Original Article

Mental Health in Self-Quarantined Pregnant Women for 14 Days During the Coronavirus Outbreak in Iran

Nasrin Ghiasi[1], Robab Kazempour[2], Arezoo Haseli[3,4], Mohammad Reza Kaffashian[5], Shayesteh Jahanfar[6]

[1]Assistant Professor, Department of Midwifery, Faculty of Medicine, Ilam University of Medical Sciences, Ilam, Iran, [2]Department of Midwifery, Marand Branch, Islamic Azad University, Marand, Iran, [3]Clinical Research Development Center, Motazedi Hospital, Kermanshah University of Medical Sciences, Kermanshah, Iran, [4]Department of Midwifery, School of Nursing and Midwifery, Ilam University of Medical Sciences, Ilam, Iran, [5]Associated Professor, Department of Physiology, Faculty of Medicine, Ilam University of Medical Sciences, Ilam, Iran, [6]Associated Professor, MPH Program Department of Public Health and Community Medicine, Tufts University School of Medicine, Boston, USA

Abstract

Background: Quarantine during COVID-19 disease may be associated with psychological distress and other behavioral problems. This study aimed to investigate depression, anxiety, and stress in self-quarantined pregnant women at home for 14 days during the coronavirus disease outbreak in Iran. **Materials and Methods:** A cross-sectional web survey was carried out on 874 pregnant women in all governmental health centers of two cities in Iran using the census method in 2020-21. Survey data were collected with the Depression, Anxiety, and Stress Scale-21. Data were analyzed using descriptive statistics and analytical tests (Chi-square, Pearson's correlation coefficient, and logistic regression) at significance level less than 0.05. **Results:** Approximately 40.04% (N = 350) of the participants were classified as a self-quarantine group. The mean (SD) of the stress score was higher for the quarantine group compared to nonquarantine (8.12 (4.95) vs. 5.96 (4.51)) ($F_{2,874} = 25.180$, $p < 0.001$). But there was no significant difference in the depression and anxiety scores between the quarantine group compared to nonquarantine, respectively. Additionally, the adjusted odds ratio for stress score was associated with an unwanted pregnancy (1.993, 95% CI: 1.108–3.587; $p = 0.021$), younger age (1.707, 95% CI: 1.082–2.692; $p = 0.022$) and uninsured coverage (2.240, 95% CI: 1.320–3.801; $p = 0.003$), and complete quarantine (2.027, 95% CI: 1.548–2.654; $p < 0.001$). **Conclusions:** Self-quarantine during the COVID-19 pandemic has been related to high-stress levels, specifically, among women of younger age, uninsured, and unwanted pregnancies. Thus, quarantined pregnant women will need more mental health support and medical supplies.

Keywords: *Anxiety, COVID-19, depression, mental disorder, quarantine, stress disorder*

Introduction

One of the oldest and most beneficial tools for controlling the spread of infectious diseases is quarantine. Quarantine means the limitation of movement of people who are thought to be exposed to infectious disease but are not sick or have no symptoms because they are still in the incubation period.[1] Quarantine has been known as one of the constructive actions taken by governments to control COVID-19 disease[2] and usually includes restrictions on the specified home or facility. Quarantine may be voluntary or mandatory. Everyone should see a pre-designated medical center immediately during quarantine if they have any symptoms.[3] Coronavirus (COVID-19) is a new respiratory disease that is widespread worldwide.[4] The main transmission route of COVID-19 is through respiratory droplets and can also be transmitted through contact.[5] The COVID-19 latency period is about 14 days, and the virus can transmit by an infected person through close contact and respiratory droplets.[6,7] To further reduce the risk of transmitting the disease, the Iranian authorities also made the recommendation of social distance and self-quarantine their top priority during the outbreak, although there were no mandatory travel restrictions and quarantine, and most people were encouraged that volunteer to quarantine and stay home.[8] However, quarantine may exacerbate the psychological effects of the infectious disease that has been shown in some studies.[3] So that, a study of patients quarantined for Middle East Respiratory Syndrome (MERS) found that more than 40% of those who were isolated and then contracted MERS required psychiatric intervention, compared to those who were not quarantined[9]

Pregnant women are one of the high-risk groups for COVID-19. Due to physiological and immune changes in pregnancy,[10]

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Address for correspondence:
Dr. Arezoo Haseli, Clinical Research Development Center, Motazedi Hospital, Kermanshah University of Medical Sciences, Kermanshah, Iran.
E-mail: Ar_haseli@yahoo.com

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these individuals may be at greater risk of contracting COVID-19 and have more complex clinical events.[11] Also, during quarantine, this population experiences more emotional damage and managing their mental health issues is more complicated.[12] Complications of mental disorder such as stress, anxiety, and depression during pregnancy have been shown in previous evidence including low birth weight, preterm labor, and future delayed psychiatric development.[13] Although preliminary data from China suggest that pregnant women have similar experiences during quarantine compared to the general population, a different picture is emerging as the disease becomes a global pandemic.[14] There appears to be a substantial knowledge gap about the relationship between quarantine and mental health in pregnant women. On the other hand, no previous research has investigated the effect of self-quarantine on mental health in pregnant women. To illuminate this uncharted area, in this present study, we examined the relationship between self-quarantine and the mental health of pregnant women during the COVID-19 pandemic that this study can be effective in order to fair Iran's health policies for recovery after COVID-19 in order to improve the health of pregnant women.

Materials and Methods

This cross-sectional study was conducted on 874 pregnant women who suspected of having COVID-19 with health records in all governmental health centers of Ilam and Ayvan cities in Iran in 2020-21. By census method, 1434 pregnant women were recognized during the COVID-19 pandemic between July 2020 and March 2021. Any person who had at least one of the clinical criteria (cough, fever, dyspnea, headache, chills, muscle pain, fatigue, vomiting and/or diarrhea, sudden onset of anosmia, old age, or dystocia) without imaging, laboratory, or epidemiological diagnostic criteria was considered a possible case.[15,16] The sample size was not calculated because we enrolled all pregnant women in this study by census method.

Inclusion criteria included pregnant women with a gestational age of 14 weeks or more and at least one attendant visit to a governmental health center, willingness to participate in the study, no drug addiction, having a smart phone, and healthy and singleton pregnancy. Exclusion criteria included medical problems during pregnancy such as hypertension, diabetes, epilepsy, sclerosis, thyroid disorders, and autoimmune, renal, and cardiopulmonary diseases, high-risk pregnancies, and a history of mental disorders such as dementia, anxiety, mood, and psychotic disorders based on mother health records. The sampling method was census. All governmental health centers in Ilam and Ayvan and their suburbs, including 31 centers, were selected for sampling, both of which were high-risk cities of corona based on urban coloration and the rate of corona virus infection. The researcher extracted the list of pregnant women covered by the centers and their telephone numbers by their midwives. After a phone call with pregnant women, aims of study and confidentiality of the information were clarified by the researcher, eligibility criteria were examined and, if eligible, they participated in the study. Due to corona protection policies, it was not possible to conduct face-to-face research and complete the questionnaires, the questionnaire was designed in Porsline, link was sent to mothers via WhatsApp, and they were asked to respond to the questionnaires online.

This study used different data collection questionnaires such as the socio-demographic and obstetrics characteristics questionnaire and the Depression, Anxiety, and Stress Scale-21 (DASS-21). The analyzed data of the socio-demographic characteristics questionnaire included age, educational levels, and insurance status (yes/no), and obstetrics questions included the parity, history of abortion, gestational age, and pregnancy type (wanted/unwanted pregnancy). To confine the spread of COVID-19 disease, the World Health Organization (WHO) suggested a 14-day quarantine time for potential COVID-19-infected cases.[17] Thus, we considered one question about whether or not a person quarantined herself in corona conditions. Those who reported quarantine were also divided into incomplete (less than 14 days) and full (14 days) quarantine.

DASS-21 was developed by Lovibond (1995) which is a shortened version of DASS-42 and includes three subscales of stress, depression, and anxiety. Each subscale has seven questions[18,19] that are rated on a scale from "not at all" (0) to very high.[3] The score is determined for each scale independently. The maximum score for each subscale is 21 which demonstrates the worst circumstance.[18] This scale is commonly used in pregnancy in Iran[20] and has been validated by Sahebi *et al*. (2005) for the Iranian population using forward-backward translation, factor analysis, and criterion validity.[21] Its reliability in Iranian pregnant women for the variables of depression, anxiety, and stress has been reported as 0.80, 0.72, and 0.80, respectively.[22] In this study, the internal reliability using Cronbach's alpha was 0.77 for the stress subscale, 0.81 for the anxiety subscale, and 0.78 for the depression subscale.

Descriptive statistics and analytical tests were used to analyze quantitative and qualitative data (Chi-square, ANOVA or Kruskal–Wallis, Pearson's correlation coefficient, and logistic regression) in SPSS 19 (SPSS Inc., version 19, IBM, Chicago, IL, USA). An adjusted logistic regression was used to assess the relationship between quarantine status and depression, anxiety, stress, and other factors. A p value <0.05 was considered statistically significant.

Ethical considerations

Ethical approval was obtained from Ilam University of Medical Sciences (Ethic No: IR.MEDILAM.REC.1399.017) on 2020-04-26. The consent form was designed online, and

all participants completed it before starting to answer the questionnaires.

Results

Of the 1434 pregnant women, 874 were included in the study. According to the World Health Organization definition, approximately 40.04% (N = 350) of the participants were classified as a self-quarantine group (complete self-quarantine). Population characteristics according to quarantine status are summarized in Table 1. When compared with nonquarantine and complete quarantine were more likely to be a higher level of education, younger age, higher age of the pregnancy, wanted pregnancy, insurance, and high depression and stress scores. Other characteristics, including parity, history

Table 1: Characteristics of the study population according to quarantine status

Characteristics	No Quarantine (*n*=460) *n* (%) or Mean (SD)	Incomplete Quarantine (*n*=64) *n* (%) or Mean (SD)	Complete Quarantine (*n*=350) *n* (%) or Mean (SD)	Statistical test
Maternal age (years) [Mean(SD)]	29.33 (5.18)	28.84 (4.50)	28.75 (5.49)	*F*=5.03*
<25 N(%)	104 (22.56)	12 (18.76)	64 (18.31)	df=2
25-34 N(%)	304 (66.12)	48 (75)	222 (63.38)	*p*=0.046
≥35 N(%)	52 (11.32)	4 (6.24)	64 (18.31)	
Para [Mean(SD)]	0.49 (0.72)	0.47 (0.50)	0.60 (0.48)	0.06
0 N(%)	286 (62.18)	34 (53.11)	182 (52.00)	
≥1 N(%)	174 (37.82)	30 (46.89)	163 (48.00)	
Abortion N(%)				0.14
Yes	86 (18.71)	8 (12.48)	78 (22.32)	
No	374 (81.29)	56 (87.52)	272 (77.68)	
Pregnancy age (weeks) [Mean(SD)]	26.54 (6.92)	26.66 (7.41)	27.56 (6.92)	X^2=5.01**
Second trimester N(%)	233 (50.69)	35 (54.67)	163 (46.64)	df=2
Third trimester N(%)	223 (49.31)	29 (45.33)	187 (53. 36)	*p*=0.041
Edu N(%)				
Primary school	12 (2.58)	0	2 (0.62)	X^2=9.03
Middle school	42 (9.12)	14 (21.90)	20 (5.68)	df=4
High school	180 (39.11)	18 (28.10)	108 (30.91)	*p*<0.001
University or higher	226 (49.09)	32 (50.00)	220 (62.89)	
Pregnancy type N(%)				X^2=6.81
Wanted pregnancy	358 (77.78)	52 (81.30)	306 (87.40)	df=2
Unwanted pregnancy	102 (22.22)	12 (18.70)	44 (12.60)	*p*=0.002
Insurance N(%)				X^2=4.99
Yes	360 (78.34)	46 (71.86)	298 (85.14)	df=2
No	100 (21.66)	18 (28.14)	52 (14.86)	*p*=0.048
Depression N(%)				
Normal N(%)	412 (89.52)	62 (96.90)	292 (83.40)	*p*=0.053
Low	17 (3.72)	1 (1.55)	31 (8.88)	
≥Moderate	31 (6.76)	1 (1.55)	27 (7.72)	
Anxiety N(%)				
Normal	390 (84.81)	54 (84.38)	289 (82.62)	*p*=0.271
Low	36 (7.82)	5 (7.82)	23 (6.52)	
Moderate	30 (6.47)	4 (6.24)	28 (8.00)	
Sever & Very Sever	4 (0.90)	1 (1.16)	10 (2.86)	
Stress N(%)				
Normal	435 (94.51)	57 (89.13)	295 (84.29)	*Z*=14.44***
Low	21 (4.47)	4 (6.32)	26 (7.43)	df=1
≥Moderate	4 (1.02)	3 (4.65)	29 (828)	*p*<0.001

*ANOVA test, **Chi-square, ***Z: Kruskal–Wallis (nonparametric test of ANOVA)

of abortion, and anxiety score, were similar for the study groups.

Table 2 shows mean (SD) DASS-21 summary scores by quarantine status. Compared with nonquarantine, quarantine had statistically higher mean (SD) DASS-21 total scores (15.46 (11.96) vs. 13.03 (11.56); p value = 0.002). Mean (SD) DASS-21 sub-scale scores were statistically higher for quarantine compared to nonquarantine only in stress domains 7.76 (6.03) vs. 5.96 (4.51); p value <0.001-. The highest mean DASS-21 total and stress sub-scale scores were observed among complete quarantine and significantly higher than the mean scores of nonquarantines.

Quarantine, as compared with nonquarantine, had higher odds of stress symptoms as measured using the DASS-21 questionnaire [Table 3]. The highest adjusted odds ratio (AOR) and 95% CI for the stress subscale score was associated with uninsured individuals 2.240, 95% CI: 1.320–3.801; p = 0.003 [Table 4].

Discussion

The main finding of this study is a higher mean score of the stress domain of DASS-21 in the quarantine group than nonquarantine group. Overall, our results showed an increased high mean score of stress in pregnant women compared to the other study statistic during COVID-19. For example, the latest data indicate that the mean score of stress in Iran is only 6.22 (4.25) in pregnant women,[23] compared to the higher mean score of stress found in this study (7.76 (6.03)). In line with the aforementioned review, the increased mean score of stress found in the current sample could be interpreted as quarantine effect of COVID-19 related, although further studies should confirm this association.

The result of one study indicates disruption of routine prenatal care and social lives due to the coronavirus pandemic increase the level of stress among pregnant women.[24] The result of our study also showed that the

Table 2: Summary of Depression Anxiety Stress Scale scores according to quarantine status

Index	No Quarantine (*n*=460)	Any Quarantine (*n*=414)	Incomplete Quarantine (*n*=64)	Complete Quarantine (*n*=350)	Test
DASS total score Mean (SD)	13.03 (8.56)	15.46 (8.96)	12.87 (7.90)	15.93 (8.47)	*Z*=9.34* df=4 *p*=0.002
DASS Depression sub-scale score Mean (SD)	3.68 (4.74)	3.88 (4.95)	3.22 (3.11)	3.77 (4.84)	*p*=0.549
DASS Anxiety sub-scale score Mean (SD)	3.38 (3.52)	3.82 (4.09)	3.91 (3.57)	3.80 (2.18)	*p*=0.088
DASS Stress sub-scale score Mean (SD)	5.96 (4.51)	7.76 (6.03)	5.75 (3.46)	8.12 (4.56)	*Z*=25.18 df=2 *p*<0.001

*Z: Kruskal–Wallis (nonparametric test of ANOVA)

Table 3: Adjusted odds ratio and 95% confidence interval for Depression Anxiety Stress Sub-Scale scores according to quarantine status

DASS items	No Quarantine (*n*=460)		Incomplete Quarantine (*n*=64)		Complete Quarantine (*n*=350)	
	n (%)	AOR**** (95% CI*****)	*n* (%)	AOR (95% CI)	*n* (%)	AOR (95% CI)
*DASS Dep score						
Normal (0-9)	413 (89.80)	1.00 (Referent)	63 (98.40)	1.00 (Referent)	310 (88.60)	1.00 (Referent)
Abnormal (≥10)	47 (10.20)	0.81 (0.48-1.35)	1 (1.60)	3.11 (0.91-15.71)	40 (11.40)	0.7 (0.42-1.16)
p-value for trend		0.414		0.062		0.168
**DASS Anx score						
Normal (0-7)	390 (84.80)	1.00 (Referent)	54 (84.40)	1.00 (Referent)	289 (82.60)	1.00 (Referent)
Abnormal (≥8)	70 (15.20)	0.89 (0.57-1.38)	10 (15.60)	650 (0.30-1.42)	61 (17.40)	0.96 (0.64-1.45)
p-value for trend		0.607		0.282		0.844
***DASS Str score						
Normal (0-14)	435 (94.60)	1.00 (Referent)	61 (95.30)	1.00 (Referent)	295 (84.30)	1.00 (Referent)
Abnormal (≥14)	25 (5.40)	2.33 (0.94-5.70)	3 (4.70)	1.654 (0.84-5.80)	55 (15.70)	3.24 (1.90-5.51)
p-value for trend		0.089		0.743		<0.001

Note: Adjusted for maternal age, education, and unplanned pregnancy. *DASS Depression Sub-scale score, **DASS Anxiety sub-scale score, *** DASS Stress sub-scale score, **** Adjusted Odds Ratio, *****Confidence Interval

Table 4: Factors related to stress in stepwise logistic regression analysis

Factors	B*	S.E.**	Wald	df	*p*	AOR***	95% Confidence Interval	
							Lower	Upper
Para	-0.22	0.27	0.69	1	0.406	0.80	0.47	1.35
Education	-0.16	0.19	0.70	1	0.402	0.85	0.59	1.24
Pregnancy age	-0.24	0.24	0.95	1	0.330	0.79	0.49	1.27
Younger age	0.54	0.23	5.28	1	0.022	1.71	1.08	2.69
Uninsurance coverage	0.81	0.27	8.93	1	0.003	2.24	1.32	3.80
Husband job	0.21	0.27	0.61	1	0.43	1.234	0.73	2.09
Unwanted pregnancy	0.69	0.30	5.30	1	0.021	1.99	1.11	3.59
Complete quarantine	0.71	0.14	26.41	1	0.000	2.03	1.55	2.65
Constant	0.68	0.73	0.86	1	0.355	1.97		

*Beta (Coefficient), **Standard Error, *** Adjusted Odds Ratio

stress level is higher among self-quarantine people during the corona virus epidemic. Therefore, it can be concluded that people who are suspected of corona virus, who are also quarantined, bear additional stress compared to others.

The results of this research showed that the level of depression (mild to severe) and mean score of anxiety in women's self-quarantined differed from those not quarantined, but these differences weren't statistically significant. The finding of different studies shows the psychological effects of quarantine can differ from stress to anxiety, depression, and other emotional disorders.[25-27] Contrary to the findings of the previous study, we did not find high anxiety in pregnant women due to the difference in the anxiety scale and the location of the study. Additionally, these results go beyond previous reports about the relationship between self-quarantine and anxiety and not only the effect of COVID-19.[28] It is intriguing that the self-quarantine affected the mental health problems such as stress and not anxiety or depression in our study. The findings are directly in line with previous findings that self-quarantine increases the incidence of stress by enhancing maladaptive cognition, and it is known as one of the stressful events.[29,30]

Interestingly, we found that self-quarantine may not increase depression and anxiety, as quarantine was not mandatory, and there was no severe traffic restriction by the government, and individuals continued to self-quarantine by choice. Though the literature on the mental health effects of quarantine and disease outbreaks mandatory or choice are scarce, one study has shown that mandatory quarantine affects more prevalent psychological distress.[2]

The results showed that in the self-quarantined group, women aged under 35 years had more stress. This finding is consistent with the results of previous studies.[23,31] Also, women in the self-quarantine group experienced more stress with an unwanted pregnancy. Due to having severe mental symptoms during pregnancy, these women have more stress in a normal situation, if quarantine is added, the effects on their health can be severe.[32] In the current study, women without insurance experienced higher stress and this finding differed from the results of the other study due to women who were not covered by insurance experiencing higher stress.[33] This finding could be the result of quarantine or an unprecedentedly high rate of inflation in Iran, which is stressful due to the impoverishment of most Iranians, lack of insurance for pregnancy care, and the cost of childbirth.

To the best of our knowledge, the current study is the first study correlation between self-quarantine and mental health in pregnant women that presents a unique correlation between different variables. Considering that this study was conducted in all governmental health centers of two cities in Iran and in the form of a census among pregnant women, it is unique in its kind. The novelty of the research is that the mental health status of pregnant women in incomplete and complete quarantine groups was investigated with women who were not quarantined, which gave us valuable information about the effects of quarantine. Given that this study is a descriptive method, researchers could not have isolated the effect of quarantine from the fear of disease or separated the anxiety caused by quarantine with the complications of the disease itself. Also, it cannot be said certainty that self-quarantine has caused more stress in pregnant mothers. Perhaps people with more stress have quarantined themselves, and this is one of the limitations of descriptive studies, which do not identify which circumstances yield the former and which the latter.

Conclusion

Self-quarantine during the COVID-19 pandemic has been related to mental health issues in pregnant women reflected by high-stress levels, specifically, among women of younger age, uninsured, and unwanted pregnancies. Considering the positive relationship between quarantine and stress in pregnant women, it is suggested that virtual mental health support is provided by midwives or primary healthcare providers.

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Conflicts of interest

Nothing to declare.

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