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ORIGINAL ARTICLE

Negative Emotions, Triggers, and Coping Strategies Among Postpartum Indian Women During Second Wave of COVID-19 Pandemic: Lessons for the Subsequent Waves and Beyond

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Abstract

Introduction The study aimed to evaluate COVID-19 associated psychological distress among pregnant and postpartum women during the second wave of COVID-19 in India.

Methods A cross-sectional survey was done using a pre-validated tool involving 491 participants attending a tertiary-care hospital during the second wave of COVID-19 in India.

Results Three-fourths of participants experienced negative emotions such as fear and various features of depression. Participants (75%) reported COVID-related news on TV/Radio/Newspapers including social media as the major trigger for these negative emotions. Loss of social support mainly affected postpartum women ($p < 0.001$) and working women ($p < 0.001$). Inability to access healthcare services had negative associations with age ($p < 0.001$), education ($p < 0.001$), and socioeconomic class ($p < 0.001$). Various coping strategies being followed by participants included watching TV/Videos or reading books (93%), resorting to social media (77%), spending more time praying and meditating (86%), and engaging in hobbies (56%).

Conclusion During the second wave, the COVID-19 pandemic had a significantly high negative impact on the psychological and social well-being of pregnant and postpartum women. Hence, it is important to initiate appropriate preventive and corrective steps by the policymakers for any future waves of the pandemic.

Keywords Developing country · COVID-19 · Pregnant women · Postpartum women

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Introduction

The world is looming with various waves of the COVID-19 pandemic, and India has recently experienced an intense second wave [1]. Wherein, the various vulnerable groups have been neglected and unduly affected. Among these groups, pregnant and postpartum women have felt various adversities [2, 3]. Though the vaccination drive has been ramped up throughout the country yet the possibility of a third wave is tangible. Due to prevalent vaccine hesitancy among pregnant and postpartum women, the pandemic has increased their susceptibility to adverse mental health outcomes. Pandemic-induced fear, restrictions, and confusion over the acceptance of the COVID-19 vaccine may also lead to impaired psychosocial functioning and negatively influence maternal, neonatal, and infant outcomes [4, 5].

Few studies have been conducted to assess the adverse effects of COVID-19 on pregnant and postpartum women.

The studies have mostly used validated tools such as the Generalized Anxiety Disorder 7-item Scale (GAD-7), State-Trait Anxiety Inventory, Beck Depression Inventory-II, Edinburgh Depression Scale (EDS), and Impact of Event Scale-Revised (IES-R) [5–7]. However, results from these studies cannot be generalized due to the unique socio-cultural make-up of India. Moreover, the scales used may not be uniformly applied to pregnant and postpartum women due to the particularity of the life stage [8]. Thus, it is imperative to assess the quantum of COVID-19-associated psychosocial changes among pregnant and postpartum women using a specific validated tool [4]. Therefore, this study aims to assess the negative emotions experienced by pregnant and postpartum women during the second wave the of COVID-19 pandemic in India. Apart from this, the study also looks into the various emotional triggers, and pregnancy concerns and coping strategies adopted by these women due to the pandemic in the Indian scenario.

Materials and Methods

Study Design

A cross-sectional survey was conducted to assess the impact of COVID-19 on the psychosocial functioning of pregnant and postpartum women.

Study Locale

The study was conducted in the Department of Obstetrics and Gynaecology, All India Institute of Medical Science, New Delhi. The sample was recruited from both in-patient and out-patient departments.

Criteria for the Selection of Locale

All India Institute of Medical Science, New Delhi is the biggest tertiary care center in the country, and one of the few healthcare centers that were providing services at the peak of the pandemic.

Selection of Sample

The sampling technique used for the study is purposive sampling. The sample size was calculated using a 95% confidence interval and a 5% of margin of error. Based on the prevalence of mental health disorders in pregnant and postpartum women which were found to be up to 40% in the pandemic [9, 10] the calculated sample size was 369.

Ethical Consideration

The study was conducted as per the declaration of Helsinki with prior approval from the Institute Ethics Committee ((IEC/236/3/2020), AIIMS, New Delhi. The principle of maximum diversity was used in recruitment and before the administration of the questionnaire, participants were briefed about the study objectives and assured of their anonymity and confidentiality. Informed and written consent was taken from all the participants.

Tools and Techniques

A well-developed and validated questionnaire was used with a Cronbach alpha of 0.90 [11]. The questionnaire had two sections. Section A of the questionnaire included questions related to participants' obstetric information and socio-demographic profile. Section B of the questionnaire comprised 38 items. Items 1–9 were about the emotions experienced by pregnant and postpartum women during the COVID-19 pandemic. Items 10–15 were for the identification of various factors responsible for negative emotions during COVID-19. Items 16–21 comprised various measures taken by these women out of the fear of contracting COVID-19 infection. Questions 22–32 addressed health-related concerns of these women during the pandemic and questions 33–38 addressed the various coping mechanisms adopted by these women during the COVID-19 pandemic.

Data Collection

The data collection was done between February 2021 and May 2021. The questionnaire was administered by the researcher (PJ), and responses were coded as per the scoring scheme of the questionnaire [11].

Data and Statistical Analysis

Descriptive analyses (such as frequency and percentage) were carried out to describe the obstetric information, socio-demographic characteristics, and participants' response to various questions. Mean and standard deviation was calculated to assess the extent of emotions and thoughts experienced during this pandemic, factors responsible for negative thoughts, measures taken by peripartum women due to the fear of getting COVID-19 infection, health concerns among these women, and stress-coping mechanisms adopted by these women during this pandemic. Chi-square values were

determined to interpret the association between socio-demographic profile and study variables. The data were analyzed using STATA/SE version 14.2 (StataCorp LP, College Station, TX, USA). *P*-value ≤ 0.05 was considered statistically significant for the analyses.

Results

Socio-Demographic Profile of Participants

A total of 563 questionnaires were administered. After data purification was done by eliminating incomplete entries, 491 were subjected to final data analysis. The participants were in the age range between 18 and 41 years with a greater representation of multigravidas (78%) as compared to primigravida (22%). The sample was also representative of all the socioeconomic classes with 17.52% of women having high-risk pregnancy. Detailed socio-demographic and obstetric information of participants has been depicted in Table 1.

Table 1 General characteristics of the participants ($n = 491$)

Characteristics of Participants	Frequency (%)
Age (years)	
18–25	208 (42.36)
26–34	271 (55.19)
≥ 35	12 (2.44)
Parity	
Primigravida	108 (22.00)
Multigravida	383 (78.00)
Type of conception	
Spontaneous	479 (97.56)
Assisted	12 (2.44)
Pregnant or Postpartum	
Pregnant	247 (50.31)
Postpartum	244 (49.69)
Pregnant women (Period of gestation)	
< 12 weeks	36 (14.57)
13–28 weeks	117 (47.36)
> 28 weeks	94 (38.05)
Postpartum women (Mode of delivery)	
NVD	152 (62.29)
LSCS	81 (33.19)
Instrumental	11 (4.50)
Educational level	
Illiterate	27 (5.49)
Up to 10th	155 (31.56)
Intermediate	141 (28.72)
Graduation	143 (29.12)
Post-graduation	25 (5.09)
Occupation	
Housewife	427 (86.97)
Working	64 (13.03)
Socioeconomic class	
Low	227 (46.23)
Middle	200 (40.73)
Upper	64 (13.03)
Whether High-Risk Pregnancy	
Yes	86 (17.52)
No	405 (82.48)

Negative Emotions and Emotional Triggers

Majority (70%) of the women had a moderate to excessive fear of either themselves or their family members getting infected with COVID-19. Fear of infection was positively associated with age ($\chi^2 = 29.42$; $p < 0.001$), postpartum status ($\chi^2 = 55.95$; $p < 0.001$), education ($\chi^2 = 157.61$; $p < 0.001$) and higher socioeconomic class ($\chi^2 = 78.51$; $p < 0.001$). Around three-fourth (75%) of the women had some features of depression, viz., loneliness, hopelessness, worthlessness, helplessness, and negative thoughts of which one-third had significant levels of depression. However, the depressive symptoms were more frequent in younger women, women with lower educational qualifications, and lower socioeconomic class. The majority (95%) of the participants were worried about their future. There were emotional triggers responsible for negative emotions among the participants during a pandemic. Three-fourths (75%) of the women reported COVID-related news on TV/Radio/Newspapers including social media as their emotional trigger for negative thoughts. The women who were most affected by the COVID-related news on TV/Radio/Newspapers were the ones with higher educational qualifications ($\chi^2 = 78.63$; $p < 0.001$) and belonged to upper socioeconomic classes ($\chi^2 = 34.41$; $p < 0.001$). Loss of social support mainly affected postpartum women ($\chi^2 = 117.16$; $p < 0.001$) and working women ($\chi^2 = 49.56$; $p < 0.001$). Inability to access healthcare services had negative associations with age ($\chi^2 = 60.58$; $p < 0.001$), education ($\chi^2 = 87.68$; $p < 0.001$), and socioeconomic class ($\chi^2 = 86.54$; $p < 0.001$). The negative emotions and emotional triggers experienced by pregnant and postpartum women due to COVID-19 infection are depicted in Table 2.

Preventive Steps Causing Discomfort

The majority of the participants were distressed with preventive measures like avoiding all public facilities like public transport (96%), parks (82%), restaurants (79%), hospitals

Table 2 Frequency of responses to the items related to negative emotions and emotional triggers experienced by participants and their association with socio-demographic variables

S. no	Preventive measures causing discomfort	Frequency of responses by participants (Percentage %)					Association with Socio-demographic correlates								
		Not Applicable (A)	Not at all (0)	Minimal (1)	Moderate extent (2)	Too much (3)	Age	Parity	Type of conception	Pregnant/ Postpartum	Mode of delivery	Education	Occupation	Socioeconomic status	Highrisk pregnancy
1	Avoid the services of domestic help/ washerman/ driver	267 (54.38)	15 (3.05)	74 (15.07)	109 (22.20)	26 (5.30)	$\chi^2=119.07$; $p<0.001$	$\chi^2=41.22$; $p<0.001$	N.S	$\chi^2=178.78$; $p<0.001$	$\chi^2=16.78$; $p<0.05$	$\chi^2=72.73$; $p<0.001$	$\chi^2=61.29$; $p<0.001$	$\chi^2=171.74$; $p<0.001$	$\chi^2=10.74$; $p<0.05$
2	Avoiding social gatherings due to COVID pandemic	05 (1.02)	15 (3.05)	148 (30.14)	287 (58.45)	36 (7.33)	N.S	N.S	N.S	$\chi^2=16.23$; $p<0.01$	N.S	$\chi^2=71.65$; $p<0.001$	$\chi2=26.61$; $p<0.001$	$\chi^2=22.25$; $p<0.01$	N.S
3	Avoiding going to the park for walking/ exercising	66 (13.44)	23 (04.58)	209 (42.57)	160 (32.59)	33 (06.72)	$\chi^2=45.78$; $p<0.001$	N.S	$\chi^2=10.38$; $p<0.05$	$\chi^2=34.36$; $p<0.001$	N.S	$\chi^2=120.22$; $p<0.001$	$\chi^2=56.35$; $p<0.001$	$\chi^2=83.90$; $p<0.001$	$\chi^2=14.13$; $p<0.01$
4	Avoid using public transport	05 (01.02)	14 (02.85)	166 (33.81)	260 (52.95)	46 (09.37)	$\chi^2=20.70$; $p<0.01$	N.S	N.S	$\chi^2=27.92$; $p<0.001$	N.S	$\chi^2=85.17$; $p<0.001$	$\chi^2=22.40$; $p<0.001$	$\chi^2=30.52$; $p<0.001$	N.S
5	Avoid eating out/ ordering food from outside	81 (16.50)	23 (04.68)	200 (40.73)	139 (28.31)	48 (09.78)	$\chi^2=61.59$; $p<0.001$	N.S	N.S	$\chi^2=75.43$; $p<0.001$	$\chi^2=18.64$; $p<0.05$	$\chi^2=105.54$; $p<0.001$	$\chi^2=35.74$; $p<0.001$	$\chi^2=73.68$; $p<0.001$	N.S

Table 2 (continued)

S. no	Preventive measures causing discomfort	Frequency of responses by participants (Percentage %)					Association with Socio-demographic correlates								
		Not Applicable (A)	Not at all (0)	Minimal (1)	Moderate extent (2)	Too much (3)	Age	Parity	Type of conception	Pregnant/ Postpartum	Mode of delivery	Education	Occupation	Socioeconomic status	Highrisk pregnancy
6	Avoiding social ceremonies related to pregnancy (Baby shower/ Godhbharai)	91 (18.53)	34 (06.92)	200 (40.73)	127 (25.87)	39 (07.94)	$\chi^2 = 65.99$; $p < 0.001$	$\chi^2 = 14.05$; $p < 0.01$	$\chi 2 = 14.70$; $p < 0.01$	$\chi^2 = 82.81$; $p < 0.001$	N.S	$\chi^2 = 114.99$; $p < 0.001$	$\chi^2 = 31.27$; $p < 0.001$	$\chi^2 = 96.29$; $p < 0.001$	N.S
7	Avoiding visits to the hospital for prenatal/ routine checkups	02 (0.41)	197 (40.12)	172 (35.03)	99 (20.16)	21 (4.28)	$\chi^2 = 53.60$; $p < 0.001$	$\chi^2 = 23.38$; $p < 0.001$	N.S	$\chi^2 = 149.52$; $p < 0.001$	N.S	$\chi^2 = 88.99$; $p < 0.001$	$\chi^2 = 26.91$; $p < 0.001$	$\chi^2 = 99.56$; $p < 0.001$	$\chi^2 = 12.38$; $p < 0.05$
Mean and SD of Preventive Measures out for Negative Emotions	Mean = 12.54, SD = 7.24.0														

N.S.: Non significant

(56%), or even domestic help (42%). More than three-fourths (75–80%) of the participants were moderately affected with all social gatherings and ceremonies related to pregnancy being held in abeyance due to the pandemic. Furthermore, it was found that the avoidance behavior was positively associated with socio-demographic variables like age ($\chi^2 = 119.07$; $p < 0.001$), level of education ($\chi^2 = 72.73$; $p < 0.001$), and socioeconomic status ($\chi^2 = 171.74$; $p < 0.001$). These preventive steps affected mostly older women and women with higher educational and socioeconomic status. Table 3 shows the lifestyle alterations causing discomfort and their association with the socio-demographic variables.

Pregnancy Concerns

Table 4 shows the frequency of responses to the items related to pregnancy concerns and their association with socio-demographic variables. More than half (61%) of the women experienced the fear of complications due to inadequate prenatal services of which around one-fourth (27%) reported excessive fear. Fear of complications had a positive and statistically significant association with age ($\chi^2 = 52.03$; $p < 0.001$) and socioeconomic status ($\chi^2 = 84.37$; $p < 0.001$). More than half of the participants avoided prenatal checkups due to the pandemic (59%) and faced difficulty in accessing healthcare facilities (60%). Most (91%) women were worried about the effect of COVID on their health while nearly every woman (99%) was bothered about the effect of COVID on the fetus of which more than half (57%) were extremely distressed. Nearly half of the women (42%) were determined to not take any additional help for baby care after delivery. Moreover, the majority (84%) were anxious about the lifestyle changes (diet, exercise, and sleep) due to the pandemic. Nearly three-fourths of the participants made deliberate attempts to avoid the thoughts of COVID (72%) and tried to avoid any discussion related to COVID-19 with their family members (68%). Furthermore, there was a statistically significant positive association between age and socioeconomic status with all the pregnancy concerns.

Coping Strategies

The majority of the participants watched TV/ Videos or read books (93%) and resorted to social media (77%) to allay their anxiety due to the pandemic. Many women (86%) spent more time praying and meditating while nearly half of the women (56%) engaged in hobbies to cope with negative thoughts and emotions due to COVID-19. Coping strategies like accessing social media, playing online or offline games, doing prayers/meditation, and engaging in hobbies had positive associations with age, education, and socioeconomic status. Thus, as the age, education, and socioeconomic status of women increased, their level of coping with negative thoughts and emotions also became stronger and vice-versa. Various coping strategies adopted by the participants have been presented in Table 5.

Discussion

This study cohesively assesses various social, emotional, and psychological effects of the COVID-19 pandemic such as fear and negative emotions. Along with it, it has also assessed factors responsible for negative emotions, pregnancy concerns, and the coping strategies adopted by pregnant and postpartum women in the second wave of the pandemic.

The survey participants had considerable fear of themselves and their family members contracting COVID-19 infection. Depressive symptoms like loneliness, helplessness, hopelessness, and worthlessness affected the majority of women similar to studies conducted in Spain [12] and Iran [13] stating that pregnant women during the COVID pandemic had greater levels of phobic anxiety and depression. This highlights the importance of social support required by this population. The participants also experienced anxiety, phobias, and depressive symptoms similar to the first wave in India (Table 6). [14–16]

Various triggers have been identified that might be responsible for the fear/negative emotions during this pandemic. Women, especially those with higher socioeconomic status and higher education levels, were negatively affected by COVID-related news on TV/Radio/Newspapers including social media. This might be due to the greater access of these women to TV and other means of social media as compared to women who were less educated and belonged to low socioeconomic status. Similar results were reported in a study conducted in Iran [13], where women residing in urban areas showed higher anxiety levels. This highlights the need to provide reliable information to these women. Telemedicine can be used by healthcare providers to provide satisfying answers to these women related to their concerns about the possible effects of COVID-19 disease on mother and unborn/newborn baby, to increase their awareness about COVID-19 signs and symptoms, and to advise them to perform yoga and deep breathing along with the intake of a healthy diet to maintain overall well-being.

Another emotional trigger observed in the present study was the inability to access healthcare services due to the pandemic similar to a study conducted in the UK [17]. Inadequate prenatal services such as reduced frequency of physical appointments with the treating doctor and delay in ultrasounds raised anxiety levels among pregnant women. Moreover, avoiding visits to hospitals due to the fear of contracting COVID-19 infection raised concerns among these women about whether their pregnancy was going right or

Table 3 Frequency of responses to the items related to preventive measures causing discomfort and their association with socio-demographic variables

S. no	Preventive measures causing discomfort	Frequency of responses by participants (Percentage %)					Association with Socio-demographic correlates								
		Not Applicable (A)	Not at all (0)	Minimal (1)	To Moderate extent (2)	Too much (3)	Age	Parity	Types of conception	Whether Pregnant/ Postpartum	Mode of delivery	Education	Occupation	Socioeconomic status	Whether high risk pregnancy
1	Avoid the services of domestic help/ washerman/driver	267 (54.38)	15 (3.05)	74 (15.07)	109 (22.20)	26 (5.30)	$\chi^2 = 119.07$; $p < 0.001$	$\chi^2 = 41.22$; $p < 0.001$	N.S	$\chi^2 = 178.78$; $p < 0.001$	$\chi^2 = 16.78$; $p < 0.05$	$\chi^2 = 72.73$; $p < 0.001$	$\chi^2 = 61.29$; $p < 0.001$	$\chi^2 = 171.74$; $p < 0.001$	$\chi^2 = 10.74$; $p < 0.05$
2	Avoiding social gatherings due to COVID pandemic	05 (1.02)	15 (3.05)	148 (30.14)	287 (58.45)	36 (7.33)	N.S	N.S	N.S	$\chi^2 = 16.23$; $p < 0.01$	N.S	$\chi^2 = 71.65$; $p < 0.001$	$\chi 2 = 26.61$; $p < 0.001$	$\chi^2 = 22.25$; $p < 0.01$	N.S
3	Avoiding going to the park for walking/exercising	66 (13.44)	23 (04.58)	209 (42.57)	160 (32.59)	33 (06.72)	$\chi^2 = 45.78$; $p < 0.001$	N.S	*$\chi^2 = 10.38$; $p < 0.05$*	$\chi^2 = 34.36$; $p < 0.001$	N.S	$\chi^2 = 120.22$; $p < 0.001$	$\chi^2 = 56.35$; $p < 0.001$	$\chi^2 = 83.90$; $p < 0.001$	$\chi^2 = 14.13$; $p < 0.01$
4	Avoid using public transport	05 (01.02)	14 (02.85)	166 (33.81)	260 (52.95)	46 (09.37)	$\chi^2 = 20.70$; $p < 0.01$	N.S	*N.S*	$\chi^2 = 27.92$; $p < 0.001$	N.S	$\chi^2 = 85.17$; $p < 0.001$	$\chi^2 = 22.40$; $p < 0.001$	$\chi^2 = 30.52$; $p < 0.001$	N.S
5	Avoid eating out/ ordering food from outside	81 (16.50)	23 (04.68)	200 (40.73)	139 (28.31)	48 (09.78)	$\chi^2 = 61.59$; $p < 0.001$	N.S	N.S	$\chi^2 = 75.43$; $p < 0.001$	$\chi^2 = 18.64$; $p < 0.05$	$\chi^2 = 105.54$; $p < 0.001$	$\chi^2 = 35.74$; $p < 0.001$	$\chi^2 = 73.68$; $p < 0.001$	N.S
6	Avoiding social ceremonies related to pregnancy (Baby shower/ Godhbharai)	91 (18.53)	34 (06.92)	200 (40.73)	127 (25.87)	39 (07.94)	$\chi^2 = 65.99$; $p < 0.001$	$\chi^2 = 14.05$; $p < 0.01$	$\chi 2 = 14.70$; $p < 0.01$	$\chi^2 = 82.81$; $p < 0.001$	N.S	$\chi^2 = 114.99$; $p < 0.001$	$\chi^2 = 31.27$; $p < 0.001$	$\chi^2 = 96.29$; $p < 0.001$	N.S
7	Avoiding visit to the hospital for prenatal/routine check-ups	02 (0.41)	197 (40.12)	172 (35.03)	99 (20.16)	21 (4.28)	$\chi^2 = 53.60$; $p < 0.001$	$\chi^2 = 23.38$; $p < 0.001$	N.S	$\chi^2 = 149.52$; $p < 0.001$	N.S	$\chi^2 = 88.99$; $p < 0.001$	$\chi^2 = 26.91$; $p < 0.001$	$\chi^2 = 99.56$; $p < 0.001$	$\chi^2 = 12.38$; $p < 0.05$

Table 3 (continued)

S. no	Preventive measures causing discomfort	Frequency of responses by participants (Percentage %)					Association with Socio-demographic correlates							
		Not Applicable (A)	Not at all (0)	Minimal (1)	To Moderate extent (2)	Too much (3)	Age	Parity	Types of conception	Whether Pregnant/ Postpartum	Mode of delivery	Education	Occupation	Socioeconomic status	Whether high risk pregnancy
Mean and SD of Preventive Measures out for Negative Emotions	Mean = 12.54, SD = 7.24														

N.S.: Non significant

not. Similarly, postpartum women have concerns about self-care and newborn care due to the reduced healthcare visits aggravated by the loss of social support. Hence, it is imperative to improve virtual maternity (antenatal and postnatal) care services, especially in a low-resource country like India where the majority of the population has no access to any virtual means.

Government norms for social restrictions to combat the COVID-19 pandemic have led to social isolation among these women. There is either reduced support or a total lack of support from friends and family. This lack of social support is yet another emotional trigger among pregnant and postpartum women. Similar findings have been reported in the study conducted in the UK [18] where women reported their anxiety and concerns due to the lack of support. This has become of utmost importance to make these women aware of various stress coping mechanisms.

The present study also shows the various coping strategies opted by these women to overcome the negative feelings associated with the pandemic. Stress coping strategies mainly included watching TV shows or reading books, resorting to social media, spending time in prayers and meditation, engaging in hobbies, and spending time with family. A study conducted in the USA [19] supports our findings stating that pregnant and postpartum women coped with COVID-19-related stress by engaging in healthy behavior related to diet and activity, making time to relax, and spending time with family and friends either offline or online mode.

Our study holds certain implications. COVID-19 pandemic-associated fear and stress have aggravated the psychosocial functioning of pregnant and postpartum women. It has become imperative for healthcare providers to convincingly respond to all queries of these women related to the effects of this pandemic on their health as well as the health of the unborn/newborn. It is also crucial to motivate these women to adopt stress coping strategies such as doing yoga, meditation, engaging in hobbies, and spending quality time with family. Moreover, authorities must take appropriate steps to strengthen virtual maternal care services in a country like India where the majority of the population has no access to any virtual means.

This study is one of the initial attempts to assess the effects of the COVID-19 pandemic on the psychological and social functioning of pregnant and postpartum women in India. The present study used a questionnaire that was validated to study pertinent components of psychological stress like negative emotions, triggers, and coping mechanisms for pregnant and postpartum women. This study highlights the need to strengthen virtual maternity services in pandemic conditions. Moreover, the study has been conducted during the second wave of the COVID-19 pandemic in India where this population group has been affected worse aggravating

Table 4 Frequency of responses to the items related to pregnancy concerns and their association with socio-demographic variables

S. no	Pregnancy concerns In COVID-19 pandemic	Frequency of responses by participants (Percentage %)					Association with Socio-demographic correlates								
		Not Applicable (A)	Not at all (0)	Minimal (1)	To Moderate extent (2)	Too much (3)	Age	Parity	Types of conception	Whether Pregnant/ Postpartum	Mode of delivery	Education	Occupation	Socioeconomic status	Whether high risk pregnancy
1	Extent of experiencing the fear of complications due to inadequate prenatal services	07 (01.43)	181 (36.86)	167 (34.01)	111 (22.61)	25 (05.09)	$\chi^2 = 52.03$; $p < 0.001$	$\chi^2 = 13.75$; $p < 0.01$	$\chi^2 = 10.35$; $p < 0.05$	$\chi^2 = 148.48$; $p < 0.001$	N.S	$\chi^2 = 79.67$; $p < 0.001$	$\chi^2 = 23.98$; $p < 0.001$	$\chi^2 = 84.37$; $p < 0.001$	N.S
2	Avoiding visiting the hospital for prenatal check-ups	09 (01.83)	189 (38.49)	177 (36.05)	98 (19.96)	18 (03.67)	$\chi^2 = 63.27$; $p < 0.001$	$\chi^2 = 26.89$; $p < 0.001$	N.S	$\chi^2 = 141.78$; $p < 0.001$	N.S	$\chi^2 = 85.10$; $p < 0.001$	$\chi^2 = 33.75$; $p < 0.001$	$\chi^2 = 104.76$; $p < 0.001$	$\chi^2 = 12.69$; $p < 0.05$
3	Difficulty in accessing healthcare facility (meeting doctors/ getting scans/ going for delivery)	01 (0.20)	180 (36.66)	174 (35.44)	115 (23.42)	21 (04.28)	$\chi^2 = 68.59$; $p < 0.001$	$\chi^2 = 17.49$; $p < 0.01$	$\chi^2 = 13.75$; $p < 0.01$	$\chi^2 = 147.36$; $p < 0.001$	N.S	$\chi^2 = 86.96$; $p < 0.001$	$\chi^2 = 57.54$; $p < 0.001$	$\chi^2 = 95.73$; $p < 0.001$	$\chi^2 = 10.63$; $p < 0.05$
4	Worry about the effect of COVID on your pregnancy/ or on your health	00 (0.00)	13 (02.65)	220 (44.81)	224 (45.62)	34 (06.92)	$\chi^2 = 24.28$; $p < 0.001$	N.S	N.S	$\chi^2 = 11.79$; $p < 0.01$	N.S	$\chi^2 = 104.63$; $p < 0.001$	$\chi^2 = 35.50$; $p < 0.001$	$\chi^2 = 10.91$; $p < 0.05$	N.S
5	Worry about the effect of COVID on your baby	03 (0.61)	15 (03.05)	180 (36.66)	248 (50.51)	45 (09.16)	N.S	$\chi^2 = 13.10$; $p < 0.05$	$\chi^2 = 19.19$; $p < 0.01$	$\chi^2 = 24.15$; $p < 0.001$	N.S	$\chi^2 = 89.72$; $p < 0.001$	$\chi^2 = 31.43$; $p < 0.001$	$\chi^2 = 25.89$; $p < 0.01$	N.S
6	Determination to not hire any additional help for baby care	264 (53.77)	15 (03.05)	87 (17.72)	100 (20.37)	25 (05.09)	$\chi^2 = 104.11$; $p < 0.001$	$\chi^2 = 43.06$; $p < 0.001$	N.S	$\chi^2 = 185.86$; $p < 0.001$	$\chi^2 = 15.53$; $p < 0.05$	$\chi^2 = 78.84$; $p < 0.001$	$\chi^2 = 70.03$; $p < 0.001$	$\chi^2 = 162.13$; $p < 0.001$	$\chi^2 = 18.16$; $p < 0.01$

Table 4 (continued)

S. no	Pregnancy concerns In COVID-19 pandemic	Frequency of responses by participants (Percentage %)					Association with Socio-demographic correlates								
		Not Applicable (A)	Not at all (0)	Minimal (1)	To Moderate extent (2)	Too much (3)	Age	Parity	Types of conception	Whether Pregnant/ Postpartum	Mode of delivery	Education	Occupation	Socioeconomic status	Whether high risk pregnancy
7	Bothered by the effect of changed lifestyle (diet, exercise and sleep)	03 (0.61)	77 (15.68)	235 (47.86)	153 (31.16)	23 (04.68)	$\chi^2 = 45.10$; $p < 0.001$	$\chi^2 = 15.16$; $p < 0.01$	N.S	$\chi^2 = 71.71$; $p < 0.001$	N.S	$\chi^2 = 98.48$; $p < 0.001$	$\chi^2 = 22.23$; $p < 0.001$	$\chi^2 = 69.91$; $p < 0.001$	$\chi^2 = 17.18$; $p < 0.01$
8	Making efforts to avoid the thoughts of COVID 19	46 (09.37)	92 (18.74)	193 (39.31)	134 (27.29)	26 (05.30)	$\chi^2 = 47.11$; $p < 0.001$	$\chi^2 = 15.75$; $p < 0.01$	N.S	$\chi^2 = 94.85$; $p < 0.001$	N.S	$\chi^2 = 126.90$; $p < 0.001$	$\chi^2 = 29.93$; $p < 0.001$	$\chi^2 = 93.92$; $p < 0.001$	$\chi^2 = 40.47$; $p < 0.001$
9	Avoiding any discussion about COVID with family members	49 (09.98)	107 (21.79)	188 (38.29)	125 (25.46)	22 (04.48)	$\chi^2 = 39.52$; $p < 0.001$	$\chi^2 = 17.25$; $p < 0.01$	N.S	$\chi^2 = 90.01$; $p < 0.001$	N.S	$\chi^2 = 102.37$; $p < 0.001$	$\chi^2 = 23.05$; $p < 0.001$	$\chi^2 = 82.43$; $p < 0.001$	$\chi^2 = 44.03$; $p < 0.001$
Mean and SD of Care and Concern	Mean = 23.31, SD = 7.53														

N.S.: Non significant

Table 5 Frequency of responses to the items related to coping strategies and their association with socio-demographic variables

S. no	Coping strategies	Frequency of responses by participants (Percentage %)					Association with Socio-demographic correlates								
		Not Applicable (A)	Not at all (0)	Minimal (1)	To Moderate extent (2)	Too much (3)	Age	Parity	Types of conception	Whether Pregnant/ Postpartum	Mode of delivery	Education	Occupation	Socioeconomic status	Whether high risk pregnancy
1	Watching TV/Videos/Reading books	03 (0.61)	28 (05.70)	192 (39.10)	222 (45.21)	46 (09.37)	$\chi^2=27.37$; $p<0.01$	$\chi^2=21.74$; $p<0.001$	N.S	$\chi^2=55.70$; $p<0.001$	N.S	$\chi^2=70.70$; $p<0.001$	$\chi^2=32.21$; $p<0.001$	$\chi^2=40.30$; $p<0.001$	$\chi^2=11.91$; $p<0.05$
2	Accessing and responding to social media (WhatsApp, Making video films, Facebook Instagrametc,)	61 (12.42)	53 (10.79)	200 (40.73)	136 (27.70)	41 (08.35)	$\chi^2=49.10$; $p<0.001$	$\chi^2=21.60$; $p<0.001$	N.S	$\chi^2=61.70$; $p<0.001$	N.S	$\chi^2=134.73$; $p<0.001$	$\chi^2=41.46$; $p<0.001$	$\chi^2=66.53$; $p<0.001$	N.S
3	Praying and meditation	05 (01.02)	62 (12.63)	303 (61.71)	72 (14.66)	49 (09.98)	$\chi^2=38.77$; $p<0.001$	$\chi^2=19.72$; $p<0.01$	N.S	$\chi^2=86.82$; $p<0.001$	N.S	$\chi^2=49.20$; $p<0.001$	$\chi^2=36.90$; $p<0.001$	$\chi^2=63.98$; $p<0.001$	N.S
4	Doing exercise and yoga	170 (34.62)	105 (21.38)	122 (24.85)	71 (14.46)	23 (04.68)	$\chi^2=86.96$; $p<0.001$	$\chi^2=24.06$; $p<0.001$	N.S	$\chi^2=140.99$; $p<0.001$	N.S	$\chi^2=121.87$; $p<0.001$	$\chi^2=41.44$; $p<0.001$	$\chi^2=106.37$; $p<0.001$	$\chi^2=16.75$; $p<0.01$
5	Playing online or offline games (e.g. ludo, carrom board, cards, mobile games etc.)	194 (39.51)	86 (17.52)	117 (23.83)	69 (14.05)	25 (5.09)	$\chi^2=78.43$; $p<0.001$	$\chi^2=26.72$; $p<0.001$	$\chi^2=15.31$; $p<0.01$	$\chi^2=141.37$; $p<0.001$	N.S	$\chi^2=126.05$; $p<0.001$	$\chi^2=38.17$; $p<0.001$	$\chi^2=117.41$; $p<0.001$	$\chi^2=21.66$; $p<0.001$

Table 5 (continued)

S. no	Coping strategies	Frequency of responses by participants (Percentage %)					Association with Socio-demographic correlates								
		Not Applicable (A)	Not at all (0)	Minimal (1)	To Moderate extent (2)	Too much (3)	Age	Parity	Types of conception	Whether Pregnant/ Postpartum	Mode of delivery	Education	Occupation	Socioeconomic status	Whether high risk pregnancy
6	Engaging into hobbies (like cooking, painting, singing, writing poetry etc.)	138 (28.11)	78 (15.89)	171 (34.83)	72 (14.66)	32 (06.52)	$\chi^2 = 74.06$; $p < 0.001$	$\chi^2 = 21.93$; $p < 0.001$	N.S	$\chi^2 = 117.76$; $p < 0.001$	N.S	$\chi^2 = 88.95$; $p < 0.001$	$\chi^2 = 34.14$; $p < 0.001$	$\chi^2 = 92.76$; $p < 0.001$	N.S
7	Drinking herbal products like green tea/*Kadha*	127 (25.87)	96 (19.55)	130 (26.48)	62 (12.63)	76 (15.48)	$\chi^2 = 50.16$; $p < 0.001$	$\chi^2 = 40.60$; $p < 0.001$	N.S	$\chi^2 = 140.33$; $p < 0.001$	N.S	$\chi^2 = 43.26$; $p < 0.001$	$\chi^2 = 27.125$; $p < 0.001$	$\chi^2 = 82.29$; $p < 0.001$	$\chi^2 = 31.44$; $p < 0.001$
Mean and SD of Coping Strategies	Mean = 19.96, SD = 11.38														

N.S.: Non significant

Table 6 Studies from India on the impact of COVID on psychosocial health of pregnant and postpartum women in the First wave of COVID

Study & Study Characteristics	Method of Data Collection and Period	Tools & Techniques	Findings
Basutkar et al. [14] Observational Study $n=120$, 60 pregnant and 60 non-pregnant women India	Face to Face Interviews First Wave of COVID	Edinburgh Depression Scale	EPDS scores were significantly higher in pregnant group, (12.48 ± 3.753 vs. 8.00 ± 2.436; p value $=0.001$; 95% CI 3.340–5.627), when compared to non-pregnant (12.90 ± 3.731 vs. 9.20 ± 2.973; p value $=0.001$; 95% CI 2.480–4.920)
Jelly et al Cross-sectional Survey [15] $n=333$, Pregnant women India	Telephonic Interviews First Wave of COVID	Impact- (Impact of Event-Revised [IES-R] scale Anxiety-Generalized Anxiety Disorder-7 [GAD-7] scale)	Positive association of psychological impact and gestational age, occupation, religion, locality, conception, history of abortion ($p<0.05$), level of anxiety was significantly associated with education, occupation, monthly income, religion, marital and family support, history of mental illness ($p<0.01$), conception type, and awareness regarding COVID-19 ($p<0.05$)
Nanjundaswamy et al. [16] Cross-sectional Survey $n=118$, Obstetricians India	Online Survey First wave of COVID-19	Self-developed 32 itemed questionnaire	Patients were concerned about hospital visits (72.65%), preventive measure (60.17%), infants safety (52.14%), social media derived anxiety (40.68%) and fear of contracting infection (39.83%)

the negative emotions experienced them. This study has the limitation of using purposive sampling with the snowball technique which limits its ability to fully represent the entire population. Multicentric studies using stratified sampling techniques should be carried out to get a complete picture of the condition of pregnant and postpartum women during this pandemic.

Conclusion

The findings of this study have raised concerns about the negative effects of the COVID pandemic on these vulnerable population groups and the need to provide physical, mental, emotional, and social support to these women as the pandemic gets more intense. The results of this study will be helpful for public health policymakers and healthcare providers to successfully tackle the issue by adopting effective strategies. This will help in increasing preparedness for the future waves arising from the various mutations of the virus.

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Declarations

Conflict of interest We, the authors approve that the requirement for the authorship as stated have been met and we believe that the manuscript represents honest work.

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