

Health anxiety and related factors among pregnant women during the COVID-19 pandemic: A cross-sectional study from Iran

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Abstract

Background: The pandemic of COVID-19 affected many countries around the world and Iran was no exception. The aim of this study was to evaluate the health anxiety of the Iranian pregnant women during the pandemic of the COVID-19.

Methods: In this cross-sectional study, 300 pregnant women in different trimesters (n=100 in each trimester) were recruited. A demographic questionnaire and the Health Anxiety questionnaire were used to collect the data. The total score < 27 of means low health anxiety, scores between 27-34 mean moderate health anxiety, and scores more than 35 means high health anxiety. Due to nationwide restrictions, data were collected through social media groups. The chi-square, ANOVA and multiple linear regression were used to analyze the data.

Results: The total score of anxiety was 22.3 ± 9.5 , 24.6 ± 9.3 and 25.4 ± 10.6 in the first, second and third trimester of pregnancy, respectively. Particularly, 9%, 13% and 21% of the women had severe anxiety or scores ≥ 35 in the first, second and third trimester of pregnancy respectively. Pregnant women in the third trimester had significantly higher health anxiety score and higher scores of "total health anxiety" than did those in the first trimester ($p=0.045$).

Conclusion: At the time of the pandemic of COVID-19, women in the second and third trimester of pregnancy were more worried about consequences of disease, but the total score of health anxiety was significantly higher among women in the third trimester of pregnancy. Health care providers should pay more attention to the mental health of pregnant women in times of crises such as Corona pandemic.

Background

Health anxiety is defined as the extensive worry that people experience about their health condition (1). Health anxiety may manifest in two types: illness anxiety disorder and somatic symptom disorder, and the symptoms of anxiety may vary from mild to severe with clinical signs. The pregnancy-specific anxiety is an autonomous anxiety disorder, that when a woman may have when she conceives, because of either immediate somatic changes, or illness anxiety disorder (2).

Stress and anxiety during pregnancy are associated with disorders such as preeclampsia, low birth weight, depression and more nausea and vomiting (3). Women with anxiety during pregnancy may experience symptoms such as worry, stress, having difficulty to stay calm, sleep disturbances, and having negative thoughts that may prevent good sleep (4). Anxiety during pregnancy mostly is mostly accompanied with depression (5). In the meantime, disorders such as depression may deteriorate the outcomes of pregnancy (6).

COVID-19 caused by SARS-COV-2 infection in human and has affected more than 50 million around the world (7). Worry during the pandemic of COVID-19 among pregnant women may lead them to refrain from attending the clinics for regular prenatal care or undergo unnecessary cesarean section because of

fear of mother-to-neonate disease transmission (8). Moyer et al evaluated the level of stress and anxiety of pregnant women before and after COVID-19 pandemic. Their results showed that the level of stress and anxiety of pregnant women increased during this pandemic of COVID-19 and most of this anxiety is independent from pregnancy-specific anxiety (9). Also, a systematic review by Hassami et al showed that the scores for depression and anxiety were higher among pregnant or postpartum women during the pandemic of COVID-19 (10).

Studies have suggested that viral respiratory diseases may cause pneumonia in pregnant women, which may lead to premature rupture of membranes, preterm labor, intrauterine fetal demise, intrauterine growth retardation and even neonatal death (11).

Limited evidence from pregnant women affected by COVID-19 in China and the USA reveal that more than 95% of these women delivered their babies by cesarean section, as the popularly held belief is that the maternal respiratory disease will be worsen with normal vaginal delivery (the rate of cesarean section in the USA and China was 32% and 54.5% respectively before the pandemic) (12-14).

COVID-19 is a novel disease and little is known about its characteristics. Iran is a country that is facing the third wave of COVID-19, with around 500 deaths per day (15). Therefore, this study was designed to investigate the health anxiety among pregnant women in different trimesters in Iran.

Method

This was a cross-sectional study in which 300 pregnant women were recruited. The design of this study was approved by the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences (Ref No: IR.AJUMS.REC.1399.006). This study started on 20 March 2020 and completed on 10 April 2020. The oral and written informed consent was obtained from each participant. Literate pregnant women in any trimester of pregnancy were recruited for this study. Women with stressful events in the past 6 months, those with positive test for COVID-19, or those with known mental disorders were excluded from the study.

Sample size

The sample size was calculated using the following formula (16):

$$\alpha = 0.05, s=4.48, d=0.15 \times s \approx 0.6$$

$$n > \frac{(z_{1-\alpha/2})^2 \times s^2}{d^2} = \frac{(1.96)^2 \times (4.48)^2}{(0.6)^2} \approx 214$$

20% non-responding ≈ 43

$$n^* > 257$$

A total number of 300 pregnant women were recruited.

Measurements

A demographic questionnaire and the Health Anxiety questionnaire were used to collect data. The demographic questionnaire included questions about age, parity, gravidity, number of children, economic situation, the women's and their partners' occupation, and the trimester of pregnancy.

The Health Anxiety questionnaire (17) consisted of 18 questions about the participants' worry during the pandemic of Corona virus in Iran. Each question had four categories from "I am not worried about my health" to "I spend most of my time worrying about my health". The score of each item ranged from zero to 3, while zero indicating "I do not have a problem", and 3 indicating to "I spend most of my time worrying about my health". The total score of this questionnaire is 54. There are three sub-scales for this questionnaire. The first is related to worry about getting sick, which is reflected in questions 5, 6, 8, 9, 11 and 12. Worry about consequences of disease is the second subscale involving questions 13, 15, 16, 17 and 18, and the third subscale deals with general health concerns, as reflected in questions 1-4, 7, 10 and 14. A total score < 27 means low health anxiety, 27-34 means moderate health anxiety, and scores more than 35 means high health anxiety. The validity and reliability of the Persian version of health anxiety questionnaire had already been assessed and approved in Iran (18). We also included a question asking women if they thought the COVID-19 pandemic had increased their feeling of anxiety during pregnancy.

The phone numbers of pregnant women were obtained from 20 public health centers in Ahvaz. Both questionnaires were sent for eligible pregnant women via social media (WhatsApp or Telegram). The front page of the questionnaires was the written informed consent, and participants were requested to sign this form before responding to the questionnaires. The completed questionnaires were sent back to one of the researchers via the same social media.

Statistics

All data were entered SPSS version 22. The normal distribution of continuous data was assessed using the Shapiro-Wilk test. The ANOVA test was used for comparing the data across three groups (three trimesters) and the chi-square test was used for comparing categorical data. Multiple linear regression models were used for assessing the relationship of different trimesters and health anxiety, controlling for

the effects of history of infertility and results of anomaly screening. $P < 0.05$ was considered statistically significant.

Results

Base on inclusion/exclusion criteria, we assessed 500 women of whom 350 were eligible and provided consent. However, only 300 participants returned the completed questionnaires ($n = 100$ women in each trimester) (Figure 1). Table 1 demonstrates the demographic and obstetric characteristics of participants in different trimesters of pregnancy. As evident from this table, the mean age of women was 25.8 ± 5.1 , 27.2 ± 5.7 and 26.5 ± 4.5 in the first, second and third trimester ($p > 0.05$). Women did not show any significant difference regarding occupation, education, economic situation and their spouses' level of education.

Table 1: Socio-demographic and maternity characteristics of participants by trimester of pregnancy

Variables	First trimester n=100	Second trimester n=100	Third trimester n=100	All trimesters N=300	P value
Age (y) mean ±SD	25.8±5.1	27.2±5.7	26.5±4.5	26.54±5.17	0.17
Gravida	1.72±1	1.83±1.1	1.91±1.1	1.82±1.09	0.47
Para	0.63±0.9	0.69±0.92	0.74±0.94	0.69±0.92	0.70
Living child	0.59±0.86	0.66±0.92	0.73±0.93	0.66±0.90	0.55
N (%)					
Occupation					
Housewife	80(80)	80(80)	86(86)	246(82)	0.32
Employee	20(20)	20(20)	14(14)	54(18)	
Education					
Primary	5(5)	12(12)	7(7)	24(8)	0.65
Secondary	12(12)	9(9)	8(8)	29(9.7)	
Diploma	44(44)	42(42)	44(44)	130(43.3)	
University	39(39)	37(37)	41(41)	117(39)	
Economic situation					
Weak	21(21)	21(21)	17(17)	59(19.7)	0.67
Moderate	72(72)	67(67)	71(71)	210(70)	
Good	7(7)	12(12)	12(12)	31(10.3)	
Education of spouse					
Illiterate	1(1)	7(7)	1(1)	9(3)	0.11
Primary	6(6)	4(4)	6(6)	16(5.3)	
Secondary	15(15)	16(16)	11(11)	42(14)	
Diploma	44(44)	31(31)	42(42)	117(39)	
University	34(34)	42(42)	40(40)	116(38.6)	
Results of anomaly screening					
Normal	66(66)	95(95)	93(93)	254(84.7)	<0 .0001
Suspicious or did not perform	34 (34)	5 (5)	7 (7)	46(15.3)	
History of infertility					
Problems in the current pregnancy	8(8)	4(4)	15(15)	27(9)	0.023
Problems in the current pregnancy					
Yes	25 (25)	19(19)	35(35)	79(26.3)	0.097
No	75(75)	81(81)	65(65)	221(73.6)	
If COVID-19 pandemic increased women's anxiety					
No	34(34)	23(23)	22(22)	79(26.3)	0.102
Yes	66(66)	77(77)	78(78)	221(73.6)	

As evident from Table 1, 95% of women in the second trimester of pregnancy had a normal anomaly screening, while 32% of women in the first trimester did not perform these tests or had test with suspicious results. Women in three trimesters showed a significant difference regarding anomaly screening (p<0.0001). The three groups also showed a significant difference regarding history of infertility (p=0.02). As with concerns about their pregnancy, 25%, 19% and 35% of women in their first, second and third trimester, respectively, reported concerns during their pregnancy. These concerns included bleeding in the first trimester, nausea and vomiting, gestational diabetes, and hypertension

($p=0.097$). Also, 73.6% of women were reported that COVID-19 pandemic increased their anxiety, most of whom were in the third trimester of pregnancy (78%).

Table 2 shows the level of anxiety among women in three trimesters. Women in the third trimester were more worried about getting sick, the consequences of the disease, and concerns about the disease. The total score of anxiety was 22.3 ± 9.5 , 24.6 ± 9.3 and 25.4 ± 10.6 in the first, second and third trimester of pregnancy. Particularly, 9%, 13% and 21% of the women had severe anxiety or scores ≥ 35 in the first, second and third trimester of pregnancy, respectively.

Table 2: The level of anxiety by trimester of pregnancy

Variable	First trimester n=100	Second trimester n=100	Third trimester n=100	Total N=300
Health anxiety				
More worried about to get sick	7.8 \pm 3.6	8.5 \pm 3.5	8.7 \pm 4.2	8.39 \pm 3.82
More worried about consequences of the disease	5.5 \pm 3.2	6.9 \pm 3.1	6.8 \pm 3.4	6.43 \pm 3.28
Reported more concerns about disease	8.9 \pm 4.1	9.2 \pm 4.07	9.7 \pm 4.4	9.32 \pm 4.20
Total score anxiety	22.3 \pm 9.5	24.6 \pm 9.3	25.4 \pm 10.6	24.15 \pm 9.93
Total score of health anxiety category				
<27	60 (60)	48(48)	40(40)	148 (49.3)
95% CI	(50.0 – 69.0)	(38.0 – 58.0)	(31.0 – 49.0)	(44.0 – 55.0)
27-34	31(31)	39(39)	39(39)	109 (36.3)
95% CI	(22.0 – 39.0)	(30.0 – 48.0)	(29.0 – 48.0)	(30.7 – 41.7)
≥ 35	9(9)	13(13)	21(21)	43 (14.3)
95% CI	(4.0 – 15.0)	(6.0 – 20.0)	(13.0 – 29.0)	(10.7 – 18.3)

Using multiple linear regression, significant association was found between the pregnancy trimester and “being worried about the consequences of disease” score, after controlling for the effects of history of infertility and results of anomaly screening. Pregnant women in the second and third trimesters had significantly higher scores of “being worried about consequences of the disease”, compared to those in the first trimester ($p=0.010$ and $p=0.009$; respectively). Also, pregnant women in the third trimester reported significantly higher health anxiety scores than women in the first trimester. Pregnant women in the third trimester had significantly higher scores of “total health anxiety”, in comparison with those in the first trimester ($p=0.045$). However, no significant difference was found in terms of “total health anxiety” between the second and the first trimester (Table 3).

Table 3. Results of multiple linear regression analyses to determine parameters most predictive interested outcomes.

Outcomes	Worry to get sick			Being worry about consequences of disease			Concerns about disease			Total health anxiety		
	Beta	95% CI for Beta	P	Beta	95% CI for Beta	P	Beta	95% CI for Beta	P	Beta	95% CI for Beta	P
Results of anomaly screening.												
Unknown or suspicious	Ref	-	-	Ref	-	-	Ref	-	-	Ref	-	-
Normal	0.04	(-1.26,1.35)	0.950	0.33	(-0.77,1.45)	0.548	0.05	(-1.39,1.49)	0.941	0.43	(-2.95,3.82)	0.801
History of infertility												
Negative	Ref	-	-	Ref	-	-	Ref	-	-	Ref	-	-
Positive	-0.75	(-2.3,0.80)	0.341	-0.46	(-1.78,0.85)	0.488	0.23	(-1.47,1.95)	0.783	-0.97	(-5.00,3.04)	0.633
Trimester												
First trimester	Ref	-	-	Ref	-	-	Ref	-	-	Ref	-	-
Second trimester	0.62	(-0.50,1.76)	0.277	1.26	(0.30,2.22)	0.010	0.25	(-0.99,1.50)	0.690	2.14	(-0.79,5.08)	0.152
Third trimester	0.97	(-0.15,2.09)	0.089	1.27	(0.31,2.22)	0.009	0.73	(-0.49,1.97)	0.241	2.98	(0.07,5.88)	0.045

Note: The results from multiple linear regression models including each parameter controlling for the effects of history of infertility and results of anomalies screening.

Discussion

This study was designed to evaluate the health anxiety of pregnant women and its related factors in the pandemic of COVID-19 in Iran. The results of this study showed that pregnant women in the third trimester compared with those in their first or second trimester were more worried about getting sick, the consequences of the disease, and concerns about disease. Also, the total score of anxiety was higher among women in the third trimester of pregnancy. A possible explanation for this may be women's lack of access to their health providers during the pandemic, or they may be reluctant to go to healthcare facilities since they consider such places as being unsafe environments during COVID-19 pandemic (19). A qualitative study by Mizrak et al in Turkey showed that fear of the unknown, disruption of routine prenatal care and disruption of social life because of quarantine cause anxiety in pregnant women during the pandemic of COVID-19 (20). Another study by Kahyaoglu et al in Turkey showed that the prevalence of anxiety and depression among pregnant women was 64.5% and 56.3%, respectively (21). Our results are in line with these studies. According to Werner et al, the use of new and diverse models of prenatal care by health care providers can reduce the anxiety of pregnant women in crises such as COVID-19 pandemic (22).

The results of the present study showed that women in the third trimester of pregnancy were more prone to be worried and also had significantly more health anxiety compared to women in the second and the first trimesters of pregnancy. Other studies showed that pregnant women are more worried about

different problems in the second and third trimesters of pregnancy (23). In the present study we controlled some confounding factors such as anomaly screening tests. According to the national guidelines in Iran, women should undergo anomaly screening tests including nuchal translucency, and PAPP-A between the 11th and 13th week of gestation. If there is any abnormality in these tests, then women are persuaded to do some other tests including measuring total hCG, uE3, AFP and Inhibin A around the 15th week of gestation. We found that 34% of women in the first trimester did not perform any anomaly test or their test results was suspicious. This may cause undue anxiety in pregnant women in addition to COVID-19 anxiety.

A study by Corbett et al (24) showed that most pregnant women (83.1%) did not worry about their health status before the pandemic of COVID-19, but during the pandemic, 50.7% were worried about their health status most of the time. Concerns of pregnant women may be related to the fact that they do not have access to their relatives if they needed, and many pregnant women may have concerns about lack of family and social support due to distancing measures (25). In the first days of COVID-19 pandemic in Iran, one hospital in Ahvaz, where a large number of middle- or lower-class women receive intrapartum care, was designated as the center for patients with the COVID-19 disease. Although another hospital was later redeveloped to care for pregnant women, the change in location of care may have contributed to women's symptoms of anxiety.

Limitations of the study

Because of the pandemic of COVID-19, women answered the health anxiety questionnaire via telephone or social media, so the answers of the participants may have been affected by recall bias. Furthermore, women were recruited non-randomly in this study, which may limit the generalizability of this study. Also, the past history of depression, anxiety, and the level of social support were not assessed in the present study and all of these have the potential to contribute to health anxiety.

Conclusion

At the time of the coronavirus pandemic, women in the second and third trimester of pregnancy were more worried about the consequences of disease, but the total score of health anxiety was significantly higher in the third trimester of pregnancy. Healthcare providers should pay more attention to the mental health of pregnant women and provide more psychological support to them in times of crises such as COVID-19 pandemic. Also, further studies about specific causes of women's anxiety and identifying supportive mechanisms during COVID-19 pandemic are needed.

Abbreviations

ANOVA: Analysis of Variance

COVID-19: Corona Virus Disease 2019

WHO: World Health Organization

SARS: Severe acute respiratory syndrome

hCG: Human Chorionic Gonadotropin

uE3: unconjugated estriol

AFP: Alpha-foetoprotein

Declarations

Ethics approval and consent to participate: This study was approved by the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences (Ref No: IR.AJUMS.REC.1399.006). The oral and written informed consent was obtained from each participant.

Consent for publication: NA

Availability of data and materials: Data will be available upon the request from corresponding author.

Competing interests: Authors declare that they do not have any conflict of interest.

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Authors' contributions: NS, PA, PDA, MB and HB were involved in designing of this research. MB collected the data. EM analyzed the data. PA and EM were involved in the data interpretation. PA was responsible for writing and finalizing the manuscript. All authors have read and approved the manuscript.

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Figures

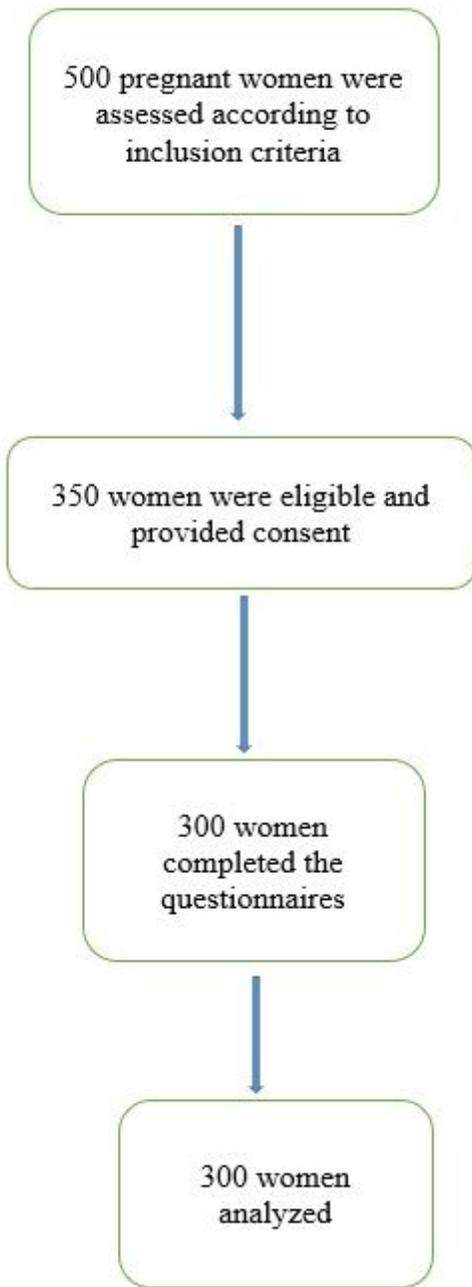


Figure 1

Flow-diagram of recruitment of participants in the study

Supplementary Files

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