

Anxiety, depression, and related factors in pregnant women during the COVID-19 pandemic in Turkey: A web-based cross-sectional study

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Abstract

Purpose: This study aimed to assess the prevalence of anxiety and depression and related factors in pregnant women during the coronavirus disease 2019 (COVID-19) pandemic.

Design and Methods: This cross-sectional study was conducted on 403 pregnant women using a web-based survey. The hospital anxiety and depression scale was used to measure anxiety and depression.

Findings: The prevalence of anxiety and depression was 64.5% and 56.3%, respectively. Working status, physical activity status, discomfort with hospital visits, having information about COVID-19, and being informed by healthcare workers about COVID-19 were factors related to anxiety ($p < .05$). Education level, physical activity status, discomfort with hospital visits, and having information about COVID-19 were factors related to depression ($p < .05$).

Practice Implications: The aforementioned factors should be considered for reducing anxiety and depressive symptoms during pregnancy.

KEYWORDS

anxiety, coronavirus, COVID-19, depression, pregnant

1 | INTRODUCTION

Coronavirus disease 2019 (COVID-19) started in Wuhan, China, in December 2019 and was declared by the World Health Organization (WHO) as the beginning of an international pandemic.¹ The Chinese government declared the person-to-person transmission of COVID-19 on January 20, 2020; this has significantly increased global concern and uncertainty.² Following this, the WHO upgraded the COVID-19 classification to a global pandemic in March 2020 (WHO¹). COVID-19 has rapidly spread throughout the world, with the total number of cases exceeding 500,000 globally as of March 27, 2020.³ The COVID-19 pandemic has drastically changed the daily lives of millions of people worldwide.⁴ Strict measures have been

implemented to prevent the spread of the virus,⁵ and people have been advised to stay at home.⁶

Studies have revealed that there is no risk of fetal transmission of COVID-19 and that pregnant women are not at risk of serious COVID-19 infection.⁷⁻⁹ However, many pregnant women worry about going to hospitals because of the fear of COVID-19.⁶ In Wuhan, 41.9% of pregnant women have refused to visit the hospital for their pregnancy follow-ups and the number of pregnant women wanting a cesarean delivery instead of waiting for labor in the hospital has increased.¹⁰ In the USA, face-to-face prenatal consultation has been found to be the most important factor that increases anxiety in pregnant women during the COVID-19 pandemic.¹¹ In India, the most common concern reported by pregnant women to obstetricians is visiting the hospital for

prenatal check-ups and ultrasound scans.¹² In a previous study, 64.3% of women were found to experience a psychological change during pregnancy.¹³ More than half of pregnant women in China were found to have moderate psychological symptoms.¹⁴

Uncertainty about the duration of the COVID-19 pandemic increases the anxiety level of pregnant women.¹⁵ However, there is no definitive information on the effect of COVID-19 on the mental health of pregnant women.¹⁶ Pregnant women are concerned about the harmful effects of the virus on their own health and fetal health (Ng et al.³⁵). In China, pregnant women reported an increase in their anxiety due to the thought that COVID-19 would be transmitted to their fetus by vertical transmission.² In Canada, perinatal loss was reported to be the most common concern.¹⁷ Moreover, in Ireland, pregnant women reported being excessively concerned about their unborn babies,¹⁸ while in Italy, they reported having high anxiety regarding vertical transmission.¹⁶ Stress-related anxiety during pregnancy may result in fetal death or fetal abnormalities.¹⁶ Pregnant women are more likely to develop anxiety and depression during the COVID-19 pandemic⁶; the prevalence of anxiety in pregnant women has been reported to range from 63% to 68%.^{16–18} In addition, higher levels of anxiety and depression have been reported in pregnant women than in nonpregnant women.^{6,19} A high level of anxiety in pregnant women during the pandemic may negatively affect pregnancy and fetal outcomes.¹¹ Increased anxiety during pregnancy also leads to a high risk of postpartum depression or other mood disorders.²⁰ In developed countries, 10% of pregnant women experience depression and the number of antidepressants prescribed to pregnant women has increased in the last decade.²¹ Providing isolation, communication, and psychological assistance during the COVID-19 pandemic is particularly beneficial for preventing negative impacts on the mental health of pregnant women and on the fetus.² The impact of COVID-19 on the mental health of pregnant women should be evaluated.²²

Being aware of and connecting with support systems for perinatal mental health protects the mental health of pregnant women.²³ Assessment of the effects of COVID-19 on anxiety and depression during pregnancy is important to determine the role of support systems in pregnancy and the possible impacts on the postpartum period. The present study aimed to examine the level and prevalence of anxiety and depression and related factors in pregnant women during the COVID-19 pandemic.

2 | METHODS

2.1 | Research design

This cross-sectional study was conducted using a web-based online survey via Facebook pregnancy groups in June and July 2020.

2.2 | Participants

The study was conducted on 403 pregnant women who were over 18 years old, were willing to complete an online survey, had no

history of psychological disorders, and did not use any psychiatric medication.

2.3 | Data collection

Pregnant women from the Facebook pregnancy groups were invited to participate in the study via an online survey link. They were informed about the study on the first page of the online survey. The survey contained three parts: the first part contained questions on sociodemographic and clinical characteristics, the second part contained questions on the knowledge and attitude about COVID-19, and the third part contained 14 items of the hospital anxiety and depression scale (HADS) for evaluating psychological distress.

2.3.1 | The first part of the survey: evaluation of sociodemographic and clinical characteristics

Sociodemographic and clinical data included age, education level (<9 years, ≥9 years), working status during pregnancy (yes or no), gestational week, presence of a chronic illness (yes or no), regular physical activity (such as walking or pregnancy exercises) (yes or no), and smoking during pregnancy (yes or no).

2.3.2 | The second part of the survey: evaluation of the knowledge and attitude of pregnant women about COVID-19

The knowledge and attitude of pregnant women about COVID-19 were evaluated using six questions with two options (yes or no): (1) Do you experience discomfort with visiting the hospital or doctor for your pregnancy follow-up visits? (2) Do you visit the hospital regularly for your pregnancy follow-up visits? (3) Do you follow the isolation rules during the pregnancy follow-up visits? (4) Does your doctor/nurse/midwife follow the isolation rules during the pregnancy follow-up visits? (5) Do you have any information about the effects of COVID-19 on pregnancy? (6) Does your doctor/nurse/midwife give you detailed information about the effects of COVID-19 on maternal and fetal health?

2.3.3 | The third part of the survey: evaluation of psychiatric symptoms

The HADS consists of 14 items and two subscales²⁴ and has been validated previously.²⁵ It was used to evaluate the anxiety and depressive symptoms in pregnant women in the present study. HADS-anxiety and HADS-depression scores were derived by summing the subscale items. Higher HADS-anxiety and HADS-depression scores indicate higher anxiety and depression levels, respectively. Pregnant women with HADS-anxiety scores ≥8 were classified as having anxiety, while those with HADS-depression scores ≥8 were classified as

having depression. The Cronbach's alpha coefficient of the HADS was found to be 0.94, indicating good reliability.

2.4 | Ethical statement

The present study was approved by the Trakya University Scientific Research Ethics Committee (2020-268). An electronic informed consent was presented on the first page of the online survey. The participants were electronically informed on the first page of the survey that they were volunteering to participate and that they could withdraw from the survey at any time.

2.5 | Statistical analysis

Normality of the numeric variables was tested using the Shapiro–Wilk test. Numeric results are presented as the mean \pm standard deviation for normally distributed data and median (min–max) for non-normally distributed data. Categorical variables are presented as the number and percentage. HADS-anxiety and HADS-depression scores between two categories of variables were compared using the Mann–Whitney *U* test due to non-normal distribution. Spearman correlation analysis was performed to investigate the association of age and gestational week with HADS-anxiety and HADS-depression scores. Statistical analysis was performed using IBM SPSS Statistics for Windows, Version 20.0 (IBM Corp). A $p < .05$ was considered statistically significant.

3 | RESULTS

3.1 | Demographic and clinical characteristics of the participants

The demographic and clinical characteristics are shown in Table 1. The mean age of the participants was 28.2 ± 4.5 years (range, 18–41 years), and their mean gestational week was 27.3 ± 8.8 .

3.2 | Knowledge and attitudes of pregnant women about COVID-19

In total, 68% of the participants reported that they experienced discomfort with visiting the hospital or doctor for their pregnancy follow-up visits, while 79.2% reported that they regularly visited the hospital for their pregnancy follow-up visits during the COVID-19 pandemic. Almost all the pregnant women (95.8%) and healthcare workers (94.3%) reported that they followed the isolation rules during the pregnancy follow-up visits. Moreover, 57.1% of the participants reported that they had information about the effects of COVID-19 on pregnancy; however, 32.8% reported that they were informed by their doctor/nurse/midwife about the effect of COVID-19 on maternal and fetal health (Table 2).

TABLE 1 Demographic and clinical characteristics of the pregnant women

	N = 403
Age, years, mean \pm SD	28.2 \pm 4.5
Gestational week, mean \pm SD	27.3 \pm 8.8
Education, years, n (%)	
<9	76 (18.9)
≥ 9	327 (81.1)
Working status during pregnancy, n (%)	
Yes	168 (41.7)
No	235 (58.3)
Chronic illness, n (%)	
Yes	37 (9.2)
No	366 (90.8)
Regular physical activity, (walking or pregnancy exercise), n (%)	
Yes	205 (50.9)
No	198 (49.1)
Smoking during pregnancy, n (%)	
Yes	32 (7.9)
No	371 (92.1)

3.3 | Anxiety and depression in pregnant women during the COVID-19 pandemic

The average HADS-anxiety score of the participants was 9.6 ± 6.4 , and their average HADS-dDepression score was 8.7 ± 5.2 . The prevalence of anxiety and depression in pregnant women during the COVID-19 pandemic was 64.5% and 56.3%, respectively (Table 3).

3.4 | Univariate analysis of factors related to anxiety and depression in pregnant women during the COVID-19 pandemic

Spearman correlation analysis revealed that age was not correlated with HADS-anxiety ($r = -0.036$; $p = .467$) and HADS-depression ($r = -0.027$; $p = .592$) scores. Similarly, gestational week was not correlated with HADS-anxiety ($r = 0.026$; $p = .598$) and HADS-depression ($r = -0.019$; $p = .701$) scores.

HADS-anxiety and HADS-depression scores were significantly higher in pregnant women whose education level was less than 9 years, who were not working, who were not engaging in physical activity, and who were smokers ($p < .05$ for all). In addition, pregnant women who had a chronic illness had higher HADS-anxiety ($p = .013$) and HADS-depression ($p = .074$) scores (Table 4).

HADS-anxiety and HADS-depression scores were significantly higher in pregnant women who experienced discomfort with visiting the hospital or doctor for follow-up visits (Q1), who did not go for follow-up visits regularly (Q2), and who did not follow the isolation

TABLE 2 The knowledge and attitudes of pregnant women about the COVID-19

	N	%
Q1. Do you experience discomfort with visiting the hospital or doctor for your pregnancy follow-up visits?		
Yes	274	68.0
No	129	32.0
Q2. Do you visit the hospital regularly for your pregnancy follow-up visits?		
Yes	319	79.2
No	84	20.8
Q3. Do you follow the isolation rules during the pregnancy follow-up visits?		
Yes	386	95.8
No	17	4.2
Q4. Does your doctor/nurse/midwife follow the isolation rules during the pregnancy follow-up visits?		
Yes	380	94.3
No	23	5.7
Q5. Do you have any information about the effects of COVID-19 on pregnancy?		
Yes	230	57.1
No	173	42.9
Q6. Does your doctor/nurse/midwife give you detailed information about the effects of COVID-19 on maternal and fetal health?		
Yes	132	32.8
No	271	67.2

Abbreviation: COVID-19, coronavirus disease 2019.

rules (Q3). Similarly, these scores were significantly higher in pregnant women when the isolation rules were not followed by the healthcare workers during pregnancy follow-up visits (Q4). In addition, HADS-anxiety and HADS-depression scores were significantly higher in pregnant women who had no information about the effects of COVID-19 on pregnancy (Q5) and who were not informed by healthcare workers about the effects (Q6) (Table 5).

TABLE 3 HADS-anxiety and HADS-depression levels in pregnant women during the COVID-19 pandemic

	Mean ± SD	Median (Min–Max)
HAD-anxiety score	9.6 ± 6.4	10 (0–21)
HAD-depression score	8.7 ± 5.2	9 (0–21)
Prevalence of anxiety (HADS-anxiety score ≥8)	64.5%	
Prevalence of depression (HADS-depression score ≥8)	56.3%	

Abbreviations: COVID-19, coronavirus disease 2019; HADS, hospital anxiety and depression scale.

TABLE 4 Comparison of HADS-anxiety and HADS-depression scores of the pregnant women by sociodemographic and clinical characteristics

	HADS-anxiety	HADS-depression
Education (years)		
<9	13 (0–21)	11 (1–19)
≥9	9 (0–21)	8 (0–21)
<i>p</i>	<.001	<.001
Working status during pregnancy		
Yes	6.5 (0–21)	5 (0–20)
No	11 (0–21)	10 (0–21)
<i>p</i>	<.001	<.001
Chronic illness		
Yes	12 (0–21)	11 (0–21)
No	10 (0–21)	9 (1–19)
<i>p</i>	.013	.074
Regular physical activity, (walking or pregnancy exercise)		
Yes	7 (0–1)	5 (0–19)
No	12 (0–21)	11 (0–21)
<i>p</i>	<.001	<.001
Smoking during pregnancy		
Yes	13.5 (0–21)	11.5 (2–19)
No	10 (0–21)	8 (0–1)
<i>p</i>	.001	.001

Note: Median (min–max).

Abbreviation: HADS, hospital anxiety and depression scale.

3.5 | Multivariate analysis of factors related to the development of anxiety and depression in pregnant women during the COVID-19 pandemic

Of the 11 probable factors related to the development of anxiety that were entered into multivariate logistic regression analysis, five factors were found to be significant (Table 6 and Figure 1). The risk of anxiety in pregnant women who were not working was 1.87 times (95% confidence interval [CI]: 1.01–3.48) higher than that in pregnant women who were working ($p = .047$). In addition, the risk of anxiety in pregnant women who did not engage in regular physical activity was 1.93 times (95% CI: 1.05–3.56) higher than that in pregnant women who engaged in regular physical activity ($p = .034$). Further, the risk of anxiety in pregnant women who experienced discomfort with visiting the hospital or doctor for follow-up visits was 8.87 times (95% CI: 4.76–16.51) higher than that in pregnant women who did not experience discomfort with these visits ($p < .001$). The risk of anxiety in pregnant women who did not have any information about the effects of COVID-19 on pregnancy was 3.4 times (95% CI: 1.56–7.43) higher than that in pregnant women who had this information ($p = .002$). Moreover, the risk of anxiety in pregnant women who were not informed by their doctor/nurse/midwife about the effect of COVID-19 was 2.6 times (95% CI: 1.31–5.17) higher than that in pregnant women who had this information ($p = .006$).

TABLE 5 Comparison of HADS-anxiety and HADS-depression scores by the knowledge and attitudes of pregnant women related to COVID-19

	HADS-anxiety	HADS-depression
Q1. Do you experience discomfort with visiting the hospital or doctor for your pregnancy follow-up visits?		
Yes	12 (0–21)	11 (2–19)
No	10 (0–21)	9 (0–21)
<i>p</i>	<.001	<.001
Q2. Do you visit the hospital regularly for your pregnancy follow-up visits?		
Yes	9 (0–21)	8 (0–21)
No	14 (2–21)	13 (1–21)
<i>p</i>	<.001	<.001
Q3. Do you follow the isolation rules during the pregnancy follow-up visits?		
Yes	10 (0–21)	8 (0–21)
No	19 (0–21)	18 (0–21)
<i>p</i>	<.001	<.001
Q4. Does your doctor/nurse/midwife follow the isolation rules during the pregnancy follow-up visits?		
Yes	10 (0–21)	8 (0–21)
No	21 (0–21)	18 (0–19)
<i>p</i>	<.001	<.001
Q5. Do you have any information about the effects of COVID-19 on pregnancy?		
Yes	7 (0–21)	5 (0–21)
No	13 (0–21)	11 (1–21)
<i>p</i>	<.001	<.001
Q6. Does your doctor/nurse/midwife give you detailed information about the effects of COVID-19 on maternal and fetal health?		
Yes	0 (0–21)	3 (0–18)
No	12 (0–21)	11 (0–21)
<i>p</i>	<.001	<.001

Note: Median (min–max).

Abbreviations: COVID-19, coronavirus disease 2019; HADS, hospital anxiety and depression scale.

Finally, the risk of anxiety was higher in pregnant women who had lower education levels (odds ratio = 2.36; CI: [0.99–5.66]; $p = .054$).

Four significantly independent risk factors were determined to be related to the development of depression (Table 6 and Figure 2). The risk of depression in pregnant women whose education level was less than 9 years was 2.76 times higher (95% CI: 1.22–6.28) than that in pregnant women whose education level was 9 years or above ($p = .015$). In addition, the risk of depression in pregnant women who did not engage in regular physical activity was 2.36 times (95% CI: 1.34–4.18) higher than that in pregnant women who engaged in regular physical activity ($p = .003$). The risk of depression in pregnant women who experienced discomfort with visiting the hospital or doctor for follow-up visits was 6.61 times (95% CI: 3.43–12.75) higher than that in pregnant women who did not experience discomfort with these visits ($p < .001$). Moreover, the risk of depression

in pregnant women who did not have any information about the effects of COVID-19 on pregnancy was 8.87 times (95% CI: 4.23–18.59) higher than that in pregnant women who had this information ($p < .001$).

4 | DISCUSSION

The present study revealed that the prevalence of anxiety and depression in pregnant women during the COVID-19 pandemic was 64.5% and 56.3%, respectively. Previous studies have reported the prevalence of anxiety in pregnant women to be between 63% and 68% during the COVID-19 pandemic.^{16–18} The prevalence of anxiety and depression in pregnant women was between 7.8% and 22.3% before the pandemic.^{26,27} Thus, the prevalence of anxiety and

TABLE 6 Effect of socio-demographic variables, knowledge, and attitudes of pregnant women about COVID-19 on anxiety and depression

	HADS-anxiety (≥ 8)		HADS-depression (≥ 8)	
	<i>p</i>	OR (95% CI)	<i>p</i>	OR (95% CI)
Education (years)				
<9	.054	2.36 (0.99–5.66)	.015	2.76 (1.22–6.28)
Working status during pregnancy				
No	.047	1.87 (1.01–3.48)	.101	1.66 (0.91–3.03)
Chronic illness				
No	.760	1.17 (0.43–3.13)	.342	1.56 (0.62–3.92)
Regular physical activity				
No	.034	1.93 (1.05–3.56)	.003	2.36 (1.34–4.18)
Smoking during pregnancy				
Yes	.319	1.9 (0.54–6.67)	.151	2.27 (0.74–6.95)
Q1. Do you experience discomfort with visiting the hospital or doctor for your pregnancy follow-up visits?				
Yes	<.001	8.87 (4.76–16.51)	<.001	6.61 (3.43–12.75)
Q2. Do you visit the hospital regularly for your pregnancy follow-up visits?				
No	.176	1.82 (0.77–4.31)	.890	1.05 (0.51–2.16)
Q3. Do you follow the isolation rules during the pregnancy follow-up visits?				
No	.310	5.76 (0.2–169.5)	.632	1.68 (0.2–14.18)
Q4. Does your doctor/nurse/midwife follow the isolation rules during the pregnancy follow-up visits?				
No	.685	0.65 (0.08–5.1)	.991	1.01 (0.19–5.5)
Q5. Do you have any information about the effects of COVID-19 on pregnancy?				
No	.002	3.4 (1.56–7.43)	<.001	8.87 (4.23–18.59)
Q6. Does your doctor/nurse/midwife give you detailed information about the effects of COVID-19 on maternal and fetal health?				
No	.006	2.6 (1.31–5.17)	.093	1.78 (0.91–3.48)

Abbreviations: CI, confidence interval; COVID-19, coronavirus disease 2019; HDAS, hospital anxiety and depression scale; OR, odds ratio.

depression in pregnant women has significantly increased after the spread of COVID-19 throughout the world.

The risk of anxiety and depression in pregnant women with low education levels was found to be higher in the present study. Similarly, low education levels have been found to be associated with a high prevalence of anxiety and depression in Chinese pregnant women.²⁸ Furthermore, the risk of psychological abnormality has been reported to be higher in pregnant women with less than high school education.⁶ These findings indicate that education is an important factor related to the development of anxiety and depression during pregnancy and that pregnant women with low education levels have a high risk of developing anxiety and depressive symptoms.

Nanjundaswamy et al.¹² found that approximately 35% of pregnant women in India have job-related concerns. A significant positive relationship has been reported between unemployment and prenatal depression in pregnant women (Ma et al.²⁶). Moreover, being a housewife (i.e., being unemployed) during pregnancy has been found to be a risk factor related to the development of anxiety and depression.²⁹ In accordance with previous findings, the present study

revealed that the risk of anxiety and depression is higher in pregnant women who are not working during the pandemic. Being unemployed or being a housewife during the pandemic increases the time spent at home and reduces socialization and interpersonal communication, thereby increasing the risk of anxiety and depression.

The present study revealed that regular physical activity is an important factor related to the development of anxiety and depression during pregnancy. Pregnant women who do not engage in regular physical activity have a higher risk of anxiety and depression. Regular activity during pregnancy has been shown to have a protective effect on the development of anxiety and depressive symptoms.²⁹ Furthermore, there is a positive relationship between a sedentary lifestyle and the development of mental problems in the second trimester and an inverted U-shaped curvilinear relationship in the third trimester.³⁰ Half of the pregnant women who prefer to stay at home during the pandemic do not engage in regular physical activity. However, regular physical activities during pregnancy have a protective effect on the development of anxiety and depressive symptoms.

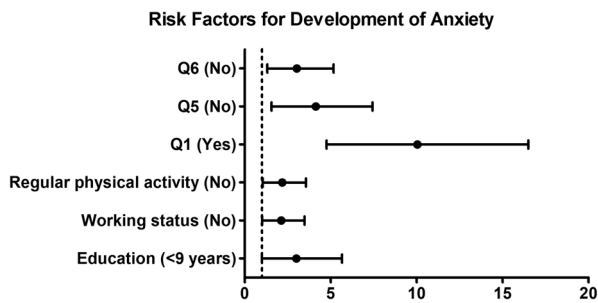


FIGURE 1 Forrest plot of significantly factors related to anxiety in pregnant women, odds ratios and 95% confidence intervals. Q1: Do you experience discomfort with visiting the hospital or doctor for your pregnancy follow-up visits?, yes; Q5: Do you have any information about the effects of coronavirus disease 2109 (COVID-19) on pregnancy?, no; Q6: Does your doctor/nurse/midwife give you detailed information about the effects of COVID-19 on maternal and fetal health?, no

In the present study, more than half of the pregnant women (68%) stated that they experience discomfort with visiting the hospital or doctor for face-to-face follow-up visits. There is a very high risk of anxiety and depression in pregnant women who experience discomfort with such follow-up visits. In Wuhan, 41.9% of pregnant women stated that they refused to visit any hospital because of the fear of infection and that they would postpone antenatal care and prenatal hospitalization. Of the pregnant women, 12.8% reported that they wanted to have a cesarean delivery instead of waiting for labor at the hospital.¹⁰ In Israel, 68.7% of pregnant women reported being concerned about going for pregnancy examinations.¹⁵

Face-to-face prenatal consultation is the most important factor that increases anxiety during pregnancy in the USA. Consequently, pregnant women plan to not give birth in the hospital. While the rate of planning to give birth in the hospital was 96.4% before the COVID-19 pandemic, it decreased to 87.7% during the pandemic.¹¹ In India, the most common concern reported by pregnant women to obstetricians is the fear of getting infected during hospital visits for prenatal check-ups and ultrasound scans.¹² Avoiding prenatal follow-ups can lead to conditions that threaten pregnancy outcomes, for example, ectopic pregnancy, delayed detection of fetal congenital anomalies, uncontrolled hypertension and pre-eclampsia, postterm birth, and dystocia.³¹⁻³³

More than 2% of pregnancies are ectopic, and 3%–5% of children are born with genetic disorders or congenital disabilities.⁶ Although the cancelation of hospital follow-up visits can reduce the risk of infections, it can cause more serious problems. Pregnant women are concerned about getting infected with COVID-19 during hospital visits; however, the maternal and fetal health benefits of such visits should be considered.

Pregnant women who do not have information about the effects of COVID-19 on pregnancy and who are not informed by their doctor/nurse/midwife about the effects have a high risk of anxiety and depression. As limited information is available about the effects of COVID-19 on pregnancy, pregnant women have a high risk of anxiety and psychological distress.¹⁵ The concerns of pregnant

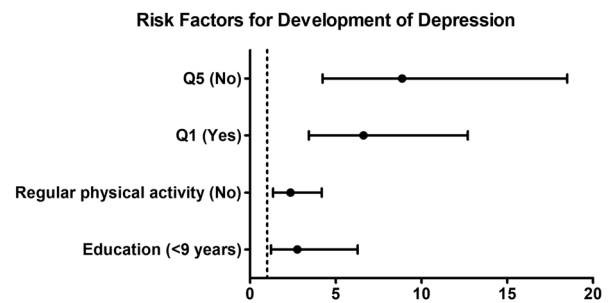


FIGURE 2 Forrest plot of significantly factors related to depression in pregnant women, odds ratios and 95% confidence intervals. Q1: Do you experience discomfort with visiting the hospital or doctor for your pregnancy follow-up visits?, yes. Q5: Do you have any information about the effects of COVID-19 on pregnancy?, no. COVID-19, coronavirus disease 2019

women also increase with the thought that the virus would be transmitted to the fetus by vertical transmission.² However, there is still no evidence of in utero or placental transmission of COVID-19 from infected pregnant women to fetuses.^{6-8,36}

The irrational use of social media to inform about the effects of COVID-19 increases the risk of anxiety and fear of getting infected.³⁴ Most pregnant women want to learn about personal protection, susceptibility to COVID-19, and intrauterine transmission.⁸ There is an urgent need for healthcare workers to manage the psychological distress of pregnant women during the pandemic. Midwives have played a very important role in providing care, health education, and counseling to pregnant women during and after the severe acute respiratory syndrome epidemic.³⁵ Not having enough information about the effects of COVID-19 on pregnancy and being uncertain about the duration of the pandemic increase the risk of anxiety and depression in pregnant women. Therefore, doctors/nurses/midwives should provide evidence-based information about the effects of COVID 19 on pregnancy according to the scientific literature to pregnant women.

4.1 | Study limitations

The present study has several limitations. One of the limitations is its cross-sectional design. The investigation of causal relationships is more difficult with a cross-sectional design than with a longitudinal design. Another limitation is that participation in the study was voluntary; therefore, there is the possibility of selection bias. The results of the present study may not be generalizable because of sociocultural differences.

5 | CONCLUSION

The prevalence of anxiety and depression in pregnant women has significantly increased during the COVID-19 pandemic. Having low education levels, not engaging in regular physical activity,

experiencing discomfort with face-to-face hospital visits, and not having information about the effects of COVID-19 on pregnancy are important factors related to the development of both anxiety and depression in pregnant women. In addition, being unemployed and not being informed by the doctor/nurse/midwife about the effects of COVID-19 are important factors related to the development of anxiety.

5.1 | Implications for nursing practice

Pregnant women are prone to anxiety and depression during the COVID-19 pandemic. High levels of anxiety and depression can have long-term effects on maternal and fetal health. Protective targets are needed within the framework of the related factors. Doctors/nurses/midwives should provide evidence-based information to pregnant women about the effects of COVID-19 on pregnancy. In addition, pregnant women should be questioned to assess anxiety and depressive symptoms. Timely psychological support should be provided to pregnant women with mental health issues. Online psychological support should be provided to pregnant women by specialists. Moreover, planning physical activity for pregnant women and encouraging them to engage in social activities are very important to reduce the development of anxiety and depression during pregnancy.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

ETHICS STATEMENT

Ethics committee approval was obtained from the Committee for Evaluation of Scientific Research of Trakya University, Faculty of Medicine (TUTF-BAEK 2020/268).

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REFERENCES

- World Health Organization. C archived: WHO timeline—COVID-19. 2020. <http://www.who.int/news-room/detail/27-04-2020-who-timeline-covid-19>
- Wu Y, Zhang C, Liu H, et al. Perinatal depressive and anxiety symptoms of pregnant women during the coronavirus disease 2019 outbreak in China. *Am J Obstet Gynecol*. 2020;223(2):240.e1-240.e9. <https://doi.org/10.1016/j.ajog.2020.05.009>
- World Health Organization. Coronavirus disease 2019 (COVID-19). Situation report-67. World Health Organization. 2020. <https://apps.who.int/iris/bitstream/handle/10665/331613/nCoVsitrep27Mar2020-eng.pdf?sequence=1&isAllowed=y>
- Centers for Disease Control and Prevention. (2020). Coronavirus disease 2019 (COVID-19). US Department of Health and Human Services. 2020. <https://www.cdc.gov/coronavirus/2019-ncov/about/transmission.html>
- Adhikari SP, Meng S, Wu YJ, et al. Epidemiology, causes, clinical manifestation and diagnosis, prevention and control of coronavirus disease (COVID-19) during the early outbreak period: a scoping review. *Infect Dis Poverty*. 2020;9(1):29. <https://doi.org/10.1186/s40249-020-00646-x>
- Chen Y, Li Z, Zhang YY, Zhao WH, Yu ZY. Maternal health care management during the outbreak of coronavirus disease 2019. *J Med Virol*. 2020;92(7):731-739. <https://doi.org/10.1002/jmv.25787>
- Rasmussen SA, Smulian JC, Lednický JA, Wen TS, Jamieson DJ. Coronavirus Disease 2019 (COVID-19) and pregnancy: what obstetricians need to know. *Am J Obstet Gynecol*. 2020;222(5):415-426. <https://doi.org/10.1016/j.ajog.2020.02.017>
- Schwartz DA. An analysis of 38 pregnant women with COVID-19, their newborn infants, and maternal-fetal transmission of SARS-CoV-2: Maternal coronavirus infections and pregnancy outcomes. *Arch Pathol Lab Med*. 2020;144(7):799-805. <https://doi.org/10.5858/arpa.2020-0901-SA>
- Chen H, Guo J, Wang C, et al. Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women. *The Lancet*. 2020;395(10226):809-815. [https://doi.org/10.1016/S0140-6736\(20\)30360-3](https://doi.org/10.1016/S0140-6736(20)30360-3)
- Liu X, Chen M, Wang Y, et al. Prenatal anxiety and obstetric decisions among pregnant women in Wuhan and Chongqing during the COVID-19 outbreak: a cross-sectional study. *Intl J Obstet Gynaecol*. 2020;127:1229-1240. <https://doi.org/10.1111/1471-0528.16381>
- Moyer CA, Compton SD, Kaselitz E, Muzik M. Pregnancy-related anxiety during COVID-19: A nationwide survey of 2,740 pregnant women. 2020. <https://www.researchsquare.com/article/rs-37887/v1>, <https://doi.org/10.21203/rs.3.rs-37887/v1>
- Nanjundaswamy MH, Shiva L, Desai G, et al. COVID-19 related anxiety and concerns expressed by pregnant and postpartum women—a survey among obstetricians 2020. <https://www.researchsquare.com/article/rs-38004/v1>, <https://doi.org/10.21203/rs.3.rs-38004/v1>
- Chen S, Zhuang J, Chen Q, Tan X. Psychological investigation on pregnant women during the outbreak of COVID-19. 2020. <http://www.researchsquare.com/article/rs-28455/v1>
- Wang C, Pan R, Wan X, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Int J Environ Res Public Health*. 2020;17(5):1729. <https://doi.org/10.3390/ijerph17051729>
- Ben-Ari OT, Chasson M, Sharkia SA, Weiss E. Distress and anxiety associated with COVID-19 among Jewish and Arab pregnant women in Israel. *J Reprod Infant Psychol*. 2020;38(3):340-348. <https://doi.org/10.1080/02646838.2020.1786037>
- Saccone G, Florio A, Aiello F, et al. Psychological Impact of COVID-19 in pregnant women. *Am J Obstet Gynecol*. 2020;223(2):293-295. <https://doi.org/10.1016/j.ajog.2020.05.003>
- Lebel C, MacKinnon A, Bagshawe M, Tomfohr-Madsen L, Giesbrecht G. Elevated depression and anxiety among pregnant individuals during the COVID-19 pandemic. *J Affect Disord*. 2020;277:5-13. <https://doi.org/10.31234/osf.io/gdhkt>
- Corbett GA, Milne SJ, Hehir MP, Lindow SW, O'Connell MP. Health anxiety and behavioural changes of pregnant women during the COVID-19 pandemic. *European J Obstet Gynecol Reprod Biol*. 2020;249:96-97. <https://doi.org/10.1016/j.ejogrb.2020.04.022>
- Durankus 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*. 2020:1-7. <https://doi.org/10.1080/14767058.2020.1763946>
- Grigoriadis S, Graves L, Peer M, et al. A systematic review and meta-analysis of the effects of antenatal anxiety on postpartum outcomes. *Archives of Women Mental Health's*. 2019;22(5):543-556. <https://doi.org/10.1007/s00737-018-0930-2>
- Noordam R, Aarts N, Verhamme KM, Sturkenboom MC, Stricker BH, Visser LE. Prescription and indication trends of antidepressant drugs in the Netherlands between 1996 and 2012:

- a dynamic population-based study. *Eur J Clin Pharmacol*. 2015;71(3): 369-375. <https://doi.org/10.1007/s00228-014-1803-x>
22. Rajkumar RP. COVID-19 and mental health: a review of the existing literature. *Asian J Psychiatry*. 2020;52:102066. <https://doi.org/10.1016/j.ajp.2020.102066>
 23. Matvienko-Sikar K, Meedy S, Claudia R. Perinatal mental health during the COVID-19 pandemic. *Women and Birth*. 2020;33:309-310. <https://doi.org/10.1016/j.wombi.2020.04.006>
 24. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand*. 1983;67:361-370.
 25. Aydemir Ö, Guvenir T, Kuey L, Kultur S. Validity and reliability of Turkish version of hospital anxiety and depression scale. *Turk J Psychiatry*. 1997;8:280-287.
 26. Ma X, Wang Y, Hu H, Tao XG, Zhang Y, Shi H. The impact of resilience on prenatal anxiety and depression among pregnant women in Shanghai. *J Affect Disord*. 2019;250:57-64. <https://doi.org/10.1016/j.jad.2019.02.058>
 27. Tuncel NT, Sut HK. The effect of anxiety, depression, and prenatal distress levels in pregnancy on prenatal attachment. *J Gynecol Obstetr Neonatol*. 2019;16(1):9-17.
 28. Zhang Y, Muyiduli X, Wang S, et al. 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. <https://doi.org/10.1080/02646838.2018.1492098>
 29. Xian T, Zhuo L, Dihui H, Xiaoni Z. Influencing factors for prenatal stress, anxiety, and depression in early pregnancy among women in Chongqing, China. *J Affect Disord*. 2019;253:292-302. <https://doi.org/10.1016/j.jad.2019.05.003>
 30. Xiang M, Zhang Z, Liang H. Sedentary behavior relates to mental distress of pregnant women differently across trimesters: an observational study in China. *J Affect Disord*. 2020;260:187-193. <https://doi.org/10.1016/j.jad.2019.08.086>
 31. Chinese Medical Association Credits will Obstetrics and Gynecology Obstetrics Group. Guidelines for preconception and pregnancy care (2018). *Chinese J Obstetr Gynecol*. 2018;53(1):7-13. <https://doi.org/10.3760/cma.j.issn.0529-567X.2018.01.003>
 32. Brown MA, Magee LA, Kenny LC, et al. Hypertensive disorders of pregnancy: ISSHP classification, diagnosis, and management recommendations for international practice. *Hypertension*. 2018;72(1): 24-43. <https://doi.org/10.1161/HYPERTENSIONAHA.117.10803>
 33. Chou D, Daelmans B, Jolivet RR, Kinney M, Say L, Every Newborn Action Plan Ending Preventable Maternal Mortality Working Groups. Ending preventable maternal and newborn mortality and stillbirths. *Br Med J*. 2015;351:h4255. <https://doi.org/10.1136/bmj.h4255>
 34. Holmes EA, O'Connor RC, Perry VH, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *The Lancet Psychiatry*. 2020;7(6):547-560. [https://doi.org/10.1016/S2215-0366\(20\)30168-1](https://doi.org/10.1016/S2215-0366(20)30168-1)
 35. Ng J, Sham A, Tang PL, Fung S. SARS: pregnant women's fears and perceptions. *British Journal of Midwifery*. 2004;12(11):698-703. <https://doi.org/10.12968/bjom.2004.12.11.16710>
 36. Qianchenga X, Jianb S, Linglingc P, et al. Coronavirus disease 2019 in pregnancy. *Int J Infect Dis*. 2020;95:376-383. <https://doi.org/10.1016/j.ijid.2020.04.065>

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