Clinical and Experimental Health Sciences

Prevalence and Associated Factors of Mental Health Problems Among Peripartum Women During the COVID-19 Pandemic

Pınar Kumru[1, 2], Seyhan Hıdıroğlu[2], Alican Sarısaltık[3], Ebru Çöğendez[1], Betül Yılmazer[1], Hümeyra Erol[1], Turhan Şalva[4], Pınar Ay[2]

[1] Health Sciences University, Hamidiye Faculty of Medicine, Zeynep Kamil Women and Children Disease Training and Research Hospital, Department of Obstetrics and Gynecology, İstanbul, Türkiye.

[2] Marmara University, School of Medicine, Department of Public Health, İstanbul, Türkiye.

[3] Republic of Türkiye, Ministry of Health, Kocaeli Provincial Health Directorate, Çayırova District Health Directorate, Kocaeli, Türkiye.

[4] Maltepe University, Faculty of Medicine, Department of Public Health, İstanbul, Türkiye.

Correspondence Author: Pınar Kumru
E-mail: pkumru@gmail.com

Received: 24.10.2022 **Accepted:** 21.05.2024

ABSTRACT

Objective: This study aimed to determine the prevalence and associated factors of probable depression and probable anxiety in early postpartum women during the COVID-19 pandemic.

Methods: This cross-sectional study was conducted with early postpartum women who applied to a maternity hospital to give birth in Turkey between March-June 2021. Women aged 19-45 years, with 23–42 weeks of gestation, with a singleton pregnancy, and negative for the SARS-CoV-2 polymerase chain reaction test were included in the study. The Hospital Anxiety and Depression Scale (HADS) was used to assess the presence of probable depression (HADS depression score >7) and probable anxiety (HADS anxiety score >10). The associations between women's sociodemographic and obstetric characteristics and depression and anxiety were evaluated using univariate and multivariate analyses.

Results: A total of 450 women were included in the study. Of these, 50.2% (n=226) had probable depression, and 28% (n=126) had probable anxiety. Multivariate analysis revealed that while perceived poor income level increased the odds for the presence of probable depression, unintended pregnancy, anemia, and SARS-CoV2 infection during pregnancy were associated with probable anxiety.

Conclusion: The presence of probable depression and probable anxiety were considerably high among women who had given birth during the pandemic. This study identified the most vulnerable groups in terms of mental health problems among women who were in the early postpartum period during the pandemic. It is essential to develop strategies to prevent and control the mental health problems of these risk groups for future emergency health crises.

Keywords: Anxiety, COVID-19, depression, pandemic, early postpartum

1. INTRODUCTION

Pregnant and postpartum women are vulnerable in terms of psychiatric problems, including depression and anxiety. Preserving mental well-being in the perinatal (it covers the 21st week of pregnancy and one month after birth) period is essential to prevent the negative impact of these problems on health that may develop in both the mother and the child (1). Studies showed that risks to children of postpartum depressed mothers include problems such as excessive crying, poor cognitive function, behavioral inhibition, feeding and sleep problems, and psychiatric and medical disorders in adolescence (2). In addition, it has been reported that postpartum anxiety may cause negative effects on breastfeeding, mother-infant interaction, infant temperament, sleep, and mental development (3).

A growing body of research has reported that psychosocial stressors (such as cultural differences, low income, discrimination, and lack of social support) increase the risk of developing postpartum anxiety and depression, along with demographic factors and a history of psychiatric and psychological problems (3, 4). The COVID-19 pandemic that emerged in Wuhan, China, led to a global crisis, and measures such as social distancing and isolation/quarantine were taken to control the pandemic. The deprivation of social and family

DOI: 10.33808/clinexphealthsci.1193477

support due to these procedures applied during the pandemic and the unpredictability of COVID-19 significantly impacted perinatal mental health (5). Perinatal depression and anxiety rates increased compared to the pre-pandemic period, associated with mothers' fear of transmitting the virus to their infants, limited access to health care, and lack of social support (6-8).

The early postpartum period is critical, as maternal mental problems may significantly affect the health and development of the infant. Psychiatric screening of new mothers before they are discharged from the hospital is essential for early detection of those prone to developing mood disorders and anxiety and for providing them psychological support. It is important to explore how the pandemic affects women's mental health in the early postpartum period, when depression and anxiety symptoms are most likely to occur (9, 10). This study aimed to find the probable depression and probable anxiety prevalences in the early postpartum period of women who got pregnant and gave birth during the pandemic and determine the factors that increased the risk. We hypothesized that different sociodemographic, medical, and obstetric factors would impact the occurrence of probable depression and probable anxiety in the early postpartum period.

2. METHODS

2. 1. Study Permissions and Ethical Statement

The study was approved by the Ethics Committee of Zeynep Kamil Women and Children Disease Training and Research Hospital (Number: 65, Dated: 03/2021). All procedures in our study were carried out per the 1964 Declaration of Helsinki and subsequent amendments. Informed written consent was obtained from the participants.

2. 2. Setting and Study Participants

This cross-sectional study was carried out between 01 March 2021 and 01 June 2021 at a Gynecology and Pediatrics Training and Research Hospital in Istanbul, Turkey. Our hospital is a leading referral hospital that continued to provide uninterrupted services to low – and high-risk pregnant women during the pandemic. The study population consisted of women who had given birth in the hospital and were followed up in the postpartum clinic. The inclusion criteria were early postpartum women aged 19-45 years, between 23-42 weeks of gestational age, with a singleton delivery, and a negative SARS-CoV-2 polymerase chain reaction (PCR) test upon admission to the delivery room. Exclusion criteria were any previously diagnosed psychiatric disease, multiple pregnancies, and pregnancies with a fetal anomaly, suspected SARS-CoV-2 infection, or a positive SARS-CoV-2 PCR test at the time of admission, stillbirth or termination of pregnancy, and birth at ≤22 weeks of gestation.

Gestational age was calculated using the first day of the last menstrual period and confirmed by the first-trimester crown rump length (CRL). Sociodemographic and medical data concerning the birth process were obtained from the hospital's electronic records and patient files. For evaluating depression and anxiety, the Hospital Anxiety and Depression Scale (HADS) was used as a self-administered questionnaire (11). The questionnaire was conducted 48-72 hours after birth, before discharge from the hospital.

The SARS-CoV-2 PCR test includes real-time PCR (qPCR) (RT-qPCR) analysis by targeting the RdRp gene fragment. During the study period, all pregnant women who had applied to our hospital for delivery were screened for SARS-CoV-2 regardless of symptoms. Swab samples from the oropharynx and nasopharynx were used for PCR analysis. The laboratory had been authorized by the Ministry of Health of the Republic of Turkey, General Directorate of Public Health, Microbiology Reference Laboratory. We also checked the results of the SARS-CoV2 PCR tests performed previously to identify the women who had contact with a COVID-19 case during their pregnancy through electronic patient records.

The sample size was calculated as 379, assuming a depression prevalence of 56%, a margin of error of 0.05, and a 95% confidence level (12).

2. 3. Definition and Measurement of the Variables

2. 3. 1. Outcomes

The Hospital Anxiety and Depression Scale (HADS) was used to assess the presence of probable anxiety and probable depression. The HADS was developed by Zigmond and Snaith in 1983 and has been used to determine the risk and severity of anxiety disorder and depression (11). The 4-point Likert-type scale consists of 14 questions scored between 0 and 3. Seven questions (with odd numbers) on the scale measure anxiety, and the rest evaluate depression. The lowest score of both subscales is zero, and the highest is 21. The validity and reliability study of the Turkish version of the HADS was performed by Aydemir et al., and Cronbach's alpha value of the scale was determined as 0.81 (13). The cut-off values were 10 for the anxiety subscale and 7 for the depression subscale. Those who score above these points are considered at risk for anxiety and depression. The purpose of the scale is not to diagnose, but to identify risk groups by scanning anxiety and depression in a short time (14, 15). Those with scores above the threshold for the anxiety and depression subscales in HADS were referred to a psychiatrist for clinical evaluation.

2. 3. 2. Independent variables

Participants' sociodemographic, medical, and obstetric characteristics and the COVID-19 history (symptoms and hospitalization due to COVID-19) were evaluated.

The definitions of perinatal outcomes (gestational diabetes mellitus [GDM], preeclampsia, small for gestational age [SGA], low birth weight [LBW], and intrahepatic gestational cholestasis) were determined according to the international criteria (16-20).

2. 4. Statistical Analysis

Statistical analyses were performed using SPSS Statistics version 17.0 (IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp.). Descriptive statistics were presented as medians (interquartile ranges [25th-75th percentiles]) for the continuous variables

and frequencies and percentages for the categorical variables. The associations between individual characteristics and anxiety and depression were evaluated with univariate and multivariate logistic regression analysis (backward stepwise method). Variables with p< .1 or those shown as associated in the literature were included in the multivariate model. The strengths of the associations were defined by Odds Ratios (OR) and 95% confidence intervals (95% CI). p< .05 was considered the statistical significance level.

3. RESULTS

A total of 450 early postpartum women were included in the study. Fifteen women were excluded due to SARS-CoV-2 PCR positivity upon admission, six due to suspected infection, eight due to multiple pregnancy, 30 due to a fetal anomaly, and six due to insufficient data.

Table 1. *Sociodemographic and medical characteristics of the participants and their spouses (n=450)*

		n (%)
Age (years)	19-24	80 (17.8)
	25-34	268 (59.6)
	35-45	102 (22.7)
Body mass index (kg/m^2)	Obese (≥30 kg/m^2)	257 (57.1)
	Non-obese (<30 kg/m^2)	193 (42.9)
Educational level	Primary school	98 (21.8)
	Middle school	114 (25.3)
	High school	144 (32.0)
	University or higher	94 (20.9)
Perceived income level	Low	67 (14.9)
	Middle	341 (75.8)
	High	42 (9.3)
Parity	Nulliparity	136(30.2)
	Multiparity	314 (69.8)
Working status	Employed	96(21.3)
	Unemployed	354 (78.7)
Loss of job during the pandemic*		5 (5.2)
Smoking during pregnancy		55 (12.2)
Chronic diseases		126 (28.0)
In vitro fertilization (IVF)		8 (1.8)
Unintended pregnancy		93 (20.7)
Attending routine prenatal care	Yes	353 (87.3)
	No	57 (12.7)
Characteristics of spouse		
Age (years)	19-24	19 (4.2)
	25-34	235 (52.2)
	≥35	196 (43.6)
Educational level of spouse	Primary school	99 (22.0)
	Middle school	132 (29.3)
	High school	134 (29.8)
	University or higher	85 (18.9)
Smoker		260 (57.8)
Spouse lost his job during the pandemic		45 (10.0)
**n=96*		

Table 2. *Obstetric and neonatal outcomes of the participants*

Obstetric outcomes		n (%)
Birth	Vaginal delivery	159 (35.3)
	Cesarean section	291 (64.7)
Cesarean section*	Emergency cesarean section	182 (62.5)
	Elective cesarean section	109 (37.5)
Indication of cesarean section	Primary cesarean section	77 (26.5)
	Previous cesarean history	214 (73.5)
At least one antenatal risk factor during current pregnancy		153(34.0)
Spontaneous preterm birth		36 (8.0)
Preterm premature rupture of the membranes (PPROM)		17 (3.8)
Gestational diabetes mellitus		78 (17.3)
Hypertensive disease	No hypertension	399 (88.7)
	Gestational hypertension	11 (2.4)
	Preeclampsia-Eclampsia	35 (7.8)
	Chronic hypertension	1 (0.2)
	Chronic hypertension superimposed preeclampsia	4 (0.9)
Neonatal outcomes		
Infant gender	Girl	231 (51.3)
	Boy	219 (48.7)
Neonatal intensive care unit admission		107 (23.8)
APGAR <7		6 (1.3)
SGA infant**		42 (9.3)
LGA infant**		95 (21.1)
Low birth weight (<2500 grams)		58 (12.9)
Macrosomia (≥4000 grams)		22 (4.9)
Neonatal death		2 (0.4)
**n=291; ** according to intergrowth2; SGA: small for gestational age; LGA: large for gestational age*		

The sociodemographic and health data of the participants and their spouses are presented in Table 1. The median age (25th and 75th percentiles) was 30.0 (26.0-34.0). The obstetric and neonatal period characteristics of the participants are shown in Table 2. Cronbach's alpha value for the HADS scale was 0.807. The medians (25th and 75th percentiles) of the HADS-depression and HADS-anxiety scores were 8.0 (5.0-10.0) and 8.0 (5.0-11.0), respectively. Of the participants, 50.2% (95,0% CI: 45.5-54.9, n=226) had probable depression (HADS depression score >7), and 28% (95,0% CI: 23.9-32.4, n=126) had probable anxiety (HADS anxiety score >10).

3. 1. Regression Analysis

Univariate analysis revealed that probable depression was more prevalent in those who had primary school education compared to those with university and higher degrees, those with a perceived low-income level compared to those with a high-income level, and those whose spouses had primary or middle school education compared to those with higher education (Table 3 and 5).

Table 3. *Sociodemographic and medical factors associated with depression and anxiety, univariate analysis (n=450)*

		Depression OR [%95 CI]	**Anxiety** OR [%95 CI]
Age (years)	35-45	0.895 [0498-1.609] p= .710	1.033 [0.542-1.968] p= .922
	25-34	0.823 [0.499-1.357] p= .445	0.928 [0.533-1.614] p= .791
	19-24	*reference*	*Reference*
BMI ≥ 30 kg/m^2		1.384 [0.951-2.013] p= .089	1.147 [0.755-1.743] p= .519
Educational level	Primary school	**1.804** [1.018-.197] **p= .043***	0.997 [0.525-1.891] p= .992
	Middle school	1.681 [0.969-2.919] p= .065	0.986 [0.531-1.830] p= .964
	High school	1.334 [0.790-2.254] p=0.282	1.255 [0.704-2.235] p= .442
	University or higher	*reference*	*reference*
Unemployment		1.023 [0.597-1.472] p= .832	0.377 [0.700-1.880] p= .587
Loss of job during the pandemic		0.936 [0.256-10.047] p= .753	5.625 [0.042-1.689] p= .348
Perceived income level	Low	**2.722** [1.210-6.125] **p= .016***	**2.933** [1.075-8.001] **p= .036***
	Middle	0.843 [0.444-1.601] p=.602	2.420 [0.988-5.925] p= .053
	High	*reference*	*reference*
Multiparity		1.056 [0.706-1.580] p= .789	1.116 [0.710-1.755] p= .634
Smoking		1.442 [0.814-2.551] p= .209	1.558 [0.861-2.818] p= .143
Having chronic disease		0.828 [0.548-1.250] p= .369	1.221 [0.778-1.916] p= .385
Unintended pregnancy		1.325 [0.448-1.124] p= .179	**2.241** [1.390-3.613] **p< .001***
Having an obstetric risk factor in the previous pregnancy		0.954 [0.0863-2.468] p= .646	**1.739** [1.129-3.320] **p< .001***
Age of the spouse (years)	19-24	***reference***	***reference***
	25-34	0.619 [0.236-1.628] p= .331	3.461 [0.778-15.389] p= .103
	≥35	0.527 [0.199-1.394] p= .197	3.400 [0.760-15.201] p= .109
Educational level of the spouse	Primary school	**1.891** [1.049-3.407] **p= .034***	1.552 [0.807-2.987] p= .188
	Middle school	**1.891** [1.086-3.293] **p= .024***	1.266 [0.675-2.374] p= .503
	High school	1.576 [0.907—2.737] p= .107	1.240 [0.661-2.323] p= .753
	University or higher	*reference*	*reference*
Spouse lost his job during the pandemic		1.553 [0.829-2.809] p= .169	**2.257** [1.204-4.230] **p= .011***

**p< .05. BMI: Body mass index*

Table 4. *Obstetric and neonatal factors associated with depression and anxiety, univariate analysis (n=450)*

		Depression OR [%95 CI]	**Anxiety** OR [%95 CI]
At least one obstetric risk factor during current pregnancy		1.180 [0.812-1.713] p= .386	1.501 [0.993-2.271] p= .054
Spontaneous preterm birth		1.455 [0.730-2.901] p= .287	1.012 [0.473-2.165] p= .975
Hypertensive disease	No hypertension	-	-
	Gestational hypertension	1.194 [0.359-3.976] p= .773	1.520 [0.436-5.296] p= .511
	Preeclampsia-Eclampsia	0.940 [0.471-1.876] p= .860	1.219 [0.578-2.573] p= .603
	Chronic hypertension	0.995 [0.139-7.137] p= .996	0.887 [0.091-8.617] p= .918
	Chronic hypertension superimposed preeclampsia	*Reference*	*Reference*
Gestational diabetes mellitus		1.023 [0.646-1.715] p= .837	1.360 [0.806-2.296] p= .250
Anemia		1.130 [0.682-1.871] p= .636	**2.781** [1.655-4.673] **p< .001***
Did not breastfeed within one hour of birth		1.401 [0.960-2.046] p= .081	**1.595** [1.053-2.418] **p= .028***
At least one complication during postpartum period		1.384 [0.752-2.548] p= .297	1.233 [0.643-2.365] p= .528
Gestational week at birth		0.997 [0.986-1.008] p= .594	0.990 [0.979-1.002] p= .105
Neonatal intensive care unit admission		0.772 [0.499-1.194] p= .244	0.998 [0.615-1.617] p= .992

**p< .05*

Probable anxiety was more common among women with a perceived low-income level compared to those with high-income, whose spouses lost their job during the pandemic, whose pregnancy was unintended, who had obstetric risk factors in the previous pregnancy, who had anemia during pregnancy, who did not breastfeed within the first hour of birth, who had COVID-19 during pregnancy, and who had a contact with a COVID-19 case during pregnancy (Table 3-5).

Table 5. *The association of depression and anxiety with COVID-19 related features in early postpartum women, univariate analysis (n=450)*

Risk factors	Depression OR [%95 CI]	Anxiety OR [%95 CI]
COVID-19 during pregnancy	0.657 [0.414-1.041] p= .074	**1.874** [1.158-3.030] **p= .010***
Contacted with a COVID-19 case during pregnancy	0.867 [0.553-1.359] p= .534	**2.056** [1.282-3.298] **p= .003***
Having a relative died due to COVID-19	1.100 [0.582-2.078] p= .769	1.865 [0.970-3.587] p= .062
Symptoms due to COVID-19 during pregnancy	0.670 [0.291-1.541] p= .346	0.629 [0.270-1.461] p= .281
Hospitalization due to COVID-19 during pregnancy	2.971 [0.516-17.110] p= .223	3.437 [0.596-19.829] p= .167

**p< .05*

Multivariate analysis showed that probable depression was more frequent in those with a perceived low-income level compared to those with a high-income level. Having a SARS-CoV2 infection during pregnancy did not increase the risk of depression (Table 6). In addition, probable anxiety was more common in those whose pregnancy was unintended, who had anemia during pregnancy, and who had SARS-CoV2 infection during pregnancy (Table 6).

Table 6. *Factors associated with depression and anxiety, multivariate analysis*

Risk factors		Depression[a] positive, *n*=226 negative, *n*=224	Anxiety[b] positive, *n*=126 negative, *n*=326
BMI ≥ 30 kg/m^2		1.386 [0.943-2.035] p= .096	-
Perceived income level	Low	**2.666** [1.178-6.034] **p= .019***	-
	Middle	0.829 [0.434-1.582] p= .569	-
	High	*Reference*	-
Unintended pregnancy		-	**2.218** [1.362-3.615] **p= .001***
Anemia during pregnancy		-	**2.514** [1.475-4.288] **p= .001***
COVID-19 during pregnancy		0.630 [0.392-1.012] p= .056	**1.658** [1.005-2.735] **p= .048***

**p< .05*

[a]Age of early postpartum women, obesity, perceived income level, educational level of spouse, and COVID-19 during pregnancy were included in the analysis.

[b]Age of early postpartum women, obesity, perceived income level, women whose spouse lost job during the pandemic, unintended pregnancy, anemia during pregnancy, COVID-19 during pregnancy, and having a relative died due to COVID-19 were included in the analysis.

4. DISCUSSION

In this study, we determined the presence of probable depression in 50.2% and probable anxiety in 28% of early postpartum women. Multivariate analysis revealed that while perceived poor income level was related to probable depression; unintended pregnancy, anemia during pregnancy, and SARS-CoV2 infection during pregnancy were associated with probable anxiety.

Perinatal depression, which was 10-20% before the pandemic, reached higher rates during the pandemic. In the study by Zhang et al. in China during the COVID-19 period, perinatal depression was reported as 34% (21). In two reviews evaluating the frequency of postpartum depression, most of which used online questionnaires and included participants with middle-high incomes, the prevalences of postpartum depression were reported as 28% and 34% (22, 23). In another study conducted in Spain, postpartum women who had given birth during the pandemic had higher depression rates than the ones who had given birth previously (37.3% vs. 22.4%, respectively) (24). Two web-based online surveys conducted during the first wave of the pandemic in Turkey revealed that the prevalences of depression in pregnant women were 35.4% and 56.3% (12, 25). Our study observed that one out of every two women had probable depression. The variation in the prevalence reported in the literature might be related to the differences in the sampling and evaluation methods used. We have determined a higher depression prevalence compared to the literature, possibly because our participants had just given birth and were concerned about being infected before leaving the hospital. Also, companions were not allowed to the hospital during the pandemic period, so pregnant women were alone during and after the delivery. They could not get social support from their family members.

Women with low income have been at high risk for increased stress and psychiatric symptoms during the pandemic. In a meta-analysis conducted by Chen et al., the prevalence of postpartum depression was reported as 9.5% in high-income countries, 20.8% in middle-income countries, and 25.8% in low-income countries during the COVID-19 pandemic (22). In the study of Moyer et al., loss of income was determined as a psychosocial risk factor associated with COVID-19 (26). In our study, consistent with the literature, the OR of probable depression was 2.67 times higher in participants with a low-perceived income compared to those with a high income.

Anxiety experienced by pregnant women during the pandemic was more pronounced than in the general population. In a meta-analysis conducted before the pandemic, covering 34 countries, the prevalence of perinatal anxiety was reported as 15.2%(27). In a meta-analysis by Yan et al., in which 23 studies related to the COVID-19 pandemic were evaluated, the prevalences of psychological stress and anxiety in pregnant women were reported as 70% and 37%, respectively (1). In another study with a limited sample, the frequency of anxiety was higher in SARS-CoV-2 positive pregnant women compared to the negative participants (41.7% vs. 23.3%, p<.05) (28). In our study, probable anxiety

was 28% regardless of a previous diagnosis of COVID-19. The variation in the prevalence reported in the literature might be related to sample characteristics, assessment methods, and the pandemic wave in which the study was conducted. However, there is an increased risk of anxiety compared to the pre-pandemic period. Also, we determined that having had a COVID-19 infection during pregnancy increased the OR of the presence of probable anxiety 1.66 times.

Unintended pregnancies during an unpredictable pandemic may increase the level of anxiety. We determined in the multivariate analysis that unintentional pregnancy increased the OR of the presence of probable anxiety 2.22 times. In a study conducted in Türkiye, anxiety scores were higher in pregnant women who did not plan their pregnancy (29). Another study showed that unintended pregnancy was a determinant of the level of postpartum anxiety (30).

In addition to all the stressors of the pandemic, experiencing a pregnancy-related problem further increases anxiety (31). Kochan et al. showed that the problems experienced during pregnancy influenced the level of postpartum anxiety (30). In our study, we could not find a relationship between obstetric problems and anxiety or depression. However, in the multivariate analyses, we showed that the OR of probable anxiety increased 2.51 times in those with anemia during pregnancy.

4. 1. Strengths and Limitations

Our study was one of the first to evaluate the depression and anxiety of early postpartum women with and without a history of infection during the COVID-19 outbreak. Most previous surveys were conducted with high-income and educated participants using social media and the internet. The fact that we conducted our surveys face-to-face allowed us to access early postpartum women with medium-to-low income and education. Another strength of our study was the confirmation of SARS-CoV-2 infection during pregnancy by PCR test positivity and the exclusion of early postpartum active SARS-CoV-2 infected cases, which have the potential to affect mental status.

Our study also has some limitations. The cross-sectional design is the major limitation in evaluating causality. The fact that our research was conducted only in a single center might bring further limitations regarding the generalizability of the findings. In addition, since our study was conducted in a large and well-equipped referral hospital in the region, our population consisted of relatively high-risk women with additional co-morbidities. Also, we used scales to determine the presence of probable depression and probable anxiety. So, the outcomes were determined based on self-report, and the participants were not evaluated through a clinical assessment. We also did not evaluate sleep, appetite, physical activity status, or personality traits, which were reported to be associated with depression in the literature. In addition, many individuals infected with COVID-19 experienced the disease asymptomatically. The diagnostic value of the PCR test is limited to approximately 60%, and it may lead to missed diagnoses at a significant rate. This might have led to a misclassification bias in the assessment of the infection. Finally, although the presence of any previous psychiatric disorders was determined as one of the exclusion criteria, the fact that this was based on participants' reporting was considered a limitation.

5. CONCLUSION

Our study revealed that probable depression and probable anxiety were prevalent among women in the early postpartum period during the pandemic. Women with a low-income level, who had an unintentional pregnancy, anemia, and COVID-19 infection during their pregnancy, were vulnerable to postpartum mental health problems. Therefore, we need to implement strategies and measures to prevent and control the mental health problems among these most vulnerable pregnant women during the COVID-19 pandemic.

Acknowledgements: *We would like to thank all the participants who spent their valuable time and participated in this research program and all the healthcare professionals working in the postpartum service.*
Funding: *The authors received no financial support for the research.*
Conflicts of interest: *The authors declare that they have no conflict of interest.*
Ethics Committee Approval: *This study was approved by Ethics Committee of Zeynep Kamil Training and Research Hospital (Approval date: 03/2021; Number: 65).*
Peer-review: *Externally peer-reviewed.*
Author Contributions: (Initials only)
Research idea: PK, SH, PA
Design of the study: PK, SH, PA
Acquisition of data for the study: PK, BY, HE
Analysis of data for the study: PK, PA
Interpretation of data for the study: PK, SH, PA, EC
Drafting the manuscript: PK, PA, AS
Revising it critically for important intellectual content: SH, PA, TS
Final approval of the version to be published: PK, SH, PA, AS, TS

REFERENCES

[1] Yan H, Ding Y, Guo W. Mental health of pregnant and postpartum women during the coronavirus disease 2019 pandemic: A systematic review and meta-analysis. Front Psychol. 2020;11:617001. DOI: 10.3389/fpsyg.2020.617001

[2] Slomian J, Honvo G, Emonts P, Reginster JY, Bruyère O. Consequences of maternal postpartum depression: A systematic review of maternal and infant outcomes. Womens Health (Lond). 2019;15:174.550.6519844044. DOI: 10.1177/174.550.6519844044

[3] Field T. Postnatal anxiety prevalence, predictors and effects on development: A narrative review. Infant Behav Dev. 2018;51:24-32. DOI: 10.1016/j.infbeh.2018.02.005

[4] Lara-Cinisomo S, Girdler SS, Grewen K, Meltzer-Brody S. A biopsychosocial conceptual framework of postpartum depression risk in immigrant and U.S.-born Latina mothers in the United States. Womens Health Issues. 2016;26(3):336-343. DOI: 10.1016/j.whi.2016.02.006

[5] Kotlar B, Gerson E, Petrillo S, Langer A, Tiemeier H. The impact of the COVID-19 pandemic on maternal and perinatal health: A

scoping review. Reprod Health. 2021;18(1):10. DOI: 10.1186/s12978.021.01070-6

[6] Aryal S, Pant SB. Maternal mental health in Nepal and its prioritization during COVID-19 pandemic: Missing the obvious. Asian J Psychiatr. 2020;54:102281. DOI: 10.1016/j.ajp.2020.102281

[7] Jungari S. Maternal mental health in India during COVID-19. Public Health. 2020;185:97-98. DOI: 10.1016/j.puhe.2020.05.062

[8] Saccone G, Florio A, Aiello F, Venturella R, De Angelis MC, Locci M, Bifulco G, Zullo F, Di Spiezio Sardo A. Psychological impact of coronavirus disease 2019 in pregnant women. Am J Obstet Gynecol. 2020;223(2):293-295. DOI: 10.1016/j.ajog.2020.05.003

[9] Giakoumaki O, Vasilaki K, Lili L, Skouroliakou M, Liosis G. The role of maternal anxiety in the early postpartum period: Screening for anxiety and depressive symptomatology in Greece. J Psychosom Obstet Gynaecol. 2009;30(1):21-28. DOI: 10.1080/016.748.20802604839

[10] Ladekarl M, Olsen NJ, Winckler K, Brødsgaard A, Nøhr EA, Heitmann BL, Specht IO. Early Postpartum Stress, Anxiety, Depression, and Resilience Development among Danish First-Time Mothers before and during First-Wave COVID-19 Pandemic. Int J Environ Res Public Health. 2021;18(22). DOI: 10.3390/ijerph182211734

[11] Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand. 1983;67(6):361-370. DOI: 10.1111/j.1600-0447.1983.tb09716.x

[12] Kahyaoglu Sut H, Kucukkaya B. Anxiety, depression, and related factors in pregnant women during the COVID-19 pandemic in Turkey: A web-based cross-sectional study. Perspect Psychiatr Care. 2021;57(2):860-868. DOI: 10.1111/ppc.12627

[13] Aydemir Ö, Güvenir T, Küey L, Kültür S. Hastane anksiyete ve depresyon ölçeği Türkçe formunun geçerlilik ve güvenilirlik çalışması. Turk Psikiyatri Derg. 1997;8(4):280-287 (Turkish).

[14] Snaith RP. The Hospital Anxiety And Depression Scale. Health Qual Life Outcomes. 2003;1:29. DOI: 10.1186/1477-7525-1-29

[15] Tetik Küçükelçi D. Hastane anksiyete ve depresyon ölçeği (HADS) üzerine bir çalışma. Yaşam Becerileri Psikoloji Dergisi. 2019;3:85-91 (Turkish). DOI: 10.31461/ybpd.560253

[16] Royal College of Obstetricians and Gynaecologists. Intrahepatic cholestasis of pregnancy. Published [9 August 2022]. Accessed [4 September 2022]. https://www.rcog.org.uk/guidance/browse-all-guidance/green-top-guidelines/intrahepatic-cholestasis-of-pregnancy-green-top-guideline-no-43/

[17] The American College of Obstetricians and Gynecologists. Hypertension in pregnancy: Executive summary. Obstet Gynecol. 2013;122(5):1122-1131. DOI: 10.1097/01.Aog.000.043.7382.03963.88

[18] Carpenter MW, Coustan DR. Criteria for screening tests for gestational diabetes. Am J Obstet Gynecol. 1982;144(7):768-773. DOI: 10.1016/0002-9378(82)90349-0

[19] Hadlock FP, Harrist RB, Sharman RS, Deter RL, Park SK. Estimation of fetal weight with the use of head, body, and femur measurements—a prospective study. Am J Obstet Gynecol. 1985;151(3):333-337. DOI: 10.1016/0002-9378(85)90298-4

[20] Villar J, Cheikh Ismail L, Victora CG, Ohuma EO, Bertino E, Altman DG, Lambert A, Papageorghiou AT, Carvalho M, Jaffer YA, Gravett MG, Purwar M, Frederick IO, Noble AJ, Pang R, Barros FC, Chumlea C, Bhutta ZA, Kennedy SH. International standards for newborn weight, length, and head circumference by gestational age and sex: The Newborn Cross-Sectional Study of the INTERGROWTH-21st Project. Lancet. 2014;384(9946):857-868. DOI: 10.1016/s0140-6736(14)60932-6

[21] Zhang Y, Muyiduli X, Wang S, Jiang W, Wu J, Li M, Mo M, Jiang S, Wang Z, Shao B, Shen Y, Yu Y. Prevalence and relevant factors of anxiety and depression among pregnant women in a cohort study from south-east China. J Reprod Infant Psychol. 2018;36(5):519-529. DOI: 10.1080/02646.838.2018.1492098

[22] Chen Q, Li W, Xiong J, Zheng X. Prevalence and risk factors associated with postpartum depression during the COVID-19 pandemic: A literature review and meta-analysis. Int J Environ Res Public Health. 2022;19(4). DOI: 10.3390/ijerph19042219

[23] Safi-Keykaleh M, Aliakbari F, Safarpour H, Safari M, Tahernejad A, Sheikhbardsiri H, Sahebi A. Prevalence of postpartum depression in women amid the COVID-19 pandemic: A systematic review and meta-analysis. Int J Gynaecol Obstet. 2022;157(2):240-247. DOI: 10.1002/ijgo.14129

[24] Mariño-Narvaez C, Puertas-Gonzalez JA, Romero-Gonzalez B, Peralta-Ramirez MI. Giving birth during the COVID-19 pandemic: The impact on birth satisfaction and postpartum depression. Int J Gynaecol Obstet. 2021;153(1):83-88. DOI: 10.1002/ijgo.13565

[25] Durankuş F, Aksu E. Effects of the COVID-19 pandemic on anxiety and depressive symptoms in pregnant women: A preliminary study. J Matern Fetal Neonatal Med. 2022;35(2):205-211. DOI: 10.1080/14767.058.2020.1763946

[26] Moyer CA, Compton SD, Kaselitz E, Muzik M. Pregnancy-related anxiety during COVID-19: a nationwide survey of 2740 pregnant women. Arch Womens Ment Health. 2020;23(6):757-765. DOI: 10.1007/s00737.020.01073-5

[27] Dennis CL, Falah-Hassani K, Shiri R. Prevalence of antenatal and postnatal anxiety: Systematic review and meta-analysis. Br J Psychiatry. 2017;210(5):315-323. DOI: 10.1192/bjp.bp.116.187179

[28] Javaid MK, Khanum Z, Parveen A, Rashid A, Iftikhar M, Kaleem R. Psychological Impact in Covid Positive Pregnant Females. Pakistan J Medical Health Sci. 2022;16(02):318-320. DOI: 10.53350/pjmhs22162318

[29] Yakşi N, Taştekin N. Effects of novel coronavirus (COVID-19) pandemic on pregnant psychology. International Journal of Current Medical and Biological Sciences. 2022;2(1):1-14. DOI: 10.5281/zenodo.6055276

[30] Kochan M, Demirci AD, Kabukcuoglu K. The postpartum period during the COVID-19 pandemic: investigating Turkish women's postpartum support and postpartum-specific anxiety. J Perinat Med. 2022;50(3):261-269. DOI: 10.1515/jpm-2021-0238

[31] Hocaoglu M, Ayaz R, Gunay T, Akin E, Turgut A, Karateke A. Anxiety and post-traumatic stress disorder symptoms in pregnant women during the COVID-19 pandemic's delay phase. Psychiatr Danub. 2020;32(3-4):521-526. DOI: 10.24869/psyd.2020.521

How to cite this article: Kumru P, Hıdıroğlu S, Sarısaltık A, Çöğendez E, Yılmazer B, Erol H, Şalva T, Ay P. Prevalence and Associated Factors of Mental Health Problems Among Peripartum Women During the COVID-19 Pandemic. Clin Exp Health Sci 2024; 14: 611-617. DOI: 10.33808/clinexphealthsci.1193477