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The relationship between pregnant women's anxiety levels about coronavirus and prenatal attachment

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A R T I C L E   I N F O

Keywords:
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A B S T R A C T

Aim: This study aimed to determine the relationship between pregnant women's anxiety levels related to concerns about the effect of coronavirus on prenatal attachment.

Design and method: This a descriptive and correlational design study was conducted from September 2020 to January 2021; it included 101 pregnant women who were more than 20 weeks pregnant. Introductory questionnaire, the Coronavirus Anxiety Scale and the Prenatal Attachment Inventory were used as data collection tools.

Results: Of the participants, 80.2% were 35 years old or younger. The participants' mean Coronavirus Anxiety Scale score was 8.85 ± 5.02 (min: 0, max: 17), which was close to the scale's cut-off value. Of the participants, 68.3% had high levels of perceived anxiety about coronavirus. The participants' mean Prenatal Attachment Inventory score was 60.08 ± 21.26 (min: 21, max: 84). Of the participants, 54.3% had high levels of Prenatal Attachment Inventory. Correlation analysis found a negative, but significant relationship between the participants' scores on the Coronavirus Anxiety Scale and the Prenatal Attachment Inventory (r = −0.244, p = 0.014).

Conclusion: The participants' prenatal attachment levels increased as their perceived anxiety scores about coronavirus decreased.

Introduction

Pregnancy is a developmental crisis period that causes physiological, social, hormonal and psychological changes (Napoli et al., 2020). It leads to a variety of positive and negative experiences (Thapa, Mainali, Schwank, & Acharya, 2020). Pregnant women may experience a number of negative feelings such as anxiety and depression, which can result in mental morbidity in the prenatal period (Ostacoli et al., 2020; Thapa et al., 2020). Extreme stress, emergencies, conflicts and natural disasters also increase the risk for morbidity (Thapa et al., 2020). The literature reports that approximately 12% of pregnant women worldwide have depression, and that their anxiety levels are 10% in developed countries and 25% in developing countries (Mappa, Distefano, & Rizzo, 2020; Ostacoli et al., 2020).

The coronavirus disease (COVID-19) and quarantine have negatively affected the world's population both physically and mentally. People have experienced anxiety and stigma due to social isolation during the COVID-19 pandemic (Ostacoli et al., 2020; Wu et al., 2020). Pregnant women are a vulnerable group that has been negatively affected by the pandemic. One in ten pregnant women was infected with COVID-19 virus in the regions where the pandemic spread (Ostacoli et al., 2020; Thapa et al., 2020; Wu et al., 2020). Studies that focus on pregnant women's mental health during pregnancy and the COVID-19 pandemic found that their mental health was negatively affected by the pandemic (Aydı̇n, Kızılkaya, Hancıoğlu Aytaç, & Taşlar, 2020; Ostacoli et al., 2020).

The COVID-19 pandemic disrupted prenatal care services and pregnancy checkups. Pregnant women had difficulty getting to health institutions, visits were delayed, and companions were not permitted during childbirth (Berthelot et al., 2020; Kızılkaya, Hancıoğlu Aytaç, & Yazıcı, 2020; Ostacoli et al., 2020). These conditions led pregnant women to experience anxiety in the antepartum, intrapartum and postpartum periods (Aydı̇n et al., 2020).

Negative feelings such as stress and anxiety during pregnancy can negatively affect psychosocial health (Berthelot et al., 2020; Mappa et al., 2020; Ostacoli et al., 2020). They can also lead to traumatic births

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by causing obstetric complications, preterm delivery, intrauterine growth restriction, loss of control, fear of childbirth, labor pain, prolonged labor and perceptions of insufficient social support (Berthelot et al., 2020; Mappa et al., 2020; Ostacoli et al., 2020). Anxiety during pregnancy can also cause postpartum depression (Mappa et al., 2020). Anxiety-ridden pregnant women may have children with emotional, behavioral and cognitive problems (Ayaz et al., 2020). Thus, evaluating anxiety and stress during pregnancy and determining appropriate interventions are important for the health of pregnant women and their unborn children.

The psychosocial well-being of pregnant women positively affects prenatal attachment (Tuncel Topaç & Kahyaoğlu, 2019). Prenatal attachment is the first important affiliative relationship between parents and their unborn children. This attachment starts when women desire to get pregnant, and it strengthens when they feel fetal movement and adopt their maternal roles (Tuncel Topaç & Kahyaoğlu, 2019). However, anxiety during the prenatal period can negatively affect prenatal attachment (Ozütk, 2019).

Determining pregnant women’s anxiety and prenatal attachment levels during the COVID-19 pandemic can contribute to evaluating the effects of the pandemic on pregnant women’s mental health, midwifery and nursing practices, and future research. No studies of pregnant women’s perceived anxiety levels about coronavirus and prenatal attachment levels were found. Therefore, this study contributes to the literature by determining pregnant women’s perceived anxiety levels about coronavirus and prenatal attachment levels.

Methods

Objective

This study aimed to determine the relationship between pregnant women’s anxiety levels related to concerns about the effect of coronavirus on prenatal attachment.

Study questions

Here are this study’s research questions:

• What are pregnant women’s perceived anxiety levels about coronavirus?
• What are their prenatal attachment levels?
• Is there a relationship between pregnant women’s anxiety levels and concerns about the effect of coronavirus on prenatal attachment?

Design

This is a descriptive and correlational study.

Population and sample

The study population consisted of women in Turkey who were pregnant from September 2020 to January 2021. Its sample included 129 pregnant women who met the inclusion criteria and were reached on online platforms. Five pregnant women were excluded from the study because they did not meet the inclusion criteria. Twenty-one pregnant women were also excluded from the study due to pregnancy-related complications. Two pregnant women did not fully complete the forms. Therefore, this study was concluded with 101 pregnant women.

Inclusion criteria

• Agreeing to participate,
• being more than 20 weeks pregnant,
• no communication problems,
• no pregnancy risks,
• and being able to access online social platforms.

Data collection tools

The data were collected using three forms: Basic data interview schedule, the Coronavirus Anxiety Scale (CAS) and the Prenatal Attachment Inventory (PAI).

Basic data interview schedule

This schedule was developed by the researchers after reviewing the literature. It has four parts and a total of 24 questions (Demir Yıldırım & Hotun Şahin, 2020; Tuncel Topaç & Kahyaoğlu, 2019). The first part queried pregnant women’s sociodemographic characteristics (age, education, place of residence, family type, employment status and chronic diseases); the second part queried their obstetric characteristics (number of pregnancies/miscarriages/stillbirths, whether the pregnancy was planned, and obstetric complications); the third part queried their health habits (smoking, nutrition, sleep and immune status), and the fourth part queried their COVID-19-related characteristics (test results, effect of COVID-19 pandemic on economic status, pregnancy care and mental health, anxiety about childbirth during the pandemic and coping with COVID-19).

The coronavirus anxiety scale (CAS)

The CAS was developed by Lee (2020) to determine anxiety during the COVID-19 pandemic. Biçer,Çakmak, Demir, and Kurt (2020) did the validity and reliability study of its Turkish version. This 5-point Likert-type scale does not have any subscales. Scale scores range from 0 to 20. The cut off value of the scale was 9. Accordingly, the value < 9 was interpreted as “has no anxiety” and the value ≥ 9 as “has anxiety/high anxiety”. The Cronbach’s alpha reliability coefficient was 0.83 for the Turkish version of the scale. The Cronbach’s alpha coefficient was 0.93 in this study.

The prenatal attachment inventory (PAI)

The PAI was developed by Muller (1993), Yilmaz and Beji (2013) did the validity and reliability study of its Turkish version. The PAI has 21 items. Scores on this 4-point Likert-type scale range from 21 to 84. Higher scores indicate higher levels of prenatal attachment. Lower scores indicate lower levels of prenatal attachment. The scale has no cut off value. We accepted the scale scores between 21 and 42 show a low level of prenatal attachment; between 43 and 63, a medium level of prenatal attachment; between 64 and 84 high/good level of prenatal attachment according to the distribution of scores obtained from this study. The Cronbach’s alpha reliability coefficient was 0.84 for the Turkish version of the inventory, indicating that its internal consistency is high. The Cronbach’s alpha coefficient was 0.91 in this study.

Data collection

The data were collected on online forms and mobile networks due to the restrictions in Turkey during the pandemic. The participants were not interviewed in person. The participants were informed about the study and were sent links on mobile networks, Facebook, WhatsApp and Instagram. They received an informed consent form (ICF) before given access to the questions. Then, those who agreed to participate in the study clicked the “next” button to start the survey. The pregnant women who received the information about and links to the study responded to the questions. The data were collected from pregnant women who were more than 20 weeks pregnant (second and third trimester). The survey required approximately 20 min to complete. The data were transferred to SPSS 21.0, reviewed and analyzed.

Statistical analysis

The data are shown as mean ± standard deviations. The categorical
data are shown as percentages (%). The Shapiro-Wilk test determined that the data were not normally distributed. Data were evaluated with chi-square and Fisher's Exact Test. The threshold for statistical significance was \( p < 0.05 \). Spearman's correlation analysis was used to determine the relationships between the participants’ CAS and PAI scores.

**Ethical considerations**

Prior to the study, ethics committee approval was obtained from the Balıkesir University Clinical Research Ethics Committee (2020/79). Necessary permissions to use the scales were obtained from their authors. Before filling out the data collection forms, the pregnant women were informed about the study, which indicated that doing so was voluntary. The pregnant women who agreed to participate confirmed this by clicking an onscreen option. No personal or institutional information was solicited by the study.

**Results**

**The pregnant women’s sociodemographic and obstetric characteristics**

Of the participants, 80.2% were 35 years old or younger; 86.2% had completed university and post-graduate education; and 72.3% were employed. Most participants (96%) had nuclear families; very few (4%) had chronic diseases; and 31.7% used medication. None of the participants were smokers. Among them, 52.5% had good perceptions of their nutrition, and 54.5% had good perceptions of their immune status.

Their mean number of pregnancies was 1.65 ± 0.733. Their mean pregnancy week was 28.08 ± 4.56 (min.: 20; max.: 37). Most of the participants (89.1%) had planned pregnancies. More than half of them (57.4%) were primiparae. Nearly all of them (93.1%) confirmed that they receive sufficient social support from their families. The frequency of pregnant women who said that pregnancy negatively affected their relationship with their spouse was 29.7%.

**The effects of the COVID-19 pandemic on the pregnant women**

Of the participants, 9.9% had a COVID-19 (+) history. Of them, 75.2% were anxious that their regular prenatal checkups would be negatively affected by concerns about the pandemic. The economic status of about half of the participants (52.5%) was affected by the pandemic, whereas the pregnancy checkups of 40.6% of the participants were not affected by the pandemic. Nearly half of the participants said that their mental health was negatively affected (62.4%), and that they had anxiety about childbirth (64.4%). Nearly all of the pregnant women indicated that they had an adequate-level coping mechanism for stressful events.

**The pregnant women’s perceived anxiety levels about coronavirus and prenatal attachment levels**

The participants' CAS scores ranged from 0 to 17. Their mean CAS score was 8.85 ± 5.02, which was close to the cut-off value of the scale. The CAS scores of 68.3% of the participants were higher than 9, which indicates high levels of anxiety (Fig. 1).

The participants’ PAI scores ranged from 21 to 84. Their mean PAI score was 60.08 ± 21.26 (Table 1). Of the participants, 54.3% had high levels of PAI (Fig. 1).

**The relationship between the pregnant women’s perceived anxiety levels about coronavirus and prenatal attachment levels**

Table 2 shows the correlation between the participants’ scores on the CAS and the PAI. Spearman's correlation analysis found a weak, negative relationship between their CAS and PAI scores (\( r = -0.244 \)). Their PAI score increased as their CAS score decreased.

**Comparison of the pregnant women's sociodemographic characteristics and the data related to the CAS and PAI**

Table 3 compares the pregnant women's sociodemographic characteristics with their pregnancy-, and COVID-19–related characteristics, and also shows their perceived anxiety levels about COVID-19 and their prenatal attachment levels. No statistically significant differences in the participants' mean CAS score were found related to their age, education, employment status, family type, nutrition, trimester, parity, planned

| Table 1 | The Distribution of the participants’ minimum, maximum and mean scores on the coronavirus anxiety scale and the prenatal attachment inventory. |
|---------|----------------------------------------------------------------------------------------------------------------------------------|
| Scales                           | Mean ± SD  | Min./Max. Possible scores |
|----------------------------------|------------|--------------------------|
| Coronavirus anxiety scale        | 8.85 ± 5.02| 0–17                     |
| Prenatal attachment inventory   | 60.08 ± 21.26| 21–84                   |
pandemic had significantly lower levels of COVID-19–related anxiety compared to those whose economic status was not affected by the pandemic (p = 0.026). The participants whose pregnancy checkups were not affected by the pandemic (p = 0.029) had higher frequency of COVID-19–related anxiety compared to those whose pregnancy checkups were affected by the pandemic. The participants who were anxious about their pregnancy checkups being negatively affected by the pandemic had higher levels of COVID-19–related anxiety compared to those who were not (p = 0.003). The participants who were anxious about the mode of delivery and the health of their baby had higher levels of anxiety compared to those who were not (p = 0.04). The participants who had good coping mechanism levels had higher mean CAS scores (p = 0.039).

No statistically significant differences in the participants’ mean PAI score were found due to their employment status, family type, nutrition,

### Table 2

| Scales | Coronavirus anxiety scale | P value | Prenatal attachment inventory |
|--------|---------------------------|---------|-----------------------------|
| r      | p                         |         |                             |
| Pupil  | -0.244**                  | 0.014   |                             |

r: Spearman’s correlation analysis, **p < 0.01.

### Table 3

Comparison of the pregnant women’s sociodemographic characteristics and the data related to the CAS and PAI.

| Participants’ sociodemographic, and COVID-19-related characteristics | CAS | PAI |
|---------------------------------------------------------------------|-----|-----|
|                                                                     | No anxiety | High anxiety | P value | Low | Midde | High | P value |
|                                                                     | N % | N %   |         | N % | N %   | N % |         |
| Age                                                                 |
| 35 years old or younger                                             | 28.44 | 35.65 | 0.21 | 19.23 | 14.17 | 48.59 | 0.001 |
| Older than 35                                                       | 24.29 | 21.60 | 0.727 | 5.57 | 5.70 | 2.14 | 0.001 |
| Egitim                                                              |
| High school                                                        | 25.31 | 60.69 | 0.039 | 27.1 | 7.1 | 53.6 | 0.039 |
| University and post-graduate                                       | 27.25 | 63.91 | 0.067 | 23.2 | 11.15 | 38.5 | 0.171 |
| Employment status                                                  |
| Employed                                                           | 24.24 | 49.67 | 0.067 | 23.2 | 11.15 | 38.5 | 0.171 |
| Unemployed                                                         | 8.58 | 71.24 | 0.067 | 8.28 | 4.17 | 17.6 | 0.067 |
| Type of family                                                      |
| Nuclear family                                                     | 5.30 | 67.91 | 0.589 | 31.3 | 12.12 | 54.5 | 0.117 |
| Extended family                                                    | 2.50 | 2.50 | 0.589 | 1.25 | 2.50 | 1.25 | 0.589 |
| Nutritional status                                                  |
| Poor                                                                | 2.50 | 4.50 | 0.246 | 29.12 | 14.15 | 50.3 | 0.763 |
| Good                                                                | 28.23 | 69.99 | 0.375 | 3.62 | 5.62 | |
| Social support system                                              |
| Insufficient                                                       | 5.71 | 2.286 | 0.036 | 31.3 | 13.18 | 50.3 | 0.558 |
| Sufficient                                                         | 27.24 | 67.91 | 0.036 | 1.14 | 1.14 | 5.7 | 0.558 |
| Trimester dönen (dönen)                                             |
| ≤28 hafta                                                           | 12.88 | 30.71 | 0.571 | 17.40 | 9.21 | 16.3 | 0.016 |
| ≥28 hafta                                                           | 20.33 | 39.61 | 0.571 | 15.25 | 5.85 | 39.6 | 0.016 |
| Parity                                                              |
| Primipara                                                          | 19.32 | 39.62 | 0.780 | 13.22 | 7.12 | 38.6 | 0.029 |
| Multipara                                                         | 13.30 | 30.69 | 0.780 | 19.44 | 7.16 | 37.9 | 0.029 |
| Planned pregnancy                                                  |
| Yes                                                                 | 26.28 | 64.71 | 0.084 | 29.32 | 9.10 | 52.7 | 0.016 |
| No                                                                  | 6.54 | 69.68 | 0.084 | 3.27 | 5.45 | 3.27 | 0.016 |
| Tested for COVID-19                                                 |
| Yes (−)                                                            | 28.38 | 63.69 | 0.721 | 29.30 | 12.10 | 50.9 | 0.839 |
| Yes (+)                                                            | 1.40 | 6.60 | 0.721 | 3.40 | 2.33 | 3.26 | 0.839 |
| The effects of pregnancy on the relationship with spouse           |
| Negative                                                           | 12.40 | 18.60 | 0.243 | 7.23 | 8.26 | 15.0 | 0.046 |
| Positive                                                           | 20.28 | 51.78 | 0.243 | 25.52 | 6.85 | 40.6 | 0.046 |
| Effect of COVID-19 on economic status                              |
| Yes                                                                | 22.41 | 31.58 | 0.026 | 13.24 | 11.20 | 29.5 | 0.067 |
| No                                                                 | 10.20 | 38.79 | 0.026 | 19.96 | 3.63 | 26.5 | 0.067 |
| Effect of COVID-19 on getting care                                 |
| Yes                                                                | 18.43 | 23.56 | 0.029 | 11.26 | 8.19 | 22.5 | 0.348 |
| No                                                                 | 14.23 | 46.76 | 0.029 | 21.35 | 6.10 | 33.5 | 0.348 |
| Anxiety about the fact that COVID-19 affects pregnancy checkup     |
| Yes                                                                | 18.43 | 58.76 | 0.003 | 30.39 | 11.45 | 35.4 | 0.07 |
| No                                                                 | 14.56 | 11.40 | 0.003 | 2.80 | 3.12 | 20.8 | 0.07 |
| Anxiety about childbirth and the baby during COVID-19              |
| Yes                                                                | 16.24 | 49.75 | 0.04 | 25.38 | 8.12 | 32.4 | 0.144 |
| No                                                                 | 16.44 | 20.55 | 0.04 | 7.19 | 6.17 | 23.6 | 0.144 |
| Effect of COVID-19 on mental health                                |
| Yes                                                                | 16.25 | 47.74 | 0.08 | 24.38 | 8.12 | 31.4 | 0.204 |
| No                                                                 | 16.42 | 22.57 | 0.08 | 8.21 | 6.15 | 24.6 | 0.204 |
| Coping with stress                                                 |
| Insufficient                                                       | 30.36 | 53.63 | 0.039 | 17.20 | 13.15 | 53.6 | 0.000 |
| Sufficient                                                         | 2.11 | 16.88 | 0.039 | 15.83 | 1.56 | 2.11 | 0.000 |

* Fisher exact test, others Pearson chi-square test.
social support system, the effect of COVID-19 on economic status, testing for COVID-19, the effect of COVID-19 on receiving prenatal care, anxiety about childbirth, and the effect of COVID-19 on mental health ($p > 0.05$).

The participants who were younger than 35 years ($p = 0.001$), had completed university education ($p = 0.001$), were in their third trimester ($p = 0.016$), were primiparous ($p = 0.029$), had planned pregnancies ($p = 0.01$), whose pregnancy affected their relationship with their spouse ($p = 0.046$), and who had a sufficient level of coping mechanism for stress ($p = 0.000$) had higher levels of prenatal attachment (Table 3).

Discussion

This study aimed to determine the relationships between perceived anxiety about coronavirus and prenatal attachment of pregnant women. The first COVID-19 case in Turkey was detected in March 2020, and then a number of restrictions were applied. The public health measures in response to the second wave of COVID-19 in Turkey included a lockdown, the closure of schools and cafés, and flexible working hours. Online educational programs were established for pregnant women who were not able to visit hospitals due to the COVID-19 pandemic.

Studies have found that pregnant women were negatively affected by the COVID-19 pandemic increasing their depression and anxiety levels (Berthelot et al., 2020; Wu et al., 2020). This study found that the participants' COVID-19-related anxiety levels were close to the cut-off value of the CAS. Of the participants, 68.3% had high levels of COVID-19-related anxiety. The frequency of the participants who said that the pandemic negatively affected their mental health was 64.4%. Lebel, Mackinnon, Bagshawe, Tomfohr-Madsen, & Giesbrecht, 2020 conducted a study in Canada and found that pregnant women's anxiety and depression levels increased during the pandemic. Saccone et al. (2020) conducted a study in Canada and found that the COVID-19 pandemic increased pregnancy-related anxiety. Additionally, women had higher levels of anxiety in the first trimester of their pregnancy than they had in the second or third trimester of their pregnancy (Saccone et al., 2020).

Moyer, Compton, Kaselitz, and Muzik (2020) found that 2740 pregnant women in the US had high levels of pregnancy-related anxiety during the COVID-19 pandemic. Berthelot et al. found that women had higher levels of stress, anxiety and depression during the pandemic (Berthelot et al., 2020). Another study found that women had higher levels of stress and anxiety throughout their pregnancy and postpartum during the COVID-19 pandemic (Stepowicz, Wencza, Bierikiewicz, Horzelski, & Grzesiak, 2020). One study found that pregnant women had high levels of COVID-19-related anxiety (Taubman-Ben-Ari, Chasson, Abu Sharkia, & Weiss, 2020). Similarly, Chaves et al. (2021) found that pregnant women showed depression (58%) and anxiety (51%) symptoms during the pandemic. A longitudinal study indicated that pregnant women had higher anxiety and depression levels during the pandemic compared to those who were not pregnant (Lopez-Morales et al., 2021). Unlike these results, Effati-Daryani et al. (2020) found that pregnant women had lower depression, stress, and anxiety levels during the COVID-19 pandemic. This study's results are similar to most of those in the literature, which indicate that the majority of pregnant women experienced more anxiety during the pandemic. Therefore, midwives and healthcare professionals should provide online counseling to pregnant women in order to reduce their anxiety levels during the pandemic. The results of the present study are similar to the results of other studies, indicating that a significant part of the pregnant women experiences anxiety during the pandemic. For this reason, it is recommended that pandemic-related concerns of the pregnant women be determined, that they be encouraged to talk about their pandemic-related concerns, and that psycho-social support be provided to them. Telehealth service guides are also important for monitoring and evaluating perinatal mental health (Moyer et al., 2020).

This study conducted during the pandemic found that prenatal attachment levels of the pregnant women were similar to those observed in studies performed before the pandemic (Demir Yıldırım & Hotun Şahin, 2020; Coskun, Okeu, & Arslan, 2019). This result is important because the pregnant women had high levels of prenatal attachment. Since this study was conducted with women who were more than 20 weeks pregnant, their prenatal attachment levels may have increased due to feeling fetal movement and communicating with their unborn babies.

Studies have found that pregnancy-related anxiety negatively affects prenatal attachment. This study's PAI scores increased as the participants' CAS scores decreased. One study found a weakly negative but significant relationship between prenatal problems and prenatal attachment (Coskun et al., 2019). Özdemir, Çevirme, & Başkaya, 2020 found a negative, moderate relationship between pregnant women's scores on the Beck Anxiety Scale and the PAI. Another study conducted during the pandemic found that the COVID-19-related anxiety might negatively affect mothers' prenatal attachment process (Craig et al., 2021). The result of the present study agrees with results from other studies conducted before and during the pandemic. COVID-19-related anxiety can cause a pregnant woman to have difficulty in adapting to pregnancy and establishing an emotional bond with fetus: this can also negatively affect prenatal attachment. Lower anxiety levels positively affect pregnant women's prenatal attachment levels. Further studies are needed to determine the effects of pandemic-related anxiety on prenatal attachment.

It has been reported that routine prenatal checkup programs should be reorganized, that pregnant women should be categorized by their risk conditions, and that antenatal visits should be restricted (Tanacan, Erol, & Yucel, 2020). The Royal College of Obstetricians & Gynaecologists (RCOG) (2020) says that six hospital visits are sufficient for pregnancy checkups. Moyer et al. (2020) found that the suspension of face-to-face prenatal visits was a cause of increased pregnancy-related perceived anxiety. Akgor et al. (2021) found that more than half of pregnant women were anxious about postponing their appointments and not seeing healthcare professionals. Similarly, this study found that the pregnant women whose pregnancy checkups were negatively affected by the pandemic or that those who were anxious about it had high levels of perceived anxiety about COVID-19. The results of this study support these studies. This study found that the participants who were anxious about their pregnancy checkups being affected by the pandemic had higher scores for perceived anxiety about coronavirus. This study also found that the participants who were not anxious about their pregnancy checkups being affected by the pandemic had higher levels of prenatal attachment. Anxiety about pregnancy checkups and childbirth increased the pregnant women's anxiety levels during the pandemic. Pregnant women's prenatal attachment levels can be positively affected by helping them to acquire coping mechanisms for managing their anxiety during the COVID-19 pandemic.

Pregnant women may have anxiety about their own health and their babies' health (Salehi, Rahimzadeh, Molaee, Zaherti, & Esmaeilzadeh-Saele, 2020). Salehi et al. (2020) found that mothers who had a contagious disease during their pregnancy were more likely to be anxious about their baby's health. Mortazavi, Mehrabadi, and Kiaeetabar (2021) found that pregnant women were anxious about their own health and their unborn children's health, and about (Akgor et al., 2021) having at least one relative infected with the COVID-19 virus. Lebel et al. (2020) found that pregnant women who were anxious about their own health and their babies' health during the COVID-19 pandemic had more symptoms of depression and anxiety. This study found that more than half of the participants were anxious about their own health and their babies' health and thus had higher CAS scores. The results of this study support those of the other studies. Trainings for anxiety management and motivation during the pandemic should be arranged in addition to training about pregnancy.

Along with its negative effects, the COVID-19 pandemic has induced people to acquire coping skills for stress and to spend more time with...
their family. Additionally, the importance of the social support provided to pregnant women by their family member during the pandemic was emphasized (Craig et al., 2021). Social support can directly play a protective role in mitigating the negative effects of stress on pregnant women (Craig et al., 2021). This study found that pregnant women who managed to cope with stress during the pandemic had higher levels of prenatal attachment. On the other hand, the participants who received sufficient social support had higher levels of COVID-19-related anxiety frequency compared to those who did not. This result may reflect that those pregnant women who have a good level of perceived social support are exposed to non-evidence-based pandemic-related news more than other women when they communicate with their environment.

This study has a number of limitations. Women who had lower education and income levels might not be able to participate in the study because the surveys were conducted online. Face-to-face interviews could not be conducted because intense isolation restrictions were applied during the pandemic. Additionally, the participants’ postpartum period could not be monitored due to similar reasons. The data were collected from the participants as per their own statements; therefore, they might give responses that did not reflect their true opinions.

In conclusion, this study showed that the pregnant women’s COVID-19-related anxiety might negatively affect the prenatal attachment process. On the other hand, a decrease in their perceived COVID-19-related anxiety positively affected their prenatal attachment levels. For these reasons, it is critical to evaluate the anxiety and prenatal attachment levels of pregnant women during the pandemic and to support them.

Conclusion

The COVID-19 pandemic caused stress and anxiety for pregnant women around the world. Stress and anxiety are related to pregnant women’s health, the well-being of their unborn children, planned pregnancies, pregnancy checkups, not seeing healthcare professionals as needed and the health of family members (Fakari & Simbar, 2020). This study found that almost half of the participants had high levels of anxiety and thus low levels of prenatal attachment. Therefore, midwives and nurses should evaluate pregnant women’s anxiety and prenatal attachment levels. Midwives and nurses should help pregnant women who have low prenatal attachment levels and high anxiety levels by offering online services, helping them to acquire positive coping skills and supporting them emotionally.

CRediT authorship contribution statement

Study design: Pelin PAKARAS
Preparation of the data form: Pelin PAKARAS; Sevde ÇUBUKÇU AKSU; Refika GENÇ KOYUCU
Data collection: Sevde ÇUBUKÇU AKSU, Pelin PAKARAS
Data analysis and interpretation: Pelin PAKARAS, Refika GENÇ KOYUCU
Writing the article: All the authors.

Declaration of competing interest

The authors have no conflicts of interest to declare.

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