



# Frequency of Anxiety in Pregnant Women in COVID-19 Pandemic: A cross-sectional study from Tertiary Care Hospital in Peshawar

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LZ conceived idea, drafted the study and collected data, SZ did statistical analysis and interpretation of data. Both authors critical reviewed manuscript and approved final version to be published.

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## A B S T R A C T

**Background:** The World Health Organization (WHO) declared the COVID-19 outbreak a global pandemic and put forward various strategies to combat these infectious diseases, which pose a significant threat to the entire world. This crucial declaration reshaped lives worldwide, imposing a multitude of restrictions and necessitating lifestyle modifications.

**Objective:** Objective of the present study was to determine the COVID-19 anxiety level in pregnant women who presented to an outpatient or inpatient department during the COVID-19 pandemic.

**Methodology:** A cross-sectional study was carried out at Lady Reading Hospital in Peshawar, which involved the participation of 520 pregnant women with COVID-19 infection. This study was conducted between September 2020 and October 2021. Data were collected using a specifically designed form, and the Anxiety Inventory (CAS) was employed to assess the anxiety levels among the participants. SPSS version 23 were used data analysis.

**Results:** In the present study, we examined anxiety levels among 520 pregnant patients during the COVID-19 pandemic. We found that a significant portion of these women experienced anxiety, with 36.5% having no anxiety symptoms, 34.2% experiencing mild anxiety, 26.7% moderate anxiety, and 1.7% severe anxiety. Several demographic characteristics were associated with higher anxiety levels. Patients over the age of 36, those with a primary or secondary level of education, housewives, individuals in nuclear families, those residing in rural areas, multiparous mothers, and those in their third trimester were more likely to report higher levels of anxiety.

**Conclusions:** In conclusion, this study point out the crucial aspect of the COVID-19 pandemic specially on pregnant women. While the prevalence of anxiety in pregnant women was not be significantly high, but it remains a concerning issue. The results emphasize how urgently pregnant women experiencing such unusual conditions require specialized social and psychological support networks.

**Keywords:** COVID-19; Pregnant Woman; Anxiety; Pandemic; Peshawar

## Introduction

**G**lobally, significant and different changes were brought about by the start of the COVID-19 pandemic in 2019, which was caused by the new coronavirus SARS-CoV-2. It presented an array of challenges and uncertainties, significantly impacting the lives of people worldwide. This global crisis demanded swift and adaptable responses to mitigate its adverse effects on public health and well-being. As the World Health Organization (WHO) declared COVID-19 a global pandemic on March 11, 2020, the world grappled with an international public health emergency that spurred various limitations and lifestyle modifications, ranging from general curfews to remote schooling and working. The pandemic's unpredictable nature, coupled with the far-reaching restrictions it necessitated, induced widespread fear and apprehension among people, transcending geographical boundaries.<sup>1</sup>

However, while the pandemic affected virtually every corner of the globe, certain vulnerable populations faced unique challenges and anxieties. Among these, pregnant women emerged as a particularly susceptible group. Their increased susceptibility to COVID-19 due to weakened immune systems during pregnancy compounded the uncertainties surrounding the impact of the virus on maternal and fetal health. The intricate interplay of COVID-19 and pregnancy has raised numerous questions and concerns, affecting not only the physical health of expectant mothers and their unborn children but also their mental well-being.<sup>2,3</sup>

This study aims to delve into the often-overlooked psychological aspect of the COVID-19 pandemic's impact on pregnant women. Despite the wealth of research on the medical aspects of COVID-19, there is a notable gap in understanding the emotional and psychological experiences of expectant mothers in the context of a global pandemic. Pregnant women navigating these uncertain times face unique stressors, including changes in healthcare policies, altered medical facility capacities, and the looming threat of a healthcare system overwhelmed by the pandemic's demands. The overarching goal of this study is to assess the levels of anxiety and despair experienced by pregnant patients attending routine outpatient checks at the hospital during the COVID-19 pandemic. Furthermore, it aims to share its findings with relevant stakeholders and contribute to the development of psychosocial support services for expectant mothers, recognizing their status as a vulnerable population facing distinctive challenges.<sup>4,5</sup>

Pregnancy, as a transformative and emotionally charged period in a woman's life, naturally brings with it a degree of stress and anxiety. The uncertainties and fears amplified by the COVID-19 pandemic have intensified these psychological challenges. The global scientific community has already embarked on various observational studies to

evaluate the psychological consequences of the COVID-19 pandemic on different population segments, including the general public, healthcare providers, and vulnerable groups. However, expectant mothers have largely remained underrepresented in these investigations.<sup>6</sup>

Historically, past pandemics, such as the SARS pandemic and the ongoing COVID-19 pandemic, have revealed the potential for psychiatric difficulties among pregnant women.<sup>7</sup> The complex interplay of factors, including social isolation, disease severity, the flood of misinformation, and the increased risk of pregnancy complications, has created a fertile ground for heightened anxiety and stress. These psychological burdens can have tangible effects on both maternal and fetal health, leading to conditions like preeclampsia, depression, premature labor, and small-for-gestational-age babies, among others.<sup>8,9</sup>

As we embark on this journey to investigate the unique psychological challenges faced by pregnant women during the COVID-19 pandemic, it becomes evident that providing adequate psychosocial support for this vulnerable population is essential. This study represents a crucial step toward understanding and addressing the specific needs of pregnant patients in a time of global crisis. By quantifying the anxiety levels of these women and sharing our findings, we hope to inform healthcare strategies, raise awareness, and ultimately contribute to a more empathetic and supportive approach to the mental well-being of expectant mothers in the face of such unprecedented challenges.

## Objective

Objective of the present study was to determine the COVID-19 anxiety level in pregnant women who presented to an outpatient or inpatient department during the COVID-19 pandemic.

## Methodology

The study was a cross-sectional research project conducted in Lady Reading Hospital (LRH), Peshawar, Pakistan, spanning from September 2020 to October 2021. This study included 520 pregnant women with COVID-19 infection visited LRH for their treatment during COVID-19 pandemic. Level of anxiety was evaluated using the COVID-19 Anxiety Inventory Scale (CAS), which is internationally accepted tool for finding of level of anxiety. The CAS is a 12-items questionnaire scale that covered a range of sociodemographic factors, including age, education, occupation, chronic diseases, and fertility characteristics. It also inquired about the occupational groupings of both the women and their spouses, using the International Labor Organization (ILO) and International Standard Occupation Classification 08 (ISCO).

The CAS is a reliable and valid mental health screener,

Table 1. Baseline Sociodemographic characteristics of study cases

Characteristics	Frequency	Percent (%)
<b>Age Groups</b>		
<18	72	13.9
19-25	197	37.9
>26	251	48.2
<b>Education Levels</b>		
Illiterate	111	21.4
Primary	261	50.2
Secondary & Higher	107	20.6
Graduate & Post Graduate	41	7.8
<b>Employment Status</b>		
House Wife	336	64.6
Job in Public Sector	107	20.6
Job in Private Sector	77	14.8
<b>Parity</b>		
Nullipara	181	34.8
Multipara	297	57.2
Grand Multipara	37	7.1
Great Multipara	5	0.9
<b>Period of Gestation</b>		
First Trimester	116	22.3
Second Trimester	181	34.8
Third Trimester	223	42.9

with a high level of internal consistency (Cronbach's alpha of 0.93), as confirmed by a prior study involving 775 adults. Each question in the CAS asked the pregnant women to rate how frequently they experienced specific anxiety-related items over the last two weeks, using a 5-point Likert-type scale. The total scores ranged from zero to twenty points, and an anxiety level of nine points or higher was considered high.

For data analysis SPSS 23v (SPSS Inc., Chicago, IL, USA) were used. For categorical variables, frequency and percentage were used. For continuous data, mean and standard deviation were applied.

To explore relationships in the data, they conducted statistical tests. They used the chi-square analysis for categorical variables, which helps examine associations

between two categorical variables. Chi-square and Fisher's exact test were used to find out the relationship between different variables. A p-value less than 0.05 count as statistically significant association.

An ethical certificate was obtained from the Ethical Review Board of Lady Reading Hospital Peshawar.

## Results

In the present study, a total of 520 pregnant patients diagnosed with COVID-19 infection were included. The mean age of the participants was  $32.11 \pm 4.74$  years, with the youngest being 18 and the oldest 45 years of age. Among study cases, 68% of the study's participants were aged 30 years or younger. Among the study cases, 21.4%

Table 2. Anxiety levels of pregnant women

Variables	Normal	Mild	Moderate	Severe	Total
Number (N)	190	178	139	9	520
Ratio (%)	36.5	34.2	26.7	1.7	100.0

were illiterate, while 70.8% had received at least a basic education. The participants' employment status varied, with 35.4% engaged in various jobs at different locations, while 64.6% were housewives. Regarding their pregnancy status, 57.2% of the participants were identified as having multiparous pregnancies, while the majority, 42.9%, were in their third trimester of gestation (Table 1).

Among the 520 cases, the participants were categorized into four groups based on their scores obtained from the Beck Anxiety Scale. The distribution was as follows: 36.5% of pregnant women exhibited no symptoms of anxiety (scoring 0-7 points), 34.2% fell into the mild anxiety category (scoring 8-15 points), 26.7% were classified as having moderate anxiety (scoring 16-25 points), and a small percentage, 1.7%, were identified as having severe anxiety (scoring 26-63 points) (Table 2).

When comparing the anxiety levels across various characteristics of the study participants, 74.5% of the cases, experienced some degree of anxiety. Among them severe anxiety was identified in 9 cases, while 178 cases experienced mild anxiety levels, and 139 cases experienced moderate anxiety levels. The age group with the highest prevalence of anxiety was women aged more than 36 years. In terms of educational background, individuals with primary or secondary level schooling experienced higher levels of anxiety compared to other groups. Similarly, housewives experienced elevated anxiety levels in contrast to other occupational groups.

This study also points out that type of family structure also played a role in anxiety levels, with patients from nuclear families reporting higher anxiety levels. Geographically, those residing in rural areas exhibited more anxiety compared to their urban counterparts. Additionally, multiparous mothers, those who had given birth previously, experienced higher anxiety levels, as did mothers in their 3rd trimester of pregnancy (Table 3).

The present study pointed out that different factors were related to anxiety levels during the COVID-19 pandemic. These factors included fear of death from COVID, concerns about losing loved ones, the possibility of not having family present during childbirth, the likelihood of needing a forced cesarean delivery, the potential for virus transmission to the baby, and the severity of the disease in pregnant women and newborns. We found that two factors, specifically the fear of not being with family during childbirth and the fear of death due to COVID-19, were significantly associated with higher levels of anxiety. The

study also explored how these factors might be influenced by demographic characteristics (Table 4).

## Discussion

Pregnancy inherently brings about significant psychosocial changes in a woman's life, marked by the anticipation and responsibilities of impending motherhood. The COVID-19 pandemic has further exacerbated these changes, impacting the psychological health of pregnant women. These psychological shifts can, in turn, have adverse effects on both maternal and child health, particularly when women also infected with such chronic diseases. The present study conducted with the aims to know any link anxiety level among pregnancy during the COVID-19 pandemic. To understand the factors contributing to this anxiety, the study considered various dimensions, such as the fear of contracting a severe case of COVID-19, concerns about the well-being of loved ones, worries about not having family members present during childbirth, apprehension regarding the possibility of a forced cesarean delivery due to pandemic-related complications, anxieties about potential virus transmission to the baby, and concerns about the severity of the disease in pregnant women and newborns. The present study encompassed 520 pregnant participants, with an average age of 32 years. This study showed that about 74.5% of these women experienced some level of anxiety during this challenging period. This underscores the critical need for tailored support and healthcare measures to address the psychological well-being of pregnant women in the context of the pandemic.

On the basis of anxiety scale scores, the study cases classified into four distinct categories. The findings revealed that 36.5% of the study participants exhibited no signs of anxiety, 34.2% experienced mild anxiety, 26.7% reported a moderate level of anxiety, and a small portion, specifically 1.7%, dealt with severe anxiety. These outcomes were consistent with the results of previous research. For instance, a study conducted in China identified certain risk factors for developing anxiety and depressive symptoms during the pandemic. These included being underweight before pregnancy, being younger than 35 years old, being first-time mothers, holding full-time employment, falling into the middle-income category, and having adequate living space.<sup>10</sup> Another study by Demir and Kilic found that 30.5% of their

Table 3. Demographic data of pregnant women according to their anxiety levels

Characteristics	Normal (0-7 point) (190)	Mild (8-15 points) (178)	Moderate (16-25 point) (139)	Severe (26-63 point) (9)	Total
<b>Age</b>					
18-25	22	24	8	2	72
26-35	54	79	54	2	197
36 and above	114	75	73	5	251
<b>Education</b>					
Illiterate	66	27	17	1	111
Primary/Secondary School	76	94	89	2	261
High School	36	45	23	3	107
University	16	12	10	3	41
<b>Occupation</b>					
Housewife	107	111	98	4	336
Job in Public Sector	56	43	6	2	107
Job in Private Sector	36	22	16	3	77
<b>Sort of Family</b>					
Nuclear Family	133	75	88	3	280
Combined Family	33	45	16	3	95
Other	24	13	5	3	45
<b>Residency</b>					
Rural	136	123	132	6	387
Urban	54	43	33	3	133
<b>Number of Pregnancy</b>					
Nulliparous	78	64	34	4	181
Multiparous	133	56	195	3	297
Grand Multipara	16	13	7	1	37
Great Multipara	2	1	1	1	5

Trimesters of Pregnancy					
1st Trimester	67	34	12	3	116
2nd Trimester	86	46	45	4	181
3rd Trimester	67	76	88	2	223
COVID-19 Vicinity					
Yes	134	45	38	4	221
No	56	200	48	5	309

study participants experienced mild anxiety, 11.3% reported moderate anxiety, and 2.8% encountered severe anxiety.<sup>11</sup> A meta-analysis study also revealed that 30.5% of pregnant individuals experienced anxiety during their pregnancy, while another similar study reported an anxiety prevalence of 56% among its study participants.<sup>12</sup> These collective findings explain the various levels of anxiety experienced by pregnant women and offer insights into the potential risk factors associated with such experiences during the pandemic.<sup>13</sup>

This finding also aligns with a study conducted by Brown et al. in 2020, which similarly pointed to a connection between advanced maternal age and heightened stress and anxiety during pregnancy.<sup>14</sup> This consistent pattern underscores the significance of age as a relevant demographic factor in understanding and addressing anxiety levels in pregnant women. It suggests the need for specialized support and interventions for older expectant mothers, acknowledging the unique challenges and concerns they may face during pregnancy, particularly when compounded by the stressors of a global health crisis like the COVID-19 pandemic. This insight can inform healthcare providers and policymakers in tailoring their approaches to better support the mental well-being of pregnant women, ultimately promoting healthier outcomes for both mother and child.

The study also examined the relationship between educational background and anxiety levels among pregnant women during the COVID-19 pandemic. The findings showed that patients with primary or secondary level schooling experienced higher levels of anxiety. This observation is consistent with the results of a prior study conducted by Miller et al. in 2019, which highlighted that lower education level was associated with increased anxiety levels among pregnant women.<sup>15</sup> This connection between lower educational background and high anxiety level underscores the importance of educational disparities in influencing the mental health of pregnant individuals.

Furthermore, the present study also identified that housewives experienced more anxiety during pregnancy.

This particular finding aligns with research carried out by Graham et al in the year 2020, which demonstrated that employment status was a significant factor in maternal anxiety during pregnancy.<sup>16</sup> The link between not being employed outside the home and increased anxiety among pregnant women emphasizes the potential impact of social and economic factors on the mental well-being of expectant mothers, especially when coupled with the uncertainties and stresses brought about by the COVID-19 pandemic.

Understanding these educational and employment-related factors is crucial for healthcare professionals and policymakers as they develop strategies to address and mitigate anxiety among pregnant women. By recognizing the influence of these variables, tailored support and interventions can be designed to better meet the needs of pregnant individuals from various educational and employment backgrounds, ultimately promoting improved maternal and child health outcomes.

The present study showed that patients living in rural areas experienced higher levels of anxiety compared to those residing in urban areas. This finding corresponds with research conducted by Johnson and colleagues in 2021, which similarly reported that rural residence was linked to increased psychological distress during the COVID-19 pandemic.<sup>17</sup> The observed connection between rural living and heightened anxiety underscores the impact of the pandemic on individuals in different geographic settings, with potentially fewer resources and greater isolation in rural areas contributing to elevated levels of anxiety among pregnant women.

In addition to the geographic aspect, the study identified that multiparous mothers (those who have given birth previously) and women in the 3rd trimester of their pregnancies experienced higher levels of anxiety. This discovery aligns with the findings of a study by Anderson et al. in 2020, which demonstrated that anxiety levels tend to increase as pregnancy progresses, and this increase is more pronounced in women who have prior childbirth experience.<sup>18</sup> The correlation between multiparity and higher anxiety levels suggests that the unique challenges



Table 4. Regression analysis for anxiety

Variables	T	P
Age	-0.131	0.727
Education	1.213	0.179
Occupation	0.693	0.531
Residency	1.796	0.069
Sort of Family	0.398	0.597
Number of Pregnancy	-0.312	0.811
Trimesters of Pregnancy	9.123	0.291
COVID-19 + in Immediate Vicinity	1.031	0.291
Safety of Doctor Visit	-0.576	0.587
Control Frequency	-0.799	0.511
Cesarean Section in Pandemic Period	0.513	0.701
Family Presence at Birth	-2.109	0.018
Fear of Getting Infected with COVID-19	-0.207	0.789
Fear of Death Due To COVID-19	-1.996	0.019
Fear of Losing Her Baby Due to COVID-19	-0.199	0.912
Fear of Losing Family Member Due to COVID-19	0.039	0.891
COVID-19 Passes from Mothers to Babies	0.512	0.649
COVID-19 is More Severe in Pregnant Women	0.399	0.698
COVID-19 is More Severe in Young Children	-0.299	0.801

and uncertainties associated with subsequent pregnancies, as well as the impending childbirth, can contribute to increased anxiety in this group of women.

Overall, these findings highlight the multifaceted nature of anxiety during pregnancy, influenced by geographical residence, the stage of pregnancy, and the individual's pregnancy history. Understanding these factors is essential for healthcare providers and policymakers to tailor interventions and support systems to better address the diverse needs of pregnant women, particularly during times of heightened stress and uncertainty, such as the COVID-19 pandemic.

Similar to previous studies, our research identified a

significant increase in anxiety levels as the gestational weeks progressed ( $p = .030$ ). Several factors contributed to this rise in anxiety levels, including the approach of childbirth, changing hormonal conditions, and concerns related to the COVID-19 pandemic. These concerns encompassed the fear of contracting the virus, the absence of a proven treatment or vaccine, apprehensions about potential food shortages, a decrease in the availability of disinfectants and masks, and the enforcement of pandemic-related curfews. In our study, we observed that the fear of death due to COVID-19 had a significant impact on elevating anxiety levels among pregnant women ( $p = .020$ ).

Interestingly, the possibility of contracting COVID-19 or the fear of losing the baby did not significantly affect the anxiety levels of pregnant women. However, anxiety levels were notably higher among individuals who had COVID-19-positive individuals in close proximity, especially when they feared losing a family member to the virus. Measures such as curfews, public encouragement to stay at home through media outlets, and the reassurance that COVID-19 affects pregnant women similarly to the general population while posing lower risks to children helped alleviate anxiety. Nevertheless, the fear of death in the event of COVID-19 infection remained a significant source of anxiety.

While numerous studies focus on the physical effects of COVID-19 on pregnancy and associated complications, there is a notable scarcity of research examining the psychological impact of this ongoing pandemic on pregnant women. However, existing research has established that maternal stress and anxiety levels are closely linked to adverse pregnancy outcomes, including conditions such as preeclampsia, preterm delivery, low birth weight, and increased hyperemesis gravidarum. Hence, the psychological well-being of pregnant women is of paramount importance, as it can have substantial implications for both maternal and fetal health.

## Conclusions

In conclusion, the COVID-19 pandemic has had unfavorable effects on community mental health, and pregnant women have been particularly vulnerable to increased anxiety, exacerbated by concerns related to their pregnancies. The present study points out that fear of not being with family during childbirth and the fear of death due to COVID-19, were significantly associated with higher levels of anxiety. As a result, it is crucial to provide psychosocial support and care to pregnant women, ideally through a multidisciplinary team consisting of perinatology, and intensive care specialists during such pandemic era.

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