

# Correlation between Knowledge, Preventive Behaviors, and COVID-19 Anxiety with Perceived Stress among Pregnant Women: A Cross-sectional Study

Maedeh Aalaei (MD)<sup>1</sup>, Fatemeh Abbasalizadeh (MD)<sup>2</sup>, Kosar Sarvaran (MD)<sup>1</sup>, Azita Fathnezhad-Kazemi (Ph.D)<sup>3,4\*</sup>

<sup>1</sup> Medical Student, Students Research Committee, Tabriz Medical Sciences, Islamic Azad University, Tabriz, Iran

<sup>2</sup> Professor, Women's Reproductive Health Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

<sup>3</sup> Assistant Professor, Women's Reproductive and Mental Health Research Center, Tabriz Medical Sciences, Islamic Azad University, Tabriz, Iran

<sup>4</sup> Department of Midwifery, Faculty of Medical Sciences, Tabriz Medical Sciences, Islamic Azad University, Tabriz, Iran

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## ABSTRACT

**Background & aim:** Psychological and behavioral factors caused by COVID-19 adversely affect physical and mental well-being, especially in pregnant women. The current study was performed to evaluate the correlation between knowledge, preventive behaviors, and COVID-19 anxiety with perceived stress among pregnant women.

**Methods:** This cross-sectional study was conducted among 290 pregnant women referring to two hospitals in Tabriz, Iran in the second six months of 2021. All participants were selected through convenient sampling. Data were collected using demographic-obstetric questionnaire, knowledge of COVID-19 questionnaire, preventive behaviors scale against COVID-19, the Corona Disease Anxiety Scale (CDAS), and the Cohen Perceived Stress Scale (PSS). Data were analyzed by SPSS software version 24 and descriptive and interpretive statistics.

**Results:** Based on the results, 23.8% and 38.6% of participants had severe anxiety and stress, respectively. There was a direct and significant correlation between knowledge and preventive behaviors ( $r=0.426$ ,  $P<0.001$ ). The results of univariate regression showed that the preventive behaviors and COVID-19 anxiety explain 1.7% ( $\beta=0.130$ ,  $SE=0.123$ ,  $P=0.027$ ) and 5.51% ( $\beta=0.742$ ,  $SE=0.034$ ,  $P<0.001$ ) of stress changes, respectively. In univariate linear regression, a moderate correlation was observed between the three variables including employment status, preventive behaviors, and anxiety with perceived stress ( $R=0.557$ ), and anxiety had the highest regression coefficient ( $\beta=-0.665$ ).

**Conclusion:** The current study highlighted the importance of measuring knowledge, preventive behaviors, COVID-19 anxiety and perceived stress in pregnant women during COVID-19 pandemic. This assessment will assist healthcare providers in delivering appropriate services during the future pandemics.

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## Introduction

The world faced a major pandemic in the 21st century, to the extent that it became a crucial and stressful situation (1-3). The World Health Organization announced a public health emergency due to the rapid spread of COVID-19 (4). The virus causes a wide range of diseases

(5) and its mortality rate is more than 4.3% (6). Pregnant mothers and fetuses are more vulnerable to emerging infections (7). Although not enough information is available about complications associated with COVID-19 in pregnancy, reports show that pregnant women

\* Corresponding author; Azita Fathnezhad-Kazemi, Assistant Professor, Women's Reproductive and Mental Health Research Center, Tabriz Medical Sciences, Islamic Azad University, Tabriz, Iran. Tel: 04133271080; Email: afnkazemi@gmail.com

experience various physical and mental health problems, including stress and anxiety (8). According to the researchers, psychological and behavioral agents may affect psychic health in a pandemic crisis (8-9).

Raising public knowledge and consciousness is important to dealing with mental health difficulties because adequate knowledge can affect people engaging in prophylactic behaviors in the face of further infection (10-11). Recent studies have shown that insufficient knowledge and receiving imprecise information damage people's mental health (12-13). Therefore, adequate knowledge about different aspects of the Coronavirus disease, such as routes of transmission, factors related to the severity and risk of the disease, and how to prevent it, is very important in maintaining health (10). Also, knowledge and the ability to control behavior can modify individual's attitudes and have emotional and behavioral consequences (14-15). So, the capability to recognize the current circumstances as a key process can be efficient in dealing with stressful situations (16). Fear and anxiety seem to be important factors influencing mental health in a crisis (17). Pregnant women are more prone to fear and anxiety with negative emotions due to the special situation (18). Fear and anxiety caused by an unfamiliar condition not only reduce the human immune system (19) but also can damage health and ultimately lead to adverse outcomes for both mother and fetus (20). People show a negative mood in more threatening and uncontrollable conditions, as well as how to deal with stressful situations will significantly affect mental health (21). The Coronavirus disease pandemic is no exception to this principle and depending on the circumstances; it can affect various aspects of health including mental health. The knowledge about the situation is important in controlling the behaviors, as has been reported in similar cases such as SARS, Ebola, and H1N1 (22-24). However, people's knowledge and behaviors about various diseases can be different in disparate age groups, periods of life, and different places. Therefore, this study was designed and implemented to evaluate the correlation between knowledge, preventive behaviors, and

COVID-19 anxiety with perceived stress among pregnant women.

## Materials and Methods

This cross-sectional study was conducted in two large gynecological hospitals in Tabriz, northwestern Iran. All pregnant women who received prenatal care during the second 6 months of 2021 were included in the study. This study was approved by the Ethics Committee of the Islamic Azad University, Medical Sciences, Tabriz Branch, Iran (code number: IR.IAU.TABRIZ.REC.1400.100).

After obtaining permission from the Ethics Committee and hospital officials, pregnant women were selected by an available sampling method based on inclusion criteria.

Inclusion criteria were pregnant women aged 18-40 years old, singleton pregnancy, gestational age  $\geq 10$  weeks, no complications, ability to read and write, and no stressful events during the last 6 months such as the death of a family member and divorce. Pregnant women who did not want to continue participating in the study or who did not complete the questionnaires were excluded from the study.

The sample size was calculated based on the study by Masjoudi et al. (2022) in Iran (25) related to the Corona Disease Anxiety Scale, 95% confidence coefficient, and 90% statistical power, an acceptable error of 0.07 and the mean ( $m = 18.20$ ), and the standard deviation of (10.45), therefore the sample size was determined to be 260 cases with the following formula. Considering a possible drop-out rate of 10%, the final sample size was estimated to be 290 subjects. [Study parameters:  $\alpha = 0.0500$ , power = 0.9000,  $d = 1.274$ ,  $m = 18.20$ ,  $SD = 10.45$ ].

$$n = \frac{(Z_1 - \frac{\alpha}{2})^2 \times s^2}{d^2}$$

Data collection tools included 5 questionnaires. The demographic-obstetric questionnaire included age, education, employment status, income, number of pregnancies, and gestational age. Corona Disease Anxiety Scale (CDAS): This questionnaire was developed in Iran by Alipour et al. (2020) (26). It consists of 18 items and 2 subscales: psychological and physical symptoms and is scored on a 4-point Likert scale. The lowest and highest scores are 0 and 54. High

scores indicate a higher level of anxiety. The total CDAS score was divided into 0-16 (mild), 17-29 (moderate), and 30-54 (severe). The reliability of the questionnaire was obtained using Cronbach's alpha method for the psychological symptoms factor (0.879), physical symptoms (0.861), and the whole questionnaire (0.919). Cohen et al. (1983) created the Cohen Perceived Stress Scale (PSS) scale with 14 questions (27). Items are scored on a Likert scale from 0 (none) to 4 (too many), with a range from 0 to 56, and the higher scores indicate a high level of perceived stress. Cohen et al. (1998) calculated the reliability of the PSS test-retest to be 0.85 and the internal consistency of the test to be 0.84 to 0.86. In Iran, Marofizadeh et al. (2014) reported that Cronbach's alpha coefficient for the PSS-14 was 0.90 (28). The level of stress was classified into mild, moderate, and severe based on quartiles. High perceived stress was defined as a PSS score >30 (25). The Knowledge of COVID-19 Questionnaire includes 12 items that evaluate people's level of knowledge about COVID-19. The responses are rated on a 2-point Likert scale, 1 = yes and 0 = no, with higher scores indicating a higher level of knowledge (29). Preventive Behaviors Scale against COVID-19: this was prepared according to the criteria and principles provided by WHO for preventive behaviors related to COVID-19 infection and transmission. The scale has ten items which are rated on a Likert scale of never = 1, Sometimes = 2, often = 3, and always = 4. The range of scores varies from 10-40 (30).

To determine the level of knowledge and preventive behaviors against COVID-19, based on similar previous studies (29), the questionnaire was adapted and modified based on the guidelines of clinical and social management of COVID-19 by Iran's Minister of Health and WHO and designed it by asking some questions in various fields, including knowledge and preventive behaviors against COVID-19. The face and content validity of this questionnaire was confirmed by a panel of experts. Content Validity Ratio (CVR) and Content Validity Index (CVI) were calculated to be more than 0.94 and 0.97, respectively.

A pilot study was performed on 30 pregnant women and the reliability of the questionnaires

was determined using the retest method. Intra-class correlation coefficient (confidence interval) and Cronbach's alpha for COVID-19 prevention, knowledge, and behaviors were reported as [0.97 (0.94-0.98), and 0.8], [0.91 (0.89-0.93) and 0.86], [0.87 (0.85-0.9) and 0.91], respectively. ICC (confidence interval) and Cronbach's alpha for perceived anxiety and stress were reported as [0.98 (0.97-0.99) and 0.95], [0.93 (0.91-0.95) and 0.79].

Informed consent was obtained after explaining the objectives of the research, and then they were asked to complete the anonymous questionnaires by the self-report method in a private room. The questionnaire completing lasted from 15 min to 20 min.

Data were analyzed by SPSS software (version 24). First of all, frequency, percentage, mean, and standard deviation were determined using descriptive statistics. The Kolmogorov-Smirnov test was used to check the normality of the data. Only the perceived stress variable had a normal distribution. Spearman correlation was used to test the main hypotheses of the research. ANOVA, independent T, and their non-parametric equivalent tests were used to determine the relationship between demographic and obstetric variables with the main variables of the research. Then, independent variables, with  $P \leq 0.05$  on bivariate tests were inserted into the univariate linear regression model (enter method).  $P < 0.05$  was considered statistically significant.

## Results

The mean of maternal age, gestational age, and number of pregnancies were 30.64 (5.83) years, 23.39 (7.78) weeks, and 2.05 (1.15), respectively. The age range of the majority of participants was 20-29 years. More than two-thirds of the participants had an educational level of more than a diploma and were housewives. In terms of obstetric characteristics, about 40% of the participants were nulliparous and 56% were in the second trimester of pregnancy (Table 1).

Table 2 presents the main research variables. The mean score of knowledge about COVID-19 was 7.99 with a range of 0-12 [Median= 8 (IQR: 7-9)] which indicates a moderate level of knowledge. The mean score of COVID-19 prevention behaviors was 34 with a range of 0-

40 [Median= 35 (IQR: 31-37)] suggesting a moderate to high rate of prevention behaviors. However, the COVID-19 anxiety score, although lower than the mean score with a range of 0-56 [Median= 20 (IQR: 10-29)], is still high, with 176

(60.7%) pregnant women reporting moderate to high level of anxiety. The mean score of perceived stress among all participants was 27.62, which is an average score. However, 112 pregnant women reported higher stress.

**Table 1.** Participant demographic-obstetric characteristics (N = 290)

Variable	Frequency (%)
<b>Mother's Age groups (year)</b>	
<20	15 (5.2)
20-29	123 (42.4)
30-40	152 (52.4)
<b>Mother's Educational status</b>	
Primary school	13 (4.5)
Secondary school	43 (14.8)
Diploma	93 (32.1)
University	141 (48.6)
<b>Mother's Employment status</b>	
Housewife	201 (69.3)
Employed	89 (39.7)
<b>Spouse's Educational status</b>	
Primary school	7 (2.4)
Secondary school	33 (11.4)
Diploma	91 (31.4)
University	159 (54.8)
<b>Spouse's Employment status</b>	
unemployed	27 (9.3)
Employed	37 (12.8)
Self-employed	226 (77.9)
<b>Household Income</b>	
< 5 million Rials	185 (63.8)
5-10 million Rials	85 (29.3)
> 10 million Rials	20 (6.9)
<b>Adequacy of income</b>	
Insufficient income	46 (15.9)
Medium income	212 (73.1)
Sufficient income	32 (11.0)
<b>Number of pregnancies</b>	
1	115 (39.7)
2	96 (33.1)
≥ 3	79 (27.2)
<b>Gestational age (weeks)</b>	
≥14	39 (13.4)
15-28	162 (55.9)
29≥	89 (30.7)

Correlation analysis showed a direct and significant relationship between awareness and preventive behaviors ( $r=0.426$ ,  $P<0.001$ , moderate), and between preventive behavior

with anxiety caused by COVID-19 ( $r=0.161$ ,  $P<0.001$ , weak). Also, a relationship was found between COVID-19 anxiety with perceived stress ( $r=0.125$ ,  $P<0.05$ , weak).

**Table2.** The score and correlations between the variables of the study

Variables	Mean	SD	1	2	3	4	5	6
Knowledge	7.99	1.70	-	0.426**	0.042 <sup>a</sup>	0.042 <sup>b</sup>	0.072 <sup>c</sup>	0.024 <sup>d</sup>
Preventive behavior	34.00	4.27		-	0.161**	0.161**	0.278**	0.125*
Total-Anxiety of COVID-19	20.12	10.78			-	0.908**	0.823**	0.687**
subscale- psychological symptoms	13.66	7.22				-	0.628**	0.687**
subscale-physical symptoms	6.21	4.90					-	0.577**
perceived stress	27.62	9.42						-
<b>Level of COVID-19 Anxiety</b>	<b>N (%)</b>							
mild	114 (39.3)							
moderate	107 (36.9)							
severe	69 (23.8)							
<b>Level of perceived stress</b>	<b>N (%)</b>							
low	178 (61.4)							
High	112 (38.6)							

\*P<0.05, \*\*P<0.001, <sup>a</sup>P=0.480, <sup>b</sup>p= 0.480, <sup>c</sup>P= 0.220, <sup>d</sup>P= 0.685

As shown in Table 3, awareness was higher among pregnant women over 30 years of age compared to younger ones and also higher among employed pregnant women with a university education, but these differences were not significant. Only there was a significant difference between the education of the spouse and the level of awareness of pregnant women. Also, the mean score of preventive behaviors was higher among highly educated and employed pregnant women, but no significant difference was found between any of the demographic-obstetric variables with preventive behaviors. In terms of Corona Disease Anxiety, although the rate was higher among educated and employed pregnant women in the age group of 20-29 years, however, no significant difference was observed between demographic-obstetric characteristics with Corona Disease Anxiety. A comparison of perceived stress between different groups showed that the level of stress among employed pregnant women was significantly higher than among housewives (29.37 vs. 26.84, P=0.035). No significant difference was found between other demographic-obstetric characteristics with perceived stress (Table 3).

After examining the correlation between the main variables of the study and the relationship between demographic characteristics and obstetrics with perceived stress, 3 regression models were performed to determine the contribution of variables in predicting perceived stress among pregnant women. In the first and second models, preventive behaviors and anxiety caused by COVID-19 were investigated using univariate linear regression. In the first step, 1.7% of the perceived stress changes were explained by preventive behaviors, so the results showed that by increasing a standard deviation in the preventive behaviors variable, the perceived stress score increased by 0.130 standard deviations. According to the second model, 5.51 perceived stress changes were related to the COVID-19-induced anxiety variable ( $\beta=0.742$ , SE=0.034, P<0.001). In the third step, all three variables of employment status, preventive behavior, and anxiety caused by COVID-19 were entered into the model simultaneously, which showed a moderate correlation between these three variables with the perceived stress score (R=0.557). In this model, anxiety obtained the highest regression coefficient ( $\beta=-0.665$ ) (Table 4).

**Table 3.** The main variables differences across the demographic-obstetric characteristics

Variable	Knowledge	Preventive behavior	Total-Anxiety of covid-19	Perceived Stress
<b>Mother's Age groups (year)</b>				
<20	7.87 (1.68)	34.07 (5.41)	17.40 (10.14)	26.87 (8.95)
20-29	7.96 (1.79)	34.49 (4.22)	21.41 (10.78)	28.49 (10.02)
30-40	8.03 (1.64)	33.59 (4.55)	19.34 (10.79)	26.99 (8.96)
F	0.106	1.370	1.767	0.911
<b>*P-value</b>	0.832	0.243	0.159	0.403
<b>Mother's Educational status</b>				
Primary school	7.23 (1.83)	31.08 (7.51)	14.08 (8.15)	24.62 (8.84)
Secondary school	8.07 (1.80)	33.53 (4.33)	17.91 (10.03)	26.00 (8.90)
Diploma	7.86 (1.72)	34.10 (4.20)	20.18 (10.10)	26.78 (9.03)
University	8.13 (1.64)	34.34 (4.26)	21.31 (11.44)	28.94 (9.76)
F	1.379	2.326	2.579	2.045
<b>*P-value</b>	0.330	0.448	0.071	0.108
<b>Mother's Employment status</b>				
Housewife	7.87 (1.64)	33.58 (4.62)	19.44 (10.54)	26.84 (9.25)
Employed	8.27 (1.81)	34.93 (3.96)	21.66 (11.22)	29.37 (9.62)
t	-1.844	-2.392	-1.624	-2.121
<b>**P-value</b>	0.066	0.017	0.105	0.035
<b>Spouse's Educational status</b>				
Primary school	7.14 (2.19)	34.57 (3.82)	16.71 (11.58)	26.14 (11.09)
Secondary school	7.97 (1.40)	33.09 (4.66)	17.30 (10.16)	27.82 (9.43)
Diploma	7.84 (1.89)	33.81 (4.34)	19.56 (9.63)	26.52 (8.55)
University	8.13 (1.62)	34.00 (4.47)	21.18 (11.42)	28.27 (9.84)
F	1.163	0.729	1.581	0.728
<b>*P-value</b>	0.324	0.536	0.194	0.536
<b>Spouse's Employment status</b>				
unemployed	7.94 (1.65)	33.88 (4.41)	19.41 (10.41)	27.31(8.98)
Employed	8.65 (1.73)	34.68 (4.16)	23.46 (11.55)	29.59 (11.00)
Self-employed	7.56 (1.92)	34.07 (5.36)	21.52 (12.16)	27.52 (10.68)
F	3.806	0.511	2.519	0.939
<b>*P-value</b>	0.023	0.600	0.082	0.392
<b>Household Income</b>				
< 5 million Rials	7.98 (1.70)	34.11 (4.50)	19.80 (10.73)	27.38 (9.41)
5-10 million Rials	7.78 (1.69)	33.61 (4.49)	20.46 (10.84)	28.21 (9.31)
> 10 million Rials	8.60 (1.72)	34.60 (4.47)	21.65 (11.42)	27.25 (10.41)
F	1.491	0.553	0.323	0.240
<b>*P-value</b>	0.227	0.576	0.724	0.787
<b>Adequacy of income</b>				
Insufficient income	8.15 (1.71)	34.30 (4.47)	19.78 (10.75)	27.91 (10.30)
Medium income	7.92 (1.74)	33.88 (4.53)	20.34 (10.98)	27.75 (9.31)
Sufficient income	8.28 (1.42)	34.34 (4.30)	19.16 (9.76)	26.28 (9.05)
F	0.876	0.279	0.193	0.365
<b>*P-value</b>	0.417	0.756	0.825	0.695
<b>Number of pregnancies</b>				
1	7.96 (1.78)	34.55 (4.46)	20.60 (11.09)	27.79 (9.82)
2	8.11 (1.69)	34.22 (3.95)	20.74 (10.22)	27.67 (9.04)
≥ 3	7.90 (1.61)	32.92 (4.91)	18.67 (11.00)	27.30 (9.39)
F	0.389	3.318	0.985	0.064
<b>*P-value</b>	0.678	0.038	0.375	0.938
<b>Gestational age (weeks)</b>				
≥14	7.90 (1.77)	34.26 (3.74)	18.18 (11.61)	27.23 (9.37)
15-28	8.09 (1.74)	34.14 (4.48)	20.27 (9.74)	27.32 (9.65)
29≥	7.87 (1.61)	33.62 (4.75)	20.71 (9.74)	28.33 (9.08)

Variable	Knowledge	Preventive behavior	Total-Anxiety of covid-19	Perceived Stress
F	0.552	0.469	0.776	0.363
*P-value	0.577	0.626	0.461	0.696

\* ANOVA and Kruskal-Wallis, \*\* t-test and Manvitney U test

**Table 4.** Effect of preventive behavior, anxiety, and demographic characteristics on self-care based on univariate and multivariate linear regression

Predictors	Unstandar dized Coefficient , $\beta$	SE	standard ized Coefficie nt, $\beta$	P-value	95% CI	R2	Adjusted R <sup>2</sup>
<b>Model1</b>							
<b>Preventive behavior</b>	0.274	0.123	0.130	0.027	0.032 to 0.516	0.017	0.013
<b>Model 2</b>							
<b>Total-Anxiety</b>	0.649	0.034	0.742	< 0.001	0.581 to 0.717	0.551	0.550
<b>Model 3</b>							
<b>Mother's Job</b>	1.229	0.813	0.060	0.132	- 0.371 to 2.828		
<b>Preventive behavior</b>	-0.115	0.086	- 0.055	0.181	- 0.285 to 0.054	0.557	0.552
<b>Total-Anxiety</b>	0.655	0.035	0.750	< 0.001	0.585 to 0.725		

## Discussion

The present study was performed to examine the correlation between knowledge, preventive behaviors, and COVID-19 anxiety with perceived stress among pregnant women. The results of the current study showed that the mean score of the level of knowledge was moderate to high. Employed and highly educated women had a higher level of knowledge. Also, higher scores of preventive behaviors were obtained, which indicates the proper performance of women in performing protective behaviors such as wearing a mask and observing social distancing. Moreover, a positive relationship was observed between knowledge and performing preventive behaviors. These results are comparable to the study conducted by Aduloju et al. (2021) (31) who reported that more than 80% of participants had above-average levels of awareness about COVID-19 and highly educated pregnant women had higher awareness scores. Also, they stated that most pregnant women had good attitudes and practices in performing preventive behaviors. Other studies on the general population samples of China (32), Malaysia (33), and Ecuador (4) have also reported moderate to high scores in the knowledge of COVID-19. Researchers also reported that housewives with

low education had a low level of knowledge about COVID-19 (16). Moderate to high levels of knowledge in pregnant women can be due to the provision of continuous health care by the health system for pregnant women as a high-risk group, however, there is a need for redoubled efforts to provide more information for high-risk groups such as pregnant women, because it seems that the average score of knowledge (7.99) is not so good. However, other studies have reported that women compared to men performed more preventative behaviors for COVID-19 (34-36). This could be due to women taking more responsibility for their health and that of family members. It should be noted that in different studies, different questionnaires with different scores have been used to assess awareness and preventive behaviors, thus it is not possible to accurately compare knowledge levels and preventive behaviors.

Moreover, analysis of data in the current study showed that the mean score of anxiety of COVID-19 was lower than average, but the majority of subjects experienced moderate to severe anxiety. Also, countries such as China (3), India (37), Jordan (38), and Iran (39), have also pointed to increased levels of stress, anxiety, and distress during the COVID-19 pandemic. According to the study conducted at the beginning of the COVID-19 outbreak, the level of

anxiety experienced by the Iranian public was higher than the anxiety experienced by the Chinese people; factors such as the level of social support were the effective factors causing anxiety (40). In the present study, a significant relationship was found between preventive behaviors and coronavirus disease anxiety. This result was similar to the finding of the study that the researchers pointed to the positive role of fear and anxiety caused by COVID-19 to increase preventive behaviors such as hand washing and social distancing (41). On the other hand, some other studies have shown that people who have a high level of control over the disease have better mental health, well-being, and performance (41). However, some researchers stated that a kind of effective and functional fear and anxiety is necessary to improve preventive function. However, long-term fear and anxiety caused by illness may have adverse effects on preventive behavior, and lead to anxiety, and psychological crises (42).

In addition, a survey by Masjoudi et al. (2022) on perceived stress levels in pregnant women found that nearly 40% of participants experienced high levels of stress (25). Anxiety, stress, and depression were high among pregnant women in Hong Kong (44) and Greece (44). Studies on the SARS pandemic have shown that during pandemics and quarantine, separation from friends and family, isolation, and financial consequences can have adverse effects on mental health, especially in pregnant women (45). Various studies in the field of mental health during the outbreak of COVID-19 reported that COVID-19 has negative effects on mental health (32, 38, 25).

Finally, according to the findings of this study, there was a direct correlation between corona disease anxiety and perceived stress in pregnant women. In the study of Ahrsu and colleagues (46), a significant and direct relationship was reported between fear of disease and psychological symptoms such as depression. Their results were in line with the results of the present study. Different researchers have reported that COVID-19 has a negative impact on the mental health of people, especially pregnant women (47-48), however according to reports, reduced mental health of pregnant

women can negatively affect pregnancy outcomes.

The present study had some limitations. The study was conducted over a specific period during the outbreak of COVID-19 disease. The non-random selection of pregnant women and their selection from two referral hospitals were other limitations of the study that may indicate selection bias. Third, self-report of anxiety and stress levels may not be an accurate assessment of mental health status. However, in this study, standard scales were used to assess anxiety and stress. The generalization of the results to other health disciplines in other areas of Iran is unclear and more studies conducted in different disciplines are needed.

## Conclusion

In general, in the middle stage of COVID-19 prevalence in Iran, the level of knowledge among pregnant women was moderate and in terms of preventive behaviors against COVID-19, the performance of pregnant women was generally good. However, COVID-19 anxiety and perceived stress were common. According to the results of the present study, a positive relationship was observed between preventive behaviors and anxiety, and finally, anxiety was perceived as a predictor variable for stress. Undoubtedly, the demand for health services, including mental health, has increased. The present study identified the factors affecting stress that can be used as a guide for the implementation of appropriate programs. Therefore, it is essential that primary care providers be equipped to deal effectively with persistent stressors. Also, they should focus on assessing the mental health and well-being of pregnant women and their risk factors and protective behaviors.

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## Conflicts of interest

The authors declared no conflicts of interest.

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