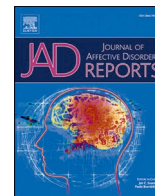




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Research Paper

Postpartum depression in Covid-19 risk-stratified hospital zones: A cross-sectional study from India

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ABSTRACT

Objective: To determine point prevalence of postpartum depression (PPD) and whether quarantine policies required in postpartum COVID-19 suspects increased the risk of depressive symptoms when compared COVID -19 non suspects in early postpartum period.

Methods: A cross-sectional study conducted in the postnatal ward of Lady Hardinge Medical College and Smt. Sucheta Kriplani Hospital, New Delhi from August 2020 to February 2021 using Edinburgh Postnatal Depression Scale (EPDS) to estimate point prevalence of postpartum depression (PPD) in the stratified zones (suspect and nonsuspect) of the hospital.

Results: Total of 408 postpartum women, 204 each (COVID-19 suspects, and nonsuspects zone) were enrolled. Prevalence of Postpartum depression using an EDPS score of >9 was 11.9%. Prevalence of depression (17.9%; vs 4.85%, $p < 0.001$) and level of depression (5.01 ± 3.41 vs 4.14 ± 2.54 , $p = 0.004$) was significantly higher in mothers in isolated quarantine wards of COVID-19 suspect zone as compared to nonsuspect zones. Anhedonia was reported significantly higher ($p < 0.001$) in suspect zone mothers. Multivariate analysis showed 'stay in COVID-19 suspect zone' and 'COVID-19 Suspect status' as a significant predictor of PPD.

Conclusion: Covid -19 postpartum suspects are at increased risk of developing postpartum depressive symptoms due to isolation and quarantine measures required in suspect zones to mitigate viral transmission.

Limitations - Due to the cross-sectional nature of the study long-term impacts on mental health due to isolation could not be assessed. Factors such as marital relationship, COVID -19 related risk factors weren't assessed which may have bearing on the risk of developing PPD.

1. Introduction

1.1. Background

As per World Health Organization, about 10% of pregnant women worldwide and 13% of women in the immediate postpartum period experience depression. Common Perinatal Mental Disorders are more prevalent in low and lower-middle-income countries (Fisher et al., 2012; WHO, 2020). The prevalence of postpartum depression (PPD) in India ranges from 15 to 20 percent (Upadhyay et al., 2017). Significant contributors for PPD are previous psychiatric illness, antenatal depression,

stressful life events, and lack of social support (Norhayati et al., 2015; Upadhyay et al., 2017). Several studies have documented maternal psycho-emotional vulnerability during catastrophic events such as a pandemic, natural disasters, and war. (Riyad et al., 2019; Zanardo et al., 2020). COVID-19 pandemic and its uncertain nature during its outbreak added psychological distress worldwide. (Wang et al. 2020).

With the advent of COVID-19 pandemic healthcare systems around world underwent restructuring in order to control viral transmission. On 12th March 2020 COVID-19 epidemic was declared in Delhi, the capital of India. The cases continued to rise and by July 2020, an average of 2000 cases per day was reported in Delhi. Primary prevention measures

Abbreviations: PPD, postpartum depression; EDPS, Edinburgh Postnatal Depression Scale, Government of India, GOI; MOH, Ministry of Health; PPW, Postpartum women.

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and restrictive policies to limit human contact were put in place to contain the spread of this contagious virus. These measures included screening, isolation of cases, contact tracing, and quarantine of close contacts, general lockdown, and social distancing (Kucharski et al., 2020). Department of Obstetrics and Gynecology changed its policy around labor, delivery, and postnatal care of women by screening all women at admission and segregating COVID-19 suspects requiring admissions to a 'COVID-19 suspect zone/orange zone' within the facility while awaiting reports. Caregivers such as husband, doulas, and relatives were not allowed with the mothers in the Covid-19 suspect zones by standard operating procedures by the Ministry of Health (MOH), India (2020). COVID-19 suspects were defined as those belonging to hotspot or containment areas, those with respiratory tract symptoms, or close contacts of COVID-19 positive cases as described in clinical criteria laid down by the MOH. All health workers in this 'suspect zone' were in level 3 personal protective gear and provided required clinical and supportive care (Fisher et al., 2012; Ministry of health, India 2020; Guidelines on use of Personal protective equipment 2020). All non-suspects postpartum women (PPW) were admitted in the designated COVID-19 'non-suspect zone/green zone' of the hospital, where one caregiver was allowed with the mother. The isolation measures required in COVID-19 pandemic reportedly has caused anxiety and depression among postpartum women. (Kamran et al., 2020; Harrison et al., 2021; Hermann et al., 2020).

1.2. Rationale of the study

It's a known fact that postpartum period causes a wide range of feelings in new mothers such as sadness, fear, tiredness, guilt, or confusion, and is a vulnerable time for the development of psychological disorders like depression, anhedonia, and anxiety (Almeida et al., 2020; Woody et al., 2017). Added isolation required in COVID-19 outbreak is likely to further enhance the mental stress (Brooks et al., 2020; Nathwad et al., 2013; Riyad et al., 2019). Hence, a need was felt for studying the psychological effects of isolation due to COVID-19 containment policies on the mental health of postnatal mothers. Literature is emerging in this area, and data from the South Asian continent is still scanty. Conventionally, screening of mental health has been carried out by validated Edinburgh Postnatal Depression Scale (EPDS) in postpartum women. Postpartum depression represents the end of a continuum of severity of symptoms (Cox et al., 1987). Our hypotheses were to determine the burden of depressive symptoms using the Edinburgh Postnatal Depression Scale (EPDS) in the immediate postpartum period and to explore whether containment policies for control of COVID-19 infection in our hospital had increased depressive symptoms in early postpartum period in COVID-19 suspects.

1.3. Aims

The study's primary aim was to estimate the prevalence of depressive symptoms amongst postpartum women and compare the prevalence of depressive symptoms among PPW admitted in different stratified (orange and green) zones of the Hospital. The secondary aim of the study was to assess various demographic and clinical predictors of depressive symptoms among PPW.

2. Material and methods

2.1. Study design

This cross-sectional study was conducted in the department of obstetrics and gynecology at Lady Hardinge Medical College and Smt. Sucheta Kriplani Hospital, New Delhi. Inclusion criteria were (a) >18 years of married women admitted in postnatal ward COVID-19 suspect/non-suspect zone (b) able to read and understand Hindi language (c) adequate social support for childcare at home. Exclusion criteria were

(a) history suggestive of any psychiatric disorder currently or in past (b) having any comorbid critical medical or obstetric condition, making interview difficult (e.g., women with extreme premature delivery <28 weeks), neonatal death in index pregnancy, postpartum hemorrhage, severe preeclampsia, and those requiring admission to the intensive-care unit). These were excluded to assess the specific impact of isolation due to COVID containment policies in stratified zones. Based on the prevalence of postpartum depression using EDPS as 10 to 50%, alpha error of 5%, and 10% of a confidence interval (CI), the sample size was calculated to be 196 for each group using Daniel's formula.

2.2. Ethical procedures

Prior to the data collection, an ethical clearance was obtained from the Institutional ethics committee of Lady Hardinge Medical College, New Delhi. IEC No. LHMC/IEC/2020/107. The study followed the ethical provisions of the Helsinki Protocol. Steps were taken to ensure respect for the dignity, confidentiality, anonymity, and freedom of each postpartum women invited to participate. Signed informed consents were obtained from the participants.

2.3. Data collection

A uniform standard operating procedure for data collection was followed. Four obstetric residents posted in the concerned postnatal wards received prior training by the principal investigator about the administration of study tools, procedure, and completeness of the data collection and research ethics. Data were collected by obstetric residents from August 2020 to February 2021 under the supervision of teaching faculty from the department of obstetrics and psychiatry. Informed consent was taken, and all participants were given information about the purpose of the study and the meaning of EDPS. Demographic and clinical data were recorded. Participants were administered a validated Hindi version of the Edinburgh Postnatal Depression Scale (EPDS) between the second and seventh day postpartum. These days were chosen because of the study site's institutional policy of hospital stay, being a minimum of 48 h for vaginal, and 4 - 7 days for cesarean delivery in absence of obstetric or neonatal complications. The first day postpartum was omitted to avoid discomfort in participation due to pain. After completion, all questionnaires were checked for completeness and consistency.

2.4. Measures

The EPDS is a self-administered ten-item questionnaire rated on a four-point Likert scale (0-3). It is designed to screen for symptoms of postpartum depression (Cox et al., 1987). The EDPS contains three subscales of anhedonia (items 1 & 2), anxiety (items 3 to 6), and depression (items 7 to 10) (Tuohy and McVey, 2008). The lowest total score is 0, while the highest score is 30. A validated Hindi version is available for the Indian population with a cut-off value of > 9 for screening of depression (Joshi et al., 2020).

2.5. Participants

Across all the zones of the postnatal ward, a total of 464 women were screened for inclusion in the study. Finally, data from 440 pregnant women, purposively sampled based on inclusion and exclusion criteria, was collected and analyzed. As ethical responsibility, all Participants screened positive for depression (score ≥ 9 in EPDS) or reporting self-harm ideation were referred to the psychiatrist for appropriate evaluation and management.

2.6. Statistical analysis

Statistical Package for the Social Sciences for Windows version 26

(SPSS Inc., Chicago, IL, USA) was used for analysis. Descriptive statistics were expressed as mean \pm standard deviation for continuous variables and frequencies or percentages for categorical variables. Mean EPDS score and values for the three subscales of anhedonia, anxiety, and depression were determined for the PPW in Covid-19 suspects and Covid-19 nonsuspect zones. Continuous variables were analyzed by independent sample *t*-test, while the Fisher exact test and chi-square test was used to analyze categorical variables. Odds Ratios (ORs) with 95% confidence intervals (95% CIs) were calculated to measure the strength of association. Multivariate analysis was carried out to identify associations of EPDS with demographic and clinical variables. EPDS was dichotomized as 0 (absence of postpartum depressive symptoms) or 1 (presence of postpartum depressive symptoms) using a cut-off of 10 points. P-value < 0.05 was considered statistically significant.

3. Results

3.1. Describing the sociodemographic and clinical profiles of PPW in stratified zones

Four hundred and forty participants were enrolled, and 32 entries were discarded due to incomplete data. A total of 408 participants were analyzed with an equal number from two zones ($n = 204$ each). The mean age of the participants was 25.52 ± 3.97 years. Most of the participants had primary education ($n = 234; 57.3\%$). The mean age of participants was significantly higher in the COVID suspect zone ($p = 0.003$). The mean weeks of gestation at delivery was 38.22 ± 2.09 weeks. Most of the women were primiparous ($n = 212; 52\%$) and had mild ($n = 101; 24.75\%$) complications in current pregnancy [Table 1](#) shows demographic, obstetric, and other clinical characteristics of both the study groups.

3.2. Prevalence of depression and subscale analysis

The percentage of women screened positive for depression, i.e., scores of > 9 on EDPS were 11.9%. The mean scores on the EDPS scale were 4.57 ± 3.03 , with significantly higher ($p < 0.001$) participants having depression in (17.9%) in the suspect zone as compared to the non-suspect zone (4.85%). The total mean scores of EDPS were also significantly higher in suspect zone participants ($p = 0.004$) with significantly higher reporting of anhedonia in subscale analysis ($p < 0.001$). [Table 2](#) shows prevalence rates of depression and subscale analysis across both groups. Linear Regression analysis was done to establish the cause-effect relationship of mean total EDPS scores with COVID suspect status after adjusting for age. COVID suspect status was found to be a significant predictor of total scores after adjusting for age. ([Table 3](#))

3.3. Analysis of depression with clinicodemographic profiles in PPW

Univariate analysis showed 'the stay in COVID suspect zone' and 'higher education level' (graduate and above) to be significant predictor of postpartum depression. No relationship was found between PPD and age, parity, per capita income, obstetric condition, period of gestation at the time of delivery, sex or weight of the baby, and need of nursery admission. ([Table 4](#)). After multivariate analysis, 'stay in COVID suspect zone' emerged as the strongest predictor of PPD when controlled for education level ([Table 5](#)).

4. Discussion

Postpartum depression (PPD) is classified by the Diagnostic and Statistical Manual of Mental Disorders as an episode of Major Depressive Disorder that begins within 4 weeks of childbirth ([Daniel, 1999](#)). It is a major disabling mood disorder that affects women during the child-bearing years. Catastrophic life events such as epidemics, wars, and natural disasters are known to increase depressive illness in women

Table 1

Socio-Demographic and Clinical Characteristics Of postpartum women in different stratified zones.

| Variables | COVID –19 Suspects Zone N = 204 Mean \pm SD/ n (%) | COVID-19 non-Suspects Zone N = 204 Mean \pm SD/ n (%) | P-Value |
|--|--|---|--------------------|
| Age (Years) | 24.98 \pm 3.8 | 26.11 \pm 4.08 | 0.003 ¹ |
| Levels of education | | | 0.78 ³ |
| Primary | 115(56.4) | 119(58.3) | |
| Secondary | 72(35.3) | 67(32.8) | |
| Graduate | 17(8.3) | 18(8.8) | |
| Per capita income | | | 0.06 ² |
| <10,000 | 56(27.5) | 57(27.9) | |
| 10,001–20,000 | 91(44.6) | 68(33.3) | |
| 20,001–30,000 | 26(27.5) | 33(16.2) | |
| >30,001 | 31(15.2) | 46(22.5) | |
| Parity | | | 0.10 ² |
| P1 | 95(46.6) | 117(57.4) | |
| P2 | 90(44.1) | 68(33.3) | |
| P3 | 17(8.3) | 15(7.4) | |
| P4 | 2(1) | 4(2) | |
| Gestational age at current delivery (weeks) | | | 0.73 ² |
| 28- 36+6 weeks | 25(12.3) | 28(13.7) | |
| 37- 41+6 weeks | 177(86.8) | 175(85.8) | |
| ≥ 42 weeks | 2(1) | 1(0.5) | |
| Obstetric risk factor | | | |
| Gestational hypertension | 10(5) | 20(9.8) | .06 ² |
| Gestational diabetes Mellitus | 10(5) | 17(8.3) | 0.23 ² |
| Anemia | 15(7.4) | 21(10.3) | 0.38 ² |
| Others ** (Abruptio placentae, Cholestasis of pregnancy) | 2(1) | 6(2.9) | 0.17 ² |
| Type of delivery 0.81 ² | | | |
| vaginal | 167(81.9) | 173(84.8) | 0.35 ² |
| cesarian | 35(17.1) | 29(14.3) | 0.34 ² |
| Operative vaginal (Forceps, ventouse) | 2(1) | 2(1) | |
| Baby gender | | | 0.69 ² |
| Male | 113(55.4) | 108(53) | |
| Female | 91(44.6) | 96(47) | |
| Nursery admission required | 22(11) | 26(12.7) | 0.64 ² |
| Neonatal weight | | | 0.64 ² |
| <2.5 kg | 52(25.5) | 66(32.4) | |
| ≥ 2.5 kg | 152(74.5) | 138(67.6) | |

Independent samples *t*-test, 2- Fisher exact test (2-sided), 3-chi-square test.

Table 2.

Comparison of Mean total EDPS scores and its subscales in postpartum women based on COVID-19 status.

| | COVID –19 suspect zones Mean \pm SD. | COVID-19 non-Suspect zone Mean \pm SD. | P value* |
|--------------------------------|--|--|----------|
| EPDS total score | 5.01 \pm 3.41 | 4.14 \pm 2.54 | 0.004 |
| EPDS subscale analysis | 0.8 \pm 1.03 | 0.5 \pm 0.93 | <0.001 |
| Anhedonia | | | |
| Anxiety | 2.83 \pm 2.04 | 2.61 \pm 1.87 | .068 |
| Depression | 1.3 \pm 1.58 | 1.03 \pm 1.24 | .077 |
| EPDS global score >9 | 11.13 \pm 1.51 | 11.18 \pm 2.0 | |

EDPS- Edinburgh Postnatal Depression Scale, Anhedonia subscale (items 1 and 2); anxiety subscale (items 3–6); and depression subscale (items 7–10); * = *t*-test.

([American Psychiatric Association, 2013](#); [Bi et al., 2021](#); [Elkind-Hirsch et al., 2010](#)). The Covid –19 pandemic and its unpredictable clinical nature, is a major stress event across the world. Social isolation and quarantine are effective methods in the prevention of the spread of viral transmission, but limit individual freedom, and are associated with

Table 3

Linear Regression analysis for the cause-effect relationship of mean total EDPS scores, and three subscales of EDPS with age.

| | Constant | | | Age | | | Covid suspect status (Suspects =1, Nonsuspect=0) | | |
|----------------------------|----------|-------|------|--------|------|------|--|------|--------|
| | B | S.E | Sig. | B | S.E | Sig. | B | S.E. | Sig. |
| Total EDPS scores | 4.095 | 1.015 | .000 | .002 | .038 | .958 | .855 | .302 | .005 |
| Subscale anhedonia | -0.337 | .330 | .309 | .032 | .012 | .010 | .346 | .098 | <0.001 |
| Subscale Anxiety | 3.539 | .661 | .000 | -0.035 | .025 | .153 | .179 | .196 | .362 |
| Subscale depression | .908 | .480 | .059 | .005 | .018 | .789 | .349 | .143 | .362 |

EDPS- Edinburgh Postnatal Depression Scale, B-Beta coefficient, B- Beta coefficients. S.E-Standard error, Sig.- P-value significance <0.05.

Table 4

Bivariate analysis of study variables in all postpartum women (n = 408) with depression as dependent variable.

| S No | Variate | Dependent variable (EDPS>9 vs EDPS<9) | |
|------|---|---------------------------------------|--------------|
| | | OR (95% CI) | P value |
| 1. | COVID -19 suspect zone (Suspect vs Nonsuspect zone) | 3.88 (1.92-1.78) | <0.001 |
| 2. | Age (Years) | 0.99 (0.92-1.07) | 0.95 |
| 3. | Per capita income | 1.09 (0.82-1.44) | 0.53 |
| 4. | Education status | 1.78 (1.16-2.73) | 0.008 |
| 5. | Parity | 0.89 (0.57-1.39) | 0.623 |
| 6. | Gestational age at current delivery (weeks) | 1.77 (0.87-3.59) | 0.11 |
| 7. | Gender of baby | 1.1(0.6-2.0) | 0.75 |
| 8. | Weight of baby | 0.98 (0.50-1.91) | 0.96 |
| 9. | Baby hospitalization in nursery | 0.65 (0.22-1.90) | .43 |
| 10. | Gestational hypertension | 0.81(0.23 - 2.8) | 0.74 |

EDPS- Edinburgh Postnatal Depression Scale.

Table 5

Multivariate logistic regression analysis in postpartum women with depression as dependent variable in COVID-19 suspect zone with adjustment of age and education status.

| Step | Variable | Wald | Sig. ^a | Odds Ratio | 95% C.I. | |
|----------------|--|--------|-------------------|------------|----------|-------|
| | | | | | Lower | Upper |
| 1 ^a | COVID -19 suspect status (Suspects =1, Nonsuspect=0) | 14.396 | <0.001 | 3.987 | 1.952 | 8.146 |
| | Education status | 6.816 | .009 | 1.814 | 1.160 | 2.837 |
| | AGE(Years) | .040 | .842 | 1.008 | .929 | 1.095 |
| | Constant | 12.293 | .000 | .017 | | |

Variable(s) entered on step 1: Covid suspect zone (Suspects =1, Nonsuspect=0), Education status (Primary =1, Secondary =2, Graduate=3). A =Sig. -P-value significance <0.05.

negative impacts on mental health. Similar effects can be seen in the postpartum period, which is a vulnerable time for mothers (Bi et al., 2021; Xiong et al., 2010).

4.1. Describing the profiles of PPW in stratified zones

To study the effects of quarantine, we analyzed PPW from the suspect and nonsuspect zone. Results showed that most parameters were comparable across both the study groups except for age. The mean age of PPW in the COVID-19 suspect zone was more than 25 years, however, this had no effect on PPD in our study.

4.2. Prevalence of depression and subscale analysis

In our study, the overall point prevalence of PPD was 11.9%, which is lower than the reported prevalence of PPD in the world during the COVID -19 pandemic (Nkire et al., 2021; Ostacoli et al., 2020; Riyad et al., 2019). This may be because we had excluded the known risk factors of PPD such as poor social support, delivery of a stillbirth, multiple pregnancies, high-risk obstetric conditions such as major antepartum or postpartum hemorrhage, severe preeclampsia, and history of any mental health disorders. (Fairbrother et al., 2017; Paoet al., 2019). This was done to analyze the effect of quarantine policy for COVID-19 suspects on postpartum depressive symptoms. Prevalence of PPD in this study was four times higher (OR 3.88) among COVID 19 suspects admitted in isolated zones than non-suspects, thereby supporting our hypotheses that social isolation and containment policies required to limit viral transmission led to an increase in PPD in these women. It may have added to the fear in mothers as to how the pandemic will impact their health, the birth, and further care of their baby as described in recent studies by Zanardo et al. (2020) and Liang et al. (2020) on PPD. Analysis of three EPDS subscales revealed significantly higher scores for anhedonia in the COVID-19 suspect group. Though not statistically significant, there was increased anxiety among COVID-19 suspects when compared with the non-suspect, highlighting the additional beneficial tools within the EPDS which may allow better insight into various negative psychological issues that may occur in new mothers due to the COVID-19 pandemic as suggested by Zanardo et al. (2020) and Osborne et al. (2021). In our study, there was a difference between the mean age between COVID -19 suspect and non-suspect PPW. However, on linear regression analysis after adjusting for age, anhedonia was still significantly higher in COVID -19 suspects.

4.3. Analysis of depression with clinico-demographic profiles in PPW

On univariate analysis, age was not significantly different among the depressed women between the two groups. There was no association of risk of PPD with the period of gestation, income, parity, type of delivery, presence of an obstetric risk factor, gender of the baby, maturity of the baby, birth weight of the baby, and admission to the nursery. There was a higher level of depressive symptoms in women with graduate level of education when compared with a primary or secondary level of education. This may be because better literacy status may have a better understanding of the uncertainty surrounding the effects of infection of the COVID 19 virus, leading to increased PPD in these women. This finding contrasts with the studies by Liang et al. (2020) and Ostacoli et al. (2020) during this pandemic where the levels of education are not associated with increased risk of PPD in the COVID-19 pandemic. However further studies in form of a questionnaire on knowledge and perceived fear due to the COVID-19 virus are required to find a causal association in Indian women. On multivariate analysis, Covid-suspect status emerged as the strongest predictor of the risk of PPD after adjusting for educational status. Studies have shown that there has been increased distress among PPW related to the absence of a partner and concerns about contracting the COVID-19 virus(Liang et al., 2020; Ostacoli et al., 2020; Wang et al., 2020).As COVID 19 postpartum suspects were quarantined in suspect zones with the restricted entry of

partners and family members, this may have been the reason for the increased risk of PPD, which has been cited in a scoping review by Kotlar et al. (2021).

4.4. Strengths

To our knowledge, this is the first study in India to evaluate the prevalence of depressive symptoms and associated clinicodemographic profile in postpartum women admitted in isolated and non-isolated zones of the healthcare facility during the Covid-19 pandemic. It had an adequate sample size, and potential confounders were eliminated to see the impact of the creation of isolation zones in health care facilities on maternal mental health. Our findings suggest that the implementation of quarantine policies to prevent the spread of the COVID-19 virus is necessary but has negative psychological effects on COVID-19 suspect postpartum women admitted in COVID-19 suspect zones when compared with non-suspect PPW. As we will encounter further COVID-19 waves, more postpartum COVID-19 suspects will be admitted in these zones. Our findings will provide vital guidance to policymakers to make provision for universal screening and institute early psychological interventions in this group to minimize PPD following childbirth.

4.5. Limitations

This study has few limitations. First, due to the cross-sectional nature of the study long-term impacts on mental health due to isolation could not be assessed. Secondly, a self-reported scale was used to ascertain the prevalence of PPD instead of a clinician-administered structured interview, hence participants might have provided responses that they feel were socially acceptable. Thirdly, certain factors such as marital relationship, COVID-19 related risk factors were not assessed which may have bearing on the risk of developing PPD. There are factors specifically related to the COVID-19 pandemic which may play an indirect role in increasing the risk of depression which requires further research.

5. Conclusion

Overall point prevalence of postpartum depression was 11.9%. There was a high prevalence of postpartum depressive symptoms in postpartum women in 'the suspect zone'. 'COVID-19 suspect status' and 'stay in suspect zone ward' were the strongest predictor of the development of risk of postpartum depression. It warrants for developing the mechanisms of universal screening and early intervention for PPD in quarantine zones for promotion of maternal mental health.

Declaration of Competing Interest

The authors report no declarations of interest.

Author contribution

Vidhi Chaudhary, Purna Kukreti and Manju Puri conceptualised and designed the study. Divya Kanwar, Anujna Tumpati, Poonam Jakhar and Geetanjali Singh collected the data and did data entry. Vidhi Chaudhary wrote the initial manuscript. Vidhi Chaudhary and Viswas Chhapola did statistical analysis and interpretation of data. Vidhi Chaudhary, Viswas Chhapola, Purna Kukreti and Manju Puri helped in revising and final drafting of the manuscript. All authors read and approved the final manuscript.

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