Awareness of Coronavirus Disease From Conception to Delivery: Antenatal Mental Journey Breaking Anxiety During Outbreak

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Abstract

Purpose

The objective of this study was to evaluate the psychological impact of the coronavirus disease on women sensitized by pregnancy after the first case was confirmed in Turkey, which has been declared a pandemic by the World Health Organization. This study also intends to help developing preventive measures for pregnants, reducing infection incidence, developing solutions to protect public health, and establishing whether pregnants have sufficient knowledge and awareness to manage this situation.

Methods

This prospective study was conducted at two centers. A total of 529 pregnant women from all three trimesters were given questionnaires that consisted of 51 original questions.

Results

The period when anxiety was highest was the 2nd trimester, whereas women in the 1st trimester had the lowest level of anxiety. High levels of awareness were observed in patients with heart disease, but patients with diabetes mellitus had a high level of anxiety. There was a statistically significant correlation between anxiety and awareness scores of the coronavirus disease.

Conclusion

The treatment and the long-term effects of the coronavirus disease remain unknown. It is important to maintain the mental and physical health of pregnants, who are in a more delicate condition in the society.

1. Introduction

The coronavirus disease (COVID-19) pandemic started on December 31, 2019, in the Chinese city of Wuhan, the capital of Hubei province [1]. On January 30, 2020, the World Health Organization reported that the COVID-19 outbreak was a public health emergency of international concern. As of May 30, 2020, the virus, which has rapidly spread across the country and around the world, has become a very serious issue and public health problem, with 6,099,000 cases, 369,000 deaths, and 2,700,000 recovered cases in approximately 6 months.

In Turkey, the first case was reported on March 11, 2020, which was later than in other developing countries owing to the precautions taken prior to the emergence of the first case. As of May 30, 2020, 163,103 cases, 4,515 deaths, and 126,000 recovered cases have been reported in Turkey [2].

The partial curfew enforced in Turkey, restrictions for certain age groups, home healthcare services and follow-up, and successful filiation practices have minimized the spread and mortality rate of the virus.

Pregnant women are known to be predisposed to the complications and the severe outcomes of a COVID-19 infection, as declared from SARS and MERS [3, 4].

The panic caused by the virus across the world coupled with the thought of staying home under quarantine, fear of death, protecting loved ones, and the mothering instinct has caused significant anxiety problems in particularly sensitive populations. It has been aimed to measure the impact of factors such as age, educational background, contact history, and number of individuals living in the household on awareness levels of pregnant women. While the effect of the pandemic on pregnant women has yet to be revealed, this survey study was planned to measure the anxiety and awareness levels of pregnant women because there are only few studies and pregnant women cannot be included in most studies. Royal College of Obstetrics and Gynecology reported that the COVID-19 pandemic increases the risk of perinatal anxiety, depression, and domestic violence [5]. The importance of mentally and emotionally supporting women has been emphasized in COVID-19 guidelines. Necessary measures should be taken to offer psychological support for pregnant women suffering from anxiety caused by this dramatic outbreak.

Pregnancy is related to increased risk for severe psychological issues such as depression, anxiety and postpartum psychosis due to physiological, immunological and hormonal alterations [6].

2. Materials And Methods

The number of cases to be included in the present study was determined to be 469 to obtain a power of 90% at $\alpha = 0.03$. However, given the potential losses, it was considered convenient to include 500 cases.

The study was approved by the institutional ethics committee (date: April 14, 2020; approval number: B.10.1.TKH.4.34.H.GP.0.01/84 – 15/04/2020-54132726-000-8582/00116578941). Our scientific research application No. 15916306-604.01.01 was approved by Istanbul Provincial Health Directorate. No. 2020-05-04T23_03_03 was approved by the Ministry of Health of the Republic of Turkey. All procedures were in accordance with the ethical standards of the national research committee and with the 1964 Helsinki declaration, its later amendments or comparable ethical standards. Before starting the study, all volunteers received an informed consent form.

This multi-centric prospective study, conducted between March 30 and May 30, 2020, was designed as a descriptive and cross-sectional study. The questionnaires were planned to be administered in the outpatient clinic for pregnant women and the obstetric emergency services at the Umraniye and Kanuni Sultan Suleyman Training and Research Hospitals. The questionnaire was designed to identify awareness levels of COVID-19, identify anxiety levels in the admitted pregnant women, and evaluate their attitudes in terms of prevention measures.

The questionnaire comprises 51 original questions that investigate the pregnant women's demographic data, history of contact with COVID-19-positive patients, knowledge and concerns about COVID-19, precautionary measures, and approach to outbreak.

A link to the online questionnaire (SurveyMonkey) was sent to the pregnant participants, who were admitted to the obstetric outpatient clinics at Umraniye and Kanuni Sultan Suleyman Training Research Hospitals. The online questionnaire was sent to 529 women, out of whom 526 returned completed surveys.

The questionnaire was delivered using the QR code method and filled online to avoid contamination during this risky time. To assess the level of anxiety, only one of the questions used the Beck Anxiety Scale [7].

Adolescent pregnant women and pregnant women with diagnosed depression, anxiety, and psychosis were excluded from the study. Illiterate pregnant women and pregnant women with diagnosed or suspected COVID-19 were not included in the study. A total of 529 pregnant women aged 18–48 years who volunteered to participate in the survey study were finally included.

Comparisons were made in terms of age, educational background, number of children, contact history, pregnancy week, risk factors, and anxiety and awareness levels. The results are intended to shed light on the measures taken by the Ministry of Health of the Republic of Turkey and contribute to informing and guiding healthcare workers and patients.

The statistical analyses were performed using the Statistical Package for the Social Sciences, version 25 (SPSS Inc.). Along with the descriptive statistical methods for data analysis, the Shapiro–Wilk test and boxplot graphs were used to test the normality of variables in terms of normal distribution. One-way analysis of variance was used in intergroup comparisons of normally distributed variables, while the Bonferroni test was used to determine groups with differences. The Kruskal–Wallis test was used for intergroup comparisons of non-normally distributed parameters, while Dunn's test was used to determine the groups with differences. The Mann–Whitney U test was used to compare the parameters between two groups. $P < 0.05$ was considered statistically significant.

3. Results

The study was conducted between March 30 and May 30, 2020, with a total of 526 participants aged 18–43 years with a mean age of 28.35 (SD: 5.43) years.

Of the pregnant women, 7% were healthcare workers. In terms of the number of children that they had, 45.8% were pregnant for the first time; 32.7% had one child, 12.7% two children, and 87% had ≥ 3 children.

A total of 97.5% of the respondents were married. In terms of educational background, 14.1% were primary school graduates, 17.9% were secondary school graduates, 24.7% were high school graduates,

12.7% had associate degrees, and 30.6% had undergraduate and graduate degrees.

Of the respondents, 87.3% were non-smokers. In terms of pregnancy week, 23.8% were in gestation week 14, 29.5% were in gestation week 14–28, and 46.7% were in gestation week > 28.

In terms of the number of people living in the household, 43% responded 1–2 people, 49.1% responded 3–5 people, and 14.6% responded 5–10 people. Those who had been admitted at the emergency service 1–5 times over the past year accounted for 49.1% of all included cases, and those admitted 5–10 times accounted for 14.6%. Those with a history of contact with an individual suspected of COVID-19 in the previous 14 days accounted for 1.5% of the cases, while those who were not sure of contact accounted for 3.4%. Public transport use rate over the past month was 23%. In addition, 49% of participants touched their faces less than 10 times a day, while 40.5% touched their faces more than 10 times a day. Moreover, 20.2% of the participants did not undergo routine pregnancy checks, 18.8% did so occasionally, and 61% did so regularly.

In terms of risk factors, 3% of the participants had diabetes mellitus (DM), 2.3% hypertension, 5.3% lung disease, 1.3% cancer, 4% heart disease, 1.5% liver disease, 1.1% renal disease, 3.8% thyroid disease, and 2.9% other risk factors, whereas 79.8% of the participants had no risk factor.

A total of 8.7% of the participants believed that the use of antibiotics is effective against COVID-19. Additionally, 53% thought that social media was being efficiently used to inform the society about COVID-19, and 4.9% of the cases had been previously vaccinated against influenza.

Those who thought that they were well informed about how COVID-19 is transmitted accounted for 77.4% of the participants; those who thought that they were well informed about its symptoms also accounted for 77.4%. Further, 86.1% of the participants thought that the most important symptom of COVID-19 is fever, while 62.5% thought it is cough, 70.7% shortness of breath, and 6.1% other symptoms. In addition, 56.3% of the participants stated that they would be interested in getting vaccinated if there was a vaccine against COVID-19, 18.1% thought that their families and friends were well informed about COVID-19, 67.7% thought that the pandemic was preventable, 80.4% thought the pandemic was deadly, 58.4% found the measures taken by the Ministry of Health against the pandemic to be satisfactory, and 33.1% were informed by healthcare workers.

Among the measures taken by the participants against the COVID-19 pandemic, frequent hand washing was 88.6%, use of hand sanitizer/cologne was 59.9%, avoiding crowds was 83.3%, wearing a mask was 61.6%, wearing gloves was 26.4%, and staying home for protection was 3.2%.

Among the measures taken to reduce the number of cases and deaths related to COVID-19 in Turkey, most were those taken by the Ministry of Health, which accounted for 23%. This was followed by staying home unless necessary (19.2%) and cleaning habits (16.2%). Furthermore, 93.5% of the participants expressed that they would perform self-protection by quarantining themselves at home for 14 days if they came in contact with individuals with suspected COVID-19, 96.4% expressed that they would not visit any

relative or friend within the first 14 days following their arrival from other countries. 86.9% stated that they were following up-to-date information about COVID-19 in Turkey and around the world, and 24.7% thought the COVID-19 pandemic was overrated. Additionally, 51.1% of the participants thought that they needed to be informed about COVID-19, 42.4% stated they would accept inpatient treatment if recommended by their doctor because of COVID-19, 51% stated they would provide swab samples if requested by their doctor after they had contacted an individual diagnosed with COVID-19, and 42.7% stated that they would share their diagnosis of COVID-19 with everyone if diagnosed with COVID-19.

The results outlined above include the distribution of the responses given by the pregnant women to the 19 questions asked to assess their awareness of COVID-19. A scoring system of 19 questions to determine the level of awareness in pregnant women was created. Every correct answer indicating awareness was converted into a hundred-point scale for standardization. Percentile values ranked at the 33.3 and is categorized as average, and awareness was classified. The scores of awareness of COVID-19 were 5.26–100, with a mean score of 60.13 ± 14.81. Of the participants, 3.6% who scored 33.3 and below had low awareness, 58.7% who scored 33.3–66.6 had moderate awareness, and 37.6% who scored ≥ 67 had high awareness. (Table 1)

Table 1
Distribution of COVID-19 Awareness Scores

	COVID-19 Awareness Scores
Min-Max	5,26–100
Avr ± SD	60,13 ± 14,81
Low Awareness Levels	19 (3,6)
Moderate Awareness Levels	309 (58,7)
High Awareness Levels	198 (37,6)

There was no statistically significant relationship between age and scores of COVID-19 awareness. (r=-0,016; p = 0,712; p > 0,05). There was also no statistically significant difference between the scores of COVID-19 awareness in terms of educational background (p > 0,05). There was no significant difference among the scores of COVID-19 awareness in terms of being a healthcare worker or not (p > 0,05). In terms of number of children, however, there was a significant difference among the scores of COVID-19 awareness (p < 0.05): the awareness increased as the number of children increased. The awareness score of women who had no children was significantly lower than that of those who had three children (p = 0,016; p < 0,05).

In terms of use of public transport in the previous 1 month, there was no significant difference among the scores of COVID-19 awareness (p > 0,05).

There was no significant difference among the scores of COVID-19 awareness in terms of having contacted anyone with suspected COVID-19 in the previous 14 days ($p > 0,05$). There was also no significant difference among the scores of COVID-19 awareness in terms of pregnancy week ($p > 0,05$). There was a significant difference among the scores of COVID-19 awareness in terms of the number of people living in the household ($p < 0.05$); the awareness score of those with a household of 1–2 people was significantly lower than that of those with a household of 3–5 people (p:0,012; $p < 0,05$). There was a significant difference among the scores of COVID-19 awareness in terms of visiting the healthcare facility for routine pregnancy check-ups ($p < 0.05$); the awareness score of those continuing routine pregnancy check-ups was significantly higher than that of those not undergoing or occasionally undergoing routine pregnancy check-ups (p:0,001; $p < 0,01$). (Table 2)

Table 2
Evaluations based on COVID-19 Awareness Scores

		COVID-19 Awareness Scores			
		Average	SD	Median	p
Educational Status	**Primary School**	60,88	17,73	63,16	[a]0,152
	Middle School	63,38	14,76	63,16	
	High School	59,72	16,64	57,89	
	Associate's degree	58,52	14,24	57,89	
	From Bachelor's degree to Doctorate	58,91	11,58	57,89	
Health-care worker	**Yes**	58,80	13,72	57,89	[b]0,280
	No	62,00	15,49	63,16	
Number of children	**Zero**	58,62	13,95	57,89	[a]0,025*
	1 child	60,86	14,59	63,16	
	2 children	60,57	17,08	63,16	
	3 and more	64,76	15,80	63,16	
Use of public transportation	**Yes**	60,77	13,78	63,16	[b]0,595
	No	59,95	15,12	57,89	
Suspected COVID-19 exposure	**No**	60,24	14,77	57,89	[c]0,531
	Yes	63,16	12,89	63,16	
	Not sure	55,85	16,95	60,53	
Gestational age	**< 14 gw**	60,76	13,93	63,16	[a]0,380
	14–28 gw	59,14	14,23	57,89	
	> 28 gw	60,36	15,16	57,89	
How many people do live in your house?	**1–2 people**	58,59	13,63	57,89	0,011*
	3–5 people	61,91	15,06	63,16	
	> 6 people	57,06	18,38	57,89	
Routine prenatal visits	**Never**	57,69	15,87	57,89	0,001**

*[a] Oneway Anova test [b] Student t test [c] Kruskal Wallis test *p < 0,05*

	Irregular	59,62	14,18	57,89
	Regular	64,43	14,94	68,42

*[a]Oneway Anova test [b]Student t test [c]Kruskal Wallis test *p < 0,05*

In terms of the risk factors of pregnant women, the scores of COVID-19 awareness did not significantly differ in other groups of risk factors, except for those with heart disease ($p > 0.05$). The awareness score of patients with heart disease was significantly higher than that in those without heart disease ($p < 0.05$) (Table 3).

Table 3
Evaluation of COVID-19 Awareness Scores according to the risk factors of pregnant women

		COVID-19 Awareness Scores			p
		Average	SD	Median	
Diabetes Mellitus	No	60,20	14,76	57,89	0,571
	Yes	58,22	16,81	60,53	
Hypertension	No	60,30	14,65	57,89	0,312
	Yes	53,07	20,38	57,89	
Lung Diseases	No	60,24	15,01	57,89	0,364
	Yes	58,27	10,90	57,89	
Cancer Diseases	No	60,14	14,77	57,89	0,699
	Yes	60,15	19,66	63,16	
Heart Diseases	No	53,13	12,88	52,63	0,016*
	Yes	60,43	14,83	63,16	
Liver Diseases	No	60,08	14,86	57,89	0,475
	Yes	63,82	12,08	65,79	
Renal Diseases	No	60,12	14,79	57,89	0,830
	Yes	61,40	18,13	63,16	
Thyroid Diseases	No	59,95	14,77	57,89	0,094
	Yes	64,74	15,75	68,42	
Other Diseases	No	60,05	14,78	57,89	0,399
	Yes	63,16	16,40	68,42	
None	No	59,93	15,23	63,16	0,988
	Yes	60,19	14,73	57,89	

*Mann Whitney U test *p < 0,05*

Moreover, 62.9% of the participants thought they were more prone to COVID-19 because they were pregnant, 69% thought their unborn infant could get infected by COVID-19, and 75.1% thought their infant could get infected by COVID-19 through breastfeeding. Because of the concern of getting infected by COVID-19, 14.6% of the participants thought that they would have pain, 7.2% bleeding, 4.2% water-breaking, 14.8% premature birth, and 13.1% miscarriage or stillbirth. In addition, 29.3% used vitamins to

boost their immunity against COVID-19 and 68.2% were concerned about family members getting infected by COVID-19. Because of the thought of getting infected by COVID-19, 3.6% of the participants expressed that they experienced numbness or tingling, 14.1% experienced increased body heat, 8.2% experienced weakness or chills, 30.6% had feelings of foreboding, 10.6% had heart palpitations, 3.4% dizziness or drowsiness, 10.5% feelings of drowning, 13.9% difficulty in breathing, 16.5% fear of death, and 12.0% discomfort in the stomach. Additionally, 45.6% thought they would never recover if infected by COVID-19, 44.7% thought that physicians could not diagnose COVID-19 in a timely manner and treat COVID-19 properly, 11.2% considered terminating their pregnancy because of the risk of COVID-19 infection in the womb, 78.3% believed that they now wash their hands more often after coughing, sneezing, and touching the nose than in the pre-pandemic period, and 93.9% avoided leaving home and going outside owing to their concerns regarding COVID-19. If an individual living in the same household is recommended treatment for suspected COVID-19, 57.2% expressed that they would live in separate rooms, 21.2% said they would live in separate houses, and 47.3% expressed that they would be willing to provide a swab sample if requested by their physician upon contacting someone suspected of COVID-19.

These results show the distribution of the participants' responses to the 15 questions asked to measure anxiety regarding COVID-19 in pregnant women. Based on the responses, we created a scoring system to determine the level of anxiety in pregnant women. Every correct response measuring anxiety was converted into a hundred-point scale for standardization and then assessed. Percentile values ranked at the 33.3 and is categorized as average, and anxiety was classified.

The scores of COVID-19 anxiety ranged from 13.33 to 86.67, with a mean score of 53.49 ± 13.63. Those with a score of ≤ 33.3 were classified as having low anxiety and accounted for 11.4% of the respondents; those with scores of 33.3–66.6 had a moderate level of anxiety and accounted for 66.2% of the respondents, and those with a score of ≥ 67 had a high level of anxiety and accounted for 22.4% of the respondents. (Table 4)

Table 4
Distribution of COVID-19 Anxiety Scores

	COVID-19 Anxiety Scores
Min-Max	13,33–86,67
Avr ± SD	53,49 ± 13,63
Low Anxiety Levels	60 (11,4)
Moderate Anxiety Levels	348 (66,2)
High Anxiety Levels	118 (22,4)

There was no statistically significant relation between age and score of COVID-19 anxiety (r=-0,043; p = 0,322; p > 0,05). There was also no significant difference among the scores of COVID-19 anxiety in terms of number of children and whether the participants were health workers or not (p > 0,05).

There was no statistically significant difference among the scores of COVID-19 anxiety in terms of public transport use over the past 1 month and educational background ($p > 0,05$). In terms of contact with an individual with suspected COVID-19 in the past 14 days, there was a significant difference among the scores of COVID-19 anxiety ($p < 0.05$). It was found that those with a history of contact had significantly higher anxiety scores than those without a history of contact ($p = 0,014$; $p < 0,05$).

There was a significant difference among the scores of COVID-19 anxiety in terms of gestation week ($p < 0.05$), with the highest level of anxiety in the 2nd trimester and lowest level of anxiety in the 1st trimester ($p = 0,014$; $p < 0,05$). In terms of household size, there was no significance among the scores of COVID-19 anxiety ($p > 0,05$). There was a significant difference among the scores of COVID-19 anxiety in terms of visiting the healthcare institution for routine pregnancy check-ups ($p < 0.05$). Those visiting regularly had significantly higher anxiety scores than those not visiting at all or visiting occasionally for routine pregnancy check-ups (p:0,008; $p < 0,01$). (Table 5)

Table 5
Evaluations based on COVID-19 Anxiety Scores

		COVID-19 Anxiety Scores			
		Average	SD	Median	p
Educational Status	**Primary School**	53,15	16,22	53,33	[a]0,992
	Middle School	54,11	12,36	53,33	
	High School	54,26	12,75	53,33	
	Associate's degree	53,63	15,11	53,33	
	From Bachelor's degree to Doctorate	52,63	13,20	53,33	
Health-care worker	**Yes**	54,94	13,88	53,33	[b]0,284
	No	54,38	13,95	53,33	
Number of children	**Zero**	53,44	12,85	53,33	[a]0,611
	1 child	53,06	13,69	53,33	
	2 children	53,43	16,84	53,33	
	3 and more	55,51	12,42	60,00	
Use of public transportation	**Yes**	52,78	13,92	53,33	[b]0,511
	No	53,71	13,55	53,33	
Suspected COVID-19 exposure	**No**	53,25	13,67	53,33	[c]0,044*
	Yes	62,17	13,06	59,67	
	Not sure	57,78	12,10	56,67	
Gestational age	**< 14 gw**	51,60	13,14	53,33	[a]0,047*
	14–28 gw	55,13	12,61	53,33	
	> 28 gw	53,31	14,19	53,33	
How many people do live in your house?	**1–2 people**	53,22	12,60	53,33	0,830
	3–5 people	53,82	14,22	53,33	
	> 6 people	52,98	15,57	53,33	
Routine prenatal visits	**Never**	51,13	15,27	53,33	0,010*

*[a] Oneway Anova test [b] Student t test [c] Kruskal Wallis test *p < 0,05*

	Irregular	53,25	12,90	53,33
	Regular	56,83	13,54	60,00

*[a] Oneway Anova test [b] Student t test [c] Kruskal Wallis test *p < 0,05*

In terms of risk factors, the scores of COVID-19 anxiety did not differ significantly among the participants, except for those with DM ($p > 0.05$). Those with DM had significantly higher anxiety scores than those without DM ($p < 0,05$). (Table 6)

Table 6
Evaluation of COVID-19 Anxiety Scores according to the risk factors of pregnant women

		COVID-19 Anxiety Scores			p
		Average	SD	Median	
Diabetes Mellitus	No	52,31	13,68	2	0,046*
	Yes	59,58	10,74	60,00	
Hypertension	No	53,46	13,51	53,33	0,757
	Yes	55,00	18,88	53,33	
Lung Diseases	No	53,71	13,74	53,33	0,107
	Yes	49,76	11,11	46,67	
Cancer	No	53,47	13,63	53,33	0,484
	Yes	55,24	14,25	60,00	
Heart Diseases	No	53,48	13,71	53,33	0,640
	Yes	53,97	11,72	60,00	
Liver Diseases	No	53,55	13,63	53,33	0,456
	Yes	50,00	14,25	53,33	
Renal Diseases	No	53,46	13,66	53,33	0,607
	Yes	56,66	11,74	53,33	
Thyroid Diseases	No	53,32	13,54	53,33	0,101
	Yes	58,00	15,46	60,00	
Other Diseases	No	53,50	13,73	53,33	0,972
	Yes	53,33	9,76	53,33	
None	No	53,96	13,48	53,33	0,591
	Yes	53,38	13,68	53,33	

*Mann Whitney U test *p < 0,05*

There was a statistically significant positive correlation between the scores of COVID-19 anxiety and the scores of COVID-19 awareness (r = 0,252; p = 0,001; p < 0,01). As the awareness level of pregnant women increased, the anxiety level increased as well. (Fig. 1)

4. Discussion

A total of 526 pregnant women from all three trimesters who were admitted to two centers in the Asian and European sides of Istanbul with the highest patient admissions were surveyed. Based on the data, 58.7% of the pregnant women were found to have moderate awareness. When the awareness rates of pregnant women with comorbidities were examined, it was found that the awareness levels of pregnant women with heart disease were higher. In total, 81.9% of the participants believed that they and their relatives were not sufficiently informed about COVID-19, and 59.1% thought that healthcare workers did not inform them about the COVID-19 properly. In addition, 64.6% of the participants thought they needed information about COVID-19. These data suggest that considering that the impact of COVID-19 on prenatal and postnatal periods has yet to be proven [8], healthcare workers should further inform pregnant women about COVID-19.

Although 58.7% of the pregnant women thought that the measures implemented by the Ministry of Health from the beginning of the pandemic in Turkey were satisfactory, only 18.1% thought that they were informed about how to protect and isolate themselves from the COVID-19 pandemic. These results are noteworthy and can encourage the Ministry of Health and healthcare workers to conduct more projects on informing people about the modes of transmission and protection against the virus.

While the COVID-19 awareness level is expected to increase as the level of education increases, there was no significant difference in the present study. This is consistent with the results obtained by Wang et al. According to their data, the anxiety rate was increased in patients with low educational background, whereas in our study, there was no positive correlation between educational background and anxiety [9].

Despite the fact that awareness levels increased as the number of children and the household size increased in the present study, there was no significant increase in the anxiety levels. In the study by Wang et al., a higher number of children and increased household size were not associated with increased awareness and anxiety [9]. Remarkably, based on data obtained in the current study, there was no significant difference between the awareness levels of healthcare worker women and non-healthcare worker women. 40.9% of the pregnant women expressed hesitation to report infection with COVID-19 to their physician and the Ministry of Health. This indicates that almost 50% of the pregnant women suffering from the disease try to avoid quarantine and do not understand the gravity of the situation. The concealment of a diagnosis puts the person's immediate environment and public health and healthcare workers at risk. It can be concluded that during the management of this process, it is necessary to provide the necessary psychosocial support and increase awareness of the COVID-19 pandemic among the public.

In terms of both anxiety and awareness scoring, those who visited the healthcare institution regularly for routine pregnancy check-ups had high levels of awareness and high anxiety scores. In addition, there was a statistically significant correlation between the scores of COVID-19 anxiety and awareness.

In our study, 66.2% of the participants were moderately concerned, while Saccone et al. found that 53% of respondents had been psychologically affected at a high level [10].

In terms of comorbidities, those with DM were more concerned about getting infected by the virus, while patients with cancer [11] and patients with chronic lung disease, who are thought to be more prone to stress and depression, did not have a significantly increased anxiety.

The period when anxiety was observed at the highest level was the 2nd trimester, whereas the lowest level was seen in the 1st trimester. On the contrary, in the study [10], the anxiety levels of pregnant women in the 1st trimester were higher.

Two studies conducted in Turkey have investigated the effect of the COVID-19 pandemic on the psychology of pregnant women. The study by Durankuş and Aksu included 260 participants, and the study by Yassa et al. included 172 participants. Both reported negative psychological effects of COVID-19 on pregnant women [12, 13]. In the present study, 44.7% of the participants from all trimesters thought that physicians could not diagnose COVID-19 in a timely manner and treat COVID-19 properly, while only 7.5% of participants thought so in the study by Yassa et al. [13].

In the present study, 47% of participants thought that social media was not being used efficiently for informing the society. Wu Y et al. reported apart from the benefits of social media, it causes extreme fear, isolation, fear of death, and proneness to depression among the society, especially during the time of lockdown [14].

Mirzadeh and Khedmat particularly stressed that pregnant women need psychological support during this crisis [15].

Studies show that there is an increased predisposition to emotional state disorders in pregnancy and childhood [16, 17, 18]. Pregnant women experience more anxiety and suffer from fears that arise as the delivery date approaches during advanced gestation weeks [16]. It is also believed that if the concerns that pregnant women suffering from infectious diseases have about the health of their babies are added to this, their mental health can be affected even more.

Postpartum psychology has also been revealed to be adversely affected by symptoms of anxiety or depression due to infant phenotype and rejection of maternal role [17, 18].

During the pandemic, women are under stress and may therefore complain about a large number of psychological symptoms or nonspecific symptoms that can be confused with those of COVID-19. They can also face many obstetric or gynecological problems, such as emergence of unintended pregnancies.

In the present study, for example, it is noteworthy that 39% of the pregnant women avoided visiting the healthcare institution for routine pregnancy check-ups.

Because maternal anxiety prevents them from visiting obstetricians, poor obstetric consequences such as anomalous infant birth, intrauterine fetal demise, and increased rates of out-of-hospital birth may occur. Previous studies [4, 19] support that pregnant women have more complications during the COVID-19 epidemic period than they had before the pandemic. Anxiety during pregnancy may be associated with

many complications, such as preterm action [20, 21], low birth weight, fetal growth restriction [21, 22], and postnatal complications [23].

5. Limitations

A significant number of individuals who had been followed up or treated as outpatients or inpatients for confirmed or suspected cases of COVID-19 could not be surveyed as part of the present study since our hospital served as a major hospital during this pandemic. The duration of the study was prolonged to reach the targeted number of pregnant women due to the decrease in the number of patients admitted to outpatient clinics due to fear and anxiety. Patients who had difficulty reading and understanding Turkish were not surveyed to avoid incorrect results. Owing to the high number of questions asked, some of the patients filled out the questionnaire by skipping some of the questions and some were unable to complete the questionnaire. Of all the pregnant women admitted to the emergency service, those who needed urgent diagnosis and treatment were not surveyed. Due to socioeconomic reasons such as not having access to internet or phone, some pregnant women could not be surveyed online.

6. Conclusions

The present study examined the paths considered by pregnant women at the time of crisis when they thought that they are facing COVID-19 and their attitudes regarding the vaccine yet to be developed. The participants were surveyed regarding whether they thought pregnancy is predisposed to infection and what ways they would resort to protect themselves and their family as well as whether they needed more information.

The pregnant women who completed the questionnaire were verbally warned to quit smoking if they were smokers, adopt a vitamin-rich diet to boost their immunity, and be careful about their self-care and hygiene. They were also informed that they could contact the District Health Directorates psychosocial support lines if they needed support.

However, it is believed that postpartum depression or psychosis can be aggregated with the COVID-19 pandemic.

COVID-19 anxiety in pregnancy can present as unwillingness to see the infant, avoidance of breastfeeding, self-harm, or harming others during the postpartum period. Mood swings and anxiety disorders during pregnancy can aggravate during the postpartum period if ignored and left untreated during pregnancy.

Maternal mental imbalance can also present as follows: a gradually increasing concern of getting infected can lead to their avoidance of postpartum pediatric and gynecological check-ups. Therefore, interventions such as phone calls or home visits are needed to increase patient tracking and prevent negative consequences that may arise from negligence.

Primary healthcare institutions also have an important duty to ensure early identification of the negative outcomes that may arise due to COVID-19 in pregnant women so that pregnant women are provided with the necessary psychological support. It is highly important that they refer pregnant women who need psychological help to secondary healthcare institutions. Antidepressant, antianxiolytic, or antipsycosis treatment may be required in severe cases that do not respond to therapy.

This study presents significant conclusions that might constitute a ground for future studies and offers guidance for family physicians, obstetricians, midwives, and other healthcare workers, as well as the Ministry of Health for developing measures to protect maternal and newborn health at an advanced level.

Declarations

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Conflict of Interest: The authors declare that they have no conflict of interest.

Ethics approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee (The ethics committee of University of Health Sciences Umraniye Training and Research Hospital, date: April 14, 2020; approval number: B.10.1.TKH.4.34.H.GP.0.01/84-15/04/2020-54132726-000-8582/00116578941) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Our scientific research application No. 15916306-604.01.01 was approved by Istanbul Provincial Health Directorate and No. 2020-05-04T23_03_03 was approved by the Ministry of Health of the Republic of Turkey.

Informed consent: Informed consent was obtained from all individual participants included in the study.

*Consent for publication:*Patients signed informed consent regarding publishing their data.

This article does not contain any studies with animals performed by any of the authors.

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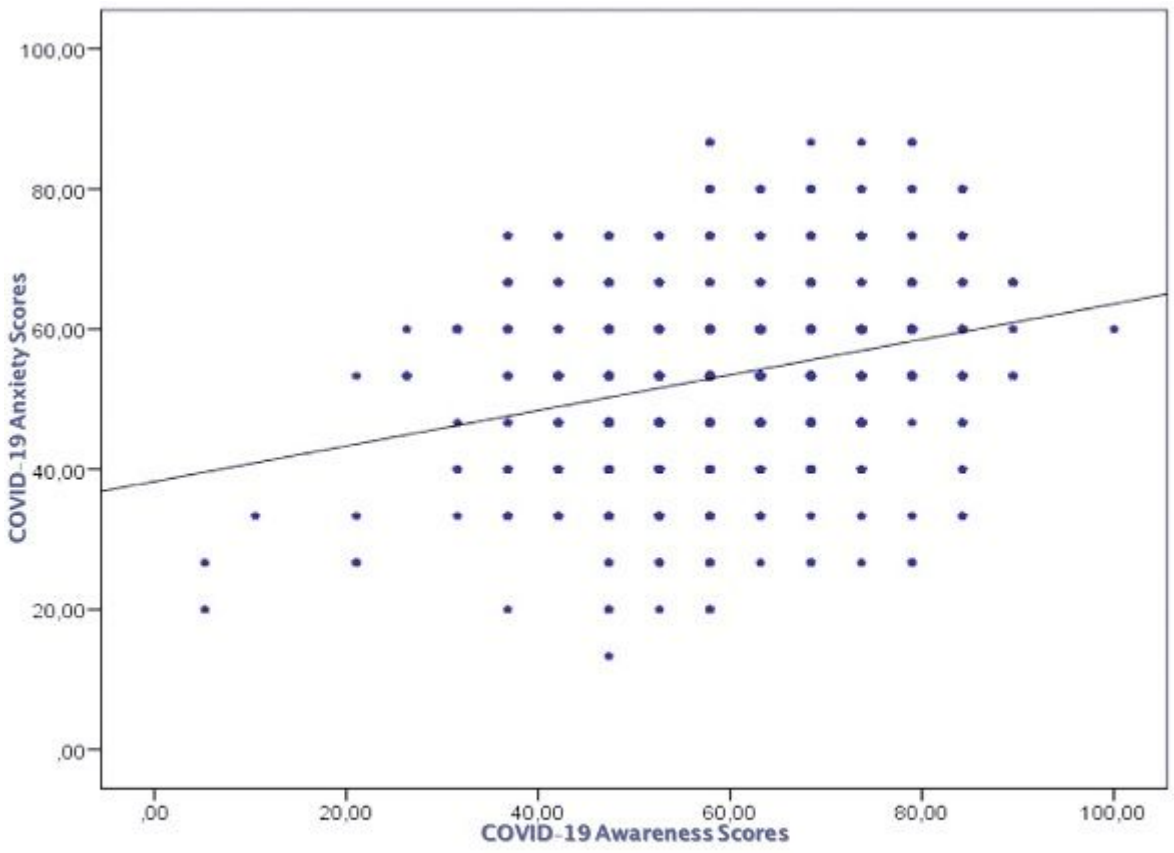
Figures



Relationship between COVID-19's anxiety scores and awareness scores on pregnant women

Figure 1

Relationship between COVID-19's anxiety scores and awareness scores on pregnant women

Supplementary Files

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- COVID19questionnaire.docx