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The Relationship between Health Anxiety and Prenatal Distress with Choosing Mode of Delivery among Pregnant Women During COVID-19 Epidemic: A Cross-Sectional Study

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ABSTRACT

Background & aim: Corona-Virus is a serious infectious disease that was rapidly spread worldwide and caused considerable anxiety among people. Pregnant women are more prone to increased anxiety caused by the Covid-19 epidemic. This study was performed to evaluate the relationship between health anxiety and prenatal distress with choosing mode of delivery among pregnant women during COVID-19 epidemic in Iran.

Methods: This cross-sectional study was performed on 200 nulliparous pregnant women referred to the health centers of Ahvaz to receive the routine prenatal care. The questionnaires used were demographic, the health anxiety index-short form, and the prenatal distress questionnaire. At the end, the participants were asked by two questions whether their views on the mode of delivery has changed during COVID-19 epidemic.

Results: A significant difference was observed between choosing mode of delivery before and after the onset of the covid-19 epidemic (P=0.012). Health anxiety and prenatal distress score was higher in women who selected cesarean section (P<001) after the onset of the epidemic. Also, the maternal concern for fetal health was significantly higher in mothers who chose cesarean section than in women who chose vaginal delivery (P=0.014).

Conclusion: The findings of the current study showed that higher health anxiety and prenatal distress in pregnant women during the COVID-19 epidemic caused a significantly higher probability of selecting cesarean section as a mode of delivery. Therefore, it is very important to promote the mental health of pregnant women during the epidemic.

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Introduction

In December 2019, an outbreak of novel coronavirus pneumonia occurred in Wuhan_city and rapidly spread throughout the world (1). The novel coronavirus was officially named Severe Acute Respiratory Syndrome (SARS-CoV-2) by the International Committee on Taxonomy of Viruses, and the disease infected by this virus was termed COVID-19 (2).

When the SARS-CoV-2 and Middle East Respiratory Syndrome (MERS-CoV) infect

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pregnant women may result in poor obstetric outcomes including maternal morbidity and death (3). Apart from the overall population-level pandemic-related stress, there is still limited formal evidence-based about the nature and clinical consequences of the various versions of coronavirus (COVID-19 or SARS-CoV-2 or HCoV-19) in pregnancy (4).

Health concern is a phenomenon which sometimes affects many people, especially after experiencing unfamiliar physical symptoms, spreading the news about a particular disease, undergoing medical tests, or following physical illness (5). Health anxiety is almost synonymous with illness. It places a significant burden on health care system because fear of having a serious illness leads to medical counseling, repeated follow-up, and more medical care (6). Some studies have shown that choice of cesarean section as a mode of delivery is higher when the level of anxiety during pregnancy is higher (7). An increase in cesarean section incidence is associated with higher maternal and neonatal complications (8). One study showed that the fear of vaginal delivery is increased following the increase of anxiety in pregnancy(9). Despite being useful on some medical occasions (10), some studies have shown that the cesarean section is related to an increased rate of neonatal mortality (11). Some complication of cesarean section which is probably 5-10 times greater than vaginal delivery include bleeding, anesthetic complications, embolism, wound infection, pelvic infection disease, venous thrombosis, and mental complications such as anger, anxiety, and disappointment in mother (12)

During the stressful condition of epidemics and the probability of health anxiety and prenatal distress in this situation, the majority of pregnant women may select a cesarean section because they assume that cesarean delivery decreases the probability of contact of mother and their neonates with the COVID-19 virus. Therefore, this study was performed aimed to investigate the relationship between health anxiety and prenatal distress with selecting the mode of delivery in nulliparous women during Covid-19 epidemic, to help the pregnant women by holding online classes and non-face-to-face training during this period and presenting appropriate information to pregnant women to choose the appropriate mode of delivery.

Materials and Methods

This cross-sectional study was conducted on 200 nulliparous pregnant women referred to the health centers in Ahvaz between March and May 2020 for receiving pregnancy routine care.

After obtaining ethical code, the researcher selected 20 centers from the whole regions of Ahvaz. The phone numbers of pregnant women were obtained from 20 health centers in Ahvaz. Prenatal Distress Questionnaire (PDQ) and Health Anxiety Questionnaire were sent online (WhatsApp or Telegram) to the eligible pregnant women who agreed to participate in the study. The first page of the questionnaires was a written consent form and the participants were asked to sign it online before answering the questionnaires. Completed questionnaires were sent online to one of the researchers (Fig. 1). The inclusion criteria were nulliparity, having literacy and access to the Internet. Pregnant women experiencing stressful events or positive COVID-19 test in the past 6 months, and mental health problems were excluded from the study.

The questionnaires were completed online to avoid unnecessary referral of pregnant women due to the Covid-19 epidemic.

The first questionnaire consists of demographic and midwifery information. The other questionnaire was the Health anxiety index short form-18. This questionnaire is a standard tool to assess the level of health anxiety.

The long-form of the questionnaire was first designed in 1989 which was developed based on cognitive, health anxiety, and hypochondriasis model. The short form consists of 18 questions, which were designed in 2002, and its validity was confirmed by test-retest that was 0.9, and Cronbach's alpha was 0.7 to 0.82. The scores of the questionnaire range 0 to 54. The score ≥26 is considered as positive health anxiety. The construct validity of the questionnaire was achieved by confirmative factorial analysis using Lisrel (v.8.8 SSI. international) software. The factorial analysis showed that the questionnaire consists of three items: affected by disease, disease outcomes, and general distress of health

(13).Validity and reliability of the Persian version of the Health Anxiety Questionnaire had previously been evaluated and approved in Iran. The validity of the test-retest of this questionnaire was 0.9 and the Cronbach's alpha coefficient was 0.82 (14). Each item of the questionnaire consists of four-option as a declarative sentence and the participant selects one of the sentences which describe her status.

The higher scores indicate higher health anxiety. The Prenatal Distress Questionnaire (PDQ) was used to assess specific prenatal distress. PDQ was developed in 2011 and consists of three subscales: distress of birth and neonate, distress of weight and body image, distress of emotions and relations (13). Also, regarding the validity, the convergent validity of the questionnaire was obtained significant with the questionnaires of general stress assessment, perceived stress, and trait-state anxiety (15). Prenatal Distress Questionnaire (PDQ)

questionnaire consists of 12 questions. The questions were scored as Likert spectrum from 1 to 4. According to one study, the Persian version of the PDQ is a reliable valid and useful screening tool for measuring pregnancy stress in Iranian pregnant women (16). Accordingly, the Cronbach's alpha coefficient for PAI was 0.856 and the test-retest reliability with ICC was 0.784 (16). In the present study, the Cronbach's alpha coefficient of the PDQ was 0.754. The maximum score which an individual can achieve in the questionnaire is 48 and the minimum score is 12. The higher score in this questionnaire indicates higher prenatal distress during Covid-19 epidemic; if the score is close to zero, it means that the pregnant mother experiences lower distress during Covid-19 epidemic (it means a positive behavioral state). At the end of the questionnaire by two questions, the participants were asked whether their views on the mode of delivery had changed during COVID-19 epidemic. The participants were asked about the reason for selection the mode of delivery and then were recorded.

This article was approved by the ethics committee of Ahvaz University of medical Sciences (code: IR.AJUMS.REC.1399.110). All participants were assured of confidentiality and anonymity and a consent was obtained for direct quotes from their interviews to be used in this study.

Data were analyzed using the Statistical Package for Social Sciences for Windows (SPSS, v.22. Inc., Chicago, IL). Descriptive statistical methods of ANOVA and Tukey post hoc test and Kruskal-Wallis test were used to analyze the quantitative data; the chi-square and McNemar test were used to analyzed the qualitative data. A confidence interval of 95% was considered.

Results

A total of 200 nulliparous pregnant women were enrolled in this study. The participants' mean age was 26.03±4.99 years with minimum age of 15 years and maximum age of 40 years. According to the results, 82% (n=164) of the participants had positive health anxiety.

There was no statistically significant association between demographic and midwifery characteristics (including education, economic status, gestational age, location, pregnancy method, pregnancy complications, fetal screening, infertility, and pregnancy caregiver) and health anxiety or prenatal distress scores (Table 1).

A significant association was observed between choosing mode of delivery before and during the COVID-19 pandemic (P=0.012). Before the epidemic, 116 (58%) women selected normal vaginal delivery and 84 women (42%) selected cesarean section, but during the COVID-19 epidemic, the McNemar test showed that 59 women (49.1%) out of 116 and 34 (40.5%) out of 84 women changed their decision. Finally, during the epidemic, 91(45.5%) women selected normal vaginal delivery, and 109 (54.5%) selected cesarean section as mode of delivery.

Women's health anxiety showed statistically significant differences among various groups (P<.001). The highest score of health anxiety was 35.06±07.34 which was observed in the group that selected vaginal delivery but then they selected cesarean section during the COVID-19 pandemic. The minimum score of anxiety was 27.44±4.69 which was seen in women who tended to undergo cesarean section before epidemics of COVID-19 but they selected vaginal delivery during epidemic (Table2).

Table1. The relationship between maternal demographic factors and health anxiety and special pregnancy anxiety after COVID-19 epidemic

Demographic and Midwifery variables	N	Health anxiety	p-value	Pregnancy anxiety	p-value
Education					
Illiterate	3	27.33±6.8		19.66±7.50	
Elementary	13	32.38±7.56		14.23±8	
Middle School	14	32.64±8.28	0.658	15±5.85	0.353
Diploma	87	32.08±7.14		17.06±5.82	
University	83	31.04±6.39		18.15±6.48	
Economic Status					
Poor	36	31.08±6.46		16.75±6.87	
Middle	142	31.81±7.09	0.841	17.32±5.92	0.881
Good	22	31.4±6.79		17.4±8.03	
Gestational Age					
First trimester	58	32.12±7.41		17.25±7.44	
Second trimester	64	31.25±6.61	0.786	18.04±5.48	0.370
Third trimester	78	31.6±6.86		16.5±6.06	
Place of living					
Town	160	31.36±6.87	0.258	17.35±6.14	0.792
Village	40	32.75±7.08		17.05±7.07	
Pregnancy Method					
Normal	183	31.56±7.08		17.23±6.37	
Drug	15	31.73±4.69	0.427	17.78±6.31	0.919
IVF/IUI	2	38±1.41		18.5±2.12	
Pregnancy Complications					
Vaginal Bleeding	21	31.76±7.19		16.8±7.37	
Hyperemesis	27	32.55±7.4		18.37±5.13	
GDM	8	29.5±5.6	0.612	14.75±6.13	0.529
Hypertension	4	32±9.01		14.75±4.5	
Other	5	36.2±8.25		14.2±8.07	
None	135	31.38±6.78		17.49±6.36	
Fetal Screening					
natural	176	31.77±6.95		17.45±6.3	
Uncertain	6	27.66±4.45	0.362	13.5±3.14	0.409
Not do	18	31.66±7.21		16.5±6.9	
Infertility					
Yes	180	32.1±5.4	0.755	18.5±6.24	0.368
NO	20	31.58±7.08		17.15±6.33	
Prenatal Care giver					
Specialist	71	31.94±7.43	0.786	18.41±6.77	0.165
Midwife	27	30.85±6.21		17.11±5.74	
Both	102	31.63±6.77		16.54±6.08	

Data presented as mean ± standard deviation, The statistical test: Kruskal-Wallis Test and ANOVA test
GDM: gestational diabetes mellitus; IVF: In vitro fertilization; IUI: Intrauterine insemination

During the covid-19 epidemic, prenatal distress score was higher in women who selected cesarean section (P=<.001) (Table2).

Evaluation of the reasons for choosing mode of delivery by pregnant women after the onset of the covid-19 pandemic, the chi-square test showed that the number of mothers who were concerned about the condition of the fetus at delivery was significantly higher in the mothers who selected cesarean section group than the women who chose vaginal delivery (67% vs. 49.5%, P=0.014) (Table3).

Table2. Relationship between health anxiety and prenatal distress and choosing mode of delivery before and during the COVID-19 epidemic

Before/during epidemic	N	Health Anxiety	F	p-value	Prenatal distress	F	p-value
NVD/NVD	57	27.78±4.12			14.47±4.83		
NVD/CS	59	35.06±7.34			19.77±6.97		
CS/NVd	34	27.44±4.69	25.13	<.001	13.26±5.47	18.42	<.001
CS/CS	50	34.84±6.51			20.06±4.72		
Total	200	31.64±6.92			17.23±6.32		

Data presented as mean ± standard deviation, the statistical test: ANOVA test
NVD: normal vaginal delivery; CS: Caesarean section

Table 3. The reason for choosing the mode of delivery during the COVID-19 epidemic

variable	N	Lower risk for the mother	Lower risk for the fetus	P
NVD	91	46(50.5)	45(49.5)	0.014
CS	109	36(33)	73(67)	

Data presented as frequency (percentage) the statistical test: Chi-square test
NVD: normal vaginal delivery; CS: Caesarean section

Discussion

This study was performed aimed to investigate the association between health anxiety and prenatal distress of pregnant women and the selection of mode of delivery during the incidence of the COVID-19 pandemic in Iran. According to the results of the present study, an increase in health anxiety and prenatal distress was associated with an increase in the selection of cesarean section during the COVID-19 epidemic. Also, there was a statistically significant association between the increase in health anxiety and prenatal distress with selection of cesarean section. In addition, in the present study, a high percentage of women (82%) had health anxiety.

Although pregnancy is a physiologic process in women, but it is a stressful experience that is associated with social, physical and emotional changes (17).

These changes leads to new physical and mental properties which cause changes in health behaviors and lifestyle and women try to adapt to these changes. Due to the importance of pregnancy distress and anxiety and numerous hazards which can be posed to the mother and fetus, precise recognition of factors that cause this distress is necessary since treatment and prevention of the factors without awareness of the leading causes are not possible (18).

COVID-19 pandemic is a rare phenomenon in modern today's life that is accompanied by long-term complications and caused worries for health and treatment centers as well as the people. These worries about health will occasionally change into anxiety and stress (15).

Social distancing and some traffic and quarantine limitations are among the main reasons which increase anxiety and distress in the majority of pregnant mothers during COVID-19 pandemic (19). The COVID-19 pandemic has reduced pregnant women's access to routine prenatal care services due to the factors such as rapid spread of the disease, lack of an effective treatment or vaccine, the necessity of quarantine and its subsequent loneliness due to affliction, stigmatization and despair (20).

In the present study, the prevalence of health anxiety was reported to be very high (82%).

According to the findings of the study performed in China, depression in pregnant women increased during the prevalence of COVID-19 disease (21).

Also, the study by Durankuş et al. showed that the corona virus increases the rate of depression and stress in pregnant women (22). An Iranian web-based survey in 2021 involving 318 pregnant women has shown that 21% had pregnancy- related anxiety and 42.5% had depression (23). The study performed in Pakistan reported that 84% of pregnant women had fear during COVID-19 and the mean score of generalized anxiety was significantly higher in women with fear during COVID-19 pandemic(24). Anxiety can increase the risk of cesarean section through some factors such as

fear of childbirth (25). The findings of one study showed that mental health of mothers, especially anxiety and depression, during pregnancy affects mode of delivery (26).

The study by Bayrampour and colleagues showed that mothers' mental health at third trimester is related to the choice of cesarean section, and the risk of emergency cesarean section was higher in mothers with mental disorder than those without mental disorder. However, they could not find a relationship between mental disorder and elective cesarean section (27).

Other study reported that some of the mental health problems during pregnancy, such as the fear of childbirth, are related to the choice of cesarean section; mothers who had fear of natural childbirth were more likely to have cesarean section (28).

Some studies (9, 28, 29) showed that psycho-mental disorders such as stress and anxiety in pregnancy causes fear of vaginal delivery and subsequently, selecting cesarean section. Fear of natural childbirth is associated with state and trait anxiety (30).

In some cases, it is reported that due to severe distress and anxiety caused by coronavirus, some of the pregnant mothers want to terminate the pregnancy and undergo elective cesarean section (19) which is in line with the result of the current study.

According to the results of the present study, after the onset of COVID-19 epidemic, increasing maternal stress levels and more concern about the condition of the fetus during childbirth lead to the choice of cesarean section. In other studies, fear of injury to the fetus during vaginal delivery was among the factors affecting selection of cesarean section (31, 32).

In this study, no association was observed among the educational level, occupation, family economic status, and gestational age with general health anxiety and prenatal distress. In the current study, 89% of mothers were at moderate and poor economic class; no association was observed among the economic class of women and total health anxiety and prenatal distress. According to the report by World Health Organization, the prevalence of mental disorders in pregnant mothers was significantly higher in low and medium-income countries (33). One study reported that low education level was a common associated risk factor for depression progression and anxiety symptoms during the COVID-19 pandemic (22). In other study, no significant association was observed among mother's age, educational level, occupational status, pregnancy history, abortion, and mode of delivery with prenatal distress (34).

One study performed in Iran revealed that pregnant women at third trimester of pregnancy were concerned with COVID-19 disease and its consequences and had higher levels of anxiety. They reported that higher levels of anxiety among pregnant women during the COVID-19 pandemic might be due to their limited access to healthcare services, their concerns about the unsafe environment of healthcare settings, and concerns about infection by the disease (35).

From the results of the present study, during the first wave of Covid-19, was that the unknown coronavirus and its high spread rate alone has increased anxiety among pregnant women, regardless of their demographic factors. Therefore, considering the importance of stress management in pregnant women, raising mothers' awareness of coronavirus transmission, identifying the risk factors, as well as providing tele-counseling for pregnancy care and telecommuting can help reduce their anxiety and worry (19).

One of the strengths of the current study is the selection of the nulliparous women who had no delivery experience because the experience of delivery can affect the fear of delivery and selecting mode of delivery. The data were collected through the questionnaires and the respondents were not reviewed by a psychiatrist. Our study was conducted in one of the advanced centers of the country. However, the findings of the present study may not be generalized among the women of Iran.

Conclusion

According to the results of the present study, higher health anxiety and prenatal distress significantly increases the probability of selecting cesarean section as the mode of delivery. Therefore, preserving the mental health of pregnant women is necessary due to the positive association among the increase in prenatal distress due to the occurrence of the

COVID-19 epidemic and selecting the cesarean section as mode of delivery by the mothers. For this purpose, long-distance training methods such as video-conference, online programs, using appropriate software, and finally, the telephone call, therapeutic and consulting protocols to decrease mothers' anxiety should be presented.

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Conflicts of interest

Authors declared no conflicts of interest.

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