Journal of Reproduction & Infertility
Volume 22, Issue no. 2
http://dx.doi.org/10.18502/jri.v22i2.5801

Original Article

Check for updates

The Impact of COVID-19 Pandemic on Stress and Anxiety of Non-infected Pregnant Mothers

Abolfazl Mehdizadehkashi [1], Shahla Chaichian [2*], Ladan Haghighi [1], Nooshin Eshraghi [3], Arash Bordbar [4], Neda Hashemi [1], Roya Derakhshan [1], Shahla Mirgalobayat [1], Samaneh Rokhgireh [1], Kobra Tahermanesh [1]

1- Endometriosis Research Center, Iran University of Medical Sciences (IUMS), Tehran, Iran
2- Pars Advanced and Minimally Invasive Medical Manners Research Center, Pars Hospital, Iran University of Medical Sciences, Tehran, Iran
3- Department of Perinatology, Shahid Akbarabadi Hospital, Iran University of Medical Sciences, Tehran, Iran
4- Shahid Akbarabadi Clinical Research Development Unit (ShACRDU), Iran University of Medical Sciences (IUMS), Tehran, Iran

* *Corresponding Author:* Shahla Chaichian, Pars Advanced and Minimally Invasive Medical Manners Research Center, Pars Hospital, Iran University of Medical Sciences, Tehran, Iran
E-mail: chaichian.sh@iums.ac.ir, shchaichian@gmail.com

Received: Aug. 31, 2020
Accepted: Jan. 31, 2021

Abstract

Background: The newly emerging COVID-19 has caused severe anxiety around the world and it is infecting more people each day since there is no preventive measure or definite therapy for the diseases. The present study aimed to evaluate its effect on anxiety and stress of pregnant mothers during perinatal care.

Methods: Three–hundred pregnant mothers without COVID–19 infection who were referred to the hospitals affiliated to Iran University of Medical Sciences for delivery during April 2020, based on negative clinical symptoms and the results of polymerase chain reaction (rt-PCR) for COVID–19, were recruited by census method and asked to complete the Persian version of the perceived stress scale (PSS); participants views about their anxiety level and the role of COVID–19 as the source of their stress and worries were recorded. Women who refused to continue the study were excluded. The frequency of variables and mean scores were calculated using SPSS v. 21.

Results: Mean age of mothers was 30.20±16.19 years; 31.3% were primigravida and mean gestational age was 38.00±4.14 weeks. Moreover, 16.3% asked for earlier pregnancy termination and 39% requested Cesarean section (C/S). Assessing the mothers' anxiety revealed a high/very high level of anxiety in 51.3%. The majority felt worried and frustrated because of COVID–19 (86.4%). Social media had a great impact on the level of stress among these mothers (60.3%).

Conclusion: COVID-19 pandemic is an important source for the increased anxiety and stress among healthy pregnant mothers.

Keywords: Anxiety, Coronavirus, COVID-19, Pregnant women, Term birth.
To cite this article: Mehdizadehkashi A, Chaichian Sh, Haghighi L, Eshraghi N, Bordbar A, Hashemi N, et al. The Impact of COVID-19 Pandemic on Stress and Anxiety of Non-infected Pregnant Mothers. J Reprod Infertil. 2021;22(2):125-132. http://dx.doi.org/10.18502/jri.v22i2.5801.

Downloaded from http://www.jri.ir

Introduction

Anxiety and stress are prevalent psychiatric disorders that can result in negative health outcomes in the long run (1, 2). The risk factors of anxiety and stress are numerous among which personal factors and genetic susceptibility are the main important ones; furthermore, the inappropriate coping with the changing environment has been identified as an important source of stress that causes anxiety as well (3). Pregnancy is one of the life periods with a high frequency of stress and anxiety disorders (4), supposed to be triggered by hormonal and physical changes, the fear of the neonate's health, giving birth, and other pregnancy-related factors (5).

Mental health of the pregnant mother is of great significance, as it can impair the emotional relationship between the mother and her fetus, and increase the risk of adverse neonatal outcomes, such as intrauterine growth retardation, preterm birth, low birth weight (6, 7), and postpartum depression that will affect infant care (8) and result in the child's cognitive and emotional problems (9). It has been shown that the fetal neurobehavioral development is also impaired by the antenatal psychological state of the mother and results in defective learning, defective motor skills, and atypical behavior of the child (5). Therefore, it is very important to pay attention to the issue of anxiety and stress in pregnant mothers. Any additional change in the environment, such as adverse events in life, can add to the mother's stress and anxiety (8).

Coronavirus disease 2019 (COVID–19), also known as 2019 novel Coronavirus (2019–n CoV), is currently the most critical health problem around the world (10). Starting from Wuhan city, China, it spread quickly around the world by human–to–human transmission (11, 12), and was announced as a pandemic respiratory disease by the World Health Organization (WHO) in March 2020. As of today, there is no preventive measure or definite treatment which resulted in daily infection of many patients with a global mortality of about 500.000 people (13).

The fear of transmission of and/or death from COVID–19 has influenced the community's mental health and has caused anxiety and depression for the general population (14). Furthermore, using personal protective equipment (PPE) and other observing safety precautions, such as social distancing and staying indoor as much as possible (15), are other sources of mental health impairment, due to feeling of loneliness and lack of face–to–face communications (16). The fear of contamination with COVID–19 is more serious in hospitals and medical centers and strict precautions are recommended for the health care workers (HCW) and the rest of personnel (17). Pregnant mothers should routinely be referred to medical centers for prenatal care and receiving maternity services and are thus at a higher risk of contamination (18).

It has been shown that COVID–19 during pregnancy may cause severe feto-maternal complications, pregnancy–related and fetal complications, such as miscarriage, intrauterine growth restriction (IUGR), preterm birth, in addition to an increase in the possible risk of vertical transmission and maternal mortality rate (19). Therefore, pregnant mothers usually have the fear of contamination of themselves, their fetuses, and their old relatives during COVID–19 fluctuations (20). As fear, stress, and anxiety can result in adverse pregnancy outcomes and endanger the mother's and/or neonate's health (21), it is of utmost importance to evaluate the effect of COVID–19 pandemic on pregnant mothers' stress and anxiety (22). Due to data scarcity about the prevalence of stress and anxiety in the era of COVID–19 pandemic in pregnant mothers who are referred to medical centers for prenatal care and the effect of COVID–19 on such anxiety, the present study aimed to evaluate the perceived stress and anxiety of pregnant mothers without COVID–19 during the current pandemic and the effect of this pandemic on their anxiety and stress.

Methods

Study design: The study protocol has been approved by the Ethics Committee of Iran University of Medical Sciences (Code: IR.IUMS.REC. 1399.633). Pregnant mothers without COVID–19, who were referred to the educational hospitals affiliated to Iran University of Medical Sciences for child birth from April 3rd to 20th 2020, were considered as the study population. All mothers were evaluated at referral for the clinical symptoms of COVID–19 including headache, cough, difficult breathing, sore throat, fever, and examined for body temperature, respiratory rate (RR), pulse rate (PR), blood pressure (BP), and oxygen saturation (SaO_2). The included mothers were not suspected of COVID–19 based on the clinical signs/symptoms or reverse transcriptase polymerase chain reaction (rt-PCR) or CT results and they signed the written informed consent after they received sufficient explanation about the study objectives.

According to the results of the meta-analysis by Salari et al., the prevalence of stress was 29.6% in the general population during the COVID-19 pandemic (23). In this study, the sample size was calculated by using equation proposed for cross-sectional studies considering p=29.6%, q=70.4%, study power=80%, and the precision (d)=5% and it turned out to be 300.

The mothers' demographic data including age and pre-pregnancy body mass index (BMI), and obstetric characteristics including gestational age, parity, gravidity, type of previous delivery/deliveries, number of abortions, number of live births, type and history of infertility, history of medical

Downloaded from http://www.jri.ir

diseases, complications during the current pregnancy, and the consumed medications were all recorded.

The mothers were asked to complete the checklist, designed by the researchers, for assessment of mothers' worries about the COVID–19 infection of their neonate, themselves, and their relatives, the role of social media and use of PPE by HCWs, the level of family members' adherence to the protective protocols, and level of their anxiety.

They were also asked to fill the Persian version of the perceived stress scale (PSS). This questionnaire was designed by Cohen et al. in 1994 (24) and its validity and reliability demonstrated acceptable psychometric properties (25). The reliability of the Persian version of this scale with 14 items, used in the present study, was approved by Maroufizadeh et al. with Cronbach's alpha of 0.86, 0.83, and 0.90 for negative factor, positive factor, and total score and its convergent validity was approved by Pearson's correlation of 0.699, indicating an acceptable convergent correlation with Depression Anxiety and Stress Scale-21 Items (26). The questions were answered on a 5–point Likert scale, ranging from 0 (Never) to 4 (Very often). The total score was calculated from 40; higher scores indicate higher levels of stress. The level of participants' anxiety was determined by the participants. For this purpose, the participants were asked to mark their anxiety as very high, high, moderate, low, or none.

Mothers were followed for two weeks and any problems during pregnancy that required admission, such as vaginal bleeding, early delivery, abortion, rupture of membrane (ROM), and evaluation of fetal movements were recorded in the study checklist. Also, the time, type, and outcome of their delivery were recorded.

Statistical analysis: Results were presented as mean±standard deviation (SD) for quantitative variables and as frequency (Percentage) for categorical variables. One–sample Kolmogorov–Smirnov test was used to determine the normal distribution of data and Levene's test was used to check the equality of variances. Continuous variables were compared using T test or Mann–Whitney U test, whenever the data did not appear to have normal distribution or when the assumption of equal variances was violated across the study groups. Categorical variables were compared using chi–square test. The association of variables was tested by Pearson's or Spearman's correlation coefficient. For the statistical analysis, SPSS Statistics version 21.0 (IBM Corp., Armonk, NY) was used. The p-values of 0.05 or less were considered statistically significant.

Results

A total of 300 mothers were included into the study with mean age of 16-45 (29±6.02) years and BMI of 25.70±5.21 kg/m^2. The obstetric history and pregnancy–related characteristics of the mothers are shown in table 1. As demonstrated in this table, 31.3% were primipara, so the majority had a history of previous delivery. Most of them (84.7%) had no complications during the current pregnancy and the most common complication was gestational diabetes mellitus (GDM), observed in 8.7% of the mothers (Table 1). The mean± SD of the gestational age of the mothers was 38.00±4.14 weeks and their mean±SD of duration of hospitalization was 2.51±1.11 days.

The mothers' answers to the questions designed by the research team are shown in table 2. As demonstrated, using PPE by HCWs caused high level of stress in 6.7% and very high in 14.7%; but generally, 10.3% had high level of stress for COVID–19 and 41% had very high level of stress during referral to medical centers; 7.3% and 29% had fear of COVID–19 infection of themselves and their child, respectively. The majority felt worried and frustrated because of COVID–19 (36.7% sometimes, 29.7% frequently, and 20% always). Social media had a great impact on increasing the mothers' stress (41.3% high level of stress, and 19% very high level of stress). The levels of stress in participants based on the studied factors are shown in figure 1.

Assessing the mothers' anxiety showed high/ very high level of anxiety in 51.3%, moderate level in 12.3%, and little/no anxiety in 36.3% of mothers. Two–week follow–up showed that none of the mothers or neonates had clinical signs and symptoms of COVID–19.

Discussion

Evaluation of 300 pregnant mothers in our study revealed that the majority of mothers had considerable anxiety (51.3% high and 12.3% moderate level). The frequency of anxiety in our study is much higher than the one in previous similar studies (4, 8). In the study on 590 Italian pregnant women, using state-trait anxiety inventory (STAI-Y), it was shown that 25.3% were positive for

Downloaded from http://www.jri.ir

Table 1. The obstetric characteristics of the study population

Variable	Categories	Frequency	Percentage
Number of pregnancies			
	1.00	77	25.7
	2.00	100	33.3
	>2	123	41
Number of deliveries			
	0.00	94	31.3
	1.00	107	35.7
	2.00	62	20.7
	>2	37	12.3
Type of previous delivery			
	None	94	31.3
	NVD	90	30.0
	C/S	111	37.0
	Not reported	5	1.5
Number of normal vaginal deliveries			
	0.00	205	68.3
	1.00	42	14.0
	2.00	28	9.3
	>2	24	8
Number of Cesarean sections			
	0.00	183	61.0
	1.00	74	24.7
	2.00	36	12.0
	>2	6	2
Number of abortions			
	0.00	232	77.3
	1.00	53	17.7
	2.00	11	3.7
	>2	3	10
Number of live births			
	0.00	95	31.7
	1.00	112	37.3
	2.00	59	19.7
	>2	33	10.9
Complications during the current pregnancy			
	None	254	84.7
	GDM	26	8.7
	Preeclampsia	8	2.7
	PROM	5	1.7
	Placenta previa	3	1.0
	Post term	2	0.7
	GDM and preeclampsia	2	0.7
History of medical diseases			
	None	231	77.0
	DM	8	2.7
	HTN	2	0.7
	Cardiovascular diseases	1	0.3
	Hypothyroidism	55	18.3
	Hyperthyroidism	1	0.3
	Anemia	4	1.3
	Thalassemia	2	0.7

NVD: Normal Vaginal Delivery, C/S: Cesarean Section, PROM: Premature Rupture of Membranes, GDM: Gestational Diabetes Mellitus

Downloaded from http://www.jri.ir

Table 2. The mother's answers to the questions regarding the change in their prenatal care

Variables	Categories	Frequency	Percentage
How much stress has the personal protective equipment of the health care caused for you?			
	None	162	54.0
	Very little	7	2.3
	Little	32	10.7
	Moderate	35	11.7
	Much	20	6.7
	Very much	44	14.7
How much stress do you have about contamination with COVID–19 during visiting this center?			
	None	90	30.0
	Very little	1	0.3
	Little	18	6.0
	Moderate	37	12.3
	Much	31	10.3
	Very much	123	41.0
How much stress do you have about contamination of your child with COVID–19 at this center?			
	None	140	46.7
	Very little	6	2.0
	Little	20	6.7
	Moderate	25	8.3
	Much	22	7.3
	Very much	87	29.0
How does social media affect your stress about COVID–19?			
	It reduces my stress	43	14.3
	It has no effect on my stress	76	25.3
	It increases my stress	124	41.3
	It increases my stress very much	57	19.0
How much do you personally care about preventive measures against COVID–19?			
	None	23	7.7
	Very little	3	1.0
	Little	18	6.0
	Moderate	50	16.7
	Much	34	11.3
	Very much	172	57.3
How much do your family members care about preventive measures against COVID–19?			
	None	24	8.0
	Very little	2	0.7
	Little	27	9.0
	Moderate	42	14.0
	Much	28	9.3
	Very much	177	59.0
How many times have you felt worried and frustrated because of COVID–19?			
	Almost never	13	4.3
	Seldom	28	9.3
	Sometimes	110	36.7
	Frequently	89	29.7
	Always	60	20.0

STAI-Y trait (27). Also, in another study on 3021 pregnant women, the frequency of anxiety was reported to be 23% using STAI-Y (28). The higher prevalence in our study can be attributed to the higher prevalence of mental health disorders, like depression, in pregnant mothers in low and middle-income countries, compared to developed countries (8). The social and administrative condi-

Downloaded from http://www.jri.ir

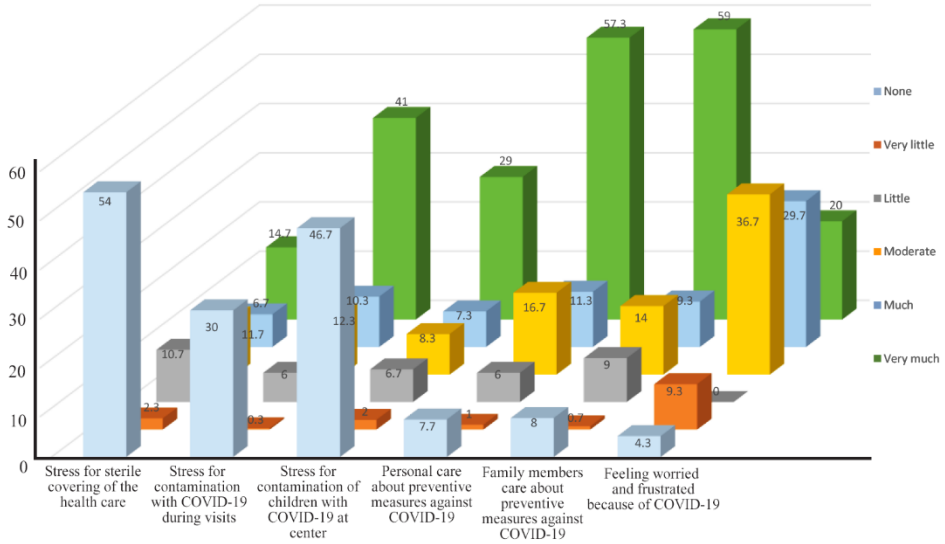

Figure 1. The status of stress and related measurements in study population

tions of the country (29) and the sanctions and economic problems are considered important sources of anxiety in the general population (30) which have an important effect on prenatal stress and anxiety in our study population. Other factors, such as social support and life events, also affect the prenatal stress and anxiety (8). One of the important life events that existed for all of our study population is COVID–19 pandemic, which could be the main cause of the high level of prenatal stress and anxiety in our study population. The results of our study showed that COVID–19 pandemic was an important source of stress and anxiety. The majority of mothers felt worried and frustrated because of COVID–19 and felt high or very high levels of stress.

Today, in the era of COVID–19 pandemic, the risk of transmission of COVID–19 and the resulting morbidity/mortality has significantly influenced the mental health of the general population (14, 31). Therefore, not only infected patients with COVID–19 but also those without the disease are influenced by mental consequences of the pandemic mainly the use of PPE and social distancing (15, 16). As the risk of contamination with COVID–19 is greater in hospitals, HCWs and those referred to the hospitals have greater fear of contamination (17), which justifies the high level of stress and anxiety in the mothers of the present study. Despite the significance of this issue, very few studies have evaluated the pregnant mothers' anxiety during COVID–19 pandemic. In a study on 71 mothers in the second and third trimester of pregnancy, more than half of the studied mothers were often or always worried about their health and the majority had concerns about the health of the elderly family member (83%), their born (66.7%), and unborn children (63.4%) (20). Although these results confirm the findings of the present study, the sample size of their study was limited and they evaluated the mothers during March, the first two weeks of the delay phase of this pandemic in Ireland (20). Our patients were evaluated during April 2020 and it is speculated that the population's information and the resulting anxiety and stress has increased during the spread of the disease (32).

One of the important sources of mothers' anxiety in our study was the social media, as most of our respondents indicated its impact to be high (41.3%) and very high (19%); others have also referred to the fact that social media has a great role in occurrence of panic in the general population (33). Studies on COVID–19 have also demonstrated that social media is a significant source of mothers' anxiety (34, 35) which confirms the results of our study. In our country, Iran, the first case of COVID–19 was reported on February 19, 2020 and the social media was an important source for distributing the related information. Another important source of stress for mothers was the use of PPE by HCWs that caused high level of stress in 6.7% and very high in 14.7%. The WHO has recommended using medical face mask, gown, gloves, and eye protection (Goggles or face shield), when dealing with a pa-

Downloaded from http://www.jri.ir

tient, during COVID–19 pandemic (36); but using these PPEs causes fear for the patients, as the results of our study showed. However, due to the significance of preventing COVID–19 transmission to HCWs, the PPEs must be used despite the negative psychological effect on the patients.

Based on the results of our study, the majority of the studied mothers and their families personally cared about the preventive measures and two–week follow–up showed that fortunately none of the mothers or their neonates were contaminated with COVID–19. These results confirmed the effectiveness of the preventive guidelines, when executed by the individual, her family, and the hospital system (37) and showed that there is no need for the pregnant mothers to be worried about transmission of COVID–19, when the hospital system is safe. The Center for Disease Control and Prevention has also recommended that the pregnant mothers should stay calm and overcome their fear or anxiety, talk to their children and inform them about COVID–19; in the meantime, they should take the precautions to prevent getting the disease (38). Fortunately, only one mother (Out of the 300 mothers studied) changed her mind about breastfeeding. Therefore, it is important that the mothers receive reliable information and adhere to the suggested guidelines.

One of the limitations of the present study was the nonrandomized enrollment of the participants into the study, which reduces the generalizability of the results. Also, mothers at the time of delivery were evaluated and the results cannot be used for the pregnant mothers at other stages of pregnancy (First or second trimester). Furthermore, results can not be compared with a similar group since the data was not collected before the COVID –19 pandemic. Therefore, it was not possible to evaluate the independent effect of COVID–19.

Conclusion

The results of the present study indicated that pregnant mothers had a high level of anxiety and stress at the time of delivery during COVID–19 pandemic and they considered the outbreak of COVID–19 an important source of their stress and anxiety, although none of the mothers or their neonates was contaminated (Two weeks) after delivery. These results suggest the need for providing correct information to the pregnant mothers during this health crisis, in order to reduce their anxiety and stress levels and the resulting complications.

Acknowledgement

The authors of the present study sincerely thank all patients that shared their emotional experiences with the researchers during COVID-19 pandemic.

Conflict of Interest

The authors of the present study declare that they have no conflict of interest.

Funding: The present study was financially supported by Iran University of Medical Sciences.

References

1. Thoits PA. Stress and health: Major findings and policy implications. J Health Soc Behav. 2010;51 Suppl:S41-S53.
2. Keller A, Litzelman K, Wisk LE, Maddox T, Cheng ER, Creswell PD, et al. Does the perception that stress affects health matter? the association with health and mortality. Health Psychol. 2012;31(5): 677-84.
3. Schneiderman N, Ironson G, Siegel SD. Stress and health: psychological, behavioral, and biological determinants. Annu Rev Clin Psychol. 2005;1:607-28.
4. Goodman JH, Chenausky KL, Freeman MP. Anxiety disorders during pregnancy: a systematic review. J Clin Psychiatry. 2014;75(10):e1153-84.
5. Schetter CD, Tanner L. Anxiety, depression and stress in pregnancy: implications for mothers, children, research, and practice. Curr Opin Psychiatry. 2012;25(2):141-8.
6. Grote NK, Bridge JA, Gavin AR, Melville JL, Iyengar S, Katon WJ. A meta-analysis of depression during pregnancy and the risk of preterm birth, low birth weight, and intrauterine growth restriction. Arch Gen Psychiatry. 2010;67(10):1012-24.
7. Lima SAM, El Dib RP, Rodrigues MRK, Ferraz GAR, Molina AC, Neto CAP, et al. Is the risk of low birth weight or preterm labor greater when maternal stress is experienced during pregnancy? a systematic review and meta-analysis of cohort studies. PloS One. 2018;13(7):e0200594.
8. Biaggi A, Conroy S, Pawlby S, Pariante CM. Identifying the women at risk of antenatal anxiety and depression: a systematic review. J Affect Disord. 2016;191:62-77.
9. Satyanarayana VA, Lukose A, Srinivasan K. Maternal mental health in pregnancy and child behavior. Indian J Psychiatry. 2011;53(4):351-61.
10. Singhal T. A review of coronavirus disease-2019 (COVID-19). Indian J Pediatr. 2020;87(4):281-6.
11. Hu Y, Sun J, Dai Z, Deng H, Li X, Huang Q, et al. Prevalence and severity of corona virus disease 2019 (COVID-19): a systematic review and meta-analysis. J Clin Virol. 2020;127:104371.

Downloaded from http://www.jri.ir

12. Hellewell J, Abbott S, Gimma A, Bosse NI, Jarvis CI, Russell TW, et al. Feasibility of controlling COVID-19 outbreaks by isolation of cases and contacts. Lancet Glob Health. 2020;8(4):e488-e96.
13. World Health Organization. Coronavirus disease 2019 (COVID-19). Geneva: World Health Organization; 2020 Mar. 10 p. Report No. 70.
14. Gao J, Zheng P, Jia Y, Chen H, Mao Y, Chen S, et al. Mental health problems and social media exposure during COVID-19 outbreak. PloS One. 2020;15(4):e0231924.
15. Wu YC, Chen CS, Chan YJ. The outbreak of COVID-19: an overview. J Chin Med Assoc. 2020; 83(3):217-20.
16. Rajkumar RP. COVID-19 and mental health: a review of the existing literature. Asian J Psychiatr. 2020;52:102066.
17. Lancet T. COVID-19: protecting health-care workers. Lancet. 2020;395(10228):922.
18. Akkerman D, Cleland L, Croft G, Eskuchen K, Heim C, Levine A, et al. Routine prenatal care. 5th ed. Bloomington (MN): Institute for clinical systems improvement (ICSI); 2012. 116 p.
19. Alzamora MC, Paredes T, Caceres D, Webb CM, Valdez LM, La Rosa M. Severe COVID-19 during pregnancy and possible vertical transmission. Am J Perinatol. 2020;37(8):861-5.
20. Corbett GA, Milne SJ, Hehir MP, Lindow SW, O'connell MP. Health anxiety and behavioural changes of pregnant women during the COVID-19 pandemic. Eur J Obstet Gynecol Reprod Biol. 2020;249:96-7.
21. Loomans EM, Van Dijk AE, Vrijkotte TG, Van Eijsden M, Stronks K, Gemke RJ, et al. Psychosocial stress during pregnancy is related to adverse birth outcomes: results from a large multi-ethnic community-based birth cohort. Eur J Public Health. 2013;23(3):485-91.
22. Dashraath P, Jeslyn WJL, Karen LMX, Min LL, Sarah L, Biswas A, et al. Coronavirus disease 2019 (COVID-19) pandemic and pregnancy. Am J Obstet Gynecol. 2020;222(6):521-31.
23. Salari N, Hosseinian-Far A, Jalali R, Vaisi-Raygani A, Rasoulpoor S, Mohammadi M, et al. Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis. Global Health. 2020;16(1):57.
24. Cohen S, Kessler RC, Gordon LU. Measuring stress: a guide for health and social scientists. 1st ed. New York: Oxford University Press; 1997. 235 p.
25. Lee EH. Review of the psychometric evidence of the perceived stress scale. Asian Nurs Res (Korean Soc Nurs Sci). 2012;6(4):121-7.
26. Maroufizadeh S, Zareiyan A, Sigari N. Reliability and validity of Persian version of perceived stress scale (PSS-10) in adults with asthma. Arch Iran Med. 2014;17(5):361-5.
27. Giardinelli L, Innocenti A, Benni L, Stefanini M, Lino G, Lunardi C, et al. Depression and anxiety in perinatal period: prevalence and risk factors in an Italian sample. Arch Womens Ment Health. 2012; 15(1):21-30.
28. Bayrampour H, McDonald S, Tough S. Risk factors of transient and persistent anxiety during pregnancy. Midwifery. 2015;31(6):582-9.
29. Zandifar A, Badrfam R. Iranian mental health during the COVID-19 epidemic. Asian J Psychiatr. 2020;51:101990.
30. Takian A, Raoofi A, Kazempour-Ardebili S. COV ID-19 battle during the toughest sanctions against Iran. Lancet. 2020;395(10229):1035-6.
31. Serafini G, Parmigiani B, Amerio A, Aguglia A, Sher L, Amore M. The psychological impact of COVID-19 on the mental health in the general population. QJM. 2020;113(8):531-7.
32. Dubey S, Biswas P, Ghosh R, Chatterjee S, Dubey MJ, Chatterjee S, et al. Psychosocial impact of COVID-19. Diabetes Metab Syndr. 2020;14(5): 779-88.
33. Depoux A, Martin S, Karafillakis E, Preet R, Wilder-Smith A, Larson H. The pandemic of social media panic travels faster than the COVID-19 outbreak. J Travel Med. 2020;27(3):taaa031.
34. Ahorsu DK, Lin CY, Imani V, Saffari M, Griffiths MD, Pakpour AH. The fear of COVID-19 scale: development and initial validation. Int J Ment Health Addict. 2020 Mar 27:1-9.
35. Shanafelt T, Ripp J, Trockel M. Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic. JAMA. 2020;323(21):2133-4.
36. World Health Organization. Rational use of personal protective equipment for coronavirus disease (COVID-19) and considerations during severe shortages: interim guidance. Geneva: World Health Organization; 2020. 32 p.
37. Yang CJ, Chen TC, Chen YH. The preventive strategies of community hospital in the battle of fighting pandemic COVID-19 in Taiwan. J Microbiol Immunol Infect. 2020;53(3):381-3.
38. The Center for Disease Control and Prevention [Internet]. USA: Center for Disease Control and Prevention. Breastfeeding and caring for newborns. 26 Feb 2021 [cited 15 Apr 2021]; [about 7 screens]. Available from: https://www.cdc.gov/co-ronavirus/2019-ncov/need-extra-precautions/preg-nancy-breastfeeding.html.

Downloaded from http://www.jri.ir