Anxiety, depression, and other related factors in Turkish pregnant women during the COVID-19 pandemic's first wave: A cross-sectional and web-based study

Filiz Aslantekin-Özçoban[1], Sibel Peksoy-Kaya[2]

[1]Department of MidwiferyDepartment, Faculty of Health Sciences, Balikesir University, Balikesir, Turkey
[2]Department of Nursing, Faculty of Health Sciences, Ankara Yıldırım Beyazıt University, Ankara, Turkey

Corresponding author:
Sibel Peksoy-Kaya.
E-mail: sibelpeksoy@gmail.com;
ORCID: 0000-0003-1444-2857

Abstract

Aim: This research aims to determine attitudes, behaviors, anxiety and depression levels of pregnant women regarding the prevention measures from the COVID-19 pandemic.

Material and methods: The cross-sectional study population consists of pregnant women (N=1008) in Turkey. Data were collected with Information Form, Hospital Anxiety and Depression Scale.

Results: Anxiety score was 8 and above in 63.6% of the pregnant women while that of depression was 8 and above in 52.1% of them. There was an increase in risk of anxiety in pregnant women regarding the items about family and loved ones being infected by COVID-19 2.36 times, and about the baby being infected and lost 2.61 times. This rate increased 1.60 times in those who could not have screening tests due to pandemic, and 1.40 in those whose frequency of attending antenatal controls decreased. Risk of depression, on the other side, increased 1.59 times in those who were anxious about not receiving any companion support at birth, 1.65 times in those who couldn't have screening tests due to the pandemic, 1.38 times in those who didn't plan the place to give birth and didn't learn its conditions, and 1.55 times whose frequency of attending antenatal controls decreased.

Conclusion: It has been determined that psychosocial support services and antenatal care may be regarded as fundamental fields of intervention.

Key words: COVID-19 pandemic, anxiety, depression, pregnancy

Introduction

Spreading of COVID-19 infection throughout the whole world since December 2019 was followed by a declaration of pandemic on March 11, 2020. Upsetting consequences such as a rapid spread of the virus associated with this infection, mortality, healthcare and uncertainty in economic processes have affected the whole world. People were physically isolated from their families, friends, and society, and businesses and schools around the world were closed [1]. During the pandemic process, the risk of illness and death due to infection on one side, and psychological and social consequences of changing living conditions with radical measures taken to protect from contamination such as social isolation and quarantine on the other side have affected mental health [2]. During the pandemic, pregnant women have emerged as a particularly vulnerable and disadvantaged group. Pregnant women experience anxiety and fear for the health of both themselves and their baby, and for their families during this period [1, 3]. Together with an increased risk of serious complications, being vulnerable to infections caused by natural suppression of the immune system during pregnancy [4], risk of vertical transmission of infections, insufficient information about treatment of the disease and uncertainties are important concerns for

pregnant women [5]. Italian pregnant women have been reported to experience a high rate of anxiety related to vertical transmission [6]. With an effect of hormonal changes during pregnancy, incidence of anxiety disorder varies between 1.3-8.5% and the incidence of depression between 5-15% [7 –9]. In addition to the increased anxiety risk and depression during pregnancy, psychosocial effects increase even more with the pandemic [10]. A research conducted in China, reported that during the pandemic period, pregnant women had significantly high depression and anxiety symptoms [5]. During the pandemic process, obligatory behavioral changes such as social isolation, remote working, transportation difficulties, child care are emerging as well as increasing concerns about the health of pregnant women, their families in general and their unborn babies [11]. In addition, the pandemic is boosting prenatal anxiety. Therefore, special support is needed for pregnant women during the pandemic [12]. In the first wave of the COVID-19 pandemic, infection treatment has been mainly focused on [13 – 15], and thus there is limited information on mental state and psychological needs [1, 5, 12]. In the literature, approximately one out of every four pregnant women are reported to experience clinically high depression symptoms and one out of every three pregnant women to experience anxiety in COVID-19 pandemic [10]. In order to prevent negative health outcomes resulting from the COVID-19 pandemic, information is also needed to determine the current mental states of pregnant women and to conduct intervention researches and to develop strategies. Therefore this research aims to determine the anxiety and depression levels of pregnant women in the COVID-19 pandemic.

Some additional factors (socio-demographic characteristics, obstetric characteristics, antenatal follow-up, pregnancy-related concerns, coping behaviors, etc.) related to the anxiety and depression levels of pregnant women during the COVID-19 pandemic were also examined.

Research Questions (RQ):

RQ (1) In what level is the prevalence of anxiety and depression in pregnant women in the COVID-19 pandemic?

RQ (2) Are there a relationship between the anxiety and depression levels of pregnant women and some socio-demographic variables during the COVID-19 pandemic?

RQ (3) Are there a relationship between the anxiety and depression levels of pregnant women and some obstetric variables during the COVID-19 pandemic?

RQ (4) Are there a relationship between anxiety and depression levels of pregnant women and antenatal follow-up characteristics during the COVID-19 pandemic?

RQ (5) Are there a relationship between the anxiety and depression levels of pregnant women and their concerns about pregnancy during the COVID-19 pandemic?

RQ (6) Are there a relationship between the levels of anxiety and depression in protective and coping behaviors of pregnant women during the COVID-19 pandemic?
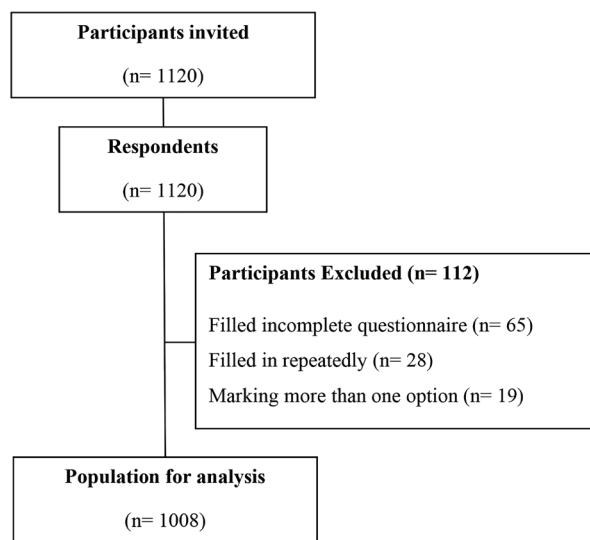
Material and methods
Study design

The research was designed as a cross-sectional study. The study was conducted online between May 1 and June 22 in 2020, during the initial spreading of the COVID-19 pandemic. Data were collected using online Google forms on social media (Facebook, Instagram and Whatsapp group) on pregnancy, childbirth, midwifery, reproductive health, and antenatal education themed groups.

Study population

The research population in Turkey live births in 2020 (N=1.112.859) was reported [16]. As a cross-sectional and web-based study, this research aimed to have a sample size of at least 385 individuals (1% absolute deviation, 50% unknown prevalence, and 95% confidence level). OpenEpi Version (2013) was used to create this sample size [17]. Participants of the research included a total of 1120 pregnant women. One hundred and twelve questionnaires were excluded because they were not filled out completely (n=65) and more than one option was marked (n=19) and they were filled in repeatedly (n=28). The study sample decreased to 1008 pregnant women as data entry repetitions and underfilled forms were excluded from the assessment (Figure 1).

Figure 1 - Flow-chart of study population

The inclusion criteria were as follows: having at least a primary school education, being pregnant, not having any diagnosed psychiatric disorder, not using psychotropic medicine, agreement to participate in the questionnaire. Being not pregnant, non-volunteering, not completing all the questions of the survey were the criteria for exclusion.

Data collection

The questionnaire had two main parts. The first main part consisted of an Information Form developed by researchers according the literature [5, 7, 9], this form consisted of three sub sections, which were; i) introductory characteristics of pregnant women (age, education level, occupation, region of residence, income status, individuals living together at home, child for care or individuals over 65 years old, etc.), ii) pregnancy-related characteristics (pregnancy history, gestational week, risky situations during pregnancy, pregnancy follow-up frequency, consulting for anxiety/concerns, etc.), iii) COVID-19 infection protection measures, attitudes and behaviors (perceiving behavioral responses to COVID-19 infection and behavioral situations, etc.). Third sub section (iii) of an Information Form consisted of 10 items for evaluating COVID-19 infection protection measures, attitudes and behaviors about pregnancy. This section had questions related to keeping social distance, washing hands, avoiding public transport, nutrition, exercising, sleeping, etc. Six of the items were related to the evaluation of prevention measures and attitude, and in this evaluation, pregnant women were asked to mark the appropriate one among the "I believe", "I am undecided" and "I don't believe" categories. Four

items were related to coping behaviors and pregnant women were asked to mark how often they performed these behaviors as "frequently", "sometimes", or "never". After development, this third section was also evaluated for clarity by two experts in the field of women's health. Since this study was conducted in the first wave of the pandemic, the standard COVID-19 infection protection measures, attitudes and behaviors evaluation form could not be reached.

The second sub section was Hospital Anxiety and Depression Scale [18]. The scale was adapted to Turkish by Aydemir et al. [19]. The scale is used to evaluate the individual's risk in terms of anxiety and depression. It is in likert type (0,1,2,3), seven items of it are for anxiety subscale (1.,3.,5.,7.,9.,11. and 13.) and seven items are for (2.,4.,6.,8.,10.,12. and 14.) depression subscale. The lowest scale score participants can get is 0 and that of the highest is 21. According to the cut-off value of the scale, the pregnant women having anxiety and depression scores ≤8 were classified as having "normal" in this research. Additionally, scale scores between 8-10 were classified as "borderline abnormal" and scores between 11-21 were classified as "abnormal". In the original research of the scale, the Cronbach's alpha for the anxiety subscale was 0.85, and the depression subscale was 0.80 [18]. In the Turkish version of the research, the Cronbach's alpha for anxiety and depression scales is 0.85 and 0.77, respectively [19] with slight difference. These values were found to be 0.84 and 0.75, respectively in our research.

Data analysis

Data were analyzed with Statistical Package for the Social Sciences 22.0 software. Likelihood of the data in showing normal distribution was evaluated through Shapiro–Wilk tests of normality. In this sense, non-parametric tests were used for the analysis since the data did not show normal distribution. Data analysis were used for distributions of means (standard deviations), numbers (percentages), Mann Whitney U, Kruskal Wallis H and, Bonferroni-corrected. Additionally, in order to identify factors that affect the risks of depression and anxiety, logistic regression analysis was performed. In the so-called analysis, the enter method was applied and odds ratio (OR) values were presented in a 95% confidence interval (95% CI). The p value of the analysis indicating <0.05 was considered as results being statistically significant.

Ethical Considerations

This research was conducted in full compliance to the Helsinki Declaration principles. The consent form was on the first page of the online survey. Confidentiality of all information to be provided was assured to the participants. Participation in the research required the consent form in the first page to be filled, which asked for voluntary agreement to participate in the research. A pregnant woman could fill out the questionnaire after declaring her consent to participate voluntarily. Ethical consent for the research was granted by Ethics Committee of a state university (30.04.2020- E.14660). Approval of the Ministry of Health was obtained by electronic submission (2020-06-09T01_48_33.xml).

Results

The mean age of pregnant women was 27.63±4.35. Mean number of pregnancies in women was 1.53±0.86, mean number of living children was 0.65±0.77, and the mean of gestational week was 24.86±9.09. Of the pregnant women living in seven geographical regions of Turkey, 35.3% were in Marmara, 24.1% in Central Anatolia and 40.6% in other regions (Aegean: 14.9%, Mediterranean: 9%, Black Sea: 7%, Southeast Anatolia: 6.6%, Eastern Anatolia: 3%). 61.4% reside in the city center, 99.5% of the pregnant women were married in our research. Education levels was found 52.9% university graduate, and 55.6% of them expressing that their income was equal to expenses. During the COVID-19 pandemic; 50.9% of them stated that their income status decreased. Approximately half of the pregnant women were housewives, 24% of them have worked online at home during the COVID-19 pandemic, and 10.6% of them could not work for various reasons (such as dismissal, unpaid leave), during the pandemic.

Anxiety mean score of the pregnant women was 9.25±4.28, and the mean depression score was 7.77±3.88. Depression scores of the pregnant women were found as 47.9% of them being 7 points and below, 28.1% between 8-10 points, 24% 11 points and above. Anxiety scores were found as 36.4% of the pregnant women having 7 points or less, 26.8% having 8-10 points and 36.8% having 11 points or above. Anxiety mean scores of women with postgraduate education were lower than the other groups (p<0.05). In pregnant women whose income was less than their expenses, the mean scores of anxiety and depression were significantly higher (p<0.05). Considering the employment status of pregnant women, it was observed that the anxiety score means of those who went to work every day, those who were dismissed or those who compulsorily took unpaid leave are significantly higher than the other groups (p<0.05). The depression score means of the pregnant women in terms of employment status also indicated that the so-called mean score was less compared to other groups in the ones who went to work a few days in a month (p<0.05). Conversely, the depression score mean was significantly higher in the group whose spouses were dismissed during the COVID-19 pandemic than the ones who worked online at home (p<0.05). Anxiety score mean was higher in pregnant women who stated that their income decreased at the pandemic period (p<0.05). However, the depression score mean was significantly lower compared to other groups in the one who stated that their income didn't change during the pandemic (p<0.05). Additionally, the depression score means were significantly higher compared to other groups in the one whose members were in their first trimester. When the anxiety and depression levels of pregnant women were examined according to the change before and after June 1, 2020, when the normalization in social life started; While the anxiety score means of the pregnant women participating in the research on 01.06.2020 and after were higher than before 01.06.2020 (p<0.05), it was found that the depression score means showed similarity (p>0.05) (Table 1).

The anxiety and depression mean scores were significantly higher in those whose frequency of going to antenatal follow-ups decreased, those who did not have screening tests during the pandemic, who did not learn the place and conditions of birth, and those who needed psychological support due to the anxiety and worries experienced during the pandemic (p<0.05) (Table 2). Anxiety and depression levels of pregnant women were examined according to some of their concerns during the COVID-19 pandemic and according to this; scale score means were significantly higher in those who are worried about their family/loved ones affected by it, those who were worried about the long duration of the pandemic, those who were worried about being infected when referring to the health institution for pregnancy follow-up, those who were worried about being infected while having birth, who are worried about the transmission of COVID-19 infection to their baby, those who

Table 1 Distribution of anxiety and depression scores according to some sociodemographic and obstetric characteristics of pregnant women

Socio-demographic variables	n	Anxiety		Depression	
		Mean±SD	Analysis*	Mean±SD	Analysis*
Residing place					
Provincial city centre	619	9.10±4.35	0.182	7.62±3.97	0.296
District centre	324	9.56±4.13		8.04±3.74	
Town/Village centre	65	9.03±4		7.77±3.84	
Educational status					
Primary[1]	123	9.20±4.03	**0.0001[a]**	8.01±3.43	0.068
High school[2]	262	10.04±4.03	**4-1**	8.23±3.80	
University[3]	533	9.13±4.38	**4-2**	7.58±4.04	
Post-graduate[4]	90	7.71±4.27	**4-3**	7.22±3.70	
Income					
Income less than expenses[1]	181	10.56±4.54	**0.001[b]**	8.86±4.06	**0.0001[b]**
			1-2		**1-2**
Income and expenses equal[2]	560	9.21±4.15	**1-3**	7.52±3.72	**1-3**
Income more than expenses[3]	267	8.43±4.17		7.54±3.99	
Employment during COVID-19 pandemic					
Online working at home[1]	242	8.60±4.18	**0.0001[c]**	7.58±3.83	**0.006[d]**
Going to work everyday[2]	49	11.22±4.41	**2-1 4-1**	8.96±4.29	**3-1**
Going to work a few days a month[3]	57	8.91±4.36	**2-3 4-3**	6.77±4.23	**3-2**
Dismissed + Unpaid leave[4]	107	10.29±4.70	**2-5 4-5**	8.70±3.83	**3-4**
Housewife[5]	553	9.19±4.14		7.66±3.81	**3-5**
Employment of spouse during COVID-19 pandemic					
Online working at home[1]	140	8.86±4.16	0.053	7.06±3.90	**0.007[e]**
Going to work everyday[2]	465	9.59±4.29		7.95±3.93	**4-1**
Going to work a few days a month[3]	240	8.73±4.11		7.49±3.75	
Dismissed + Unpaid leave[4]	70	8.81±4.84		8.05±4.20	
Unemployed[5]	93	8.91±4.21		7.66±3.50	
Changes in income during COVID-19 pandemic					
Had no change[1]	489	8.67±4.08	**0.0001[f]**	7.27±3.90	**0.0001[g]**
Yes, income decreased[2]	511	9.80±4.38	**2-1**	8.22±3.79	**1-2**
Yes, income increased+Other[3]	8	8.88±5.17	**2-3**	9.13±5.82	**1-3**
Changes in social life					
Pregnant women before June 1, 2020	766	9.09±4.22	**0.027[h]**	7.63±3.75	0.059
Pregnant women on June 1 and later	242	9.74±4.42		8.19±4.27	
Gestational week					
First trimester[1]	143	9.74±4.41	0.119	8.73±3.94	**0.002[i]**
Second trimester[2]	413	8.92±4.08		7.78±3.75	**1-2**
Third trimester[3]	452	9.39±4.40		7.45±3.95	**1-3**
Number of pregnancies					
Primiparous	645	9.21±4.45	0.459	7.70±3.92	0.359
Multiparuos	363	9.31±3.96		7.89±3.82	

*Mann-Whitney U test was used in paired groups. In more than two groups, Bonferoni corrected Kruskall-Wallis H test was used and post hoc analysis was examined with Mann-Whitney U test.

[a]Significantly lower in the ones who said "Post-graduate".

[b]Significantly higher in the ones who said "Income less than expenses".

[c]Significantly higher in the ones who said "Going to work everyday" and "Dismissed or Unpaid leave".

[d]Significantly lower in the ones who said "Going to work a few days a month".

[e]Significantly higher in the ones who said "Dismissed or Unpaid leave".

[f]Significantly higher in the ones who said "Yes, income decreased".

[g]Significantly lower in the ones who said "Had no change".

[h]Significantly lower in the ones who said "Pregnant women before June 1, 2020"

[i]Significantly higher in the ones who said "First trimester".

Table 2 Distribution of anxiety and depression scores of pregnant women according to antenatal follow-up

Antenatal Follow-up Information	n	Anxiety		Depression	
		Mean±SD	Analysis*	Mean±SD	Analysis*
Going to follow-ups decreased before the delivery					
Yes	664	9.65±4.17	0.0001[a]	8.11±3.79	0.0001[a]
No	344	8.47±4.39		7.10±3.98	
Having consultancy on the phone					
Yes	474	9.37±3.98	0.163	7.64±3.67	0.453
No	534	9.13±4.53		7.88±4.07	
Going to a private physician in this process, not to a hospital.					
Yes	389	9.39±4.37	0.451	7.99±3.93	0.169
No	619	9.15±4.22		7.63±3.86	
Couldn't have screening test done because of this process					
Yes	242	10.23±4.17	0.0001[a]	8.77±3.82	0.0001[a]
No	766	8.94±4.27		7.45±3.86	
Have you planned the place where you will have delivery and learned the conditions?					
Yes	508	8.94±4.13	0.042[b]	7.17±3.73	0.0001[b]
No	500	9.55±4.41		8.37±3.96	
Do you think you need information and psychological support for your anxieties/concerns during this process?					
Yes	372	11.19±4.11	0.0001[a]	9.25±3.91	0.0001[a]
No	636	8.11±3.95		6.90±3.60	

Mann-Whitney U test was used.
[a]*Significantly lower in the ones who said "No".*
[b]*Significantly lower in the ones who said "Yes".*

Table 3 Distribution of anxiety and depression scores according to pregnancy-related concerns

Some Concerns Experienced by Pregnant Women	n	Anxiety		Depression	
		Mean±SD	Analysis*	Mean±SD	Analysis*
I'm worried that it might affect my family, my loved ones.					
Yes	947	9.45±4.23	0.0001[a]	7.86±3.89	0.0001[a]
No	61	6.15±3.90		6.31±3.55	
I'm worried that the psndemic will continue for a long time.					
Yes	953	9.39±4.26	0.0001[a]	7.84±3.89	0.021[a]
No	55	6.71±3.80		6.56±3.62	
I'm worried about being infected when referring to the health facility for pregnancy follow-up					
Yes	883	9.54±4.23	0.0001[a]	7.96±3.87	0.0001[a]
No	125	7.14±4.02		6.38±3.70	
I'm worried about being infected while having delivery.					
Yes	840	9.78±4.17	0.0001[a]	8.07±3.88	0.0001[a]
No	168	6.60±3.78		6.24±3.57	
I'm worried that COVID-19 will be transmitted to my baby while having delivery.					
Yes	908	9.58±4.24	0.0001[a]	7.93±3.911	0.0001[a]
No	100	6.22±3.338		6.29±3.36	
I'm worried about infecting and losing my baby.					
Yes	813	9.89±4.19	0.0001[a]	8.12±3.92	0.0001[a]
No	195	6.55±3.55		6.31±3.38	
I'm worried that I won't have companion support at delivery.					
Yes	807	9.72±4.27	0.0001[a]	8.11±3.89	0.0001[a]
No	201	7.35±3.78		6.38±3.55	
I'm worried about not being able to breastfeed my baby after delivery.					
Yes	719	10.05±4.14	0.0001[a]	8.32±3.83	0.0001[a]
No	289	7.25±3.97		6.40±3.69	

Mann-Whitney U test was used.
[a]*Significantly lower in the ones who said "No".*

Table 4	Distribution of anxiety and depression scores by prevention and some coping behaviors from the COVID-19 pandemic				

Characteristics regarding prevention and coping behaviors	n	Anxiety		Depression	
		Mean±SD	Analysis*	Mean±SD	Analysis*
Characteristics regarding prevention					
Social activities and reducing the number of people interviewed will reduce the risk of catching COVID-19 infection;					
I believe[1]	935	9.13±4.19	0.061	7.66±3.89	**0.017**[a] **3-1** **3-2**
I'm undecided[2]	50	10.14±4.2		8.66±3.95	
I don't believe[3]	23	11.87±6.48		10.22±5.13	
Not using public transport/reducing the use of public transport will reduce the risk of catching COVID-19 infection;					
I believe[1]	938	9.17±4.22	0.278	7.65±3.84	**0.005**[a] **3-1** **3-2**
I'm undecided[2]	45	9.82±4.08		8.67±3.66	
I don't believe[3]	25	11.00±6.08		10.36±4.90	
Not being in shopping areas / markets / shops will reduce the risk of catching COVID-19 infection;					
I believe[1]	919	9.17±4.22	0.346	7.65±3.83	**0.019**[a] **3-1** **3-2**
I'm undecided[2]	53	9.77±4.22		8.58±3.61	
I don't believe[3]	36	10.44±5.64		9.56±5.04	
Cleaning or disinfecting hard surfaces like door handles, table, chair, etc. will reduce the risk of catching COVID-19 infection;					
I believe[1]	897	9.19±4.24	0.376	7.67±3.87	0.072
I'm undecided[2]	84	9.81±4.30		8.45±3.71	
I don't believe[3]	27	9.26±5.26		8.81±4.64	
Washing my hands regularly with soap and water will reduce the risk of catching COVID-19 infection;					
I believe[1]	941	9.20±4.24	0.651	7.70±3.86	0.116
I'm undecided[2]	49	9.61±4.27		8.39±3.81	
I don't believe[3]	18	10.72±6.10		9.72±4.81	
Maintaining social distance will reduce the risk of catching COVID-19 infection;					
I believe[1]	933	9.14±4.21	0.095	7.64±3.82	**0.002**[a] **3-1** **3-2**
I'm undecided[2]	53	10.38±4.50		8.77±3.99	
I don't believe[3]	22	10.86±5.89		10.77±3.98	
Characteristics regarding coping behaviors					
I prayed/meditated					
Frequently[1]	776	9.56±4.28	**0.0001**[b] **3-1** **3-2**	7.91±3.87	0.161
Sometimes[2]	133	8.70±3.98		7.26±3.87	
Never[3]	99	7.52±4.23		7.35±4.02	
I paid attention to my diet					
Frequently[1]	890	9.20±4.26	0.534	7.58±3.86	**0.0001**[d] **1-2** **1-3**
Sometimes[2]	91	9.48±4.30		9.18±3.67	
Never[3]	27	9.85±4.80		9.11±4.25	
I slept regularly					
Frequently[1]	714	8.91±4.18	**0.0001**[c] **3-1** **3-2**	7.36±3.80	**0.0001**[c] **3-1** **3-2**
Sometimes[2]	203	9.71±4.12		8.28±3.50	
Never[3]	91	10.87±4.90		9.78±4.63	
I slept regularly					
Frequently[1]	345	8.99±4.18	0.479	6.94±3.75	**0.0001**[c] **3-1** **3-2**
Sometimes[2]	318	9.33±4.13		7.82±3.67	
Never[3]	315	9.43±4.54		8.61±4.08	

* Checked with Bonferoni corrected Kruskall-Wallis H test, Mann-Whitney U test in post Hoc analyses.

[a]Significantly higher in the ones who said "I don't believe".

[b]Significantly lower in the ones who said "Never".

[c]Significantly higher in the ones who said "Never".

[d]Significantly lower in the ones who said "Frequently".

Variables (Reference cagetory)	Anxiety		
	p	OR	95% CI
Lower- Upper			
The frequency of going to antenatal control decreased (yes)	**0.029**	1.401	(1.035-1.897)
I couldn't get the screening tests done because of this process (yes)	**0.004**	1.609	(1.169-2.214)
I'm worried that the disease will infect me while I'm having delivery (yes)	**0.045**	1.665	(1.012-2.741)
I'm worried that I won't be able to breastfeed my baby after delivery (yes)	**0.001**	1.811	(1.267-2.587)
I'm worried about infecting and losing my baby (yes)	**0.000**	2.618	(1.587-4.317)
I'm worried that it might affect my family, my loved ones (yes)	**0.026**	2.365	(1.109-5.042)
Variables (Reference cagetory)	**Depression**		
	p	OR	95% CI
Lower- Upper			
The frequency of going to antenatal control decreased (yes)	**0.003**	1.552	(1.166-2.066)
I couldn't get the screening tests done because of this process (yes)	**0.002**	1.659	(1.200-2.292)
Have you planned the place where you will have delivery and learned its conditions? (no)	**0.016**	1.388	(1.060-1.810)
I'm worried that I won't have companion support at delivery (yes)	**0.009**	1.591	(1.120-2.259)
I'm worried about not being able to breastfeed my baby after delivery (yes)	**0.008**	1.557	(1.124-2.156)
I'm worried about infecting and losing my baby (yes)	**0.025**	1.541	(1.057-2.249)
Trimester (first trimester)	**0.040**	1.222	(1.009-1.481)

Table 5 — Evaluation of factors affecting anxiety and depression levels with regression analysis

were worried about the loss of their baby after birth, those who were worried about the lack of companion support, those who were worried about not being able to breastfeed their baby after birth (p<0.05) (Table 3).

The scale scores of pregnant women regarding their perceptions on protection recommendations of international and national health organizations during the COVID-19 pandemic indicated that the mean depression scores are significantly higher in those who do not believe that reducing the number of social events and meetings, not using or limited use of public transport, avoiding from places such as shopping venues, maintaining social distance will reduce the risk of COVID-19 infection (p<0.05), when compared to ones who were of the opposite opinion and who were undecided on this matter. Anxiety and depression levels of pregnant women according to some coping behaviors in the COVID-19 pandemic were also examined and this revealed that the anxiety score means of pregnant women who prayed/ meditated frequently was significantly higher than the other groups (p<0.05). The mean depression score in pregnant women who paid attention to their nutrition was significantly lower than the other groups (p<0.05). In pregnant women who answered "never" to "I slept regularly" behavior, the mean scores of anxiety and depression were significantly higher than those who answered "sometimes" and "often" (p<0.05). The mean depression score of pregnant women who answered "never" to the behavior "I exercised regularly at home" was significantly higher than those who answered "sometimes" and "often" (p<0.05) (Table 4).

Multivariate logistic regression analysis indicated that six factors were significant in the development of anxiety. Level of this anxiety was 2.61 times in those who were worried about their babies getting infected and dying (95% CI: 1.587-4.317; p=0.000), 2.36 times in those who were worried that their family members and loved ones may be affected by COVID-19 (95% CI: 1.109-5.042; p=0.026), 1.81 times in those who were worried about not being able to breastfeed their baby after birth (95% CI: 1.267-2.587; p=0.001), 1.66 times in those who were worried about the transmission of COVID-19 infection at giving birth (95% CI: 1.012-2.741;p=0.045), 1.60 times in those who could not have the screening tests due to the pandemic (95% CI: 1.169-2.214; p=0.004), and 1.40 times in those whose frequency of going to antenatal control decreased (95% CI: 1.035-1.897; p=0.029) .

According to multivariate logistic regression analysis, seven factors were found significant in the development of depression. The fact that the pregnant women were not able to have screening tests because of the pandemic increased the probability of depression 1.65 times (95% CI:1.200-2.292; p=0.002), frequency of going to antenatal controls 1.55 times (95% CI:1.166-2.066; p=0.003), anxiety of not having a companion support at the birth 1.59 times (95% CI:1.120-2.259; p=0.009), inability to plan the place to give birth and not learn the conditions (95% CI:1,060 -1.810; p=0.016), worrying about not being able to breastfeed after birth 1.55 times (95% CI:1.124-2.156;p=0.008), worrying that their baby will be infected and losing their babies 1.54 times (95% CI: 1.057-2.249; p=0.025), and being in the first trimester 1.22 times (95% CI: 1.009-1.481; p=0.040) (Table 5).

Discussion

Stress, depression and anxiety disorders experienced during pregnancy are reported to have negative effects on the psychosocial development of the baby [20]. COVID-19 pandemic which affect the whole world, in all areas of life, may be a risk-increasing situation in terms of maternal mental health. In this context, assessment of pregnant women will contribute to the measures to be taken and the care to be given [21]. This research suggests that the attitudes and behaviors of pregnant women regarding pandemic protection measures and their anxiety and depression levels. Depression score was found above the scale cut-off values in the 52.1% of pregnant women and anxiety score in 63.6% of them, and thus risk of experiencing mental problems seem to be high. A cross-sectional research conducted before the COVID-19 pandemic indicated that while the probability of depression increased (10.0%) in late pregnancy, anxiety symptoms decreased (14.2%) [22]. Similarly, Dikmen-Yildiz et al. (2017) in our country, reported the prevalence of depression as 14.6% and of anxiety as 29.6% in pregnancy [23]. In addition, anxiety and depression levels were found to be significantly higher than research conducted in pregnant groups before the pandemic [24, 25]. A high anxiety level [10, 26] and depression [26] is reported in researches conducted during the COVID-19 pandemic process in pregnant women. In a multicenter cross-sectional research comparing the mental states of pregnant women prior to and after the

declaration of COVID-19 outbreak in China, it is reported that the pregnant women who were evaluated after the declaration of the COVID-19 outbreak showed significantly higher anxiety levels and a higher rate of depression symptoms [5]. A research conducted with pregnant women in Canada also reported that the risk of anxiety and depression symptoms are high [1]. Limited research conducted during the current pandemic report anxiety rates between 63-68% during pregnancy [11]. Similarity of the literature and our research findings showed that pregnant women were under threat against anxiety and depression risks. This research has found that lower education levels, lower income levels, full-time work and compulsory unpaid leave increase the risks of anxiety and depression. While the risk of depression in the first trimester was higher in pregnant women whose income decreased during the pandemic process, depression score was lower in those whose income level did not change. The depression scores of pregnant women whose spouses were dismissed and whose spouses had to take unpaid leave in this pandemic process were higher than those whose spouses work online at home. Another research found the risk of depression and anxiety is high in primiparous pregnant women who are in low socioeconomic status and work full time [5]. The high anxiety and depression scores of women with low socioeconomic levels may be explained by the economic fluctuation and increased unemployment anxiety caused by the COVID-19 pandemic crisis [21]. The necessity to go to work full-time is seen as a worrying result as it carries the risk of socialization and contact during the pandemic process. Risks of anxiety and depression are high in those whose frequency of antenatal care during the pandemic period decreased, those who did not have screening tests, those who did not know the place and conditions of birth, and those who need psychological support due to pandemic concerns.

The pandemic's impact on the world in a short time, limited information about the transmission routes, the effects of the pandemic on pregnancy, and the uncertainty of vertical transmission are among the important concerns for the pregnant women [3, 5]. It is recommended to pay attention to quarantine measures taken in the pandemic globally and not to go to health institutions unless necessary [28]. However, the need to go to health institutions for the tests and controls that pregnant women should have can cause dilemma and anxiety [29]. Community alerts and messages appear to create global concern among individuals and lead to self-censorship in hospitals in terms of contamination risk [25, 29]. The epidemic raises concerns about childbirth in many aspects, including disrupted expectations for antenatal care in pregnant women. Decrease in the frequency of receiving antenatal care during COVID-19 pandemic process, not having screening tests, not knowing under which conditions to have delivery and needing psychological support, and the high risk of anxiety and depression are important findings.

Many authorities state that it will be appropriate to reduce the frequency of antenatal care in health institutions in order to minimize the human density and virus transmission risk in health institutions and that this care can be carried out with technological support. However, antenatal care and follow-up, which cannot be provided directly in the health institution, are recommended to be carried out on various social media platforms such as Skype, Zoom. Health and government actors should be aware of high stress levels during pregnancy in the pandemic and guidance should be provided to support pregnant women [31]. Similarly, Peahl et al. (2020) recommend reducing the frequency of direct antenatal care and follow-ups, and using services that integrate telehealth practices as an alternative [32].

Health authorities and policymakers work together to minimize the risk of infection and virus spread in the fight against the COVID-19 pandemic in the world and in Turkey [26]. Lockdown and quarantine have been applied in some areas after detecting the first cases in Turkey and strict measures have been taken to comply with social distance rules throughout the country. When the number of cases decreased over time, changes such as the removing of the lockdowns and the opening of closed shopping centers after June 1, 2020 were made. Anxiety scores of pregnant women who took part in the research after this date are higher than that of the ones before this date. The mobility that has emerged with the change in social life rules is thought to cause the increase in anxiety along with the increasing of the risk of contamination in this research. Pregnant women have a high risk of anxiety and depression if they are worried about COVID-19 pandemic affecting their families, the long duration of the pandemic, the infection of themselves and their baby during antenatal follow-up and delivery, lack of accompanying support at birth, not being able to breastfeed their baby after birth. The possibility of clinical depression symptoms increases the anxiety of the pregnant woman and her baby about COVID-19 infection transmission [1]. The sources of concern frequently reported to obstetricians in a research conducted in India are hospital visits for antenatal services and ultrasonography scans, infection protection measures, concern about social media messages and infant health and breastfeeding [33]. Concerns about pregnancy, fetus/baby and health services can also cause mental problems during the pandemic process. Those who do not believe that social activities and limiting the number of people interviewed, not using or limited use of public transport, not being in environments such as shopping malls, and attempts to maintain social distance will reduce the risk of COVID-19 infection are at higher risk of depression. The idea that protection from contamination will not be possible is thought to lead to a high risk of depression in these pregnant women. Individuals put into effect self protection measures against threats without realizing it, and they cannot perceive public service ads and messages sent to protect themselves from infection. In this respect, anxiety, which can lead to more serious mental problems, is a factor that should not be ignored for mental well-being [34]. In this context, providing information that creates trust is thought to be more be beneficial. Anxiety risk was found to be higher in pregnant women who frequently prayed/meditated during the pandemic process. Additionally, the risk of depression is high in pregnant women who often do not pay attention to their diet and do not exercise regularly at home. The risk of anxiety and depression is higher in those who have irregular sleep. A research emphasizes that increased social support and exercise have a protective role in reducing anxiety and depression during the pandemic process [1]. While the pandemic process is a global concern that may trigger the risk of anxiety and depression during pregnancy, the psychological changes experienced in this process also affect physical activity, nutrition and sleep problems.

Limitations

This study has two limitations. First is that we did not use a previously validated questionnaire for data collection on COVID-19 infection protection measures, attitudes and behaviors of pregnant women. The second is that the research has been conducted online on social media platforms. Pregnant women who do not use social media platforms are not included in the study. Therefore, the results of the study cannot be generalized to all pregnant women.

Conclusion

The study findings indicate that COVID-19 pandemic and its vital effects may pose a risk on the mental health of pregnant women. Perinatal mental health interventions should be one of the priority areas during an epidemic. Safe and applicable strategies should be established during the pandemic to manage perinatal mental health under the conditions of psychological helplines and tele-health counseling.

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