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ORIGINAL ARTICLE

Effect of the COVID-19 pandemic on anxiety and depression in pregnant women

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ABSTRACT

Objective: To examine the effect of COVID-19, which caused the pandemic, on anxiety and depression in pregnant women.

Material and Methods: We analyzed the changes in the anxiety and depression levels of pregnant women before and after the declaration of COVID-19 as a pandemic, using the Beck Depression Inventory II (BDI-II) and Beck Anxiety Inventory (BAI), which was administered to pregnant women before the oral glucose tolerance test for another study. We compared the BDI-II and BAI scores before and after the pandemic with paired sample t-test in the same pregnant women.

Results: According to the Kolmogorov–Smirnov test applied to all groups before and after the pandemic, the variables age, gravida, body mass index, number of living children, education level, and gestational diabetes status were in accordance with the normal distribution. When the results of the BDI-II and BAI before and after the pandemic were compared, we found that both anxiety and depression scores increased statistically with the pandemic ($p \leq 0.05$).

Conclusion: The COVID-19 pandemic not only affects the people physically but also affects pregnant women psychologically.

Keywords: Anxiety, COVID-19, depression, pandemics, pregnancy.

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INTRODUCTION

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which was first detected in Wuhan, China, spread rapidly throughout the world.[1] On March 11, 2020, the World Health Organization (WHO) declared the coronavirus infection as a pandemic.[2] SARS-CoV-2 affects pregnant women as well.[3] At the time of writing this article, there were 218,946,836 confirmed cases of COVID-19 in the world and a related death count of 4,539,723.[4]

A pandemic may create stress, anxiety, and depression.[5] Anxiety results from stress. Depression and anxiety may occur more easily in pregnant women due to physical and mental changes. The measures taken to reduce the spread of the coronavirus resulted in negative psychological effects.[6] In pregnant women, the prevalence of anxiety/depression disorder is reported to be about 25%.[7]

In pregnancy, depression and anxiety carry the risk of miscarriage, preterm birth, low birth weight, low Apgar score, and fetal death.[8] While many studies have investigated the physical effects of the COVID-19 pandemic on pregnant women, our study focused on its psychological impact. In the present study, we included the same pregnant women, which was both our advantage and disadvantage. The advantage was we could compare the data of the same patients before and after the declaration of the pandemic. The disadvantage was that the gestational weeks were advancing.

MATERIAL AND METHODS

Research permission (23618724-799) was obtained from the Kanuni Training and Research Hospital for this study. Ethical permission certificate numbered 2021/39 was obtained from the Clinical Research Ethics Committee of Kanuni Training and Research Hospital to carry out the study.

We repeated the questionnaires between June 1, 2020, and July 15, 2020, due to the COVID-19 pandemic within one week before delivery to the patients we surveyed with the Beck Depression Inventory II (BDI-II) and Beck Anxiety Inventory (BAI) scales before performing the oral glucose tolerance test at 24–28 weeks of gestation in February 2020.

The first SARS-CoV-2 case was declared on March 11, 2020, by the Ministry of Health in Turkey. Just before this announcement, we assessed the data of about 250 patients. Afterward, we repeated the BDI-II and BAI scales with 150 of these patients before delivery. The patients were the second trimester pregnant women who were surveyed with BDI-II and BAI before the COVID-19 pandemic.

The age, number of pregnancies, number of living children, diabetes status, body mass index (BMI), previous delivery type, and education level of the patients were recorded. The BDI and BAI scales, which were performed in the second trimester of pregnancy, with the prenatal scales of the same pregnant women were compared.

The WHO classification for BMI was used (Table 1).[9] The BDI and BAI scales, which are widely used for the classification of anxiety and depression, were used in in our study.[10] BDI was developed and revised in 1996 by Beck to distinguish depressive patients from other psychiatric patients. It consisted of 21 questions with 4 different answers, 0 (no symptoms) to 3 (symptoms are very intense).[11] BAI is a self-assessment scale consisting of 21 questions, ranging from 0 (no symptoms) to 3 (symptoms are very intense), which is used to determine a person's physical and cognitive anxiety level for the past week.[12] Higher scores of BDI and BAI indicate higher levels of depression and anxiety, respectively. After the BDI-II scores were determined, we used Kapci et al.'s[13] classification under the validity of the Turkish version (Table 2). Similarly, after calculating the BAI scale scores, we used Ulusoy et al.'s[12] classification under their Turkish validity (Table 3).

Table 1: World Health Organization classification of body mass index

BMI	Weight status
<18.5	Underweight
18.5–24.9	Normal
25.0–29.9	Overweight
30.0 and above	Obese

Table 2: Beck Depression Inventory II classification

Score	Depression status
0–13	Normal
14–19	Mild
20–28	Moderate
29–63	Severe

Table 3: Beck Anxiety Inventory classification

Score	Depression status
0–7	Normal
8–15	Mild
16–25	Moderate
26–63	Severe

Statistical analysis was performed using IBM SPSS Statistics for Windows, version 23.0. A p-value below 0.05 was accepted as significant. The age, gravida, BMI, number of living children, education level, previous birth history, gestational diabetes status, BDI-II scores, and BAI scores were analyzed by the Kolmogorov–Smirnov test for conformity to normal distribution. BAI and BDI-II scores were analyzed according to age, gravida, BMI, and number of living children using the analysis of variance (ANOVA) test. BAI and BDI-II scores were analyzed according to education level, previous birth history, and gestational diabetes status using the Chi-squared test. Statistical analyses of BDI-II and BAI scales were performed before and during the pandemic using paired sample t-test.

Table 4: Demographic characteristics of the participants (n=150)

	Minimum	Maximum	Mean	
Age (years)	18	43	29.9±6.5	
Gravida	1	7	3.4±1.5	
Number of children of the patients	0	5	2.9±1.6	
	BMI			
	Underweight	Normal Weight	Overweight	Obese
	26 (17.3%)	54 (36%)	53 (35.3%)	17 (11.3%)
	Diabetes status (n=150)			
	Normal	Regulated by diet	Regulated by insulin	
	102 (68%)	39 (26%)	9 (6%)	
	Previous birth history (n=150)			
	Vaginal delivery	Cesarean section		
	78 (52%)	72 (48%)		
	Education level (n=150)			
	Primary school	Secondary school	High school	
	29 (19.3%)	84 (56%)	37 (24.6%)	

BMI: Body mass index.

Table 5: Classification according to BDI-II and BAI results

	Before the pandemic BDI-II		After the pandemic BDI-II		Before the pandemic BAI		After the pandemic BAI	
Classification	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Normal	50	33.3	14	9.3	60	40	15	10
Mild	54	36	47	31.3	55	36.6	47	31.3
Moderate	34	22.6	52	34.6	20	13.3	54	36
Severe	12	8	37	24.6	15	10	34	22.6
Total	150		150		150		150	
p		**0.001**				**0.001**		

BDI-II: Beck Depression Inventory II; BAI: Beck Anxiety Inventory.

RESULTS

There were 150 patients included in the study. Demographic characteristics are given in Table 4.

The first BAI and BDI-II evaluations of the patients were performed at 26.3±1.9 weeks of gestation, while the last evaluations were performed at 38.3±1.7 weeks of gestation. Table 5 shows the classification of patients according to BDI-II and BAI scores before and after the pandemic. A significant increase was observed in the scores after the COVID-19 pandemic.

In the present study, no statistically significant difference in anxiety and depression scores in terms of age, gravida, BMI, num-

Table 6: p-values of the depression and anxiety levels

	Depression level	Anxiety level
Age	0.812	0.521
Gravida	0.917	0.904
Number of living children	0.936	0.435
Diabetes status	0.104	0.931
Graduated school	0.685	0.467
Weight status	0.767	0.246
Previous delivery	0.272	0.834

ber of living children, education level, previous birth history, and gestational diabetes status was found. Separate analyses of these parameters were performed for BDI-II and BAI scores before the pandemic. The p-values of the depression level and anxiety level are presented in Table 6.

DISCUSSION

The major result of this study is that the level of anxiety and depression increased in pregnant women, who are an easily affected group, with the COVID-19 pandemic. In our study, the rate of severe depression among pregnant women before the declaration of the pandemic was 8% according to BDI-II. Depression is a life-long problem faced by approximately 20% of women, and pregnancy increases the susceptibility to this condition.[14] The depression rate during pregnancy is high in the prenatal period.[15] Antenatal depression is the most important predictor of postnatal depression.[16] Depression has both fetal and maternal adverse consequences.[17] Antenatal depressive pregnancy rates varied between 5% and 25% when different studies were conducted with different scales.[14,18,19] Our patients were in the second trimester of a pregnancy before the pandemic. Our depressive pregnancy rates were similar to the literature.

There are some reasons for predisposition to depression during pregnancy.[20] In our study, we recorded age, gravida, BMI, number of living children, education level, previous birth history, and gestational diabetes of patients. No significant relationship was found between these variables and depression scores. This was attributed to the multifactorial change in the level of depression.

After the declaration of the pandemic, 24.6% of our pregnant women who repeated the BDI-II scale had severe depression symptoms. BDI-II scores were significantly higher than those before the pandemic. The COVID-19 pandemic appears to be a major trigger for the increased score in pregnant women, and our study matches with other studies in the literature.[15,21–25] However, the COVID-19 pandemic may not be the only reason. Little time left for the termination of pregnancy also plays some role in an increased depression score. In a study by Da Costa et al.,[26] depression was found more frequently in the third trimester of pregnancy.

Before the declaration of the pandemic, we encountered severe anxiety in 10% of the patients included in the study. Anxiety during pregnancy is a risk factor for postpartum depression and has many side effects for the mother and baby.[27] Anxiety and stress in pregnancy are associated with fetal heart rate changes and preterm birth.[28,29] Anxiety disorder prevalence was found to be 20%–25% during pregnancy and 15%–20% during the postpartum period.[30–32] Considering the level of general anxiety symptoms, approximately 30% of women during pregnancy, 20% in the early postpartum period, and approximately 30% in the late postpartum period had high levels of anxiety.[33] In our study, the rate of patients with severe and mild anxiety symptoms was 23.3%. Our data align with the literature.

After the declaration of the pandemic, 58.6% of our patients had severe and mild anxiety symptoms in the BAI scale we applied to our patients before delivery. There was a statistically significant increase in the scores compared to the pre-pandemic period. It seems normal to see an increase in the level of anxiety with epidemics.[34,35] In a study by Silva et al.,[36] anxiety was found in 17.9% in the first trimester, 39.3% in the second trimester, and 42.9% in the third trimester. Anxiety symptoms increase with the progression of pregnancy. In our study, the pandemic and the progression of pregnancy play a role in an increase in the anxiety level of pregnant women, which is in agreement with the literature. In the study of Durankuş and Aksu, an increase in anxiety and depression levels in pregnant women was found to be associated with the COVID-19 pandemic.[37] In our study, while we were able to repeat our questionnaires to the same pregnant women, which is an advantage, the progress in their pregnancy period was a disadvantage.

Most of the patients infected with COVID-19 have a mild or asymptomatic disease, and very few of them need mechanical ventilators.[38] Physiological changes in pregnancy increase susceptibility to infection and hypoxia.[39] Estrogen-dependent gestational rhinitis affects approximately 20% of healthy pregnant women and can be confused with the symptoms of COVID-19 as it causes nasal congestion and rhinorrhea.[39] COVID-19 causes thrombocytopenia, lymphopenia, fever, cough, dyspnea, and pneumonia in pregnant women and has been associated with miscarriage/stillbirth, intrauterine growth restriction, preterm birth, and neonatal death.[40]

As a result, the COVID-19 pandemic not only affects people physically but also affects pregnant women psychologically.

Statement

Ethics Committee Approval: The Kanuni Training and Research Hospital Clinical Research Ethics Committee granted approval for this study (date: 21.05.2020, number: 2021/39).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – DK, YBT; Design – DK, RE; Supervision – DK, RE; Resource – DK, YBT; Materials – DK, KBE; Data Collection and/or Processing – DK, KBE; Analysis and/or Interpretation – DK, KBE; Literature Search – DK, RE; Writing – DK, RE; Critical Reviews – DK, YBT.

Conflict of Interest: The authors have no conflict of interest to declare.

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