotional support can help their recovery.

Finally, the present study will provide more data on the effects of COVID-19 on pregnant women and help guide the development of preventive measures and interventions to improve maternal mental health in emergencies.

Ethics Committee Approval: Informed consent from all participants (written from those who came to the hospital, verbal consent from those who filled out the online questionnaires) and approval from the ethics committee of our hospital (ethics committee no: 2020/ 677) were obtained. In addition, the local institutional administration board approved the study (No: 2020-10-05T19_24_21).

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