





EFFECTS OF COVID-19 PANDEMIC ON PREGNANT PSYCHOLOGY

COVID-19 PANDEMİSİNİN GEBE PSİKOLOJİSİ ÜZERİNE ETKİLERİ

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Abstract

Background: Coronavirus Disease 2019 (COVID-19) pandemic has affected many countries from different aspects since December 2019. The present study aims to determine the frequency of prenatal depression risk and anxiety and associated risk factors in pregnant women as a vulnerable group in the COVID-19 Pandemic. **Materials and Methods:** This cross-sectional study included 234 pregnant women selected by cluster sampling method from all Primary Care Outpatient Clinics in Nigde. After ethics committee approval and institution permission was obtained, the data were collected online using the "Edinburgh Postpartum Depression Scale", "State and Trait Anxiety Index (STAI)" and a sociodemographic questionnaire. **Results:** In the present study, the frequency of prenatal depression risk was 24.4%. The median value of the STAI trait score was 41 (23-74), and the median value of the STAI state was 34 (20-80). Prenatal depression risk was associated with job loss (OR: 2.68), multiple pregnancies (OR: 15.31), high COVID-19 perceived risk score (OR: 1.14), and high STAI state score (OR: 1.10) ($p < 0.05$). Prenatal anxiety was associated with being a healthcare worker (OR: 11.66), smoking (OR: 17.21), having health problems during last pregnancy (OR: 3.74), thought of the people living with her at risk (OR: 2.48), and being depressed (OR: 4.73) ($p < 0.05$). **Conclusion:** The COVID-19 Pandemic has been increasing the prevalence of depression risk and anxiety in pregnant women. It is essential to continue routine visits to healthcare centers taking necessary preventive measures and providing psychosocial support to pregnant women.

Keywords: COVID-19, prenatal depression, prenatal anxiety, Turkey

ÖZ

Amaç: Koronavirüs hastalığı 2019 (COVID-19) pandemisi Aralık 2019'dan bu yana birçok ülkeyi farklı açılardan etkilemektedir. Bu çalışmanın amacı COVID-19 pandemisinde kırılgan bir grup olan gebelerde perinatal depresyon ve anksiyete sıklığının ve ilişkili risk faktörlerinin belirlenmesidir. **Gereç ve Yöntem:** Kesitsel tipteki çalışmamıza Niğde'deki tüm Aile Sağlığı Merkezleri'nden küme örnekleme yöntemi ile seçilen 234 gebe dahil edilmiştir. Etik kurul ve kurum izinleri alındıktan sonra veri 'Edinburgh Postpartum Depresyon Ölçeği', 'State and Trait Anxiety Index (STAI)' ve sosyodemografik soru formu ile online olarak toplanmıştır. **Bulgular:** Bu çalışmada perinatal depresyon sıklığı %24.4 olarak tespit edilmiştir. STAI sürekli anksiyete puan ortanca değeri 41 (23-74), durumluk anksiyete ortanca değeri 34 (20-80) olarak bulunmuştur. Perinatal depresyon, kendisinin ve/veya eşinin iş kaybı yaşaması (OR:2.68), çoğul gebeliğe sahip olma (OR:15.31), COVID-19 algılanan risk puanının yüksek olması (OR:1.14) ve durumluk anksiyete puanının yüksek olması (OR:1.10) ile ilişkili bulunmuştur ($p < 0.05$). Perinatal anksiyetenin ise sağlık çalışanı olma (OR:11.66), sigara kullanımı (OR:17.21), gebelikte sağlık problemi yaşama (OR:3.74), beraber yaşadığı kişilerin risk altında olduğunu düşünme (OR:2.48) ve depresif olma (OR:4.73) ile ilişkili olduğu gösterilmiştir ($p < 0.05$). **Sonuç:** COVID-19 pandemisinin gebelerde depresyon ve anksiyete sıklığını artırdığı gösterilmiş olup, gebelere bu dönemde gerekli koruyucu önlemlerin alınarak rutin sağlık kontrollerinin devamı ve psikososyal desteğin sağlanması önem arz etmektedir.

Anahtar kelimeler: COVID-19, perinatal depresyon, perinatal anksiyete

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Introduction

Coronavirus disease 2019 (COVID-19) emerged in China with the reporting of cases of pneumonia with unknown etiology since December 2019, and World Health Organization (WHO) declared this outbreak as an international emergency public health problem.(1) SARS-CoV-2 spread all over the world rapidly and this situation accepted as a pandemic in March 2020,. Turkey is the 9th country where the COVID-19 cases were most commonly seen as of May 2021 (2).

Pregnants are one of the vulnerable groups of epidemics. Pregnancy during Swine Flu (H1N1) (3) and Severe Acute Respiratory Syndrome (SARS) (4) pandemics were associated with increased mortality. Therefore, with the many questions about the COVID-19 infection, clinical studies primarily focused on the effects of the virus on pregnancy and fetus (5). However, it is essential to address the psychosocial impacts of the pandemic as well as the clinical course and prevention methods of the disease in both the general population and pregnant women. The fact that the COVID-19 disease is novel, highly contagious from person to person, and has a high fatality rate, the long-term consequences of the disease are unknown, (6) quarantine and social isolation (7) are the main factors that could explain the increased psychological impact on pregnant women.

Pregnants have physiological and anatomical changes, worry both for themselves and their babies. In addition, prenatal stress increases with the limited access to routine health services due to the concern of being infected, lack of social support due to isolation during the Pandemic (8).

Worsening of psychosocial functions (9) nausea/vomiting, preeclampsia, a cesarean delivery (10), preterm birth (11), low birth weight (12), low APGAR score, impairment in emotional and neuropsychiatric development in the baby (13) can be observed with perinatal mental problems.

In a systematic review conducted by WHO before the COVID-19 Pandemic, the prevalence of prenatal psychological disorders was approximately 16% (14). In meta-analysis studies conducted during the COVID-19 Pandemic, the frequency of prenatal depression was 25-32%, and the frequency of prenatal anxiety was 37-43% (15–17). In the prenatal period, it is important to reveal the effects of stress factors brought about by the Pandemic to develop effective and specific interventions. Unfortunately, there are a limited number of studies on this subject in Turkey (18–21). The present study aims to determine the prenatal depression risk and anxiety status and affecting factors during the COVID-19 Pandemic.

Materials and Methods

Study Design and Participants

The study was conducted in Nigde, a province in Central Anatolian Region of Turkey (Figure 1). The universe of this cross-sectional study consists of 1386 pregnant women registered to Primary Care Outpatient Clinics (PCOC) in the province. There are 120 PCOCs in Nigde, and six PCOCs were not included in the study since they did not have a documented pregnant woman. Using the Open-epi program, the sample size was calculated as 346 (event frequency 25%, the margin of error 5%, design effect 1.2, confidence interval 95%). Inclusion criteria were determined as being pregnant, literate, speaking and understanding Turkish, and agreeing to participate in the study. The women whose pregnancy terminated at the time of the study were excluded from the study. The sample was selected according to the cluster sampling method as each PCOC was accepted as a cluster. The list of pregnant women registered to PCOCs was obtained from the relevant unit of the Provincial Health Directorate. The pregnant women were selected according to the pregnancy trimester and pregnant number registered in the PCOCs. Family physicians were informed about the study, and an online informed consent and questionnaire were applied to the selected pregnant women by reaching them through family physicians. Two hundred thirty-four pregnant women were included in the study (67% of the minimum sample number).



Figure 1. Nigde Province Location in Turkey map (taken from Google Earth software)

Data Collection

The data was collected between 11.06.2020-08.07.2020 using the online survey method by the Google forms application. Before the survey, informed consent was obtained online. Then, sociodemographic forms, 'Edinburgh Postpartum Depression Scale' and 'State-Trait Anxiety Scale (STAI)' were applied. Self-score about COVID-19 risk and family communication scores were determined by asking participants to give a score between 1 (no risk) and 10 (high risk).

Edinburgh Postpartum Depression Scale (EPDS): EPDS can be used for screening both pregnant and postpartum women (22). EPDS is a 10-question scale with four options used for evaluating how mothers felt in the last week. The total score is obtained by giving points of 0,1,2,3 to each question. There are direct and reverse coded statements on the scale. The EPDS Turkish validation study was conducted by Engindeniz et al., and EPDS has a sensitivity of 84% and a specificity of 88% in the Turkish population (23). Cronbach alpha coefficient was reported as 0.79 by Engindeniz et al. (23). In the present study, the EPDS Cronbach alpha-coefficient was calculated as 0.88. The cut-off value was accepted as 13 for depressive symptoms in the present study.

State-Trait Anxiety Scale (STAI): STAI is a four-option Likert-type scale that separately measures state and trait anxiety levels with 20 questions. The total score for both scales varies between 20-80. A high score indicates high anxiety. There are direct and reverse statements. A predetermined constant value is added to the difference between the total scores of the direct and reverse statements. This constant value is 50 for State Anxiety Inventory and 35 for the Trait Anxiety Inventory. The last value obtained is the individual's anxiety score (24,25). Reliability coefficients determined by the alpha correlations of the STAI; 0.83 to 0.87 for the STAI-Trait subscale, 0.94 and 0.96 for the STAI-State (25). In the present study, the Cronbach alpha-coefficient was calculated as 0.93 for the STAI-State subscale and 0.87 for the STAI-Trait subscale presenting very high reliability.

Data Analysis

Frequency, percentage, median, minimum and maximum values for descriptive statistics; Chi-Square Test and Fisher's Exact Test for categorical variable analysis; Mann Whitney U Test and Kruskal Wallis test for continuous variable analysis; Binary Logistic Regression for multivariate analysis were used. STAI-State and STAI-Trait scores were transformed into categorical variables with the "median split" method, and multivariate analysis was applied.

Ethical Approval

Before data collection, permission from the ethics committee (Decision number: 2020 / 05-15) and institutional approval from Provincial Health Directorate were obtained.

Results

Sociodemographic Features

Two hundred thirty-four pregnant women were included in the present study, and the median age is 26 (17-42). Eleven (4.7%) of the participants are healthcare workers. 23.1% of the participants are in the first trimester, 41.0% are in the second, and 35.9% are in the third trimester. 81 (34.6%) of the participants have their first pregnancies. A previous pregnancy loss exists among 28.2% of the participants.

The rate of having pregnancy controls in a PCOC is 24.8%, in a private hospital/clinic is 32.5%, and in a state hospital/university hospital/training and research hospital is 42.7%. Only one participant stated a family member developed COVID-19 infection living at the same home. Of the participants, 75.2% regularly follow the statistical data about the COVID-19 Pandemic, and 80.3% learn about COVID-19 infection from healthcare workers/Ministry of Health. Some sociodemographic, obstetric, and COVID-19 characteristics of the participants are shown in Table 1 and Table 2.

Depression risk and Related Factors

The frequency of prenatal depression risk in the present study is 24.4%, as the cut-off point is 13, and 29.9% as the cut-off point is 12. The depression risk was lower in those with private health insurance (20%) than those without (33.8%) ($p=0.022$). According to working status, the highest depression risk was found among the pregnant women on maternity leave (71.4%) and the lowest in the pregnant women working flexible hours (20.0%) ($p=0.036$). The rate of depression risk is higher in the pregnant women (35.7%) who/whose spouses lost their work compared to who/whose spouses did not (16.2%) ($p=0.001$).

The factors affecting prenatal depression risk as the results of univariate analysis are shown in Table 3.

Age, income level, educational status, being a healthcare worker, family type, home type, physical exercise, gestational week, parity, previous pregnancy loss, plan of the present pregnancy, and family communication score were not associated with prenatal depression risk ($p > 0.05$). According to the result of multivariate analysis, those who/whose spouse lost their work ($OR=2.68$), having multiple pregnancies ($OR=15.31$), giving a high self-score about COVID-19 risk ($OR=1.14$), and having higher state anxiety scores ($OR=1.10$) were found to be more depressive ($p > 0.05$) (Table 4).

Trait Anxiety and Related Factors

The median score of STAI-Trait is 41 (23-74). The frequency of trait anxiety is 67.9%, as the cut-off point is 40. Married participants, those who/whose spouses lost their works during the COVID-19 Pandemic, occasional smokers, those having health problems during the present pregnancy, those who have not yet planned about the birth process, those having multiple pregnancies, those thinking she/family members living with her/ friends and relatives had a high COVID-19 risk, those who did not know who was at risk in the society were found to have higher STAI-Trait anxiety score ($p < 0.05$) (Table 5).

Additionally, trait anxiety score was found to have low positive correlation with income level ($r = 0.138$) and with the self-score for COVID-19 risk ($r = 0.200$); low negative correlation with daily sleep time ($r = -0.144$) and family communication score ($r = -0.264$); moderate positive correlation with the STAI-State anxiety score ($r = 0.693$) ($p < 0.05$).

State Anxiety and Related Factors

The median score of STAI-State anxiety of participants is 34 (20-80). The frequency of state anxiety is 32.1%, as the cut-off point is 40. Married participants, healthcare workers, occasional smokers, those not exercising regularly, those having planned pregnancy, those having health problems during the present pregnancy, those having a plan about the birth process, those having multiple pregnancies, those thinking she/family members living with her had high COVID-19 risk were found to have higher STAI-State anxiety score ($p < 0.05$) (Table 5). Additionally, state anxiety score was found to have low positive correlation with income level ($r = 0.173$) and the self-score about COVID-19 risk ($r = 0.196$); low negative correlation with the last child age ($r = -0.170$); moderate negative correlation with family communication score ($r = -0.348$); moderate positive

correlation with the STAI-Trait anxiety score ($r = 0.693$) ($p < 0.05$). According to multivariate analysis, those who/whose spouses lost their works (OR = 2.32), occasional smokers (OR = 26.11), those thinking themselves had high-risk COVID-19 (OR = 7.88), and those having depression risk (OR = 12.98) have higher trait anxiety; healthcare workers (OR = 11.66), occasional smokers (OR = 17.21), those having health problems during the present pregnancy (OR = 3.74), those thinking family members living with themselves had high COVID-19 risk (OR = 2.48) and those having depression risk (OR = 4.73), have higher state anxiety (Table 6).

Table 1. Sociodemographic Characteristics of Participants (n=234)

Education level, (%)*	Secondary school or lower	117 (50.0)
	High school or higher	117 (50.0)
Marital status, (%)*	Single	4 (1.7)
	Married	230 (98.3)
Having private health insurance, (%)*	Yes	160 (68.4)
	No	74 (31.6)
Working status, (%)*	Not working	188 (80.3)
	Yes/Full time	17 (7.3)
	Yes/Flexible hours	10 (4.3)
	Administrative leave/Maternity leave	19 (8.1)
Having extended family, (%)*	Yes	37 (15.8)
	No	197 (84.2)
Having a house with garden, (%)*	Yes	95 (40.6)
	No	39 (59.4)
Having chronic disease, (%)*	Yes	16 (6.8)
	No	218 (93.2)
Smoking, (%)*	Yes/Everyday smoker	9 (3.8)
	No/Ex smoker	21 (9.0)
	Never smoked	190 (81.2)
	Yes/Occasional smoker	14 (6.0)
Physical exercise, (%)*	Never exercise	122 (52.1)
	Occasional exercise	81 (34.6)
	Regular exercise	31 (13.2)
Age, years, median (min-max)		26 (17-42)
Monthly income level (TL), median (min-max)		2500 (250-15000)
Daily sleep hours, median (min-max)		8(1-15)
*Indicates column percentages		

Table 2. Obstetric and COVID-19 Characteristics of Participants (n=234)

Multiple pregnancies, (%)*	Yes	7 (3.0)
	No	227 (97.0)
Having health problems during the present pregnancy, (%)*	Yes	28 (12.0)
	No	206 (88.0)
Having a plan for the birth process, (%)*	Yes	167 (71.4)
	No	67 (28.6)
Thinking she had a high COVID-19 risk, (%)*	Yes	100 (42.9)
	No	134 (57.1)
Thinking the people living with her had a high COVID-19 risk, (%)*	Yes	51 (21.9)
	No	183 (78.1)
Thinking her relatives and friends had high COVID-19 risk, (%)*	Yes	33 (14.2)
	No	201 (85.8)
Not knowing who had high COVID-19 risk in the community, (%)*	Yes	142 (60.9)
	No	92 (39.1)
Self-score about COVID-19 risk, median (min-max)		4 (1-10)
Family communication score, median (min-max)		10 (1-10)

*Indicates column percentages

Table 3. Factors Affecting Prenatal Depression during COVID-19 Pandemic (n=234)

		Non-depressive (%) *	Depressive (%) *	P
Private health insurance	Yes	128 (80.0)	32 (20.0)	0.022**
	No	49 (66.2)	25 (33.8)	
Working status	Not working	147 (78.2)	41 (21.8)	0.036**
	Yes/Full time	11 (64.7)	6 (35.3)	
	Yes/Flexible hours	8 (80.0)	2 (20.0)	
	Administrative leave	9 (75.0)	3 (25.0)	
	Maternity leave	2 (28.6)	5 (71.4)	
Work loss of herself or her spouse	Yes	63 (64.3)	35 (35.7)	0.001**
	No	114 (83.8)	22 (16.2)	
Smoking	Yes/Everyday smoker	7 (77.8)	2 (22.2)	0.002**
	No/Ex smoker	19 (90.5)	2 (9.5)	
	Never smoked	146 (76.8)	44 (23.2)	
	Yes/Occasional smoker	5 (35.7)	9 (64.3)	
Daily sleep hours median (min-max)		8 (2-15)	8 (1-13)	0.052§

* Indicates row percentages, ** Chi-Square Test, § Mann Whitney U Test, ¥Fisher's Exact Test

Table 3. Factors Affecting Prenatal Depression during COVID-19 Pandemic (continued)

		Non-depressive (%) *	Depressive (%) *	P
Trimester	1 st Trimester	39 (72.2)	15 (27.8)	0.753**
	2 st Trimester	74 (77.1)	22 (22.9)	
	3 st Trimester	64 (76.2)	20 (23.8)	
First pregnancy	Yes	67 (82.7)	14 (17.3)	0.067**
	No	110 (71.9)	43 (28.1)	
Planned pregnancy	Yes	139 (78.1)	39 (21.9)	0.120**
	No	38 (67.9)	18 (32.1)	
Pregnancy type	Singleton	176 (77.5)	51 (22.5)	0.001 [¥]
	Multiple	1 (14.3)	6 (85.7)	
Having health problem during the present pregnancy	Yes	16 (57.1)	12 (42.9)	0.015**
	No	161 (78.2)	45 (21.8)	
Having a plan about the birth process	Yes	131 (78.4)	36 (21.6)	0.115**
	No	46 (68.7)	21 (31.3)	
Thinking themselves had high COVID-19 risk	Yes	69 (69.0)	31 (31.0)	0.044**
	No	107 (80.5)	26 (19.5)	
Self-score about COVID-19 risk median (min-max)		3 (1-10)	6 (1-10)	0.012 [§]
STAI trait anxiety score median (min-max)		38 (23-61)	48 (37-74)	<0.001 [§]
STAI state anxiety score median (min-max)		31 (20-55)	43 (20-80)	<0.001 [§]

* Indicates row percentages, ** Chi-Square Test, [§] Mann Whitney U Test, [¥]Fisher's Exact Test

Table 4. Multivariate Analysis of Factors Associated with Prenatal Depression during COVID-19 Pandemic (n=234)

	OR (95% CI)	P*
Work loss of herself or her spouse	2.68 (1.30-5.51)	0.007
Having multiple pregnancy	15.31 (1.44-162.03)	0.023
Self-score about COVID-19 risk	1.14 (1.01-1.28)	0.029
STAI-State anxiety score	1.10 (1.06-1.14)	<0.001

* Binary logistic regression (age, private health insurance, thinking she had a high COVID-19 risk, working status, loss of work for herself or her spouse, smoking, daily sleep time, having health problem in the present pregnancy, pregnancy type, STAI-state score, self-score about COVID-19 risk were entered into the model)

Table 5. Factors Affecting Prenatal Anxiety during COVID-19 Pandemic (n=234)

		STAI Trait anxiety score median (min-max)	P	STAI State anxiety score median (min-max)	P
Marital status	Single	27 (27-33)	0.003*	21 (21-29)	0.008*
	Married	41 (23-74)		34 (20-80)	
Healthcare worker	Yes	45 (35-62)	0.106*	44 (29-80)	0.004*
	No	41 (23-74)		33 (20-71)	
Working status	Not working	41 (23-74)	0.234**	33 (20-71)	0.126**
	Yes/Full time	39 (35-62)		35 (22-80)	
	Yes/Flexible hours	39 (31-57)		34 (21-53)	
	Administrative leave	41 (32-54)		40 (22-51)	
	Maternity leave	50 (29-73)		45 (29-63)	
Work loss of her- self or her spouse	Yes	45 (23-74)	0.007*	37 (20-80)	0.128*
	No	39 (25-70)		32 (20-55)	
Smoking	Yes/Every day smoker	36 (27-70)	<0.001**	22 (21-54)	0.008**
	No/Ex smoker	38 (28-49)		35 (20-51)	
	Never smoked	41 (23-74)		33 (20-80)	
	Yes/Occasional smoker	49 (39-57)		40 (27-69)	
Physical exercise	Never exercise	43 (26-74)	0.049**	35 (20-80)	0.027**
	Occasional exercise	40 (23-70)		34 (20-54)	
	Regular exercise	38 (27-52)		30 (20-64)	

*Mann Whitney U Test, **Kruskal Wallis Test

Table 5. Factors Affecting Prenatal Anxiety during COVID-19 Pandemic (continued)

		STAI Trait anxiety score median (min-max)	P	STAI State anxiety score median (min-max)	P
Planned pregnancy	Yes	40 (23-74)	0.062*	33 (20-80)	0.017*
	No	43 (29-61)		37 (20-69)	
Having health problem during the present pregnancy	Yes	47 (26-70)	0.020*	41 (20-80)	0.002*
	No	40 (23-74)		32 (20-71)	
Having a plan about the birth process	Yes	40 (23-74)	0.021*	32 (20-71)	0.012*
	No	43 (25-73)		37 (20-80)	
Pregnancy type	Singleton	40 (23-74)	0.005*	33 (20-80)	0.002*
	Multiple	51 (42-57)		49 (35-49)	
Thinking themselves had high COVID-19 risk	Yes	44 (23-70)	<0.001*	38 (20-80)	0.003*
	No	39 (25-74)		32 (20-71)	
Thinking the people living with her had high COVID-19 risk	Yes	48 (29-73)	<0.001*	40 (20-80)	<0.001*
	No	39 (23-74)		32 (20-71)	
Thinking her relatives and friends had high COVID-19 risk	Yes	47 (29-62)	0.041*	39 (20-80)	0.117*
	No	40 (23-74)		34 (20-71)	
Not knowing who had high COVID-19 risk in the community	Yes	40 (25-74)	0.006*	33 (20-80)	0.087*
	No	43 (23-73)		37 (20-69)	
Depression (EPDS \geq 13)	Non-depressive	38 (23-61)	<0.001*	31 (20-55)	<0.001*
	depressive	48 (37-74)		43 (20-80)	

*Mann Whitney U Test, **Kruskal Wallis Test

Table 6. Multivariate Analysis of Factors Associated with Trait and State Anxiety during COVID- 19 Pandemic (n=234)

	STAI Trait Anxiety		STAI State Anxiety	
	OR (95% CI)	P *	OR (95% CI)	P **
Being healthcare worker	-	-	11.66 (1.25-108.65)	0.031
Work loss of herself or her spouse	2.32 (1.18-4.55)	0.015	-	-
Being occasional smoker (compared to everyday smoker)	26.11 (1.54-440.54)	0.024	17.21 (1.47-258.35)	0.039
Having health problem during the present pregnancy	-	-	3.74 (1.26-11.12)	0.017
Thinking the people living with her had high COVID-19 risk	7.88 (3.40-18.29)	<0.001	2.48 (1.18-5.21)	0.016
Being depressive (EPDS \geq 13)	12.98 (4.81-35.00)	<0.001	4.73 (2.16-10.34)	<0.001

* Binary logistic regression (age, marital status, work loss of herself or her spouse, thinking she had a high COVID-19 risk, smoking, having a health problem during the present pregnancy, pregnancy type, physical exercise, being depressed (EPDS \geq 13) were entered into the model.) ** Binary logistic regression (age, marital status, risk, smoking, having health problems during the present pregnancy, pregnancy type, being a healthcare worker, physical exercise, planned pregnancy, thinking she had a high COVID-19 risk, being depressed (EPDS \geq 13) were entered into the model.)

DISCUSSION

In this population-based study, the frequency of prenatal depression risk is 24.4%. Prenatal depression prevalence during the COVID-19 Pandemic, which was about 16% before the COVID-19 Pandemic, (14) has been found as over 30% all over the world.(15) In a study from Turkey, prenatal depression frequency was 35.4% (19). In the present study, since the participation rate of pregnant women with depressive symptoms may be low, the frequency of depression risk may be found as lower than exists, but the increase in the prenatal depression risk compared to the pre-pandemic period is obvious. In the present study, the median score for trait anxiety is 41 (23-74), and for the state anxiety is 34 (20-80). In the study of Yassa et al., the STAI trait and state anxiety mean scores were 43.16 and 41.96, respectively (26). In the present study, the state anxiety score was lower than the trait anxiety score. This result may be due to maternity leave for pregnant women with 24th gestational week in Turkey decreasing the social contact and anxiety of being infected. In addition, since the study was conducted in Nigde, a small Anatolian city, the state anxiety score might be found relatively low.

In the present study, the frequency of state anxiety is 32.1%, as the cut-off point is 40. In a meta-analysis study including 23 studies, the frequency of anxiety was 37% (16). Although using different screening scales shows different rates. It is obvious that the Pandemic causes an increase in prenatal anxiety. Since a comprehensive review in 2017, the frequency of prenatal anxiety was found to be 15.2% (27).

Working status is another factor increasing prenatal depression and anxiety during the COVID-19 Pandemic. While actively working can be protective, creating a social environment can increase anxiety by increasing viral exposure. In the study of Durankus, depression level among actively working women was significantly higher than non-working women (19). Diversely, there are studies in which actively working was shown to be protective against prenatal depressive symptoms (21,28,29). In the present study, in accordance with the literature, the highest rate of depression risk is among the women on maternity leave, and the lowest depression risk rate was among the women working flexible hours. In this context, it can be concluded that working flexible provides some protection creating a social environment.

Being a healthcare worker can protect psychological problems due to better health-related knowledge and practices and increase the anxiety of being infected due to increased risk of viral exposure. According to the literature, being a healthcare worker does not affect depression and anxiety scores (28,30). However, in the present study, the state anxiety

is 11.66 times higher in healthcare workers than those who are not healthcare workers, while there was no significant relation in terms of depression risk. A higher rate of full-time work during the Pandemic and increased risk of viral exposure among healthcare workers may have increased the anxiety. Additionally, evaluating the risk of COVID-19 exposure in the department where the healthcare worker has been working would explain the difference with the literature.

The Pandemic has had a considerable impact on the economy, with many people being laid off or closing their shops during strict restrictions. 18.3% of the participants in the study of Lebel et al. (31) and 63.7% of the participants in the study of Moyer et al. (30) were found to be lost their work. While there was no relationship between work loss and depression or anxiety in Lebel's study (31), work loss was associated with increased anxiety in the study of Moyer et al. (30). In the present study, 41.9% of the participants have had a work loss themselves/their spouses during the COVID-19 Pandemic. It has been shown that this work loss increased the risk of depression risk 2.68 times and the risk of anxiety 2.32 times.

Smoking, which is one of the high-risk health behaviors, can either be a cause of the stress by the Pandemic or be evaluated as a result. In the study conducted by Dagklis et al., smoking was found to be increased prenatal stress 3.81 times (32). In the study of Sut et al., anxiety and depression scores were higher in smokers during pregnancy than non-smokers (21). In the present study, the most high-risk group in terms of depression risk and anxiety was occasional smokers. Occasional smoking was shown to alleviate anxiety symptoms (33). Therefore, this group may be smoking to suppress their anxiety symptoms. Ex-smokers were found to have the least prenatal depression risk. This result may be because the women who could quit smoking had a stronger will and coped better with stress during the Pandemic. Nevertheless, the results should be interpreted by considering possible confounding and shared risk factors in terms of causality. During pandemics, avoiding high-risk behaviors as well as improving protective behaviors is a part of stress management.

Physical activity is associated with decreased depression and anxiety during pregnancy (21,31,34). In the present study, one out of every two participants stated that they did not exercise at all. The lowest trait and state anxiety scores were found in those exercising regularly. Physical inactivity has become a significant problem in the general population with home confinement during the COVID-19 Pandemic. This condition may be the target of intervention programs as it is a modifiable risk factor for prenatal psychiatric diseases.

Parity is one of the obstetric determinants of prenatal anxiety. A higher anxiety rate among the women with their first pregnancy was demonstrated through a pre-pandemic study (35). There are different findings during the COVID-19 Pandemic. In the study of Chaves et al., the depression score was the lowest among the women with their first pregnancy (28). In a study from Iranian, it was shown that women with their first pregnancy had two times less anxiety compared to those with third or more pregnancies (36). In the study of Durankus, the highest depression rate was among the women with their first pregnancy (19). In the present study, the depression risk rate was lower in the women with their first pregnancy, but this difference was not significant. The child number did not affect anxiety scores.

Health problems during pregnancy are another factor affecting prenatal psychology, with the anxiety about the present health problem and the anxiety of being infected as a result of increased hospital admissions. In the study of Wu et al., pregnant women with placenta previa were 1.6 times more depressed (29). In the present study, both the rate of depression risk and anxiety scores were higher in the women having health problems during the present pregnancy. Multiple pregnancies, which is described as a high-risk pregnancy, were also evaluated in the present study. It was shown to increase the depression risk rate 15.31 times and increase the anxiety scores. The fact that routine hospital visits, which should be at shorter intervals in high-risk pregnancies, are less due to the viral exposure risk increases prenatal anxiety. Another issue is planning the birth process. In the study of Moyer et al., the number of women planning to give birth in a hospital decreased significantly in the Pandemic compared to the pre-pandemic period. However, the rate of planning to give birth at home and not knowing where to give birth increased (30). In the present study, one out of every three participants has not made a plan about where and how the delivery will occur, which significantly increases the anxiety scores.

A major determinant of prenatal psychology during the COVID-19 Pandemic is the fear of being infected and lack of knowledge about the disease prognosis and how their babies would be affected by the infection. During the pandemics, the health concerns related to the infections were shown to increase prenatal depression and anxiety (19,31,37,38). In the present study, the rate of prenatal depression risk and anxiety scores are higher in those thinking themselves had high COVID-19 risk.

Study Limitations and Strengths

The present study has some limitations and strengths. The cross-sectional design of the present study does not allow us to compare the pre-pandemic and Pandemic periods. In addition, it is difficult to evaluate the causality between prenatal psychological problems and some risk factors since the bidirectional relationship. Prenatal depression and anxiety were not evaluated with a clinical interview. In the present study, reaching the minimum sample size is 67%. Therefore, the characteristics of the pregnant women who did not participate in the study are important. Lastly, the relatively low sample size may have prevented the finding of some significant relationships. Few studies are evaluating psychological effects in pregnant women during the COVID-19 Pandemic. The present study will make an essential contribution to the literature.

CONCLUSION

In the present study, it was shown that the COVID-19 Pandemic increased prenatal depression risk and anxiety. Smoking, physical inactivity, not working actively, being a healthcare worker, work loss, multiple pregnancies, health problems during the present pregnancy, unplanned pregnancy, not having a plan for the birth process, and high-risk perceptions about COVID-19 were found to increase prenatal depression risk or anxiety. Pregnant women should be informed about COVID-19 infection and preventive measures, especially in primary health care centers, and they should be encouraged to continue their routine controls by family physicians, midwives, and nurses working at PCOCs. Primary health care workers are often more aware of the family structure, existing chronic diseases, and psychosocial problems of pregnant women than the health care providers in secondary and tertiary healthcare institutions. Therefore, it is more convenient and applicable to support pregnant women in primary health care institutions. Furthermore, methods of coping with stress should be taught by psychosocial counseling. It should be built on an active pregnancy by providing a suitable outdoor environment for physical exercise. Pregnant healthcare workers should be employed in departments with the least risk of COVID-19 infection.

Ethical Approval: *The Ethics Committee of Nigde University (Decision number: 2020 / 05-15) approved the study.*

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