











Anxiety, attitudes-behaviors, coping styles, and social support among high-risk pregnant women in the late period of the coronavirus disease 2019 pandemic

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SUMMARY

OBJECTIVE: The purpose of this study was to investigate the prevalence of anxiety among high-risk pregnant women in the late period of the coronavirus disease 2019 pandemic and to evaluate the relationship between anxiety levels, attitudes-behaviors, coping styles, and other psychometric parameters.

METHODS: Pregnant women who were followed up in our gynecology outpatient clinic were evaluated during their admissions between November 15, 2020 and February 15, 2021. This cross-sectional study analyzes prospectively collected data from a university hospital. Inclusion criteria were those being at risk of pregnancy and between the age of 18 and 45 years, while exclusion criteria were mental retardation and the presence of serious psychiatric illness. The study included 140 participants. Sociodemographic and pregnant attitudes-behaviors data form, State-Trait Anxiety Inventory, Coping Styles Scale Brief Form (Brief-COPE), and Multidimensional Scale of Perceived Social Support were used to collect data.

RESULTS: Participants had high anxiety levels (State-STAI: 40.32±9.88; Trait-STAI: 42.71±7.32) and high prevalence of probable clinical anxiety [State-STAI: 84 (60.0%); Trait-STAI: 92 (65.7%)]. The fact concerning the transmission of the coronavirus disease 2019 to the baby during pregnancy/birth, extent to which coronavirus disease 2019 pandemic prevents regular pregnancy checkups, and family subgroup-Multidimensional Scale of Perceived Social Support predicted state probable clinical anxiety. Use of disinfectants predicted trait probable clinical anxiety. Employment status predicted state/trait probable clinical anxiety. The existence of trait probable clinical anxiety was significantly associated with behavioral disengagement and substance use which are considered ineffective coping styles. Participants without trait probable clinical anxiety had significantly more adopted positive reinterpretation, one of emotion-focused coping styles.

CONCLUSION: Based on our results, the concern of the transmission of the coronavirus disease 2019 to the babies during pregnancy/birth may be the main factor influencing anxiety among high-risk pregnant women.

KEYWORDS: Anxiety. COVID-19. Social support. Pregnant women.

INTRODUCTION

Turkey was facing a new wave of the coronavirus disease 2019 (COVID-19) pandemic, which is a worldwide health disaster. In Turkey, there were 33.198 new cases and 22.0375 new active cases daily during the time period from November 15, 2020 to February 15, 2021¹.

The secondary effects of COVID-19 on the general population, such as worsening financial circumstances, quarantine conditions, and psychological reactions in emergency situations, could have a number of negative psychiatric implications². According to a recent review, up to 28% of research volunteers screened in response to the COVID-19 pandemic showed symptoms of depression and anxiety³.

Children, adolescents, geriatric population, pregnant women, and those with preexisting mental illness all require special attention as they may be disproportionately affected by the secondary psychological consequences of the pandemic. Pregnant women may face increased levels of distress due to various reasons, particularly during the period of infectious disease outbreak⁴. Prenatal anxiety, depression, and stress have been linked to negative delivery outcomes, such as miscarriage, premature labor, low birth weight, and fetal death⁵. Furthermore, research reveals that if a mother is depressed, anxious, or stressed during pregnancy, her child is more likely to have a variety of unfavorable neurodevelopmental consequences, including increased emotional, behavioral, and cognitive issues⁶. It is critical to comprehend

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Conflicts of interest: the authors declare there is no conflicts of interest. Funding: none.

Received on December 22, 2021. Accepted on January 01, 2022.

the psychological effects of pandemic on pregnant women. Multiple psychological and social elements undoubtedly influence an individual's behavior and coping skills in the face of a pandemic. More objective data are urgently required at this time to offer pregnant mothers with dependable comprehensive information and psychological support⁷. Therefore, early recognition of mental health problems in pregnant women and determination of the response to these problems and coping styles, as well as the social support they have, may lead to the development of effective and comprehensive treatment programs. However, information on the impact of the COVID-19 outbreak on mental health of pregnant women is still lacking^{8,9}.

In this study, our aim was to measure the prevalence of anxiety among high-risk pregnant women in the late period of the COVID-19 pandemic and to evaluate the relationship between anxiety levels and attitudes-behaviors, coping styles, and other psychometric parameters.

METHODS

Participants and procedures

Between November 15, 2020 and February 15, 2021, this cross-sectional study analyzes prospectively gathered data from Sakarya University Hospital. During their admissions, pregnant women who were followed up in the gynecology outpatient clinic were evaluated. Inclusion criteria were those being at risk of pregnancy and between the age of 18 and 45 years, while the presence of mental retardation and severe psychiatric illness were the exclusion criteria. Informed consent was obtained from all pregnant women.

The study was approved by the ethical committee of our university (no. 10840098-604.01.01-E.15517).

Survey instruments

Sociodemographic and pregnant attitudes-behaviors data form was used to collect data.

The Spielberger's State-Trait Anxiety Inventory (STAI) is a two-part Likert-type scale: one part measures anxiety at a point in time (State-STAI) and another part measures overall anxiety (Trait-STAI). Each part has 20 statements, with score ranging from 20 to 80, with the higher score indicating the higher anxiety level. A cutoff score of 40 is typically used to determine if a person has probable clinical anxiety¹⁰. The Turkish version of Spielberger's STAI has an internal reliability of 0.94–0.96 for State-STAI and 0.83–0.87 for Trait-STAI^{11,12}.

The Coping Styles Scale Brief Form (Brief-COPE) measures behaviors related to stress¹³ and it contains 28 statements,

each describing various coping methods. These statements may be broken down into 14 subscales, each having 2 statements. Each item response is rated on a scale of 1–4. Each subscale provides a raw score that ranges from 2 to 8¹⁴.

The Multidimensional Scale of Perceived Social Support (MSPSS) is a 12-item scale¹⁵. The items are scaled on a seven-point rating system, with score ranging from “definitely no” (1) to “definitely yes” (7). Family, friends, and significant others make up the three subgroups. Higher scores indicate higher perceived social support. The internal reliability coefficient of the Turkish version of the MSPSS ranged from 0.80 to 0.95 for the total score and its subgroups¹⁶.

Statistical analysis

We conducted univariate analysis using the Mann-Whitney U-test and chi-square test in addition to descriptive statistics. A binary logistic regression analysis was performed to evaluate the association of the relevant predictors with our categorical dependent variable. Those factors showing statistical significance ($p < 0.05$) were included in the regression analysis as independent variables.

RESULTS

Description of study sample

A total of 149 participants were evaluated in this study. Out of these, 9 were excluded due to missing data, and the remaining 140 were included in the study. The mean age of the participants was 29.58 ± 5.62 . Regarding educational background, 35.0% completed primary school, 40.0% completed high school, and 25.0% completed bachelor's and master's degrees. About 78.6% of the high-risk pregnant women were unemployed. The mean gestational week was 30.83 ± 5.95 . Using a five-point Likert scale, the level of knowledge about COVID-19 was 3.69 ± 0.84 , and the rate of the transmission of COVID-19 to self, family/relatives, and the baby during pregnancy/birth were 2.44 ± 1.06 , 2.41 ± 1.09 , and 2.84 ± 1.23 , respectively. In addition, the extent to which the COVID-19 pandemic prevents regular pregnancy checkups was 2.77 ± 1.28 . The main pregnancy risk factors were as follows: 17.9% of our high-risk pregnancies had gestational diabetes mellitus (GDM), 12.9% had gestational hypertension (GHT), 9.3% had twin pregnancy, 6.4% had polyhydramnios, 6.4% had pregestational DM, 5% had intrauterine growth retardation, and 5% had preterm labor. Of all individuals, 84 (60.0%) had state probable clinical anxiety and 92 (65.7%) had trait probable clinical anxiety. The most common coping style adopted by high-risk pregnant women was turning to religion

(mean >6), while substance use, behavioral disengagement, denial, and humor (mean <4) were the least adopted coping styles. Participants stated that their family provided them with the majority of their social assistance. Table 1 shows the study

Table 1. Attitudes-behaviors, anxiety levels, coping styles, and social support levels among high-risk pregnant women.

	N (%) / mean (SD)
Overall	140 (100)
Preventive behaviors	
Use of masks	138 (98.6)
Use of disinfectants	120 (85.7)
Pay attention to social distance	135 (96.4)
Handwashing	130 (92.9)
Frequency of sleep problems during the COVID-19 pandemic	1.88 (1.20)
State-STAI score (≥ 40)	40.32 (9.88)
No	56 (40.0)
Yes	84 (60.0)
Trait-STAI score (≥ 40)	42.71 (7.32)
No	48 (34.3)
Yes	92 (65.7)
Problem-focused coping	
Using instrumental social support	5.71 (1.54)
Suppression of competing activities	5.04 (1.41)
Restraint coping	5.23 (1.35)
Planning	5.90 (1.44)
Emotional-focused coping	
Humor	3.79 (1.65)
Acceptance	5.10 (1.47)
Turning to religion	7.40 (1.11)
Positive reinterpretation	5.74 (1.31)
Using emotional social support	5.05 (1.49)
Ineffective coping	
Denial	3.74 (1.60)
Behavioral disengagement	3.73 (1.51)
Mental disengagement	4.56 (1.46)
Focus on and venting of emotions	5.19 (1.56)
Substance use	2.41 (1.14)
Multidimensional Scale of Perceived Social Support (MSPSS)	
Family	25.59 (4.35)
Friends	21.96 (6.49)
Significant other	20.31 (7.81)
Total score	67.86 (14.85)

Possible scores are between 1 and 5 (no=1, rarely=2, sometimes=3, often=4, and always=5).

population's pregnancy attitudes-behaviors, anxiety levels, coping styles, and social support.

Factors associated with state/trait probable clinical anxiety in the study sample

Table 2 indicates the findings of the univariate analysis for probable clinical anxiety among the participants. When evaluating the sociodemographic data, employment status was found to be significantly associated with both state and trait probable clinical anxiety.

When examining the attitudes-behaviors, state probable clinical anxiety was significantly higher in pregnant women who stated that COVID-19 pandemic more frequently prevents regular pregnancy checkups (3.01 ± 1.30) and the concern for COVID-19 transmission to the baby during pregnancy/birth (3.12 ± 1.19) than those who did not state such situations (2.41 ± 1.17 and 2.43 ± 1.17 , respectively). In high-risk pregnant women, there was a significant relationship between the use of disinfectants and handwashing and trait probable clinical anxiety. The frequency of sleep problems was significantly higher in patients with trait probable clinical anxiety than those without such problems.

When examining the coping styles, , adopting behavioral disengagement and substance use was significantly higher in high-risk pregnant women with trait probable clinical anxiety than those without. Positive reinterpretation was adopted significantly high in those without trait probable clinical anxiety than in those with.

The MSPSS family subgroup scores were significantly higher in high-risk pregnant women without state probable clinical anxiety than in those with.

The concern for COVID-19 transmission to the baby during pregnancy/birth, extent to which the COVID-19 pandemic prevents regular pregnancy checkups, and MSPSS family subgroup were found to be predictors of state probable clinical anxiety. Use of disinfectants was found to be a predictor of trait probable clinical anxiety. Employment status was found to be a predictor of both state and trait probable clinical anxiety (Table 3).

DISCUSSION

Despite positive findings such as increased availability of information and assurance through healthcare professionals and primary care¹⁷, our study found that in the late period of the COVID-19 pandemic, high-risk pregnant women experienced high levels and prevalence of anxiety. The mean State-STAI and Trait-STAI scores were above the limit for probable clinical anxiety (≥ 40)¹⁰. As a result, people with probable clinical anxiety

Table 2. The relationship between probable clinical anxiety and sociodemographic factors, attitudes-behaviors, coping styles, and social support among high-risk pregnant women.

	State-STAI<40 N (%) / mean (SD)	State-STAI≥40 N (%) / mean (SD)	p-value	Trait-STAI<40 N (%) / mean (SD)	Trait-STAI≥40 N (%) / mean (SD)	p-value
Employment status						
Employment	7 (23.3)	23 (76.7)	<0.05*	4 (13.3)	26 (86.7)	<0.01*
Unemployment	49 (44.5)	61 (55.5)		44 (40.0)	66 (60.0)	
Use of disinfectants						
No	6 (30.0)	14 (70.0)	0.324 [†]	2 (10.0)	18 (90.0)	<0.05*
Yes	50 (41.7)	70 (58.3)		46 (38.3)	74 (61.7)	
Handwashing						
No	2 (20.0)	8 (80.0)	0.315 [†]	0 (0.0)	10 (100.0)	<0.05*
Yes	54 (41.5)	76 (58.5)		48 (36.9)	82 (63.1)	
Frequency of sleep problems during the COVID-19 pandemic	1.63 (0.96)	2.05 (1.32)	0.074"	1.54 (0.82)	2.05 (1.33)	<0.05"
Problem-focused coping						
Using instrumental social support	5.82 (1.43)	5.64 (1.61)	0.608"	5.67 (1.56)	5.74 (1.53)	0.888"
Suppression of competing activities	5.04 (1.40)	5.05 (1.43)	0.993"	4.92 (1.38)	5.11 (1.43)	0.433"
Restraint coping	5.29 (1.17)	5.19 (1.47)	0.650"	5.3 (1.32)	5.18 (1.37)	0.596"
Planning	6.14 (1.31)	5.74 (1.50)	0.122"	6.04 (1.37)	5.83 (1.47)	0.371"
Emotional-focused coping						
Humor	3.75 (1.68)	3.81 (1.64)	0.756"	3.60 (1.66)	3.88 (1.64)	0.252"
Acceptance	5.14 (1.37)	5.07 (1.54)	0.694"	5.25 (1.44)	5.02 (1.48)	0.338"
Turning to religion	7.46 (0.93)	7.36 (1.22)	0.935"	7.58 (0.87)	7.30 (1.21)	0.231"
Positive reinterpretation	5.96 (1.31)	5.60 (1.30)	0.070"	6.13 (1.10)	5.54 (1.37)	<0.05"
Using emotional social support	5.30 (1.54)	4.89 (1.44)	0.117"	5.02 (1.55)	5.08 (1.46)	0.721"
Ineffective coping						
Denial	3.96 (1.71)	3.60 (1.52)	0.224"	3.81 (1.66)	3.71 (1.58)	0.743"
Behavioral disengagement	3.43 (1.40)	3.93 (1.56)	0.073"	3.29 (1.46)	3.96 (1.50)	<0.01"
Mental disengagement	4.70 (1.33)	4.48 (1.54)	0.238"	4.73 (1.41)	4.48 (1.49)	0.408"
Focus on and venting of emotions	4.91 (1.52)	5.37 (1.57)	0.127"	4.85 (1.49)	5.36 (1.57)	0.090"
Substance use	2.34 (1.01)	2.46 (1.23)	0.369"	2.15 (0.71)	2.55 (1.30)	<0.05"
Multidimensional Scale of Perceived Social Support (MSPSS)						
Family	26.84 (2.18)	24.75 (5.17)	<0.05"	26.46 (3.11)	25.13 (4.83)	0.284"
Friends	22.95 (6.35)	21.31 (6.54)	0.082"	22.33 (6.13)	21.77 (6.70)	0.676"
Significant other	20.41 (8.08)	20.24 (7.69)	0.807"	20.40 (7.90)	20.26 (7.80)	0.752"
Total score	70.20 (13.64)	66.30 (15.49)	0.165"	69.19 (13.61)	67.16 (15.48)	0.530"

[†]Chi-square test. [‡]Mann-Whitney U-test. Bold value indicates statistically significant.

Table 3. Binary logistic regression analysis of factors associated with probable clinical anxiety of high-risk pregnant women.

	B	SE	Wald	df	Sig.	OR	95%CI for OR
State-STAI probable clinical anxiety							
Concern for the transmission of COVID-19 to the baby during pregnancy/birth	0.460	0.164	7.883	1	0.005	1.583	1.149–2.182
Extent to which the COVID-19 pandemic prevents regular pregnancy check-ups	0.351	0.155	5.136	1	0.023	1.421	1.049–1.925
Family-MSPSS	-0.158	0.060	6.963	1	0.008	0.854	0.759–0.960
Employment status							
Employment (ref.)	-	-	-	-	-	-	-
Unemployment	-1.083	0.515	4.417	1	0.036	0.339	0.123–0.930
Trait-STAI probable clinical anxiety							
Employment status							
Employment (ref.)	-	-	-	-	-	-	-
Unemployment	-1.530	0.604	6.419	1	0.011	0.216	0.066–0.707
Behavioral Disengagement	0.198	0.147	1.812	1	0.178	1.218	0.914–1.624
Use of disinfectants							
No	-	-	-	-	-	-	-
Yes	-1.861	0.806	5.333	1	0.021	0.155	0.032–0.755
Substance use	0.346	0.263	1.728	1	0.189	1.414	0.844–2.369
Positive Reinterpretation	-0.303	0.159	3.615	1	0.057	0.739	0.541–1.009
Frequency of sleep problems during the COVID-19 pandemic	0.316	0.192	2.724	1	0.099	1.372	0.942–1.998

State-STAI: Nagelkerke R²: 0.263, Hosmer and Lemeshow test: 0.663; Trait-STAI: Nagelkerke R²: 0.279, Hosmer and Lemeshow test: 0.884. OR: odds ratio, CI: confidence interval, df: degree of freedom. Bold value indicates statistically significant.

required to be evaluated for an anxiety disorder. Hocaolu et al. who conducted the study in pregnant women during the delay period of the pandemic reported that trait anxiety was higher than state anxiety and that maternal anxiety was high⁸ (State-STAI: 39.52±10.56; Trait-STAI: 42.74±8.33). In a study conducted by Yassa et al., the mean STAI-T score of 203 pregnant women was 41.96±9.15, and the incidence of STAI >40 score was 62.6%. Although our study was conducted in the late period of the pandemic, it was remarkable that our results were very close to the levels and prevalence of anxiety of the study conducted at the beginning of the pandemic (April 2020)¹⁸.

Employment status predicted state/trait probable clinical anxiety. We think that this situation is related to the fact that unemployment reduces the risk of transmission by preventing contact with other people. According to the study conducted by Mortazavi et al. in 484 pregnant women with healthy fetuses between May 5 and August 5, 2020, the prevalence of employment (22.9%) was very close to our study and being employed

predicted worry similar to our study¹⁹. In a study conducted by Hocaoglu et al. with 283 pregnant women during the COVID-19 pandemic, the prevalence of employment status was very close to our study (78.1%), but employment status did not predict state/trait anxiety⁸.

The concern for the transmission of COVID-19 to the baby during pregnancy/birth and extent to which the COVID-19 pandemic prevents regular pregnancy checkups predicted the state probable clinical anxiety. According to Yassa et al., 42% of pregnant women thought their baby would be infected after delivery during the pandemic²⁰. In a study of prenatal and postnatal women in the COVID-19 pandemic, Lee et al. reported that many participants were unclear about the likelihood of vertical COVID-19 transmission, and 81.3% stated that pregnant women were more vulnerable to COVID-19 than the general population²¹. The effects of COVID-19 on pregnant women and their children are poorly documented. Participants who used disinfectants and washed their hands

for preventing COVID-19 had less trait probable clinical anxiety. Moreover, using disinfectants predicted less trait probable clinical anxiety. Consistent with our study, in a study conducted in the general population (n=1210) in China during the early phase of the pandemic, washing hands after touching contaminated objects was associated with lower levels of anxiety²². We think that these behaviors may have a mitigating effect on anxiety in high-risk pregnant women during the pandemic. Trait probable clinical anxiety was higher in those who had frequent sleep problems during the pandemic. In two separate studies conducted in 1,794 and 751 pregnant women in the early period of the pandemic, decreased sleep duration and poor sleep quality were associated with increased anxiety symptoms, supporting our findings^{23,24}.

The existence of trait probable clinical anxiety was significantly associated with behavioral disengagement and substance use, which are considered ineffective coping styles. On the contrary, high-risk pregnant women without trait probable clinical anxiety had significantly more adopted positive reinterpretation, one of the emotion-focused coping styles. In an online study conducted in 304 pregnant women in Canada, GAD-7 anxiety scores were significantly positively correlated with dysfunctional (ineffective) coping style ($r=0.53$, $p<0.01$) and negatively correlated with emotion-focused coping style ($r=-0.12$, $p<0.05$), while it was not significantly correlated with problem-focused coping style ($r=0.10$, $p>0.05$) during the COVID-19 pandemic²⁵. During the COVID-19 pandemic, Zhu et al. found that positive coping was negatively correlated with total anxiety and depression score in frontline healthcare workers²⁶. In a study evaluating substance use as a coping strategy in 83 pregnant women during the COVID-19 pandemic, more substance use was associated with elevated stress, depressive symptoms, and poorer mental health²⁷. These findings are consistent with the data of our study. In general, we think that problem- and emotion-focused (i.e., positive reinterpretation) coping styles should be adopted instead of ineffective coping styles (i.e., behavioral disengagement and substance use), and strengthening therapeutic approaches in this direction may be effective in reducing anxiety in pregnant women during the COVID-19 pandemic.

In the earlier stages of the COVID-19 pandemic, Lebel et al. conducted an online study in 1,987 pregnant women and found that anxiety symptoms were negatively associated with perceived social support ($r=-0.315$, $p<0.001$)⁹. In addition, in a study of 79 pregnant women with hypertension and diabetes, low social support was correlated with higher anxiety scores ($r=-0.273$, $p<0.05$)²⁸. However, this study showed that total perceived social support score was not associated with

anxiety levels whereas perceived social support family subgroup scores predicted state probable clinical anxiety among the participants. In this context, more family and social support in high-risk pregnant women draws attention in relation to less state probable clinical anxiety. Social support is considered to reduce the effects of prenatal maternal stress on the infant's stress reactions, thereby buffering the biological stage of stress from mother to baby²⁹.

The strengths of this study are that the survey data were collected through face-to-face interviews with our follow-up patients, providing comprehensive data on the sociodemographic and attitude-behavioral characteristics of the participants, and referring to probable clinical anxiety. The limitations of our study were that the measurements were carried out using self-report assessments and that it was a single-center study.

CONCLUSION

Our findings revealed that during the late period of the COVID-19 pandemic, high-risk pregnant women may suffer significant levels of anxiety symptoms and require a lot of social support. To reduce anxiety and improve attitudes-behaviors of pregnant women, information by specialists, appropriate focused coping styles (i.e., positive reinterpretation), and especially family social support could be a guide in rehabilitation of pregnant women. In addition, it is important to arrange the work environment in a way to reduce social contact in high-risk pregnant women, giving rest leave when necessary, and remedial interventions for sleep problems to combat anxiety during the pandemic.

AUTHORS' CONTRIBUTIONS

AK: Conceptualization, Formal Analysis, Investigation, Methodology, Resources, Writing – original draft. **KG:** Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Resources, Writing – original draft. **LY:** Formal Analysis, Resources, Writing – original draft. **ZK:** Conceptualization, Methodology, Resources, Supervision, Validation, Writing – review & editing. **AÖ:** Conceptualization, Data curation, Investigation, Resources, Writing – original draft. **BK:** Data curation, writing – original draft. **NT:** Investigation, Resources, Writing – original draft. **OK:** Data curation, Investigation, Resources, Writing – original draft. **MSB:** Data curation, Investigation, Methodology, Validation, Writing – review & editing. **SÖ:** Methodology, Supervision, Validation, Writing – review & editing.

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