

Research Paper

Knowledge, Anxiety, and Fear of the Unknown Among Pregnant Women During COVID-19 Pandemic



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Citation Khosravan S, Mohammadzadeh F, Hassannia E, Mansoorian M, Zamani Z, Bahri N. Knowledge, Anxiety, and Fear of the Unknown Among Pregnant Women During COVID-19 Pandemic. *Journal of Research & Health*. 2022; 12(6):397-406. <http://dx.doi.org/10.32598/JRH.12.6.2063.1>

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**ABSTRACT**

Background: This study aimed to determine pregnant women's knowledge about COVID-19 and their anxiety and fear of the unknown.

Methods: This online cross-sectional study was conducted in March and April 2020 on Iranian pregnant women visiting comprehensive healthcare centers affiliated with the Gonabad University of Medical Sciences. Participants were selected using a stratified random sampling strategy among pregnant women who agreed to participate, had a Telegram or WhatsApp account or phone number, and had no history of pregnancy complications. A demographic questionnaire, Spielberger's state-trait anxiety inventory, fearing the unknown questionnaire, and an uncertainty scale was used to collect data. Data were analyzed using simple and multiple linear regression models using SPSS software, version 16.

Results: A total of 190 pregnant women were included in the analysis. The Mean±SD for knowledge of COVID-19 was 8.82±1.72. The knowledge of 71.1% of participants was moderate. The Mean±SD for fearing the unknown was 36.2±9.1. The Mean±SD for the state anxiety about COVID-19 incidence in pregnant women was 47.6±10.2. The results showed that 65.3% of the participants had a moderate level of anxiety. Multiple regression analysis showed an increase of 0.16 (P=0.029) in the fearing the unknown score for each week of increase in the gestational age. Similarly, the anxiety increased by 0.56 (P<0.001) for each unit of increase in fearing the unknown. Moreover, the results showed that the anxiety of people using Telegram or WhatsApp was 3.44 units more than others (P<0.018)

Conclusion: The findings showed that the pregnant women's knowledge was moderate at the time of research. However, with increasing gestational age, fear of the unknown, and sources of knowledge were associated with anxiety. This points to the essentiality of increasing supportive programs and it is required to screen pregnant women to prevent the adverse effects of anxiety.

Keywords: Knowledge, Anxiety, Fear, COVID-19, Pregnancy

Article info:

Received: 06 Sep 2022

Accepted: 30 Oct 2022

Publish: 01 Nov 2022

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1. Introduction

About 21%-25% of pregnant women experience symptoms of prenatal anxiety [1, 2]. These include excessive anxiety, nervousness, and stimulation during a crisis or in ordinary conditions due to the risk factors of premature childbirth, low birth weight, and neonatal health issues. These symptoms can have long-term effects on children [3]. They also increase the rate of gastric inflammatory diseases and the need for medical care in mothers and neonates [1, 2].

COVID-19, formerly known as the novel coronavirus or N-COV 2019, 1st, emerged in Wuhan, China in December 2019 and has since prevailed worldwide. On January 30, 2020, it was recognized by the World Health Organization (WHO) as a global health emergency that required international cooperation measures to prevent the epidemic [4].

According to the statistics and figures reported by WHO, the total number of confirmed cases of the disease until March 12, 2020 was 125,048, of which 4,613 mortalities were caused by it [5]. This number soon began to increase. Worldwide, until March 23, 2021, in 223 countries (when the present paper was drafted), 123,419,065 confirmed cases of the disease and 2,719,163 mortalities were reported to WHO. In Iran, 1,808,422 cases of the disease were diagnosed, and 61,877 cases died until February 12, 2021. The severity of clinical symptoms in patients varied from asymptomatic to infection leading to death [5]. Emergencies that helped to fight against the disease, such as quarantine and constrained traffic in cities, the loss of beloved friends or relatives and increased number of patients, and changes in norms, values, and family relations, as formerly experienced in severe acute respiratory syndrome (SARS) epidemic, can provoke anxiety among community members [6, 7]. However, in the whole population, pregnant women experience more anxiety due to their specific conditions and fetus [8]. Pregnant women are generally at a higher risk of infection and are prone to more complex clinical side effects due to their special physiological conditions and lower immunity during pregnancy. This can be a threat to the mother and fetus [9].

The coronavirus accounting for the Middle East respiratory syndrome (MERS) and SARS caused severe adverse effects during pregnancy, such as abortion, intrauterine growth retardation (IUGR), and maternal death [10]. However, the knowledge of the side effects of COVID-19 in pregnancy is still lacking and is largely

based on a limited number of case studies showing the possibility of transmitting the disease from mother to fetus. So far, no virus has been found in the amniotic fluid, placenta, or milk of affected mothers. No cases were found in neonates' nasal secretion. However, after birth, transmission is possible through close contact with the neonate and that is why the infected mothers are advised not to breastfeed the neonates directly. They are advised to use pumped milk instead [11].

Though the rate of maternal mortalities induced by COVID-19 is low [12], abortion, stillbirth, and infection in the 3rd trimester of pregnancy are associated with a higher risk of premature rupture of membranes (PROM), preterm labor, fetal tachycardia, and fetal respiratory distress. Though the rate of abortion and stillbirth induced by COVID-19 is still unknown, specialists are expressing concerns about pregnant women's decision to have an abortion. Because in such a situation, the recommendations of specialists are unreliable and are only based on previous epidemics [10]. Besides, women are concerned because of a lack of awareness of the disease and its consequences for the fetus. They are also worried about the fetus's hereditary infection and virus teratogenesis [1, 11].

In a study conducted on 170 pregnant women, it was found that a positive correlation is observed between fear of coronavirus transmission and the level of anxiety and risk perceptions regarding COVID-19, it affected the level of anxiety and knowledge of pregnant women [13]. In a similar cross-sectional study, it was found that pregnant women with higher scores of HES and HL were less likely to experience anxiety [14]. Moreover, Salehi et al demonstrated that the anxiety about COVID-19 and concerns during pregnancy were variables that were positively and significantly correlated with mental health only through one path, which was direct, and anxiety of COVID-19 also had the highest positive direct correlation among them [15]. Another study conducted in Spain showed that reduced working hours and income due to the COVID-19 pandemic were related to increased anxiety levels, as were levels of concern about COVID-19 symptoms, potential complications, contagion, and consequences for the baby [16].

Controlling mothers' anxiety has been recommended to midwives and gynecologists as a primary need of pregnant women [17]. Anxiety is context-dependent and is also a function of different factors, such as education level and socioeconomic status [18].

After the COVID-19 pandemic in China, most cities in Iran including Gonabad City, Iran, were affected. Meanwhile, it was attempted to take protective measures, such as public awareness-raising and preventive acts, such as frequent washing of hands, avoiding physical contact (e.g., shaking hands, hugging or kissing), and public quarantine. For pregnant women, certain changes were made to their healthcare plans to reduce the number of times they physically attend healthcare centers. Thus, we decided to evaluate pregnant women's knowledge of the disease and their anxiety and fear of the unknown among those who refer to healthcare centers in Gonabad City.

2. Methods

Study design, participants, sampling, and data collection

The present online cross-sectional research was conducted in March and April 2020. The sample size was estimated to be 194 people (CI 95%, test power: .8, low effect size: .15, population size:352, attrition rate: 10%). Participants were selected using a stratified sampling strategy among Iranian pregnant women referring to comprehensive healthcare centers affiliated with the [Gonabad University of Medical Sciences](#). The inclusion criteria included the willingness to participate in the study, having Iranian citizenship, having a Telegram or WhatsApp account or an active phone number, having no history of pregnancy complications, and having no history of psychological disorders. Contact information of pregnant women was obtained from the research deputy of [Gonabad University of Medical Sciences](#) after obtaining the necessary approval. Selected people were contacted by phone, the purpose of the survey was explained, and they were invited to participate in the survey. If they want to participate, the link to the online questionnaire and its relevant details was sent via text message, and they were asked to complete it. Telephone interviews were used to complete questionnaires for some cases without a mobile phone number or a Telegram or WhatsApp account.

Study instruments

The questionnaires used to collect the required data include:

A researcher-made questionnaire with 14 items: It explores a person's knowledge about COVID-19 and pregnancy. The content was developed based on the related literature and the queries on the WHO and the centers for disease control and prevention (CDC) web-

sites. It included the symptoms of the disease, ways of transmission to mother and fetus, how to prevent the disease for mother and neonate, and the consequences for mother and fetus compared to the ordinary population. Questions were answered as multiple-choice questions consisting of "true", "false" and "I don't know". A score of 1 was given to correct answers and the overall score varied between 0 and 14. The Kuder-Richardson 20 (KR20) was employed to determine internal consistency with values of 0.862 indicating the high reliability of the instrument.

A short version with 12 items of the intolerance of uncertainty scale (IUS): Fearing the unknown is short version of the intolerance of uncertainty scale, a questionnaire developed by Carleton et al. [19] based their work on the 27-item form developed by Freestone et al. [20, 21] and introduced their scale in 2007. This scale included two dimensions of prospective and inhibitory anxiety. Evidence showed that the revised version of the scale has more strengths than the original version. Carleton et al. developed this scale using psychometric measures and factor analysis. Each item was rated on a 5-point Likert scale, never, rarely, sometimes, often, and always [22]. The internal consistency of the questionnaire in the present study was acceptable, with Cronbach's alpha value of 0.834.

Spielberger State-trait Anxiety Inventory (STAI): Anxiety was assessed using the Persian version of the Spielberger state-trait anxiety inventory (STAI). The STAI scale consists of 40 statements describing various emotional states. Twenty of these statements require the subjects to describe their emotional reaction in terms of anxiety at a particular moment or period in time (state anxiety). Statements are scored on a 4-point scale of increasing intensity, from 'not at all' to 'very much so' (with scores of 0-3, respectively). The other 20 items require the subject to describe how they feel and their general response to situations perceived as threatening (trait anxiety). These items are also scored on a 4-point intensity scale, from rarely' to 'almost always'. For both sections, possible cumulative scores for each scale range from 0 (not anxious) to 60 (high anxiety). Scores of 40 or more indicate anxiety symptoms [23]. The Persian version of STAI has been used in previous studies and its validity and reliability have been demonstrated. The value of Cronbach's α coefficient for state/trait anxiety were 0.70 and 0.78, respectively [24, 25]. The internal consistency of the questionnaire in the present study was acceptable with a Cronbach's alpha value of 0.977.

Statistical procedure

All required statistical analyses were conducted in SPSS version 16.0 software. Quantitative variables were represented in Mean±SD, and qualitative variables were reported in frequency and percentage.

To analyze the correlation between demographic variables, knowledge, and fearing the unknown, a linear regression analysis was used. Initially, the correlation between each variable and anxiety was analyzed via simple linear regression analysis. Those with linear regression and $P < 0.15$ went for a further multiple regression analysis to check their correlation with anxiety in the presence of other variables within the model [26]. If $P < 0.05$, the correlation was interpreted as statistically significant.

The assumptions of linear regression analysis, normality of distribution, homogeneity of variance, and independence of residuals were tested using the Kolmogorov-Smirnov test, standard residuals plot versus the estimated values, and residual time-series plot. The multicollinearity assumption was also tested via the variance inflation factor (VIF).

3. Results

Participants' demographic variables:

The data were collected from 190 pregnant women from 5 urban health centers in Gonabad City. The Mean±SD age was 27.7 ± 6.17 years ($R = 16-45$). A total of 26 women (13.7%) were below 17 years of age or above 35. The Mean±SD age of pregnancy was 24.3 ± 8.83 ($R = 5-39$ weeks). Most women (59.5%) gained knowledge about COVID-19 from TV. Table 1 presents other demographic variables.

Knowledge level, fearing the unknown, and anxiety level during COVID-19:

Table 2 presents the participant's knowledge regarding COVID-19 and pregnancy based on the researcher-made questionnaire.

Table 3 summarizes the Mean±SD and the range of scores for knowledge, anxiety, and fearing the unknown. The Mean±SD for knowledge of COVID-19 was 8.82 ± 1.72 . The knowledge of 21.6% of participants was low (95% CI:15.9%-28.1%). The cut-off score was 1-7; 71.1% was moderate (95% CI:64.0%-77.4%). The cut-off score was 8-11; 7.4% was high (95% CI:4.1%-12.1%). The cut-off point was 12-14.

The Mean±SD for fearing the unknown was 36.2 ± 9.1 . The Mean±SD for the sub-scales of 3. Table 3 lists the fearing the unknown (i.e. inhibitory, and prospective anxiety). The Mean±SD for the state anxiety about COVID-19 incidence in pregnant women was 47.6 ± 10.2 . The results showed that 4.2% of the participants (95% CI:1.8%-8.1%) had mild anxiety, 65.3% of the participants had a moderate level of anxiety (95% CI:58.0%-72.0%), and 30.5% had a severe level of anxiety (95% CI:24.1%-37.6%).

Correlation between anxiety, knowledge, and fearing the unknown COVID-19:

Pearson correlation coefficients showed a positive and statistically significant correlation between anxiety about the COVID-19 pandemic and fearing the unknown ($r = 0.50$, $P < 0.001$) as well as the sub-scales (i.e. inhibitory anxiety ($r = 0.49$, $P < 0.001$), and prospective anxiety ($r = 0.46$, $P < 0.001$)). The correlation coefficient between anxiety and knowledge was not statistically significant (Table 4).

As the simple linear regression analysis showed, the gestational age, fearing the unknown, and information sources for the disease showed a P value lower than 0.2 and thus entered a multiple regression analysis (Table 4). Multiple regression analysis showed an increase of 0.16 ($P = 0.029$) in the fearing the unknown score for each week of gestational age. Similarly, the anxiety increased by 0.56 ($P < 0.001$) for each unit of increase in fearing the unknown. Moreover, the results showed that the anxiety of people who use Telegram or WhatsApp was 3.44 units higher than others ($P < 0.018$) (Table 4).

4. Discussion

The present research was conducted to examine knowledge, anxiety, and fearing the unknown in pregnant women. As the results in Table 1 showed, the majority of women between the ages of 18 and 35 years were housewives and had a diploma or bachelor's degree. Most of them experienced their 1st pregnancy. Their age of pregnancy ranged between 14 and 37 weeks. Their pregnancy was not considered high-risk. Neither they nor their relatives were infected with the COVID-19 disease. Most of them mentioned national TV as their main source of information about the disease. Gaining accurate and reliable knowledge of the person's disease and health status can play a key role in lowering the anxiety of pregnant women and their family members [8, 20, 21, 27].

Table 1. Participants' demographic variables

Variables	No. (%)	
Age (y)	<18	1(0.5)
	18-35	164(86.3)
	≥36	25(13.2)
Gestational age (wk)	1-13	26(13.7)
	14-27	88(46.3)
	28-40	76(40.0)
Gravida	1	71(37.3)
	2	63(33.2)
	≥3	56(29.5)
Number of children	1	83(43.7)
	2	68(35.8)
	≥3	39(20.5)
History of stillbirth	Yes	45(23.7)
	No	145(76.3)
High-risk pregnancy	Yes	14(7.4)
	No	176(92.6)
Have you been infected with COVID-19?	Yes	1(0.5)
	No	189(99.5)
Have your relatives been infected with COVID-19?	Yes	1(0.5)
	No	189(99.5)
Job status	Employed	32(16.8)
	Housewife	158(83.2)
Educational level	Elementary school or junior high school	30(15.8)
	High school	69(36.3)
	Associates' degree	14(7.4)
	Bachelors' degree	73(38.4)
	Masters' degree and above	4(2.1)
Information sources about COVID-19	Telegram and WhatsApp	54(28.4)
	TV	113(59.5)
	Health centers	23(12.1)

The results of the present research project showed that the knowledge of more than 70% of the participants about COVID-19 and its effect on pregnancy was moderate at the time of research (March, April 2020) (based on the questions asked). In this study, as the available knowledge shows, the vertical transmission of the disease from mother to fetus is not done and the symptoms of the disease in pregnant mothers are similar to other patients [28]. However, in another research in Columbia (March 1 and May 30, 2020), the main source of gaining knowledge about the disease for

pregnant women was mass media and most of these women had a low level of education and limited knowledge which did not reflect the realities of SARS COVID-19 [29].

Moreover, the anxiety level of about 95% of the participants in the present research was moderate or high. Most of them did not experience a high-risk pregnancy and their academic degree was a diploma or higher and no statistically significant correlation was observed between their anxiety and level of education. In Parra-Saavedra's study, the anxiety scores of pregnant women, especially

Table 2. Frequency participants answer to the 14 items of researcher-made questionnaire about knowledge of the COVID-19 and pregnancy

Item	Choice/ No. (%)			Correct Answer	
	True	False	Do Not Know		
1	Dry coughs and fever are among the main symptoms of COVID-19	178(92.7)	12(6.3)	0	Correct
2	At present, a definite cure exists for COVID-19	42(22.1)	148(77.9)	0	Correct
3	The least distance to keep from a symptomatic patient to prevent infection is 1 m	31(16.3)	159(83.7)	0	Correct
4	To prevent affliction with COVID-19, it is essential to wear masks	112(58.9)	78(41.1)	0	Correct
5	Regular washing of hands for at least 20 s is the most effective way to prevent affliction with the disease	186(97.9)	4(2.1)	0	Correct
6	Coronavirus can be transmitted through shaking hands or touching infected objects	185(97.4)	5(2.6)	0	Correct
7	Pregnant women are more likely to be afflicted with COVID-19 than others	150(78.9)	40(21.1)	0	Correct
8	If afflicted with the disease, the severity of symptoms is higher in pregnant women than others	114(60)	76(40)	0	Correct
9	Coronavirus can be transmitted from mother to fetus during pregnancy	92(48.4)	98(51.6)	0	Incorrect
10	It is possible to transmit the virus from mother to neonate during breastfeeding	102(43.7)	88(46.3)	0	Correct
11	Mother's affliction with COVID-19 can cause physical damage to the fetus	70(26.8)	120(63.2)	0	Incorrect
12	Stress and anxiety can weaken body immune system	184(96.8)	6(3.2)	0	Correct
13	Mother's affliction with COVID-19 increases the chances of preterm labor and low birth weight	48(25.3)	142(74.7)	0	Correct
14	Less social communications and staying at home are the best preventive strategies against COVID-19	189(99.5)	1(0.5)	0	Correct



Table 3. Mean±SD and range of scores for knowledge, state anxiety, fearing the unknown, prospective anxiety and inhibitory anxiety among pregnant women

Variables	Mean±SD	Observed Range	Pearson Correlation Coefficients					
			1	2	3	4	5	
State anxiety	47.63±10.23	26.00-76.00	---					
Knowledge	8.82±1.72	3.00-13.00	-0.06	---				
Fearing the unknown	36.17±9.12	15.00-60.00	0.50*	-0.11	---			
Inhibitory anxiety	13.96±4.25	5.00-26.00	0.49*	-0.09	0.93*	---		
prospective anxiety	22.21±5.40	9.00-35.00	0.46*	-0.11	0.96*	0.78*	---	

* P<0.001



Table 4. Regression analysis of anxiety correlates during COVID-19 pandemic among pregnant women

Variables	Simple Linear Regression				Multiple Linear Regression				
	B	SE	t	P	B	SE	t	P	
Age (y)	-0.02	0.12	-0.14	0.889	---	---	---	---	
Gestational age (wk)	0.14	0.08	1.65	0.100	0.16	0.07	2.19	0.029	
Gravida	1	1.86	1.53	1.22	0.226	---	---	---	
	2	---	---	---	---	---	---	---	
Job status	Housewife	0.52	1.99	0.26	0.795	---	---	---	
	Employed	---	---	---	---	---	---	---	
Educational level	High school and below	0.12	1.49	0.08	0.938	---	---	---	
	College	---	---	---	---	---	---	---	
History of stillbirth	Yes	0.09	1.78	0.05	0.962	---	---	---	
	No	---	---	---	---	---	---	---	
High-risk pregnancy	Yes	1.71	2.85	0.60	0.549	---	---	---	
	No	---	---	---	---	---	---	---	
Information sources about COVID-19	Fearing the unknown	0.56	0.07	7.93	<0.001	0.55	0.07	7.69	<0.001
	Knowledge	-0.34	0.43	-0.78	0.435	---	---	---	---
	Telegram and WhatsApp	3.44	1.63	2.11	0.036	5.29	2.21	2.39	0.018
Information sources about COVID-19	TV	-1.01	1.52	-0.67	0.505	3.34	2.01	1.66	0.099
	Health center	---	---	---	---	---	---	---	---

B: Unstandardized coefficient; SE: Standard error.



31 pregnant women were high and significantly correlated with their education level [29].

Another research conducted in Iran showed that about half of the participants experienced anxiety, which was negatively correlated with their education level and positively correlated with married life satisfaction, husband's support, and husband's higher income, which were not covered in the present research [30]. Higher levels of education and lack of support created more anxiety among pregnant women during the COVID-19 epidemic [31]. Another study conducted in Turkey used Spielberger's STAI-T and Beck's anxiety scale and showed changes in the anxiety level of women with and without the symptoms of high-risk pregnancy (separately) in a healthcare center for COVID-19 patients. This study was conducted on 446 pregnant women. The higher rate of anxiety during the COVID-19 pandemic in women with a high-risk pregnancy, especially those with rupture in amniorrhexis and the threat of preterm labor was significantly higher than in women with ordinary pregnancies. The state anxiety score was higher during the pandemic ($P < 0.5$). The need for hospitalization increased the level of anxiety.

For women with chronic diseases, such as thrombophilia, Beck's test score was higher for those affected by the disease [32]. Also according to another study, the COVID-19 pandemic doubled the number of anxious pregnant women [33]. In the present research, no statistically significant correlation was found between high-risk pregnancy and anxiety levels. However, approaching the time of labor increased women's anxiety, which may be due to the general anxiety of labor or their awareness of the impossibility of vertical transmission of disease (from mother to fetus) and also due to the essentiality of hospitalization in a hospital, where COVID-19 patients were also hospitalized. Some other research in Italy used STAI and interpreted scores above 40 as a normal level of anxiety. As the findings showed, the COVID-19 pandemic had doubled the number of women with unusual anxiety levels. A total of 89% of women were worried that COVID-19 would damage the fetus. The probability of anomalies, intrauterine growth retardation (IUGR), and preterm labor caused fear in 47%, 65%, and 51% of women, respectively. A statistically significant positive linear correlation was observed between education and STAI-S ($P < 0.0001$). Similarly, in the present research, a positive correlation was observed between the fear of the unknown score of intolerance of uncertainty scale (IUS) and anxiety level. The related literature confirmed the correlation between great fear of the unknown, higher anxiety levels, and low mental health.

At the end of April 2020, 788 pregnant women were surveyed via social networks and completed an online questionnaire at Stony Brook University. They filled out a socio-demographic questionnaire about labor, including prenatal behaviors (e.g., vitamins, exercises, and enough sleep) and changes in appointments for healthcare during pregnancy (canceling or replanning) due to the incidence of COVID-19 and general anxiety disorder-7 (GAD-7). Clinical scores lower than 4 were interpreted as normal, between 4 and 9 as mild, between 9 and 14 as moderate, and lower than 21 as severe. A total of 166 women (21.1%) reported little or no anxiety; 280 women (35.6%) experienced mild anxiety (GAD-7, 5-9); 170 women (21.6%) reported moderate anxiety (GAD-7, 10-14); 171 women (21.7%) reported severe anxiety (GAD-7, 15-21). Independent predictors of anxiety were history of abuse, high-risk pregnancy, preparation stress, and stress of infection during pregnancy. Higher age and better healthcare during pregnancy are correlated with lower anxiety [1]. According to the studies which were conducted on the word, a positive correlation was observed between fear of coronavirus transmission and the level of anxiety and risk perceptions regarding COVID-19. These results are similar to our results in this study [13, 15, 16].

An online survey in April 2020 examined the effect of COVID-19 on pregnant women's anxiety and its correlates. A total of 706 women (25.8%) stopped face-to-face visits, 415 women (15.2%) had video-cam visits, and 817 women (31.8%) used telephone calls to receive healthcare services during pregnancy. Due to the COVID-19 pandemic, the number of women intending to have a delivery in hospitals reduced from 2 641 (96.4%) to 2 400 (87.7%). In the present research, the level of anxiety was higher in women who approached the delivery time because the healthcare or labor services could not be provided at home and women had no other choice but to visit hospitals. No video or phone-call instructional content was prepared for them either.

One limitation of the study was its online implementation due to the quarantine which limited the access to the research participants. Thus, completing the questionnaire and asking for informed consent were not done face-to-face. Also, due to time pressure, only the content validity of the knowledge questionnaire was tested. The reasons for mothers' anxiety were not investigated.

Based on the study results, it is suggested to pay more attention to the mental health of pregnant women during the pandemic. In addition, it is recommended to

provide a training campaign group to reduce anxiety caused by coronavirus and pregnancy concerns.

5. Conclusion

The present findings showed that the pregnant women's knowledge was moderate at the time of research. They also showed a high level of anxiety and fearing the unknown. Contrary to the existing literature, demographic variables and high-risk pregnancy did not show a correlated relationship with anxiety and the fear of the unknown. However, increasing gestational age, fearing the unknown, and sources of knowledge were associated with anxiety. This points to the essentiality of increasing supportive programs, especially non-attendance programs in healthcare centers to promote pregnant women's knowledge of the disease as a reliable source. It is also required to screen pregnant women for any mental disorder to identify people with a high level of anxiety to prevent the adverse effects of anxiety, to plan for safe labor in the hospital, and to inform them of the services that can be provided for them in the only regional hospital available. This can ensure mothers' and neonates' health during the COVID-19 pandemic (especially those in the later stages of pregnancy). Further suggestions include providing services for safe home labor and establishing permanent or temporary maternity hospitals.

Ethical Considerations

Compliance with ethical guidelines

The study was approved by the Ethics Committee of [Gonabad University of Medical Sciences](#) (Code: IR.GMU.REC.1399.193). The necessary details of the study and its objectives were presented at the outset of the online questionnaire, and the online questionnaires were filled out by participants anonymously.

Funding

This study was sponsored by the research council of [Gonabad University of Medical Sciences](#) (Grant No.: A-10-1656-1).

Authors' contributions

Designing the study: Shahla Khosravan, Elham Hassanni, Narjes Bahri, Fatemeh Mohammadzadeh, Mozghan Mansoorian, and Zohreh Zamani; Collecting data: Shahla Khosravan, Mozghan Mansoorian, and Zohreh Zamani; Analyzing and modeling the data: Fatemeh

Mohammadzadeh; Drafting the manuscript: Shahla Khosravan, Narjes Bahri, and Fatemeh Mohammadzadeh; All authors read and confirmed the manuscript.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgments

The authors appreciated [Gonabad University of Medical Sciences](#).

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