Psychological Consequences in pregnant women diagnosed with COVID-19 in a tertiary care hospital

Suchita V Dabhadkar[1], Manjiri C Datar[2], Mahima Arya[1], Vaishali S Taralekar[1], Jyoti V Shetty[2]

[1]*Department of Obstetrics and Gynecology, Bharati Vidyapeeth (Deemed to be University), Medical College and Hospital, Pune, Maharashtra, India*
[2]*Department of Psychiatry, Bharati Vidyapeeth (Deemed to be University), Medical College and Hospital, Pune, Maharashtra, India*

Corresponding Author
Manjiri C Datar
E-mail ID: manjiri231@gmail.com

Abstract

Background: Pregnancy is a psychologically vulnerable phase in a woman's life. The diagnosis of COVID illness during pregnancy makes her susceptible to psychological problems. The support system has a crucial role in affecting the psychological state of pregnant women. Early detection can help in interventions for the mental health of these women. **Objectives:** To evaluate psychological consequences in pregnant women diagnosed with COVID-19 disease. **Methods:** This cross-sectional study was conducted in the Obstetrics and Gynecology unit of a tertiary care hospital in India; during the second wave of COVID-19 disease pandemic. A total of 40 pregnant women above 18 years of age diagnosed with COVID-19 disease were included. A thorough sociodemographic and obstetrics evaluation was done. Psychological evaluation was done using the Depression, Anxiety, and Stress Scale – 21 (DASS-21), and perception of support was evaluated with the Multidimensional Scale of Perceived Social Support. **Results:** Mean gestational age was 30 weeks. A total of 35% of the cases were moderate, and 5% had severe COVID illness. On the DASS, 30% of women had mild depression, and 20% had moderate depression. A total of 77% of women reported anxiety, 32% with mild, 20% with moderate, and the rest 20 % with severe anxiety. Twenty percent of women had mild stress, and 7.5% showed severe stress. All 40 women reported moderate to high social support from a family member, friend, or significant another person. **Conclusion:** COVID-19 positive pregnant women, irrespective of its severity, had the presence of depression, anxiety, and stress. There was a lower proportion of depression, anxiety, and stress with the presence of social support.

Keywords: pregnancy, COVID-19, DASS -21, MSPSS

Introduction

Pregnancy is a sensitive and crucial phase in a woman's life. It is a vulnerable period for psychological distress and disorders[1]. The COVID-19 pandemic is one of the most serious public health concerns of the 21st century. It causes acute respiratory illness syndrome and has very high infectivity, leading to an exponential rise in cases[2]. Many studies have reported serious mental health problems in patients suffering from COVID-19[3]. However, there are few studies that evaluate the psychological consequences on special populations like pregnant women suffering from COVID-19.

Infectious disease outbreaks have an adverse impact on the psychological status of pregnant women[4]. The various long-term adverse effects of the novel Coronavirus are unknown, and there is a lack of information about the adverse effects on pregnancy and on the fetus. This can lead to numerous mental health effects, especially among pregnant women[5]. They can range from stress-related psychological issues to clinical anxiety and depression[6]. The COVID-19 pandemic could cause psychological effects in pregnant women. The levels of anxiety and depression symptoms in pregnant women increased during the pandemic[7].

Social support is an important factor in influencing the psychological state during pregnancy. Social support includes subjective and objective support and its utilization. Previous studies have shown that high social support plays a protective role in anxiety during pregnancy[8,9].

The psychological issues in pregnancy should be detected, and prompt interventions should be initiated. Many studies have reported adverse consequences of psychological disorders in pregnancy. Complications of stress during pregnancy include preterm labor, low birth weight, and delayed neuropsychiatric development in children born to these mothers[10]. Depression during pregnancy can also have adverse effects on the fetus, the most important of which are preterm labor and low birth weight[11]. Anxiety during pregnancy increases the risk of preterm labor, low birth weight, preeclampsia, and cesarean delivery[12].

Detection of common psychological reactions like depression, anxiety, and stress with stressors of COVID during pregnancy will help in devising early interventions for pregnant women. With this background, a study was conducted to assess depression, anxiety, and stress among pregnant women diagnosed with COVID-19 and determine their relationship with obstetric factors, severity of COVID and perceived social support.

Materials and Methods

The study was a cross-sectional observational study. The study was conducted in an Obstetric and Gynaecology unit of a tertiary care hospital, on all pregnant females diagnosed with COVID illness using Reverse Transcription-Polymerase Chain Reaction (RT-PCR) test for the virus, from April to June 2021, which was the peak of the 2nd COVID wave in India.

The inclusion criteria were patients in any trimester of pregnancy, diagnosed to be suffering from COVID-19 i.e., with a positive RT-PCR test, consulted the Obstetric department of the hospital and gave written consent for participation in the study. The exclusion criteria were patients suffering from a prior psychiatric illness and any condition that could make the interview impossible.

The study was approved by the Institutional ethics committee before initiation. (Ref-BVDUMC/IEC/14 - 5/5/21)

Since the study was conducted during the COVID peak, all successive patients with COVID positive status during pregnancy were enrolled, until the cases among pregnant women halted and the sample collection was stopped. All pregnant women, irrespective of gestational age, were interviewed about the socio-demographic and obstetric details by the Obstetrician. The Physician evaluated COVID illness and classified it as 'mild', 'moderate', and 'severe' as per the standard clinical criteria[13]. A brief psychiatric evaluation was done by clinical psychiatrist working in liaison with the treating Obstetrician.

Tools

Two tools for assessment of psychological status were used.

Depression, Anxiety and Stress Scale - 21 (DASS)[13]

The DASS is a validated quantitative measure of distress along the three axes of depression, anxiety, and stress. The DASS-21 is a shortened version of DASS-42 and includes 21 questions for three subscales of stress, depression, and anxiety (7 questions for each subscale). The score for each question ranges from not at all (0) to very high (3). The score is calculated for each scale separately. The minimum score for each subscale is zero, and the maximum is 21, and a higher score indicates distress in the domains. Depression, anxiety, and stress are categorized as normal, mild, moderate, severe, and extremely severe, depending on the score on the subscales[14].

Multi-dimensional Scale of Perceived Social Support (MSPSS)

The MSPSS is a validated brief research tool designed to measure perceptions of support from 3 sources as family, friends, and a significant another person. The scale is comprised of a total of 12 items, with four items for each subscale. The MSPSS has shown good internal and test-retest reliability, validity, and a fairly stable factorial structure[15].

Results

A total of 40 COVID positive pregnant women were included in the study. All women responded to both questionnaires, with a response rate of 100%. As presented in Table 1, the mean age of the participants was 24.8 years, ranging from 19 to 32 years.

Table 1: Distribution of the study population as per socio-demographic profile (n=40)

Parameter	n (%)
Age in years	
18-22	12 (30)
23-26	16 (40)
27-32	12 (30)
Education	
Secondary	32 (80)
Graduate	08 (20)
Occupation	
Homemaker	25 (62.5)
Service	08 (20)
Business	07 (17.5)
Income	
10-20 k/month	29 (72.5)
21-30 k/month	01 (2.5)
30 k/month	10 (25)

Thirteen out of 40 women were from the first or second trimester and away from delivery, whereas 27 women were from the third trimester. The average gestational age of the study participants was 30 weeks (Table 2). The incidence of high-risk factors during pregnancy was 12.5% for hypertension, 10% for diabetes, and 22.5% for thyroid disorder. Among 16 near-term patients, five had a vaginal birth, ten had cesarean sections for different obstetric indications, and one had a preterm vaginal delivery with intrauterine death. A total of 60% of women had a mild infection, 35% had a moderate infection, and 5% had severe COVID-19 disease, as per the classification.

Table 2: Obstetric & COVID details of the participants

Parameter	n (%)
Parity	
G1	21 (52.5)
G2	4 (10)
≥G3	5 (37.5)
Trimester	
1st or 2nd Trimester	13 (32.5)
3rd Trimester	27 (67.5)
Presence of co-morbidities	
Diabetes	4 (10)
Hypertension	5 (12.5)
Thyroid disorder	9 (22.5)
Pregnancy outcome (n=16)	
FTND	3 (18.8)
FTVD	2 (12.5)
LSCS	10 (62.5)
PTVD IUD	1 (6.3)
Severity of COVID	
Mild	24 (60)
Moderate	14 (35)
Severe	2 (5)

Abbreviations: FTND: Full-Term Normal Delivery, FTVD: Full-Term Vaginal Delivery, LSCS: Lower (uterine) Segment Cesarean Section, PTVD IUD: Preterm Vaginal Delivery Intra-Uterine Death

The results of DASS depict that 50% of women did not have depression; the rest had mild and moderate depression. About three-forth (77%) of women reported anxiety from mild to severe levels. Twenty percent of women reported mild stress, and 7.5% reported severe stress (Table 3). MSPSS elicited that all women were found to have good or moderate support from family and friends. There was a perception of good support from family members or friends in 62.5% (25 women) of women. The remaining 37.5% (15 women) expressed a perception of moderate support.

Table 3: DASS scale: Severity of depression, anxiety, and stress

	Depression	Anxiety	Stress
Grade	**n (%)**	**n (%)**	**n (%)**
Mild	12 (30)	14 (35)	8 (20)
Moderate	8 (20)	9 (22.5)	3 (7.5)
Severe	0 (0)	8 (20)	0 (0)
No DAS	20 (50)	9 (22.5)	29 (72.5)

Abbreviations: DAS: Depression, Anxiety, Stress

There was no statistical association between the severity of COVID illness with depression and anxiety. But presence of mild COVID illness was associated with mild levels of stress (Table 4) There was no association between obstetric parameters like stage of pregnancy and the presence of comorbidities with depression, anxiety, and stress.

Table 4: Association between DASS with the severity of COVID and obstetric parameters

Para-meter	Depression			χ^2 (p-value)	Anxiety			χ^2 (p-value)	Stress			χ^2 (p-value)
	Mild (n=12)	Moderate (n=8)	Severe (n=0)		Mild (n=14)	Moderate (n=9)	Severe (n=8)		Mild (n=8)	Moderate (n=3)	Severe (n=0)	
Severity of COVID												
Mild (n=24)	10	4	0		9	4	5		6	1	0	
Moderate (n=14)	2	3	0	4.79 (0.31)	5	4	2	3.67 (0.72)	1	1	0	9.32 (*0.05)
Severe (n=2)	0	1	0		0	1	1		1	1	0	
Gestational age												
1st or 2nd trimester (n=13)	6	2	0	2.79 (0.30)	4	4	2	0.90 (0.83)	0	1		4.89 (0.09)
3rd trimester (n=27)	6	6	0		10	5	6		8	2		
Obstetric comorbidities												
Hypertension (n=5)	1	1	0	0.31 (0.86)	12	2	1	0.1 (0.55)	1	1	0	131 (0.52)
Diabetes (n=4)	11	8	0	1.48 (0.47)	1	0	1	2.67 (0.45)	1	0	0	0.39 (0.82)
Thyroid disorder (n=9)	1	3	0	0.25 (0.29)	5	1	0	2.77 (0.43)	2	0	0	0.94 (0.62)

*p - value < 0.05 significant

The proportion of mild form of depression, anxiety, and stress among the patients was higher among those with high level of support, indicating negative association, although not significant (Table 5).

Table 5: Association between MSPSS and DASS

MSPSS	Depression			χ^2 (p-value)	Anxiety			χ^2 (p-value)	Stress			χ^2 (p-value)
	Mild (n=12)	Moderate (n=8)	Severe (n=0)		Mild (n=14)	Moderate (n=9)	Severe (n=8)		Mild (n=8)	Moderate (n=3)	Severe (n=0)	
High Support	9	4	0	1.38 (0.5)	9	4	6	1.87 (0.5)	5	1	0	1.2 (0.54)
Moderate Support	3	4	0		5	5	2		3	1	0	

Discussion

COVID-19 2nd wave has been a psychological crisis with an exorbitant number of cases and mortality in India[16]. Multiple studies report high depression, anxiety, and stress levels in pregnant women during the COVID pandemic[17-19]. However, to the best of our knowledge, there have been very few studies on the psychological consequences that women would have faced, when they contracted COVID illness during their pregnancy[20].

The literature is sparse on the psychiatric symptoms of pregnant women diagnosed with COVID illness, especially during India's COVID 2nd wave in April- May 2021. In our study, 12 (30%) were found to have mild depression, and 8 (20%) had moderate depression, 14 (35%) had mild anxiety, 9 (22.5%) had moderate anxiety and 8 (20%) had severe anxiety, 8 (20%), 3 (7.5%) had moderate stress on depression, anxiety, stress 21 rating evaluation scale.

As per the demographic profile of the concerned women, the mean age was 24.82 with a range of 19-32 years which corresponds to previous studies[21]. The majority of the study population, i.e., 80%, had completed their education till the 12th standard. The distress of transient income sources can be related to 80% of the women experiencing anxiety.

Irrespective of the gestational age, the majority of women experienced anxiety. Maximum women i.e. 21 out of 27 (74.04%) belonging to the second half of pregnancy seemed to have presented with anxiety and 22.22% had severe anxiety (6 out of 27). This finding was in correlation with the previous studies[21]. Another study involving 308 pregnant women in the third trimester showed that this group's anxiety incidence was 14.3%[22]. Women with children and higher gestational age were also more likely to report better mental health findings inconsistent with the present study[23]. Medical comorbidities like hypertension, thyroid, and Diabetes Mellitus (DM) had no significant statistical association with the DASS scales. However, these women were found to have more propensity towards anxiety. The majority of cases were labeled as moderate COVID infection. No recorded HDU/CCU admissions were seen. Conservative management was adapted for Antenatal Care (ANC), and routine scans were done for proper surveillance and non-stress tests for term patients.

About 62.5% of women were delivered by cesarean section for different obstetric indications. Out of the two patients with severe COVID infection, one ended up having preterm intrauterine death, which was attributed to severe hypoxia due to COVID infection.

The presence of psychiatric features of stress, anxiety, and depression in the pregnant woman can have adverse consequences on her physical health and perinatal outcome[21]. In our study, the women with COVID, irrespective of its severity, had depression, anxiety, and stress. Most women with moderate and severe COVID illness had mild to moderate depression, anxiety, and stress-related symptoms. Without considering the severity of the diagnosis, COVID condition itself seemed to evoke psychological symptoms in pregnant women. In a review article by Rogers et al. on patients diagnosed with COVID during the acute illness, common symptoms among patients admitted to the hospital for Severe Acute Respiratory Syndrome (SARS) or Middle East Respiratory Syndrome (MERS) included depressed mood [42 (32·6%; 95% CI 24·7–40·9) of 129 patients], anxiety [46 (35·7%; 27·6–44·2) of 129], impaired memory [44 (34·1%; 26·2–42·5) of 129], impaired concentration or attention [39 (38·2%; 29·0–47·9) of 102]; in one study, and insomnia [54 (41·9%; 22·5–50·5) of 129][24]. Wang et al. studied the psychological consequences of COVID in pregnant women during pregnancy and at delivery; and neurobehavioral outcomes of infants. It reported that pregnant women with COVID illness who experienced separation from infants after delivery or had an abortion had symptoms of depression and posttraumatic stress disorder, three months after delivery or abortion[25].

Research among pregnant women has shown that younger age, lower socioeconomic status, and more socioeconomic impact of the pandemic were associated with mental health problems[26]. The presence of pregnancy complications was identified as a significant risk factor, while social support was a significant protective factor for mental health and health behaviors among pregnant women[25,26]. In our study, all 40 women reported moderate to high social support from a family member, friend, or a significant another person. There was a higher proportion of mild form of depression, anxiety, and stress among those with good social support. Studies report that individuals with higher levels of social support during the epidemic outbreak might have received more cognitive, emotional, and tangible resources to meet the adversities, preventing the risk of mental health problems. In addition, an individual's family, friends, or significant others can act as positive models or social control for health behaviors or encourage personal preventive behaviors[23]. Previous studies have shown that high social support plays a protective role in anxiety during pregnancy[8]. Social support has a direct negative influence on the anxiety of pregnant women, which is consistent with previous studies[27]. Social support can directly protect individuals' negative emotions by helping with behavior and providing emotional support. In addition, social support can also improve individuals' assessment and coping skills, reduce the perceived severity of stressful events, and thus play an indirect protective role in mental health[28]. The care and support of family members, especially spouses, can alleviate the adverse effects of stressful life events on pregnant women[22].

Our study cordially cites all COVID-19 positive pregnant women and their psychological impact, with the advantage of 100% participation and joint association of an obstetrician and a psychiatrist.

Limitations

Limited sample size and cross-sectional design, where follow-up of psychological consequences was not done, are some of the limitations of the study.

Conclusion

The study has shown concerning elevated symptoms of anxiety in COVID-19 disease-positive pregnant women. It highlights a decreased intensity of the negative psychological reactions in pregnant women perceiving high social support.

Recommendations

ANC should be directed to detect common psychological reactions like depression, anxiety, and stress with stressors of COVID in pregnancy. Emotional and social support from family and friends should be offered to warrant better perinatal outcomes in this vulnerable population.

Conflict of Interest: Nil

Source of Support: Nil

ORCiD

Manjiri C Datar   0000-0002-7836-6075

References

1. Saccone G, Florio A, Aiello F, et al. Psychological impact of coronavirus disease 2019 in pregnant women. Am J Obstet Gynecol. 2020; Aug;223(2):293-95.

2. Sanche S, Lin YT, Xu C, Romero-Severson E, Hengartner N, Ke R. High Contagiousness and Rapid Spread of Severe Acute Respiratory Syndrome Coronavirus 2. Emerg Infect Dis. 2020;26(7):1470-7. DOI: 10.3201/eid2607.200282.

3. Sahoo S, Mehra A, Dua D, et al. Psychological experience of patients admitted with SARS-CoV-2 infection. Asian Journal of Psychiatry. 2020 Dec; 54:102355.

4. Lee DT, Sahota D, Leung TN, Yip AS, Lee FF, Chung TK. Psychological responses of pregnant women to an infectious outbreak: a case-control study of the 2003 SARS outbreak in Hong Kong. J Psychosom Res. 2006 Nov 1;61(5): 707–13.

5. Rasmussen SA, Smulian JC, Lednicky JA, Wen TS, Jamieson DJ. Coronavirus disease 2019(COVID-19) and pregnancy: what obstetricians need to know. Am J Obstet Gynecol. 2020 May 1; 222(5):415–26.

6. Li S, Wang Y, Xue J, Zhao N, Zhu T. The impact of COVID-19 epidemic declaration on psychological consequences: a study on active Weibo users. Int J Environ Res Public Health. 2020 Mar; 17(6):2032.

7. Durankuş F, Aksu E. Effects of the COVID-19 pandemic on anxiety and depressive symptoms in pregnant women: a preliminary study. J Matern Fetal Neonatal Med. 2022 Jan 17;35(2):205-11.

8. Gümüşsoy S, Keskin G, Çiçek Ö, Yiğitoğlu S, Kirazlı G, Yıldırım GÖ. Psychological problem areas of pregnant women diagnosed with abortus imminens as a result of assisted reproductive techniques: A comparative study. Perspect Psychiatr Care 2021 Jan; 57(1): 73-81.

9. Nath A, Venkatesh S, Balan S, Metgud CS, Krishna M, Murthy GV. The prevalence and determinants of pregnancy-related anxiety amongst pregnant women at less than 24 weeks of pregnancy in Bangalore, Southern India. Int J Women's Health. 2019;11:241–48.

10. Cardwell MS. Stress: pregnancy considerations. Obstet Gynecol Surv. 2013 Feb 1; 68(2): 119–29.

11. Glover V. Maternal depression, anxiety and stress during pregnancy and child outcome; what needs to be done. Best Pract Res Clin Obstet Gynaecol. 2014 Jan 1;28(1):25–35.

12. Ravid E, Salzer L, Arnon L, et al. Is there an association between maternal anxiety propensity and pregnancy outcomes? BMC Pregnancy Childbirth. 2018 Dec;18(1):1-6.

13. Hassan SA, Sheikh FN, Jamal S, Ezeh JK, Akhtar A. Coronavirus (COVID 19): a review of clinical features, diagnosis and treatment. Cureus. 2020 Mar 21; 12(3).

14. Tran TD, Tran T, Fisher J. Validation of the depression anxiety stress scales (DASS) 21 as a screening instrument for depression and anxiety in a rural community-based cohort of northern Vietnamese women. Bmc Psychiatry. 2013 Dec; 13(1):1-7. DOI: 10.1186/1471-244X-13-24.

15. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The Multidimensional Scale of Perceived Social Support. Journal of Personality Assessment. 1988 Mar 1; 52(1):30-41.

16. Sv P, Lathabhavan R, Ittamalla R. What concerns Indian general public on second wave of COVID-19? A report on social media opinions. Diabetes & metabolic syndrome. 2021 May; 15(3):829.

17. Khoury JE, Atkinson L, Bennett T, Jack SM, Gonzalez A. COVID-19 and mental health during pregnancy: The importance of cognitive appraisal and social support. Journal of affective disorders. 2021 Mar 1; 282:1161-9.

18. Masjoudi M, Aslani A, Khazaeian S, Fathnezhad-Kazemi A. Explaining the experience of prenatal care and investigating the association between psychological factors with self-care in pregnant women during COVID-19 pandemic: a mixed method study protocol. Reproductive health. 2020 Dec; 17(1):1-7.

19. Berthelot N, Lemieux R, Garon-Bissonnette J, Drouin-Maziade C, Martel É, Maziade M. Uptrend in distress and psychiatric symptomatology in pregnant women during the coronavirus disease 2019 pandemic. Acta obstetricia et gynecologica Scandinavica. 2020 Jul; 99(7):848-55.

20. Zhou Y, Shi H, Liu Z, et al. The prevalence of psychiatric symptoms of pregnant and non-pregnant women during the COVID-19 epidemic. Translational psychiatry. 2020 Sep 19;10(1):1-7.

21. Effati-Daryani F, Zarei S, Mohammadi A, Hemmati E, Yngyknd SG, Mirghafourvand M. Depression, stress, anxiety and their predictors in Iranian pregnant women during the outbreak of COVID-19. BMC psychology. 2020 Dec; 8(1):1-10.

22. Yue C, Liu C, Wang J, Zhang M, Wu H, Li C, Yang X. Association between social support and anxiety among pregnant women in the third trimester during the coronavirus disease 2019 (COVID-19) epidemic in Qingdao, China: The mediating effect of risk perception. The International journal of social psychiatry. 2021 Mar; 67(2):120-7.

23. Wang Q, Song B, Di J, et al. Intentions to Seek Mental Health Services During the COVID-19 Pandemic Among Chinese Pregnant Women With Probable Depression or Anxiety: Cross-sectional, Web-Based Survey Study. JMIR mental health. 2021 Feb 11;8(2):e24162.

24. Rogers JP, Chesney E, Oliver D, et al. Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic. The Lancet Psychiatry. 2020 Jul 1; 7(7):611-27.

25. Wang Y, Chen L, Wu T, et al. Impact of Covid-19 in pregnancy on mother's psychological status and infant's neurobehavioral development: a longitudinal cohort study in China. BMC medicine. 2020 Dec;18(1):1-10.

26. Ng J, Sham A, Tang PL, Fung S. SARS: pregnant women's fears and perceptions. British Journal of Midwifery. 2004 Nov,12(11):698–702.

27. Gao L, Qu J, Wang AY. Anxiety, depression and social support in pregnant women with a history of recurrent miscarriage: a cross-sectional study. Journal of reproductive and infant psychology. 2020 Oct 19;38(5):497-508.

28. Lakey B, Orehek E. Relational regulation theory: a new approach to explain the link between perceived social support and mental health. Psychological review. 2011 Jul; 118(3):482.