

# Evaluation of Coronavirus Anxiety in Pregnant Women on Apgar Score and Birth Weight After One Year of Coronavirus Outbreak (Case Study: Zabol, Iran)

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## ABSTRACT

**Background & Objective:** Pregnancy is a stressful event in and of itself, which may have an impact on the present prevalence of COVID-19 illness. It is crucial to think about what factors can help pregnant women cope with the anxiety brought on by the COVID-19 outbreak. The purpose of this study was to determine the prevalence of COVID-19 in pregnant women, as well as the impact of COVID-19 anxiety on pregnant women's Apgar scores and birth weights of newborns.

**Materials & Methods:** From early January to late March 2021, 102 pregnant women were included in this descriptive cross-sectional study using any accessible sampling method. Questionnaires such as the "Demographic" and "Corona Anxiety Scale" were used to collect data. SPSS software version 22 was used to analyze the data.

**Results:** The mean score of total anxiety caused by COVID-19 in the pregnant women was  $20.88 \pm 21.08$ , which was moderate. Among the components of anxiety, the mean score of psychological symptoms ( $13.05 \pm 5.31$ ) of pregnant women was higher than physical symptoms ( $5.64 \pm 5.72$ ). There was no statistically significant link between demographic characteristics and COVID-19-induced anxiety ( $P > 0.05$ ). The findings also revealed no statistically significant connection between COVID-19-induced anxiety and newborn weight or Apgar score 1 and 5 minutes after birth ( $P > 0.05$ ).

**Conclusion:** The definitive incidence of COVID-19 in pregnant women was low. They experienced a moderate level of anxiety caused by COVID-19, which requires the necessary measurements to be taken by the relevant authorities, family and others to reduce this anxiety during the coronavirus pandemic.

**Keywords:** Anxiety, Apgar, COVID-19, Pregnancy, Pregnant women, Newborns



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## Introduction

Despite very good scientific advances in the field of physical problems during pregnancy, mental health problems are still an important issue for the pregnant women (1). Pregnancy has enormous impact on women's lives because women are more sensitive to psychiatric problems. It is also accompanied by many physical and psychological changes (2-4). Motherhood is among the most joyful and evolutionary events of a woman's life however, it is still one of the most stressful periods of her life. Therefore, it needs serious attention owing to the changes, and physiological and psychological adaptations (3). Understanding the significant responsibilities and duties of parenthood, as well as conflicting sensations of enthusiasm, worry,

terror, and anxiety may generate instability in the pregnant woman (5). According to the studies, the prevalence of mood disorders is in higher rate during pregnancy than those of other times in a woman's life, and in most pregnancies the physical and physiological features of the pregnancy are prioritized above the mental and psychological dimensions (6). It seems that the stressful and anxious period of pregnancy on the one hand and the panic and anxiety caused by the outbreak of the new coronavirus on the other hand may create instability in all members of society, especially pregnant women. Given the widespread prevalence of the new coronavirus and COVID-19 disease, the psychological effects of this viral disease on people's

mental health are currently at various levels. One of the vulnerable groups that need special attention is pregnant women (3). The new virus, known as the coronavirus-2, belongs to a broad virus family (*Coronaviridae*) that may cause respiratory diseases ranging from the common cold to more serious disorders like SARS and MERS. The new virus disease was termed COVID-19, as its outbreak began in Wuhan, China, in December 2019 (7). In some contaminated geographical areas the COVID-19 spreads quickly (7, 8). In Iran, the coronavirus spreads swiftly, putting people's physical and mental health in jeopardy. Fever, cough, and difficulty breathing are some indications and symptoms of the virus, which range from moderate to severe (7, 9). Anxiety is a typical symptom among people with chronic respiratory diseases, and it can have a big impact on the quality of their life. Almost all anxiety evaluations include physical cases that may overlap with symptoms of chronic respiratory disease or pharmaceutical side effects (10). About two-thirds of chronic respiratory patients suffer from clinical anxiety. There has been little research on anxiety in the patients with severe respiratory problems (11). Anxiety over COVID-19 is frequent and it appears to be linked to the people's lack of familiarity with the virus. Fear from unknowns diminishes the immunity system function (12). People are looking for more information to help them cope with their worry at this time (13). Stress and worry can compromise the immune system, making people more susceptible to diseases like coronary heart diseases (7). There have been little research on COVID-19 anxiety around the world, and most of them have been done in non-pregnant individuals. According to Roy *et al.*, the level of anxiety during coronary heart disease is extremely high (14). According to Rajkumar, common psychological symptoms to coronary heart disease anxiety include worry, depression, and health concerns (15). Li *et al.*, showed that the wide spread of coronavirus increases negative emotions such as anxiety, depression, and anger, and thus decreases positive emotions such as happiness (16). Wang *et al.*, believed that the crisis caused by COVID-19 disease has led to the significant effects on the general mental health of the community and widespread depression and anxiety (17). According to a study by Corbett *et al.*, (2020), the COVID-19 epidemic has increased anxiousness among pregnant women, with their primary concern of COVID-19 effect on elderly relatives, followed by their children, and finally the unborn child (18). In a different study, Wu *et al.*, from China found that depression increased during the COVID-19 outbreak among pregnant women (19). For fear of getting COVID-19, some pregnant moms may avoid going to a health center or doctor for follow-up on their status and that of the fetus (20). According to the previous studies, pregnancy poisoning, pregnancy depression, nausea and vomiting throughout pregnancy, premature birth, low birth weight, and even a low Apgar score in the newborn are all linked to the increased levels of anxiety and stress during pregnancy

(21, 22). Health specialists all over the world have stated that the current epidemic is not only a medical problem and phenomenon, but also impacts on people's psychological well-being, leading to a variety of panic disorders and stress (23). The World Health Organization (WHO) has been concerned about the harmful impact of the COVID-19 epidemic on people's mental health since the outbreak began and it has emphasized its importance to those with coronary heart disease, along with personal hygiene (24). Based on the above studies about the incidence of COVID-19 on pregnant women and the effect of anxiety on women and their children around the world, we decided to evaluate (I) the level of anxiety caused by COVID-19 among pregnant women; and (II) the effect of anxiety caused by COVID-19 on Apgar score and neonatal weight after one year of coronavirus prevalence in Zabol, Iran.

## Materials and Methods

Between January and March 2021, 102 pregnant women referred to health centers in Zabol (Iran) were studied in a descriptive cross-sectional study. The consent to participate in the study, and completion of the questionnaires were both obtained for inclusion. The exclusion criteria included unhappiness with research participation and inadequate questionnaire completion. The samples were collected from the first of December 2020 until the end of March 2021. The research project was approved by Zabol University of Medical Sciences ethics committee and the questionnaires for this study were developed and distributed to participants.

### Data Collection Tools

The "Demographic Information Questionnaire" and the "Corona Disease Anxiety Scale" were used as measurement instruments in this study. Age, education, type of delivery, gestational age, existence of a kid or middle-aged kid, occupation, and history of underlying diseases were among the questions on the demographic information questionnaire. The Coronavirus Anxiety Score was calculated to quantify the anxiety produced by the prevalence of coronavirus. This questionnaire was created and validated to assess anxiety caused by the coronavirus outbreak in Iran. This tool final version had 18 items and two components (agents). Questions 1 to 9 were used to assess the psychological symptoms, while items 10 to 18 were used to assess physical symptoms. The instrument was graded on a four-point Likert scale (never = 0, occasionally = 1, most of the time = 2, and always = 3). The total score on this questionnaire ranged from 0 to 54, with higher values indicating greater anxiety than the prevalence of COVID-19. A score of 0 to 16 showed no or mild anxiety, a score of 17 to 29 suggested moderate anxiety, and a score of 30 to 54 suggested severe anxiety on this scale. A score of 0 to 5 showed little anxiety or mild anxiety, a score of 6 to 19 showed

moderate anxiety, and a score of 20 to 27 suggested severe anxiety in the subgroup of psychological symptoms. A score of 0 to 1 indicated no or mild anxiety, a score of 2 to 9 indicated moderate anxiety, and a score of 10 to 27 indicated severe anxiety. Cronbach's alpha technique confirmed the instrument reliability, which was 0.919 for the entire questionnaire, 0.870 for the first component, and 0.861 for the second factor. The exploratory and confirmatory factor analysis supported its validity (7).

#### Ethical Considerations

Zabol University of Medical Sciences Ethics Committee approved the current investigation under the number IR.ZBMU.REC.1399.163. The ethical standards observed in the study included voluntary participation, discretion in not completing the questionnaire, clarifying the study objectives to participants and getting consent, as well as confidentiality and trust.

## Results

The participants' demographic findings revealed that the highest frequency (23.5%) belonged to the age range of 25 to 29 years, with a mean age of  $27.08 \pm 6.71$  years. The bulk of the samples were elementary literate in terms of education (66.7%). The 92.2% of the women were housewives, while 7.8% worked as employees. In terms of their husbands' employment position, 46.1% worked for the government, 30.4% worked for the others, and 23.5% worked for themselves. When it came to disease history, 68.6% had none, whereas 31.4% had a history of underlying diseases. The natural approach was used to deliver 67.7% of the samples, whereas the cesarean section was used to deliver 35.3%. The presence of a youngster or middle-aged child was recorded in 64.7% of the samples, while its absence was reported in 35.3%. The average age of the participants in the third trimester of pregnancy was  $37.62 \pm 1.98$ . The average weight of newborns was  $3045.32 \pm 435.81$  gr. In the first and fifth minutes of the newborns' lives, the mean  $\pm$  standard deviation of Apgar scores was  $8.73 \pm 0.48$  and  $9.72 \pm 0.49$ , respectively (Table 1).

**Table 1.** Description of demographic characteristics of pregnant women participating in the study

Variable	Variable levels	Frequency (%)	Mean $\pm$ Standard deviation
Age	Less than 20 years	22 (21.6)	27.08 $\pm$ 6.71
	20 to 24 years	17 (16.7)	
	25 to 29 years	24 (23.5)	
	30 to 34 years	23 (22.5)	
	More than 34 years	16 (15.7)	
Education	illiterate	68 (66.7)	
	Primary	12 (11.8)	
	Intermediate	5 (4.9)	
	Diploma	5 (4.9)	
Job	Bachelor and higher	12 (11.8)	
	Housewife	94 (92.2)	
	Employee	8 (7.8)	
Spouse job	Manual worker	31 (30.4)	
	Self-employment	24 (23.5)	
History of underlying disease	Governmental	47 (46.1)	
	Yes	32 (31.4)	
Type of delivery	No	70 (68.6)	
	Natural delivery	71 (69.6)	
	Cesarean delivery	31 (30.4)	
	Yes	26 (25.5)	

Variable	Variable levels	Frequency (%)	Mean± Standard deviation
Hospitalization in infants	No	76 (74.5)	
	Yes	66 (64.7)	
Existence of a child or middle-aged	No	36 (35.3)	
Gestational age			37.62±1.98
Baby weight (g)			3045.32±435.81
Apgar first minute			8.73±0.48
Apgar fifth minute			9.72±0.49

The review results of the history of corona disease in themselves and their families, definitive involvement of COVID-19, and the extent to which participants studied corona disease are presented in [Table 2](#). According to the results, 93.1% of participants reported no history of corona disease and 91.2% had no history

of corona disease among their family members. The majority of participants (64.7%) followed the health principles related to the COVID-19, and nearly half of them (49%) had a moderate level of knowledge on COVID-19. Only 2% of participants had definite disease, and 98% did not have clear corona disease.

**Table 2.** Frequency distribution of symptoms, definite coronavirus infection, observance of health principles and level of knowledge about the disease among pregnant women participating in the study

Variables	Variable levels	Frequency (%)
A person's history of Corona symptoms and referrals to medical facilities	Yes	7 (6.9)
	No	95 (93.1)
The presence of Corona disease in person	Yes	2 (2)
	No	100 (98)
History of corona disease in the family and referral to health centers	Yes	10 (9.8)
	No	92 (90.2)
The presence of Corona disease in the family	Yes	9 (8.8)
	No	93 (91.2)
Keeping a standard of hygiene	Low	5 (4.9)
	Medium	31 (30.4)
	Much	66 (64.7)
The rates of daily study about covid-19	Low	24 (23.5)
	Medium	50 (49)
	Much	28 (27.5)

The frequency of individual responses to the corona anxiety questionnaire items is shown in [Table 3](#). "I am concerned about the corona spreading to people around me (45.1%)", "I am very concerned about the prevalence of corona (40.2%)", and "I am terrified to get corona virus (37.3%)" were among the topics in the questionnaire. In most cases, they were anxious during the tests.

The statistics revealed that during the pandemic of the novel coronavirus (COVID-19) in Zabol, 79.4% of the

participants suffered mental anxiety and 57% suffered moderate anxiety. In the general dimension of anxiety, 45%, 44% and 13% were in the category of mild, moderate and severe anxiety, respectively. The mean and standard deviation of mental, physical and general anxiety scores were 5.31±13.05, 5.72±5.64 and 21.08±20.88, respectively, which were in the upper to upper middle level ([Table 4](#)).

**Table 3.** Frequency of pregnant women responses to anxiety questionnaire items

Items	Always	Usually	Sometimes	Never
	Frequency (%)			
Thinking about Corona makes me anxious.	12 (11.8)	19 (18.6)	50 (49)	21 (20.6)
I feel tense when I think about the Corona threat.	13 (12.7)	19 (18.6)	32 (31.4)	38 (37.3)
I am very worried about the prevalence of Corona disease.	41 (40.2)	32 (31.4)	20 (19.6)	9 (28.4)
I'm afraid to get a Corona.	38 (37.3)	24 (23.5)	23 (22.5)	17 (16.7)
I think I might get a Corona at any moment.	17 (16.7)	19 (18.6)	37 (36.3)	29 (28.4)
With slightest sign, I think I have taken the Corona and examined myself.	21 (20.6)	22 (21.6)	23 (22.5)	36 (35.3)
I'm worried about the Corona spreading to those around me.	46 (45.1)	25 (24.5)	17 (16.7)	14 (13.7)
Corona anxiety has disrupted my activities.	13 (12.7)	26 (25.5)	25 (24.5)	38 (37.3)
The media attention to Corona worries me.	14 (13.7)	26 (25.5)	35 (34.3)	27 (26.5)
Thinking about Corona has disturbed my sleep.	5 (4.9)	12 (11.8)	17 (16.7)	68 (66.7)
Thinking about Corona has made me anorexia.	4 (3.9)	8 (7.8)	16 (15.7)	74 (72.5)
I get a headache when I think about Corona.	2 (2)	13 (12.7)	22 (21.6)	65 (63.7)
My body trembles when I think about Corona.	7 (6.9)	9 (8.8)	25 (24.5)	61 (59.8)
When I think about Corona, my body hair stands on end.	6 (5.9)	12 (11.8)	23 (22.5)	61 (59.8)
Corona has become a nightmare for me.	6 (5.9)	16 (15.7)	22 (21.6)	58 (56.9)
My physical activity has decreased due to the fear of Corona.	4 (3.9)	20 (19.6)	21 (20.6)	57 (55.9)
It is difficult for me to talk about Corona with others.	7 (6.9)	13 (12.7)	31 (30.4)	51 (50)
I get a heartbeat when I think about Corona.	5 (4.9)	14 (13.7)	26 (25.5)	57 (55.9)

**Table 4.** The rate of mental, physical and general anxiety caused by corona disease in research participants

Variables	The level of variables	Number	Frequency (%)	Mean± Standard deviation
Mental Anxiety	Light	7	6.9	13.05±5.31
	Medium	81	79.4	
	Intense	14	13.7	
Physical anxiety	Light	24	23.5	5.64±5.72
	Medium	57	55.9	
	Intense	21	20.6	
Total anxiety	Light	45	44.1	20.88±21.08
	Medium	44	43.1	
	Intense	13	12.7	

No statistically significant link was observed between anxiety generated by COVID-19 and its components and the factors of participants' age, infant

weight, and Apgar score in the first and fifth minutes ( $P>0.05$ ) as shown in [Table 5](#).

**Table 5.** Correlation between Covid-19-induced anxiety with measures of age, infant weight, and Apgar score in the first and fifth minutes by using Pearson correlation test

Variables	The first minute of infants Apgar	The fifth minute of infants Apgar	Infant weight	Age
<b>The correlation coefficient</b>				
Physical symptoms of anxiety	0.026	0.049	0.001	0.088
<b>Sig</b>	0.798	0.626	0.989	0.377
Psychological symptoms of anxiety	0.032	0.009	-0.069	0.080
<b>Sig</b>	0.750	0.928	0.494	0.425
Total anxiety	0.032	0.033	-0.036	0.094
<b>Sig</b>	0.749	0.741	0.719	0.345

[Table 6](#) shows the mean scores of anxiety caused by COVID-19 in participants during the corona pandemic in Zabol (Iran) in terms of demographic variables.

There was no significant relationship between demographic variables and anxiety caused by COVID-19 ( $P>0.05$ ).

**Table 6.** Anxiety caused by Covid-19 based on demographic variables

Variable	Variable levels	Total anxiety	DF	F	Sig
<b>Age</b>	Less than 20 years	17.23±11.89	4	0.670	0.500
	20 to 24 years	16.94±7.52			
	25 to 29 years	18.50±9.23			
	30 to 34 years	21.35±9.89			
	More than 34 years	19±10.22			
<b>Education</b>	illiterate	17.57±9.14	4	1.253	0.294
	Primary	18.67±9.23			
	Intermediate	19.80±9.78			
	Diploma	26.60±16.04			
<b>Job</b>	Bachelor and higher	21.25±11.22	1	1.35	0.985
	Housewife	18.68±9.69			
	Employee	18.75±12.41			
<b>Spouse job</b>	Manual worker	20.97±11.97	2	2.763	0.068
	Self-employment	14.88±5.73			
<b>History of underlying disease</b>	Governmental	19.13±9.61	1	1.11	0.91
	Yes	18.84±8.96			
	No	18.61±10.30			



Variable	Variable levels	Total anxiety	DF	F	Sig
Type of delivery	Natural delivery	18.63±8.85	1	5.270	0.936
	Cesarean delivery	18.81±12.01			
Hospitalization in infants	Yes	20.31±10.42	1	0.314	0.334
	No	18.13±9.67			
Existence of a child or middle-aged	Yes	19.27±10.13	1	0.168	0.409
	No	17.61±9.34			

## Discussion

According to the findings and data analysis, pregnant women made up only 2% of all instances. Given the low rate of definitive infection in pregnant women in the current study, this theory can be supported by the fact that COVID-19-related health protocols, such as the amount of knowledge and awareness about the disease, the use of masks, maintaining social distance, and so on, may be effective and useful in preventing COVID-19 spread and infection (25, 26). The current study findings confirmed this notion based on the participants' high rate of study on corona disease and their high degree of compliance with health guidelines. Sarkarat *et al.*, reported a 2% incidence of coronavirus in the first trimester in Iran, which is consistent with the findings of this investigation. They claimed that regular environmental disinfection, sterilization, and the use of protective equipment can be beneficial and valuable in reducing the disease transmission and infection (25). According to the results of the anxiety survey of pregnant women, they had moderate anxiety in terms of physical, mental, and general anxiety, with 57%, 79.4%, and 44% experiencing moderate anxiety, respectively, and a tiny percentage of mild anxiety caused by COVID-19.

Pregnancy is a stressful time for women, with physiological and psychological changes that can be exacerbated by factors like stress of isolation for lengthy periods of time due to the corona pandemic. After one year, since the world first epidemic of coronavirus it appears that the pregnant women have become mentally accustomed to it (27). Unfortunately, majority of the news published by COVID-19 is discouraging, and such statistics are sometimes associated with rumors, which is why, if a person is constantly exposed to the COVID-19 news or stays at home for an extended period of time, he may develop psychological disorders and anxiety (28). Other research from around the world backs up the COVID-19 anxiety experience. In addition to the current study, Mohammadi *et al.*, looked at anxiety produced by COVID-19 and its physical and psychological symptoms in the Iranian adult population. Their findings revealed that there was substantial anxiety in the general population of Iran following the outbreak (29). Another study surveyed 52730 persons from China's

general population (36 provinces), Hong Kong, Taiwan, and Macao to analyze the psychological impact of the COVID-19 outbreak. According to the findings, 35% of the participants in the study suffered psychological distress such as anxiety, stress, and sadness (23). During the COVID-19 outbreak, Corbett *et al.*, reported that more than half (63.4%) of Irish pregnant women in the second and third trimesters of pregnancy expressed considerable concern over the health of their unborn kid (18). Another outcome of the current study was that no statistically significant link existed between individual demographic characteristics and anxiety generated by COVID-19 ( $P>0.05$ ). This shows that engaging in high-risk actions may contribute to the people anxiety (28). The amount of anxiety generated by COVID-19 in the breast cancer patients during the corona pandemic, according to Immortal *et al.*, was not statistically significant in the analyzed groups in terms of demographic characteristics such as education, occupation, and so on (28), which was a corroboration of the current study findings. The lack of COVID-19 anxiety effect on weight and Apgar score at birth ( $P>0.05$ ) was another finding of the current investigation. In contrast to these findings, Bazrafshan and Mahmoudi Rad found that women's anxiety during pregnancy had a substantial and negative link with Apgar score at 1 and 5 minutes after birth in their investigation of the effect of pregnant women's anxiety on Apgar score and neonatal weight at birth. The researchers also discovered that women's anxiety during pregnancy had an impact on birth weight and resulted in newborn weight loss (1). To justify this, it can be said that the Anxiety Scale studied in Bazrafshan and Mahmoudi Rad study was State-Trait Anxiety Inventory, which was different from the scale studied for anxiety in the present study. Another reason for this difference can be related to the timing of two studies, so that the present study was performed in the Corona pandemic conditions and different from the normal study conditions of Bazrafshan and Mahmoudi Rad. Fear of infection, concern for the health of family, friends and relatives, insecurity, disorder, and social isolation that have become part of people daily lives in many parts of the world during the COVID-19 epidemic

have undoubtedly had profound effects on the entire population; however, pregnancy has been reported to be terrifying for many women during this global epidemic (30). Pregnant women who are under additional stress may experience indirect negative consequences on their physical and mental health; therefore, detecting this problem is critical and governments and policymakers must provide attentive and up-to-date support. In COVID-19, basic solutions such as TV news bulletins, the most extensively used source of health message information, are highlighted as being beneficial in addressing patients' concerns, and social media can also be highly useful in this regard (18). This study strength was determination of the exact prevalence of corona disease in pregnant women, the level of anxiety produced by the COVID-19 outbreak among them, and its impact on Apgar score and the weight of their newborns at birth, which is the first study of its kind in our country. There were varieties of limitation in our investigation such as limited access to the study population due to home quarantine, lack of interest in participating in the study due to the crisis caused by COVID-19, and also due to the recent issue and limitations of studies conducted in this field in the country. There was also limitation in comparing and diversifying the discussion due to lack of variety of the topic, which should be compensated by comprehensive research in future.

## Conclusion

Based on our results, it can be stated that the rate of definite corona illness among pregnant women participating in the study was low, and they

experienced moderate levels of anxiety as a result of COVID-19. The findings also revealed critical issues like a high compliance to health guidelines, a high study rate on COVID-19, no link between demographic characteristics of pregnant women and COVID-19 anxiety, and no influence of COVID-19 anxiety on weight or Apgar scores of 1 and 5 minutes. The pregnant mothers were enrolled in the study at the time of birth. Regarding the high prevalence of psychological and physical symptoms of COVID-19 anxiety in pregnant women, it is the most important component in the community care of vulnerable populations. In the meantime, both pregnancy and the COVID-19 outbreak cause tension and anxiety in pregnant women. Families, governments, and policymakers appear to need to take measures to reduce COVID-19 concern in pregnant women more seriously.

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## Conflict of Interest

The authors declared no conflict of interests.

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