Original Research Article

# Depression, anxiety and stress among COVID positive pregnant women

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## ABSTRACT

**Background:** Impact of the news that patient is covid positive may increase the risk of depression and anxiety among the vulnerable population such as pregnant women. Aims of the study were to estimate the prevalence of depression, anxiety and stress among covid positive pregnant women. To evaluate the demographic and obstetric factors contributing to the psychological manifestations in covid positive pregnant women.
**Methods:** A cross sectional descriptive study was conducted at a tertiary hospital of North Kerala from July to August 2020. The demographic and factors were recorded and DASS 21 self-reported questionnaire was used to assess depression, anxiety and stress.
**Results:** We found that using the DASS 21 scoring system, 37.5% out of the 120 study subjects were having psychological symptoms either of depression, anxiety or stress. Depression was seen in 32 (26.7%), anxiety in 29 (24.2%) and stress in 14 (11.7%) of the study participants. The psychological symptoms of depression and anxiety were more pronounced in those with low education, unemployed and in the first and third trimester of pregnancy.
**Conclusions:** The current study shows that COVID-19 positive pregnant women have a high prevalence of depression and anxiety. Our findings can be used to formulate psychological interventions to improve mental health and psychological resilience during the COVID-19 pandemic.

**Keywords:** Anxiety, Covid, Cross sectional, DASS 21, Depression, Pregnancy, Stress, Questionnaire

## INTRODUCTION

The COVID-19 outbreak poses significant risk to public health, including mental health. During pregnancy, women may experience stress and anxiety associated with potential adverse obstetrical outcomes such as fetal death or fetal abnormalities. Stress and anxiety level also increase due to infectious disease outbreaks.

It has been shown that the impact of the news that the patient is COVID-19 positive, brings considerable depression, stress and anxiety.[1] This brings an adverse maternal and fetal outcome like pre eclampsia, preterm birth and smaller birth weight and which can be managed to an extent with timely psychologic intervention and counselling.[2] Currently, there is sparse information on the psychological impact and mental health of covid positive pregnant women during COVID-19 pandemic. Though there were such studies in pregnancies, a PubMed search showed only very few studies, from China, in covid positive pregnancies.[3]

Globally, the extent and adverse impacts of maternal mental health problems are increasingly recognised. As the World Health Organisation (WHO) states "Virtually all women have increased chance to develop mental disorders during pregnancy and in the first year after delivery".[4] Conditions such as extreme stress, emergency and conflict situations and natural disasters can increase risks for specific mental health disorders". Maternal and parental mental health problems are associated with long term risks for the mother, partner and for their children. This raises the question: How can we improve the mental health of pregnant women and their partners in the era of COVID-19 infection?

Isolation, social distancing, and extreme changes in daily life may increase the risk of depression among vulnerable

population such as pregnant women. Therefore, it is of paramount importance to assess the psychological impact of COVID-19 outbreak in this group. A study conducted in the Department of Obstetrics and Gynaecology, School of Medicine, Magna Graecia University of Catanzaro, Italy published in AJOG 2020 during covid pandemic has shown that among pregnant women, irrespective of their covid status, more than half of the respondents rated the psychological impact of COVID-19 outbreak as severe, and about two third reported anxiety higher than the normal.[5] Almost half of the women reported high anxiety due to the concern of vertical transmission of the disease. Psychological impact and anxiety of the COVID-19 epidemic seems to be more severe in women who are in the first trimester of pregnancy during the outbreak.

The present study was therefore intended to estimate the level of depression, anxiety and stress among COVID-19 positive pregnant patients admitted at Government Medical College, Kannur district of North Kerala, India during covid pandemic. This research would facilitate our strategic planners in formulating appropriate policies to wisely tackle mental health issues in covid positive pregnancies.

## METHODS

A cross sectional descriptive study was carried out during July 1 to August 31, 2020 among the COVID positive pregnant women admitted in Government Medical College, Kannur district in North Kerala, India. Prospects who were covid positive and pregnant and willing to participate in the survey were recruited, whereas those who had a past or present history of psychiatric disorders were excluded from the research.

The study proforma comprised of demographic characteristics, medical history, physical symptoms and the depression anxiety stress scales (DASS-21) instruments.

Baseline demographic characteristics such as age, educational status, occupation, obstetric history and past medical history were recorded. Depression, anxiety and stress were assessed using depression anxiety stress scales (DASS-21).[6] DASS-21 is a validated screening instrument for use among patients as well as general population, developed by the University of New South Wales, Australia. This scale consists of questionnaire of 21 items, 7 each for depression, anxiety and stress. The subjects are asked to mark the response to each of these 21 items on a 4 point severity scale graded from 0-3 depending on the extent to which they have experienced the negative emotional states over the past week. Scores for depression, anxiety and stress are then calculated by adding the scores for each item, and then multiplying by two to calculate the final score. Cut-off scores of more than 9 for depression, more than 7 for anxiety and more than 14 for stress represent a positive screen for these negative emotional states. DASS-21 subscale severity ratings is done as shown below.

**Table 1: DASS-21 subscale severity ratings.**

| Severity | Depression | Anxiety | Stress |
|---|---|---|---|
| Normal | 0-9 | 0-7 | 0-14 |
| Mild | 10-13 | 8-9 | 15-18 |
| Moderate | 14-20 | 10-14 | 19-25 |
| Severe | 21-27 | 15-19 | 26-33 |
| Extremely severe | 28+ | 20+ | 34+ |

The data was analyzed by means of SPPS version 25.0. Pearson's Chi-square tests were applied to determine demographic profile based difference in depression, anxiety and stress among COVID 19 pregnant women. P value ≤0.05 was considered statistically significant.

## RESULTS

During the study period, 120 women were enrolled for the study, who were covid positive pregnant women.

**Table 2: Demographic characteristics of the study subjects (N=120).**

| Variable | Frequency | Percent |
|---|---|---|
| **Age in years** | | |
| ≤20 | 11 | 9.2 |
| 21-30 | 84 | 70 |
| ≥31 | 25 | 20.8 |
| **Education** | | |
| Secondary | 75 | 62.5 |
| Degree | 34 | 28.3 |
| Post graduate | 11 | 9.2 |
| **Occupation** | | |
| Homemaker | 97 | 80.8 |
| Teacher | 9 | 7.5 |
| HCW | 7 | 5.8 |
| Bank employees | 7 | 5.8 |
| **Socio economic status** | | |
| Upper | 17 | 14.2 |
| Middle | 83 | 69.2 |
| Lower | 20 | 16.7 |
| **Gravida** | | |
| Primi | 42 | 35 |
| Multi | 78 | 65 |
| **Trimester** | | |
| First | 17 | 14.2 |
| Second | 12 | 10 |
| Third | 91 | 75.8 |
| **Symptoms** | | |
| No | 99 | 82.5 |
| Yes | 21 | 17.5 |

Demographic characteristics of the study subjects are shown in Table 2. 70% of the participants were in the age

group 21-30 years. The educational data showed 62.5% of the study group had secondary level of school education. 28.3% were graduates and 9.2% post graduates. Regarding the occupational status, majority 80.8% were unemployed and 19.2% were employed. 69.2% belonged to middle class family, 16.7% belonged to poor socioeconomic status and 14.2% upper socioeconomic status.

The obstetric evaluation showed 65% were multigravida and 35% primigravida. 14.2% of the pregnant women were in the first trimester, 10% in the second trimester and 75% in the third trimester. In the third trimester, 59% were less than 37 weeks and 41% more than 37 weeks who were the term patients.

On analysing the symptomatology, 82.5% were asymptomatic. Among the 17.5% of symptomatic women, fever was the most common symptom followed by headache along with other symptoms like cough, rhinitis, sore throat, myalgia, insomnia etc. Out of the 120 study subjects, 54% delivered. 39% were discharged antenatally once they recovered from COVID-19 and 7% had miscarriage which was managed medically.

Of the 120 study subjects, 45 (37.5%) were having psychological symptoms either of depression, anxiety or stress.

**Table 3: Frequency of the psychological symptoms in study subjects (N=120).**

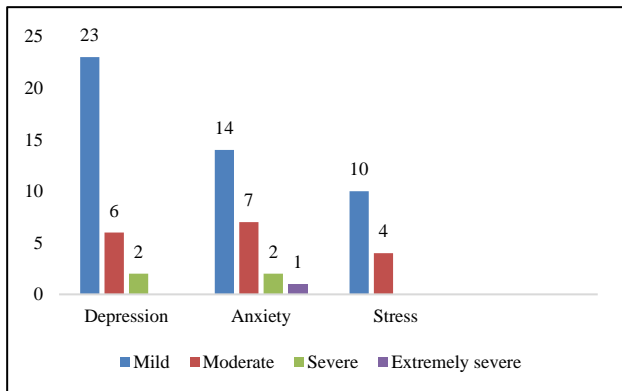| Variable | Frequency | Percent |
|---|---|---|
| **Depression** | | |
| Yes | 32 | 26.7 |
| No | 88 | 73.3 |
| **Anxiety** | | |
| Yes | 29 | 24.2 |
| No | 91 | 75.8 |
| **Stress** | | |
| Yes | 14 | 11.7 |
| No | 106 | 88.3 |



**Figure 1: Frequency of varying severity of psychological symptoms.**

We found depression in 32 (26.7%), anxiety in 29 (24.2%) and stress in 14 (11.7%) of the study participants. The frequency of depression, anxiety and stress is depicted in Table 3.

The frequency and the severity of the psychological symptoms of the study subjects are shown in Figure 1. Of the 32 pregnant women screened positive for depression, 23 (71.8%) had mild depression, 61 (8.7%) had moderate depression and 2 (6.2%) had severe depression. Of the 24 patients who screened positive for anxiety, 14 (48.2%) had mild anxiety, 7 (24.2%) had moderate anxiety, 2 had severe and 1 patient had extremely severe type of anxiety. Of the 14 screened positive for stress, 10 (71.4%) had only mild stress and 4 (28.6%) had moderate stress.
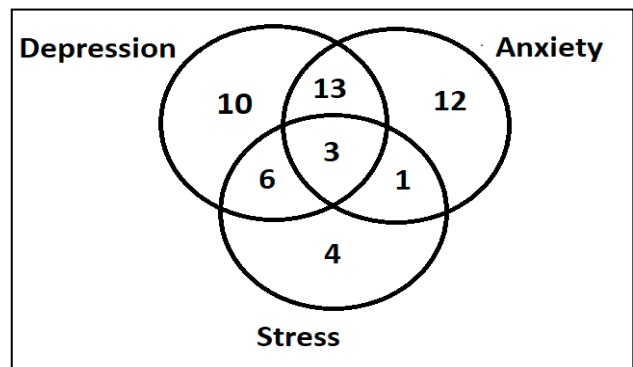


**Figure 2: Psychological symptoms of the study subjects.**

Considering the psychological symptoms of depression, anxiety and stress together in the study subjects as shown in Figure 2, 13 had both depression and anxiety. 6 had both depression and stress and 1 with anxiety and stress together. 3 study subjects had symptoms of depression, anxiety as well as of stress together.

**Table 4: Demographic factors of the subjects with/without depressive symptoms.**

| Variables | Yes | No | Total | P value |
|---|---|---|---|---|
| **Maternal age** | | | | |
| ≤20 | 3, 9.4% | 8, 9.1% | 11 | 0.944 |
| 21-30 | 23, 71.9% | 61, 69.3% | 84 | |
| ≥31 | 6, 18.8% | 19, 21.6% | 25 | |
| **Education** | | | | |
| Secondary | 20, 62.5% | 55, 62.5% | 75 | 0.705 |
| Degree | 8, 25% | 26, 29.5% | 34 | |
| Postgraduate | 4, 12.5% | 7, 8% | 11 | |
| **Occupation** | | | | |
| Unemployed | 27, 84.4% | 70, 79.5% | 97 | 0.552 |
| Employed | 5, 15.6% | 18, 20.5% | 23 | |
| **SES** | | | | |
| Upper | 7, 21.9% | 10, 11.4% | 17 | 0.282 |
| Middle | 19, 59.4% | 64, 72.7% | 83 | |
| Lower | 6, 18.8% | 14, 15.9% | 20 | |

The demographic factors of the pregnant women according to their status of depressive symptoms are given in Table 4. The frequency of the study subjects with low education, unemployed, middle socioeconomic status was more in the depressive group than in the non-depressive group. Also, the frequency of depressive symptoms was more in those in first and third trimester of pregnancy than in second trimester of pregnancy, though it was not statistically significant as shown in Table 5.

**Table 5: Obstetric factors of the subjects with/without depressive symptoms.**

| Variable | Yes | No | Total | P value |
|---|---|---|---|---|
| **Gravida** | | | | |
| Primi | 15 46.9% | 27 30.7% | 42 | 0.100 |
| Multi | 17 53.1% | 61 69.3% | 78 | |
| **Trimester** | | | | |
| First | 8 25% | 9 10.2% | 17 | |
| Second | 1 3.1% | 11 12.5% | 12 | 0.056 |
| Third | 23 71.9% | 68 77.3% | 91 | |
| **Symptoms** | | | | |
| Asymptomatic | 23 71.9% | 76 86.4% | 99 | 0.065 |
| Symptomatic | 9 28.1% | 12 13.6% | 21 | |

## DISCUSSION

Due to contagiousness of COVID-19 and consequent lockdown situation, mental health of the people especially of the pregnant women is deemed to be drastically affected. But the impact of COVID-19 pandemic on the psychology of pregnant women is a neglected fact and hence it should be brought to the attention of stakeholders for timely intervention.[7]

We found that in our study, the prevalence of depressive symptoms among covid positive pregnant women was 26%. Also 24.2% of them reported having anxiety symptoms. 11.7% reported stress symptoms. The study conducted at Medical University of Rawalpindi has shown prevalence of depression in 27.8% and anxiety in 24.8% among COVID-19 patients.[8] This is almost consistent with our results. The concern whether the fetus will have birth defects due to COVID-19, separation from home and family, stay in isolated hospital rooms, all might have contributed to the increase in psychological manifestations in pregnant women.

Analysis of the demographic factors, according to the status of depressive symptoms has shown that mean scores for depression and anxiety were significantly higher among those who had low educational status and who were unemployed. This may be because of higher educated group were better aware of the disease and had better means and access to communication tools to outside world from isolated rooms . However there was no statistical difference between depressive and non-depressive groups in maternal age, education, occupation and social economic status (p value >0.05). Darayani et al reported that pregnancy risk, gestational age and education level are the strongest predictors of mental health in pregnancy period, with low education, low income and high-risk pregnancy predisposing to depression and anxiety which is consistent with our results.[9]

Other predictors of depression and anxiety among the covid positive pregnant women were the parity and the gestational age. Multi gravidas were having more psychological symptoms than primigravidas in our study. This may be because of the fact that they were more anxious about their elder children at home whether they will be infected too and concern regarding their care at home in the absence of their mother.

Analysis according to the gestational age has shown that women in first trimester and third trimester of pregnancy had higher depression and anxiety than those in second trimester which is similar to the study by Zahra et al.[10]

The high prevalence of depression and anxiety in the third trimester of pregnancy may be due to the fact that, they were more worried about the outcome of pregnancy and uncertainty about the mode of delivery.

Also, 75.8 % of the participants in our study were in the third trimester. This was because, COVID-19 testing was done routinely near dates before planning delivery. Moreover, the Northern part of Kerala has significant number of expatriate population who come to their homeland for delivery purpose near term.

The concern whether the fetus will have birth defects due to COVID-19 was more during the first trimester and might have contributed to increase prevalence of depression in first trimester. Almost half of the women (48%) reported high anxiety regarding vertical transmission of the disease to the fetus. Our findings are consistent with the study by Lee et al.[11]

9 (53%) out of 17 cases in first trimester presented with miscarriage. The psychological symptoms among those in the first trimester were more for those with miscarriage. This high rate of miscarriage in the first trimester in my study may be due to the fact that our institution was the only hospital managing covid pregnancies in two Northern districts of Kerala. So all cases of miscarriages with covid positive status were referred to us from the periphery. Also, the expatriates from Middle East who needed intervention for miscarriages also came to their homeland in fear of the

covid outbreak in Middle East countries and for economic and socio cultural reasons.

### Clinical significance

It is important that the obstetrician should be aware that covid positive pregnant women have high prevalence of psychological symptoms as per this study. Hence, this signifies the importance of screening for these symptoms for each and every patient in this group and take appropriate interventions to alleviate the adverse effects.

## CONCLUSION

The current study shows that COVID-19 positive pregnant women have a high prevalence of depression and anxiety. The psychological symptoms of depression and anxiety were more pronounced in those with low education, unemployed and in the first and third trimester of pregnancy. Our findings can be used to formulate psychological interventions to improve mental health and psychological resilience during the COVID-19 pandemic.

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