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An investigation COVID-19 related knowledge, attitude, depression, anxiety, and stress levels of pregnant women

Gebelerin COVID-19'a yönelik bilgi durumları, tutumları ile depresyon, anksiyete ve stres düzeylerinin incelenmesi

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Abstract

Aim: The aim of the study was to examine pregnant women's COVID-19-related knowledge and attitudes, and their levels of depression, anxiety, and stress.

Materials and Methods: This is a descriptive study. Data were collected online between May 28, 2020 and June 20, 2020 from 348 pregnant women using the Questionnaire Form and the Depression Stress and Anxiety Scale Turkish Short Form.

Results: The median age of pregnant women was 26 (18-43) years. The median COVID-19 knowledge score of pregnant women was 84 (52-96). In the study, 83.9% of the pregnant women worried that "COVID-19 infection would transmit to their baby". While 19% of the pregnant women have "depression" 29.6% of the pregnant women have "anxiety" and 19.8% of the pregnant women have "stress".

Conclusion: COVID-19-related knowledge level of pregnant women was "good". The frequency of depression, anxiety, and stress of pregnant women during the pandemic period was similar to pre-pandemic data.

Keywords: Attitude; COVID-19; Depression; Knowledge; Nurse; Pregnancy.

Öz

Amaç: Çalışmanın amacı, gebe kadınların COVID-19 ile ilgili bilgi ve tutumlarını ile depresyon, anksiyete ve stres düzeylerini incelemektir.

Gereç ve Yöntem: Tanımlayıcı bir çalışmadır. Veriler 28 Mayıs 2020 ile 20 Haziran 2020 tarihleri arasında 348 gebeden Anket Formu ile Depresyon Stres ve Anksiyete Ölçeği Türkçe Kısa Formu kullanılarak çevrimiçi toplanmıştır.

Bulgular: Gebe kadınların ortanca yaşı 26 (18-43)'idi. Gebe kadınların COVID-19 bilgi puanı ortancası 84 (52-96)'idi. Çalışmada gebe kadınların %83,9'u "COVID-19 enfeksiyonunun bebeğine geçeceğinden" endişelenirken, gebelerin %19'unda "depresyon", %29,6'sında "anksiyete" ve %19,8'inde "stres" varlığı saptanmıştır.

Sonuç: Gebelerin COVID-19 ile ilgili bilgi düzeyi "iyi" idi. Pandemi döneminde gebe kadınların depresyon, anksiyete ve stres sıklığı, pandemi öncesi verilere benzerdi.

Anahtar Kelimeler: Tutum; COVID-19; Depresyon; Bilgi; Hemşire; Gebelik.

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Introduction

Coronavirus disease 2019 (COVID-19), which first appeared in Wuhan, China in mid-December 2019, has spread in around 170 countries, affecting the whole world in a very short time, like 4 months. In Turkey, the first case was seen on March 10, the first death was seen on March 17, the number of the total cases was over 1,5 million, and the total number of deaths was close to 16000, based on the most recent reports.[1] While the number of cases in the world exceeds 65 million according to current data, the reported number of deaths related to COVID-19 is more than one million.[2] In addition, COVID-19 negatively affects the lives of the individuals all over the world, from the economy to psychology.[3,4]

Pregnancy, which is one of the most special periods of the woman's life, is considered as a period in which the disease and health get closer to each other due to physical, physiological, social, and psychological changes in the female body.[5] According to the latest data, there is insufficient information on whether pregnancy increases the rate of COVID-19 infection.[6,7] However, due to the physiological changes, pregnancy is considered a risky period as it may increase the rate of infection. In addition, infections during pregnancy may cause negative effects on the mother and the fetus. Due to infections, complications such as maternal deaths, abortion, and intrauterine fetal death may occur often. For this reason, it is very important to protect pregnant women from COVID-19 infection as well as all kinds of infections.[1,7]

Expectant mothers are usually in a period of vital crisis in which the changes in bio-psychosocial balance, changes in roles in the family and the workplace, and parenting relationship between mother and baby are established, and the global COVID-19 pandemic risk during pregnancy has been an additional burden.[5] During this period, fears experienced by expectant mothers about pregnancy and childbirth and physical, psychosocial, and neuroendocrine changes may cause anxiety, depression, and stress.[8] In the literature, both antenatal and postnatal depression have been reported as 7%-20%[9], antenatal anxiety as 16%[10], and perceived stress as 84%.[11]

Anxiety, stress, and depression developing during pregnancy have negative health consequences for both the mother and the fetus.[12] Depression, anxiety, and stress during pregnancy may cause low birth weight, preterm birth,[13,14] placental abruption,[15] suicide,[16,17] postpartum depression, and behavioral disorders.[18] Therefore, coping with psychological problems during pregnancy is important for obstetricians, women health nurses, and midwives, especially during the COVID-19 pandemic period because excessive stress and emergency situations (disasters such as war, floods, and pandemics) can increase the risk of perinatal mental health morbidity. Therefore, pregnant women are likely to experience mental health problems during the COVID-19 pandemic, and it should be noted that pregnant women may be adversely affected in the pandemic period more than the others.[19] Social distance restrictions place a strain on individuals, families, communities, and countries during the pandemic period. Many aspects of daily life are affected, resulting in stress, anxiety, and depression.[20] In this period, prospective mothers cannot be socially active due to infection risk, and they cannot get out of their homes too much. In addition, the mothers who have concomitant pregnancy with the pandemic period, they will be stressed in the postpartum period[21] because in mothers who are COVID-19 positive, isolation from the baby and limiting breastfeeding to prevent contamination to the newborn may pose a risk in terms of depression, anxiety, and stress in the postpartum period.[22] In recent studies, depression, anxiety, and stress levels of pregnant women have been reported to be increased during the pandemic.[23-26] The lack of knowledge about the short- and long-term psychological health of the mother and the baby in the postnatal period following the prenatal care experiences during the COVID-19 pandemic period is a serious gap in the literature. Such studies are important to prevent negative mental health consequences of the pandemic and to plan appropriate

treatment and care for psychological disorders.

COVID-19 infection is a recent global pandemic. There are limited studies in the literature evaluating women's knowledge of and attitudes towards COVID-19 and psychological diseases during pregnancy. The aim of the study was to examine pregnant women's COVID-19-related knowledge and attitudes, and their levels of depression, anxiety, and stress.

Research questions

1. What is the COVID-19-related knowledge level of pregnant women?
2. What is the attitude of pregnant women towards COVID-19?
3. What are the pregnant women's levels of depression, anxiety, and stress during the pandemic period?
4. Is there a relationship pregnant women's COVID-19-related knowledge level and their depression, stress, and anxiety levels?
5. Is there a relationship between pregnant women's attitude towards COVID-19 and their depression, stress, and anxiety levels?

Materials and Methods

Type of research

This is a descriptive study.

The population and the sample of the study

The sample size of the study was calculated using the G*Power program as 327 pregnant women with 0.20 (medium) effect size, 95% statistical power, and 0.05 α error probability level. Data collection was completed with 348 pregnant women. The researcher reached out to pregnant women through her social media accounts, with a messaging app, colleagues, family, and relatives, and sent the link of the online questionnaire survey and scales via phone or social media accounts. They were also asked to forward the online link to other pregnant women from their social circles. Inclusion criteria of the study were literate pregnant women, with no chronic disease, who were accessible (no mental disability, no visual/hearing impairment) and healthy from all trimesters comprised the study group.

Data collection tools

Data were collected between May 28, 2020 and June 20, 2020 from pregnant women. The data were collected via an online survey, whose link was sent to the pregnant women via a text message. They were asked to click the link (https://docs.google.com/forms/d/1ctAB_2L1tjAgN9CVgqPiCzF0VRxeGIEPL5lCLGhwOik/edit?gxids=7628), open the online survey, answer all questions, and record the answers with the submit button. It was explained to the pregnant women that the data in the online survey will be collected anonymously, and that after clicking the "accept to participate in the study" button, they can proceed to answer the questions. A missing answers reminder was added to ensure the integrity of the data, and incomplete questionnaires were not submitted to the system. The answers from the pregnant women have accumulated in the e-mail address of the researcher with no mark identifying the participant. The data were collected using the "Online survey" and the Depression Stress and Anxiety Scale (DASS 21) Turkish Short Form. Fill out time of the online questionnaire is 15-20 minutes.

Online survey

The online survey consists of three parts. In the first part of the survey, there are 13 items evaluating the socio-demographic and obstetric characteristics of the pregnant women (age, education level, gestational week, etc.). In the second part of the survey, there are 25 statements assessing the COVID-19-related knowledge status of the pregnant women, for example: "The most common symptoms of COVID-19 infection are fever, cough, and difficulty breathing.", "It is sufficient to be half a meter apart from infected people." These statements were prepared in accordance with the World Health Organization and Republic of Turkey Ministry of Health COVID-19 guidelines.[1,27] The pregnant women were asked to mark the "True" or "False" box for each of these statements. For each correct answer, 4 points

were assigned, and for each wrong answer, 0 point was assigned, and the possible highest knowledge score was calculated 100 for 25 items. The third part of the survey consists of a total of 21 statements measuring the attitudes of the pregnant women towards COVID-19. For example, "I believe that I can be protected from COVID-19 infection if I stay home during my pregnancy and pay attention to social distance.", “I am afraid to go to doctor controls during pregnancy due to COVID-19 infection outbreak.” Pregnant women were asked to tick one of the boxes for these statements: "I agree", "I am indecisive", and "I disagree". All parts of the survey were prepared by the researcher.

Depression stress and anxiety scale (DASS 21) Turkish short form

The 42-item long form of the scale was developed by Lovibond and Lovibond in 1995,[28] and adapted into Turkish by Akin and Cetin in 2007.[29] Validity and reliability study of the short form of the scale was performed in 2017 by Yilmaz et al.[30] Each subscale of the short form, anxiety (items 1-7), depression (items 8-14), and stress (items 15-21), consists of 7 items. The short form is a 4-point Likert type scale: 0=Did not apply to me at all, 1=Applied to me to some degree, or some of the time2=Applied to me to a considerable degree or a good part of time, 3=Applied to me very much or most of the time. The scale does not contain any reverse items. High scores obtained from each subscale indicate that the individual has the relevant problem. The minimum score that can be obtained from each sub-dimension of the short form of the scale is 0, the maximum score is 21. Also, for the depression sub-dimension: 0-4 points indicate “normal”, 5-6 points “mild”, 7-10 points “moderate”, 11-13 points “severe,” and 14 and above indicate “extremely severe” level of depression. For anxiety subscale, 0-3 points indicate “normal”, 4-5 points “mild”, 6-7 points “moderate”, 8-9 points “severe,” and 10 or more points indicate “extremely severe” level of anxiety. For the stress sub-scale, 0-7 points indicate “normal”, 8-9 points “mild”, 10-12 points “moderate”, 13-16 points “severe,” and 17 points and more indicate “extremely severe” level of stress. According to the results of the analysis, it is seen that the factor loads of the scale varies between .41 and .81. The reliability coefficients of the scale data are between .75 and .82[30,31] In this study, Cronbach alpha coefficients of depression, anxiety, and stress dimensions were calculated as 0.88, 0.77, and 0.88, respectively.

Data analysis

To analyze the data, Statistical Package for the Social Sciences for Windows, version 20.0 (SPSS) was used. The normality of the study was tested by the Kolmogorov Simirnov test and nonparametric tests were performed because the significance value was $p<0.05$. Descriptive statistics (number, percentage, median, minimum and maximum values) were used to analyze the data. The association between independent variables (socio-demographic characteristics of the pregnant women, obstetric characteristics of the pregnant women, COVID-19-related knowledge status of the pregnant women, and the attitudes of the pregnant women towards COVID-19) and their depression, anxiety, and stress scores were analyzed using the bivariate tests, such as Spearman correlation analysis and Mann Whitney U test. In bivariate analyses, variables that were significant with depression, anxiety and stress were included in the Linear and Multivariate regression analysis. In the study, two-tailed tests were used, and significance was accepted as $p<0.05$.

Ethical aspect of the research

The research has been prepared in accordance with the Declaration of Helsinki Principles. Ethics committee approval was obtained from the Faculty of Health Sciences Ethics Committee of the relevant university (Date: 27.05.2020 and Number: 2020/599). In addition, the pregnant women were sent an "Informed Consent Form" by a text message before the online form and they were asked to click the "accept" button if they volunteered to be included in the study.

Results

Description of the sample

In the study, the median age of the pregnant women was 26 (18-43) years and the median of the gestational week was 35 (5-41). The education level of 54% of the pregnant women was high school and above, 91.1% of them wanted the last pregnancy, and 82.5% of them received at least 4 or more prenatal care (Table 1).

Table 1. Socio-demographic and obstetric characteristics of the sample (n=348).

	Median (Minimum-Maximum)
Age	26 (18-43)
Partner's/husband's age	29 (20-54)
Gestational week	35 (5-41)
	% (n)
Education status	
Literate/primary school	46 (160)
High school and above	54 (188)
Location where resided longest	
City	69.3 (241)
District/village	30.7 (107)
Family type	
Nuclear family	72.1 (251)
Extended family	27.9 (97)
Employment status	
Yes	42 (12.1)
No	87.9 (306)
Spouse's employment status?	
Yes	297 (85.3)
No	51 (14.7)
Perceived income	
Poor	114 (32.8)
Moderate	195 (56)
Good	39 (11.2)
Wanted pregnancy	
Yes	91.1 (317)
No	8.9 (31)
Receiving regular prenatal care (4 and over)	
Yes	82.5 (287)
No	17.5 (61)

COVID-19-related knowledge status of the pregnant women

In the study, 7 out of 10 pregnant women agreed with the statement that "If you have complaints such as fever, cough, and difficulty breathing, you should go to a health facility immediately" and 3 out of 10 pregnant women ticked the "correct" box for the expression "Washing the throat or nasal mucosa with liquids such as garlic water, alcohol, salt water, or antiseptic mouthwashes is protective against COVID-19" (Table 2). The median COVID-19 knowledge score of the pregnant women was 84 (52-96).

The attitudes of the pregnant women towards COVID-19

In the study, 83.9% of the pregnant women worried that "COVID-19 infection would transmit to their baby", and 56.3% of them were "afraid to go for antenatal follow-up during pregnancy due to the COVID-19 pandemic." It was found that 6 out of every 10 pregnant women replied "I agree" to the statement "I could not go to antenatal monitoring due to COVID-19 and I could not have my tests done during pregnancy (such as double, triple screening tests)". Furthermore, 81.3% of the pregnant women believed that the pandemic will end if the COVID-19 infection pandemic is fought well (Table 3).

Table 2. Distribution of responses of the pregnant women to "True/False" statements about COVID-19 (n=348).

Items	True		False	
	Number	%	Number	%
K1.COVID-19 is transmitted by the droplets produced by infected individuals through coughing and sneezing, and the other people's contact with their hands to these droplets, and taking their hands to their mouth, nose, or eyes (T).	340	97.7	8	2.3
K2. The average time for symptoms to appear after a person is infected with the coronavirus causing COVID-19 is 14 days (T).	334	96	14	4
K3. The most common symptoms of COVID-19 infection are fever, cough, and difficulty breathing (T).	345	99.1	3	0.9
K4. It is sufficient to keep half a meter distance with the infected people (F).	56	16.1	292	83.9
K5. We should keep a distance of at least 1.5-2 meters from other people (T).	339	97.4	9	2.6
K6. After contact with infected people/environment, it is sufficient to clean our hands with a wet wipe (F).	29	8.3	319	91.7
K7. Hands should be washed with soap and water for at least 20 seconds after contact with infected people/environment (T).	343	98.6	5	1.4
K8. There is no need to wear a mask when going out (F).	6	1.7	342	98.3
K9. Touching the eyes, mouth, and nose outsidewith hands should be avoided (T).	343	98.6	5	1.4
K10. Avoid crowded places (T).	342	98.3	6	1.7
K11. If you have complaints such as fever, cough, and difficulty breathing, you should go to a health facility immediately (F).	248	71.3	100	28.7
K12. If you have complaints such as fever, cough, difficulty breathing, ALO 184 should be called before going to a health facility[a] (T).	272	78.2	76	21.8
K13.A Three-layer surgical mask should be worn when going out (T).	273	78.4	75	21.6
K14. Covering our mouth with a cloth like scarf, shawl, or neckwear when going out protects us from COVID-19 (F).	68	19.5	280	80.5
K15. Washing the throat or nasal mucosa with liquids such as garlic water, alcohol, salt water, or antiseptic mouthwashes is protective against COVID-19 (F).	101	29	247	71
K16. Good nutrition, good sleep, and good rest, avoiding cigarettes and tobacco products, and excessive alcohol strengthens your immune system, protecting you against COVID-19 (T).	324	93.1	24	6.9
K17. Taking a shower with very hot water kills the coronavirus on my body (F).	59	17	289	83
K18. Cleaning the entire body with alcohol or chlorine kills the coronavirus (F).	44	12.6	304	87.4
K19. Coronavirus is transmitted only to individuals over 65 years of age (F).	22	6.3	326	93.7
K20. Live cells are absolutely necessary for viruses to survive. The possibility of contamination with various products received via cargo is very weak, even impossible (T).	110	31.6	238	68.4
K21.COVID-19 can live on plastic, steel, and cardboard for a short time, and keeping products that come with grocery shopping for 1-2 hours outside home is enough to eliminate the possibility of contamination (T).	193	55.5	155	44.5
K22. The idea that the mask protects me completely is wrong. The best method of protection is to maximize social distance by staying at home (T).	340	97.7	8	2.3
K23. Being alarmed and experiencing unnecessary stress weakens your immune system (T).	301	86.5	47	13.5
K24. For protection against COVID-19, medication and food supplements should never be taken without consulting a doctor (T).	326	93.7	22	6.3
K25. There is no evidence showing that pets and stray animals transmit the coronavirus (T).	256	73.6	92	26.4

[a] Report line for COVID-19 suspect diagnosis, K = Knowledge. T = True item, F = False item.

Table 3. Distribution of responses of pregnant women to attitude expressions towards COVID-19 (n=348).

Items	Agree		Not sure/Not agree	
	Number	%	Number	%
A1. I have no fear of COVID-19 disease.	63	18.1	285	81.9
A2. I am very afraid to get infected with COVID-19.	199	57.2	149	42.8
A3. I am worried about whether COVID-19 infection gets to my baby.	292	83.9	56	16.1
A4. I am not interested in COVID-19 infection at all.	30	8.6	318	91.4
A5. I feel unlucky as my pregnancy coincides with the COVID-19 pandemic.	201	57.8	147	42.2
A6. I think that COVID-19 pandemic will negatively affect my pregnancy physically and psychologically.	151	43.4	197	56.6
A7. I believe that if I stay home during my pregnancy and pay attention to social distance, I can be protected from COVID-19.	289	83	59	17
A8. I think I will get mad if someone comes home during my pregnancy or if my husband asks me to go out with him.	128	36.8	220	63.2
A9. I am not at risk of COVID-19 infection because I am young and I find it unnecessary to be protected from COVID-19.	19	5.5	329	94.5
A10. I am afraid to go to antenatal follow-up during pregnancy due to COVID-19 pandemic.	96	56.3	152	43.7
A11. I could not go to antenatal follow-up due to COVID-19 and I could not have my tests (such as double, triple screening test) done during pregnancy.	213	61.2	135	38.8
A12. I feel tired of staying home because of the COVID-19 pandemic.	117	33.6	231	66.4
A13. I consider the global COVID-19 pandemic as a punishment from God.	251	72.1	97	27.9
A14. I consider the COVID-19 pandemic as a warning from God.	82	23.6	266	76.4
A15. I feel helpless in the face of COVID-19 infection.	87	25	261	75
A16. I think that no one can avoid COVID-19 infection and that everyone will definitely get this infection.	235	67.5	113	32.5
A17. I am concerned that the COVID-19 pandemic will continue in the postpartum period.	61	17.5	287	82.5
A18. I think that the COVID-19 pandemic will never end.	281	80.7	67	19.3
A19. I believe the pandemic will end if it is fought well.	283	81.3	65	18.7
A20. I believe that good days will come after COVID-19 pandemic.	286	82.2	62	17.8
A21.I hope that COVID-19 pandemic will end soon.	93	26.7	255	73.3

A = Attitude.

Comparison of socio-demographic and obstetric features of the pregnant women and their COVID-19 knowledge score, and their response to some attitude expressions with depression, anxiety, and stress levels

The median of depression, anxiety, and stress scores of the pregnant women were 1 (0-21), 2 (0-19) and 2 (0-21), respectively. While 81% of the pregnant women did not have “depression” according to DASS-21, 5.2% had “mild”, 8.3% “moderate”, and 5.5% “severe-extremely severe” depression. While 70.4% of the pregnant women were not found to have “anxiety” according to DASS-21, their “anxiety” level was detected as 7.8% “mild”, 13.2% “moderate,” and 8.6% “severe-extremely severe”. While 80.2% of the pregnant women did not show "stress" according to DASS-21, "stress" was found in 5.2% as “mild”, 4.6% as "moderate," and 10.1% as "severe-extremely severe".

In terms of the socio-demographic characteristics of the pregnant women, there was a statistically significant difference only between the family type variable and anxiety (p=0.022) and stress (p=0.003) levels. No statistically significant difference was found between other socio-demographic and obstetric features and depression, anxiety, and stress median scores (p>0.05). No statistically significant relationship was found between the COVID-19 knowledge scores and the mean scores of depression (p=0.848), anxiety (p=0.188), and stress (p=0.747). When the attitudes of pregnant women towards COVID-19 and depression, anxiety, and stress levels were compared, there is a statistically significant difference between the attitude 3 and the median of depression (p=0.032) and stress (p=0.017). Similarly, there is a statistically significant difference between the attitude 4 and the median of depression

(*p*=0.017) and stress (*p*=0.001) (Table 4).

Table 4. Comparison of the pregnant women's socio-demographic and obstetric characteristics, COVID-19 knowledge scores, and their responses to some attitude expressions with depression, anxiety, and stress levels (n=348).

Variables	**Depression[a]**		**Anxiety[a]**		**Stress[a]**	
Age	r=-0.028 *p*=0.603		r=-0.056 *p*=0.296		r=-0.024 *p*=0.411	
Partner's/husband's age	r=-0.015 *p*=0.0778		r=-0.50 *p*=0.349		r=0.030 *p*=0.573	
Gestational week	r=0.091 *p*=0.092		r=0.070 *p*=0.192		r=0.024 *p*=0.662	
COVID-19 knowledge scores	r=-0.010 *p*=0.848		r=-0.071 *p*=0.188		r=-0.017 *p*=0.747	
Variables	**Depression Median (Min-max)**	**Analysis**	**Anxiety Median (Min-max)**	**Analysis**	**Stress Median (Min-max)**	**Analysis**
Education status						
Literate/primary school	1 (0-20)	z=-0.168	2 (0-16)	z=-0.613	3 (0-21)	z=-0.938
High school and above	1 (0-21)	*p*=0.867	1 (0-19)	*p* = 0.540	2 (0-21)	*p*=0.348
Location where resided longest						
City	1 (0-21)	z=-0.134	1 (0-19)	z=-0.041	2 (0-21)	z=-0.077
District/village	1 (0-20)	*p*=0.893	2 (0-16)	*p*=0.968	2 (0-21)	*p*=0.938
Family type						
Nuclear family	1 (0-21)	z=-1.949	1 (0-19)	z=-2.293	2 (0-21)	z=-2.979
Extended family	2 (0-14)	*p*=0.051	2 (0-15)	***p*=0.022**	4 (0-21)	***p*=0.003**
Employment status						
Yes	1 (0-10)	z=-0.810	1 (0-10)	z=-1.183	3 (0-18)	z=-0.183
No	1 (0-21)	*p*=0.418	2 (0-19)	*p*=0.237	2 (0-21)	*p*=0.855
Husband's employment status?						
Yes	1 (0-21)	z=-0.076	1 (0-19)	z=-1.355	3 (0-21)	z=-0.197
No	1 (0-20)	*p*=0.940	2 (0-16)	*p*=0.175	2 (0-21)	*p*=0.844
Perceived income						
Poor	1 (0-20)	KW=1.893	2 (0-16)	KW=3.451	2 (0-17)	KW=1.120
Moderate	1 (0-21)	*p*=0.388	2 (0-19)	*p*=0.178	3 (0-21)	*p*=0.571
Good	1 (0-7)		2 (0-17)		2 (0-15)	
Willing pregnancy						
Yes	1 (0-21)	z=-0.070	2 (0-19)	z=-0.101	2 (0-21)	z=-0.092
No	1 (0-8)	*p*=0.944	2 (0-9)	*p*=0.919	3 (0-16)	*p*=0.927

Receiving regular prenatal care (4 and over)						
Yes	1 (0-21)	z=-0.618	1 (0-19)	z=-1.652	2 (0-21)	z=-0.009
No	1 (0-12)	*p*=0.537	2 (0-12)	*p*=0.099	3 (0-18)	*p*=0.993
A3. I am worried about whether COVID-19 infection gets on my baby.						
Agree	1 (0-21)	z=-2.142	1 (0-19)	z=-1.724	2 (0-21)	z=-2.376
Not sure/Not agree	2 (0-18)	***p*=0.032**	2 (0-15)	*p*=0.085	4 (0-21)	***p*=0.017**
A4. I am not interested in COVID-19 infection at all.						
Agree	2 (0-17)	z=-2.377	2 (0-11)	z=-1.417	5 (0-21)	z=-3.215
Not sure/Not agree	1 (0-21)	***p*=0.017**	1 (0-19)	*p*=0.157	2 (0-21)	***p*=0.001**

[a]Spearman correlation analysis. Min = Minimum, Max = Maximum. z = Mann Whitney U test. KW = Kruskal Wallis test. A = Attitude

Analysis of some socio-demographic and attitude expressions related to depression, anxiety and stress levels according to regression analysis

According to the multivariate regression analysis result, attitude #3 (*p*=0.047) affected the depression score of the pregnant women at a statistically significant level, and attitude #3 (*p*=0.008) and attitude #4 (*p*=0.014) affected the stress score at statistically significant levels. According to the linear regression analysis, the family type does not have a statistically significant effect on the anxiety score of the pregnant women (*p*=0.145) (Table 5).

Table 5. Analysis of some socio-demographic and attitude expressions related to depression, anxiety and stress levels according to the regression analysis.

Depression[a]	**Predictors**	**B**	**Std. Error**	**Beta**	**t**	***p***	**95% Confidence Interval for B**	
							Lower	**Upper**
	(Constant)	4.222	0.795		5.314	**< 0.001**	2.659	5.785
	Attitude #3 (agree)	-1.140	0.573	-0.108	-1.989	**0.047**	-2.268	-0.013
	Attitude #4 (not agree)	0.743	0.751	0.054	0.990	0.323	-2.219	0.733
R=0.128	**R^2**=0.016		**Adjusted R^2** =0.011					
Anxiety[b]	(Constant)	2.538	0.204		12.428	**< 0.001**	2.136	2.939
	Family type (extended)	0.565	0.387	0.078	1.461	0.145	-0195	1.326
R=0.078	**R^2** =0.006		**Adjusted R^2** =0.003					
Stress[a]	(Constant)	7.055	0.997		7.078	**< 0.001**	5.094	9.015
	Family type (extended)	1.397	0.565	0.130	-1.844	0.066	-2.656	0.086
	Attitude #3 (agree)	-1.285	0.697	-0.098	-2.654	**0.008**	-4.218	-0.627
	Attitude #4 (not agree)	-2.423	0.913	-0.141	2.475	**0.014**	0.287	2.508
R=0.238	**R^2** =0.056		**Adjusted R^2** =0.048					

[a] Multivariate regression analysis. [b] Linear regression analysis.

Discussion

Discussion of COVID-19-related knowledge status of the pregnant women

The knowledge of the community on COVID-19, which is a very recent pandemic for the whole world, is limited to the information provided by the healthcare professionals through the media and the news circulating on the social media. Every day, new information about symptoms, treatment and care periods of COVID-19 appear in the literature, but research is still limited. In the literature, there is no study that examines the COVID-19-related knowledge status of pregnant women in detail. In just one study, pregnant women were asked, "How many points between 1 and 10 do you give to your COVID-19-related knowledge status?"[23] Therefore, this study is considered to make an important contribution to the COVID-19 literature. In this study, COVID-19 knowledge score (median=84) of the pregnant women was found to be "good". The accuracy rate of the answers given by the pregnant women to the information form containing true-false information about COVID-19 was found high (Table 2). According to the present study results, in Turkey, the dissemination of informative content by the Republic of Turkey Ministry of Health and health professionals through the media appears to be at a very good level.[32] However, 71% of the pregnant women think that "in case of any complaints, one should directly go to a health institution", which may lead to unnecessary accumulation of pregnant women in health institutions and an increased risk of getting COVID-19 infection. In antenatal follow-ups, physicians, nurses, and midwives should explain that when pregnant women have a symptom, they should first call ALO 184, the line exclusive for the diagnosis of COVID-19 suspect. In the study, one fifth of the pregnant women think that "wrapping a piece of cloth like scarf, shawl, and neckwear around the mouth protects from COVID-19". In this sense, health professionals should always remind pregnant women about the use of masks before going out. One third of the pregnant women believe that the use of liquids such as garlic water, alcohol, salt water, and various antiseptic mouthwashes in the oral cavity and on nasal mucosa is protective against COVID-19. It should also be explained to pregnant women that the best measure against COVID-19 is social distance, mask, and hand hygiene.[32]

Discussion of the pregnant women 'attitudes towards COVID-19

In this study, a large majority of the pregnant women (83.9%) were concerned about "COVID-19 infection transmission to their baby" (Table 3). In a limited number of studies, no vertical transition from mother to fetus has been detected during pregnancy.[33-35] For this reason, during antenatal follow-ups, nurses and midwives should inform the pregnant women and resolve their concerns because anxiety and stress in pregnant women have negative effects on maternal and fetal health.[12]

Since more than half of the pregnant women in this study were afraid of getting COVID-19, they stated that "they could not go to antenatal follow-ups and did not perform the screening tests recommended during pregnancy". The opinions of the experts in the COVID-19 pandemic period are that the antenatal appointment program should be developed according to the pandemic propagation stage. In the early stage of the pandemic, antenatal visits are recommended to be maintained as long as possible in the routine program for all women providing that the number of hospitals and staff allows.[36] The frequency of routine antenatal monitoring recommended by the Republic of Turkey Ministry of Healthis at least once in the first 14 weeks, 2nd follow-up in weeks 18-24, 3rd follow-up in weeks 28-3, and 4th follow-up in weeks 36-38.[37] The rate of pregnant women in Turkey receiving prenatal care from an expert/qualified person was reported to be 96%, pre-pandemic.[38] According to the results of the present study, it was found that there was a significant decrease in the rate of pregnant women going to antenatal follow-ups due to the concerns of getting COVID-19 during the pandemic period. Healthcare professionals should inform the pregnant women about attending the antenatal follow-ups by making an

appointment and following the safety measures, such as wearing a mask and social distancing, and they should also explain the importance of having the screening tests recommended by the physician in appropriate gestational weeks to evaluate fetal health.

Discussion of the relationship of socio-demographic and obstetric features of pregnant women and their COVID-19 knowledge score and their responses to some attitude expressions with depression, anxiety, and stress levels

According to the DASS-21, the median of depression (median = 1), anxiety (median = 2), and stress (median = 2) of the pregnant women were found to be quite low, but in 19% of the women mild to severe levels of depression, in 29.6%, mild to severe levels of anxiety, and in 19.8%, mild to severe levels of stress were detected. This study results were in line with the results from the pre-pandemic literature regarding the frequencies of depression,[9,39,40] anxiety,[10,40-42] and stress[41] in pregnancy. COVID-19 pandemic, which emerged suddenly for the whole world and changed the lifestyle of virtually everybody, also negatively affected the mental health of the people. Preliminary evidence estimates that symptoms of anxiety and depression (16%-28%), perceived stress (8%), and sleep disturbance are common psychological reactions to the COVID-19 pandemic.[43] In a study conducted in Turkey, depression was seen in 35% of the women during the COVID-19 pandemic period.[23] In another study, an increase in the frequency of depression and anxiety of the pregnant women was reported during the pandemic period compared to the pre-pandemic period.[26] Pregnancy is a unique period that concerns the health status of both the mother and the fetus. For this reason, this group should not be neglected during the pandemic periodtheir mental health conditions should be evaluated during antenatal follow-ups and concerns about COVID-19 should be eliminated.

In this study, the reason why there was no significant difference between the COVID-19 knowledge score and the depression, anxiety, and stress levels of the pregnant women, maybe the "good" knowledge scores of pregnant women. Durankus and Akus also reported that there was no significant relationship between COVID-19 knowledge and presence of depression in pregnant women.[23] The two study findings were similar. In this study, there was a significant difference between depression and stress and attitudes #3 (I am concerned about whether COVID-19 infection is transmitted to my baby) and attitude #4 (I am not interested in COVID-19 infection at all) (Table 4). According to the regression analysis, attitude #3 was identified as a risk factor for the presence of depression and attitudes #3 and #4 for the presence of stress (Table 5). The question "Did the COVID-19 pandemic affect your psychology negatively?" was asked to a group of pregnant women in a previous study, and they were instructed to answer this question between 1 and 10, and a significant relationship was found between the effects of COVID-19 on psychology and the presence of depression in pregnant women.[23] Anxiety and fears of pregnant women about COVID-19 may affect their mental health. In antenatal follow-ups, nurses and midwives should encourage pregnant women to express their concerns and fears about COVID-19 and evaluate their mental health status. In addition, new studies evaluating pregnant women's COVID-19-related fear and anxiety during the pandemic period will also contribute to the literature of the field.

Strengths and limitations

This is the first and only study in Turkey evaluating pregnant women's knowledge of and attitudes towards COVID-19 pandemic in detail. It will also make an important contribution to the COVID-19 literature in terms of examining the relationship between pregnant women's knowledge of and attitudes towards COVID-19 and their levels of depression, anxiety, and stress. The study provided a unique opportunity to compare the prevalence of depression, anxiety, and stress in pregnant women during- and pre-pandemic period. Although the present study possesses much strength, the fact that hospitals and family health centers do not accept researchers from outside the institution

forced us to carry out an online study. Another limitation was that the evaluation of symptoms of depression, anxiety, and stress was based on a self-report measure.

Clinical implications

In this study, pregnant women's COVID-19-related knowledge and attitudes were assessed with an online questionnaire, and the points on which they had insufficient information and false knowledge were revealed. In addition, attitude expressions directed to the pregnant women also provided an opportunity for them to express their feelings towards COVID-19. This study will guide healthcare professionals' care practices for pregnant women. In this study, the evaluation of depression, stress, and anxiety levels of the pregnant women during the pandemic period will encourage health professionals to be aware of psychological changes in care practices for pregnant women during pandemic. Perinatal depression, anxiety, and stress screening can be recommended internationally in the pandemic period and should be one of the areas to be evaluated primarily during an international public health crisis. Under population-based social isolation and quarantine conditions, psychological helplines and online counseling can be a safe and feasible method to protect and manage perinatal mental illness.

Conclusion

This study examined the knowledge status, attitudes, and mental health of the pregnant women during the COVID-19 outbreak. According to the results of the study, COVID-19-related knowledge level of the pregnant women was "good", but there was a lack of data about the use of masks. While most of the pregnant women were worried that COVID-19 infection might transmit to their baby, more than half of them did not go to antenatal follow-ups because they were afraid of COVID-19 infection. According to the literature, the frequency of depression, anxiety, and stress of the pregnant women during the pandemic period was similar to pre-pandemicdata.

Ethics Committee Approval

The research has been prepared in accordance with the Declaration of Helsinki Principles. Ethics committee approval was obtained from the Faculty of Health Sciences Ethics Committee of the relevant university (Date: 27.05.2020 and Number: 2020/599). In addition, approval was obtained from the Republic of Turkey Ministry of Health for this research. The pregnant women were sent an "Informed Consent Form" by a text message before the online form and they were asked to click the "accept" button if they volunteered to be included in the study.

Informed Consent

It was explained to the pregnant women that the data on the online form would be collected anonymously and that after clicking the "accept to participate in the study" button, they could proceed to answer the questions. The pregnant women's answers accumulated in the e-mail address of the researcher without the name and phone number of the participants.

Author Contributions

The idea of the research, data collection process, analysis and interpretation, literature review, article writing were made by H.A.D.

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Conclict of Interest

I declare that I have no conflicts of interest.

Financial Disclosure

I was given no financial support, fund or grants from other institutions.

Statements

I declare that the study has been sent to no other journals or instruments to be published. I read carefully the final version of the study and approved it to be sent to your journal.

Peer-review

Externally peer-reviewed.

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