

Psychological impact of COVID-19 quarantine measures in northeastern Italy on mothers in the immediate postpartum period

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Abstract

Objective: To explore whether quarantine measures and hospital containment policies among women giving birth in a COVID-19 “hotspot” area in northeastern Italy enhanced psycho-emotional distress in the immediate postpartum period.

Methods: We designed a non-concurrent case-control study of mothers who gave birth during a COVID-19 quarantine period between March 8 and May 3, 2020 (COVID-19 study group), with an antecedent group of matched postpartum women (control group) who delivered in the same period in 2019. Participants completed the Edinburgh Postnatal Depression Scale (EPDS) on the second day postpartum.

Results: The COVID-19 study group (n=91) had significantly higher mean EPDS scores compared with the control group (n=101) (8.5 ± 4.6 vs 6.34 ± 4.1 ; $P < 0.001$). Furthermore, 28.6% of women in the COVID-19 group had a global EPDS score above 12. Analysis of three EPDS subscales revealed significantly higher scores among the COVID-19 group compared with the control group for anhedonia (0.60 ± 0.61 vs 0.19 ± 0.36 ; $P < 0.001$) and depression (0.58 ± 0.54 vs 0.35 ± 0.45 ; $P = 0.001$).

Conclusions: Concerns about risk of exposure to COVID-19, combined with quarantine measures adopted during the COVID-19 pandemic, adversely affected the thoughts and emotions of new mothers, worsening depressive symptoms.

KEYWORDS

Anhedonia; Anxiety; Coronavirus; COVID-19; Depression; Edinburgh Postnatal Depression Scale; Postpartum period; Quarantine

1 | INTRODUCTION

In February 2020, northern Italy became the epicenter for coronavirus disease 2019 (COVID-19) in Europe, with many exportations to other countries and widespread community transmission, particularly within the region.¹ As a public health response, on February 22, 2020, Italy imposed a lockdown for 14 days comprising shutdown of businesses, schools, and public places, as well as physical distancing in “hotspot” towns close to Milan and Venice. On March

8, quarantine measures were expanded to all of Lombardy and 14 other northern provinces. By March 9, 7375 laboratory-confirmed cases of COVID-19 and 366 deaths had been observed in Italy. Hence, on that date, quarantine was extended nationwide until April 13 to limit viral transmission.^{2,3} Following the Decree of The Council of Ministers on April 10, 2020, all measures to counter the spread of coronavirus infection were extended until May 3. After this date, phase two began, with eased lockdown measures implemented to “coexist” with the coronavirus.

The municipality of Vo' in the Veneto region of northeastern Italy (about 45 km from Venice) was identified as a COVID-19 hotspot. On February 21, the death of one of its residents, a 78-year-old man, was registered. He became the first known Italian—and European—to die of COVID-19.³ Most of the COVID-19 victims from this area were elderly. Pregnant women are a minority group, with low and late fertility and high sociocultural status. On average, around 1000 neonates are born annually at the Policlinico Abano Terme, a suburban hospital located about 15 km southwest of Vo'. The hospital borders the municipalities most devastated by the COVID-19 epidemic.

Several studies have documented maternal psycho-emotional vulnerability during catastrophic events.⁴ Trauma, terrorist attack, and natural and man-made disasters (e.g. earthquakes, tsunamis, and Chernobyl) were predictors of postpartum depression symptoms for mothers in the general population.⁴⁻⁶ After the outbreak of severe acute respiratory syndrome (SARS) in 2003, both healthcare workers and people who were self-quarantined exhibited symptoms of post-traumatic stress disorder.⁷ Hence, the effect of stress caused by COVID-19 on pregnant women cannot be ignored.

Pregnant women are considered an at-risk population for viral respiratory infections with possible consequences for the mother and fetus; however, at present, little information exists on the susceptibility of pregnant women to the pathology of COVID-19.⁸

Since the beginning of the COVID-19 epidemic in Italy, the Italian central and regional government implemented primary prevention actions and tailored several restrictive measures to contain the spread of the infection. These measures included isolation of cases, contact tracing, and quarantine and mitigation measures, including general lockdown and social or personal distancing—lessons learned from China's successful battle against COVID-19.⁹ Hospitals changed policies around prenatal care, labor and delivery, and postnatal care, replacing office visits with remote checkups, sending pregnant women to an offsite laboratory for blood tests, cancelling birth center tours and other nonessential visits, and barring extra people (fathers, doulas, and visitors) from the delivery room and postpartum units in an effort to keep mothers and babies safe.¹⁰

People in quarantine may experience a wide range of feelings, including fear, anger, sadness, irritability, guilt, or confusion, which may make isolation challenging for maternal health.^{6,11} The aim of the present study was to explore whether quarantine measures and hospital containment policies among women giving birth in a hotspot area for COVID-19 enhanced psycho-emotional distress in the immediate postpartum period. We tested for anhedonia, anxiety, and depression using the Edinburgh Postnatal Depression Scale (EPDS) in the immediate postpartum period.^{12,13} Understanding the relationship between stress and maternal health is critical for the development of a complete support system in the setting of an extremely contagious pandemic.

2 | MATERIALS AND METHODS

The study was designed as a non-concurrent case-control study on psycho-emotional distress in the immediate postpartum period in

women who gave birth at Policlinico Abano Terme (COVID-19 study group) and an antecedent group of matched postpartum women (control group). Data collection was approved by the Institutional Review Board (IRB) of Policlinico Abano Terme. Ethical approval was also obtained from the IRB. All participants were given an information sheet and were only included in the study if they had signed the consent form.

Women aged over 18 years who could read and understand Italian, who had delivered a singleton, healthy neonate at term at Policlinico Abano Terme between March 8 (start of nationwide quarantine) and May 3 (quarantine measures eased), 2020 were consecutively asked to participate. A control group of women was also recruited, comprising women aged over 18 years (able to read and understand Italian) who lived in the same geographic area and had delivered at the hospital in the same time period as the study group but in the previous year (2019). This was possible because mothers provided written permission for us to access their obstetric records, which included basic personal data, education, medical history, and pre-discharge EPDS screening results.

The EPDS¹² is a self-administered questionnaire made up of 10 items scored using a four-point Likert scale (0-3) designed to screen for symptoms of postpartum depression. Postpartum depression represents the end of a continuum of severity of symptoms. The present study used a cutoff point for depressive symptomatology risk of higher than 12.¹⁴ Several authors have studied the structure of the EPDS and found that, along with postpartum depressive symptomatology risk, it also measures anxiety and anhedonia.¹⁵ Tuohy and McVey¹³ extracted three subscales from the EPDS: anhedonia subscale (items 1 and 2); anxiety subscale (items 3-6); and depression subscale (items 7-10).

According to standard maternity routines, in the absence of obstetric or neonatal complications, length of hospital stay was scheduled at 48 hours for both vaginal and cesarean delivery. During the study period (March 8 to May 3), the EPDS was distributed prior to discharge to 113 women (COVID-19 study group) on the second day postpartum. During the corresponding period in 2019, the EPDS had been distributed to 106 women (control group).

A total of 11 women were excluded from the study group: 5 whose length of hospital stay was prolonged; 2 who underwent general anesthesia; 1 who underwent psychological treatment; 1 who required hospitalization for COVID-19; and 2 whose infants had jaundice. Four women were excluded from the control group: 3 whose length of hospital stay was prolonged and 1 whose infant had jaundice. Among eligible mothers, seven subsequently declined to participate (6 in the study group and 1 in the control group). In addition, five women in the study group were excluded owing to incomplete data. Thus, data from 91 women in the study group and 101 in the control group were analyzed.

SPSS version 19 (IBM, Armonk, NY, USA) was used for analysis. Data are expressed as mean \pm SD or number (percentage). EPDS global score and values for the three subscales of anhedonia, anxiety, and depression were determined for the study and control groups. Continuous variables were analyzed by independent sample *t* test, while the Fisher exact test was used to analyze qualitative variables. $P < 0.05$ was considered statistically significant.

3 | RESULTS

The sociodemographic characteristics and clinical features of 91 study group mothers and 101 control group mothers are shown in Table 1. There were no significant differences between the groups for all variables except neonatal birth weight, which was significantly lower in the babies born during the COVID-19 pandemic compared with the previous year (3354.51 ± 374.2 vs 3478.60 ± 409.8 g; $P=0.031$).

Pre-discharge EPDS, anhedonia, anxiety, and depression subscale scores collected on the second day postpartum for the COVID-19 study group and control group are shown in Table 2. Mean EPDS scores were significantly higher in the COVID-19 study group compared with the control group (8.5 ± 4.6 vs 6.34 ± 4.1 ; $P<0.001$). The percentage of high-risk women, those with a global EPDS score above 12, was also significantly higher in the COVID-19 group compared with the control group (28.6% vs 11.9%; $P=0.006$).

TABLE 1 Sociodemographic characteristics and clinical features of mothers who gave birth between March 8 and May 3, 2020 (COVID-19 study group) and mothers who gave birth during the same period in the previous year (control group).^a

Characteristics	COVID-19 study group	Control group	P value
n=192	91 (47.4)	101 (52.6)	
Age, y	33.73 ± 5.01	32.98 ± 5.07	0.301
Gestational age, wk	39.41 ± 1.12	39.42 ± 1.14	0.966
Parity			
Nulliparous	49 (53.8)	52 (51.5)	0.774
Level of education			
Elementary	9 (9.9)	7 (6.9)	0.603
High	59 (64.8)	62 (61.4)	0.655
Degree	27 (29.7)	32 (31.7)	0.876
Civil status			
Single	0 (0)	0 (0)	1.000
Married	52 (57.1)	61 (60.4)	0.662
Cohabiting	39 (42.9)	40 (39.6)	0.622
Occupation			
Student	1 (1.1)	1 (1.5)	1.000
Housewife	8 (8.8)	9 (11.1)	1.000
Unemployed	8 (8.8)	5 (5.0)	0.391
Working	74 (81.3)	86 (85.1)	0.562
Gestational BMI >30	18.0 (19.8)	17.0 (16.8)	0.709
Cesarean delivery	12 (13.2)	12 (11.9)	0.830
Elective	9 (9.9)	8 (7.9)	0.800
Emergency	3 (3.3)	4 (4.4)	1.000
Neonatal birth weight, g	3354.51 ± 374.2	3478.60 ± 409.8	0.031

Abbreviations: BMI, body mass index (calculated as weight in kilograms divided by height in meters squared).

^aValues are given as mean \pm SD or number (%).

EPDS subscale analysis showed that mean scores for anhedonia, anxiety, and depression were all higher in the COVID-19 study group compared with the control group, although the differences were only significant for anhedonia (0.60 ± 0.61 vs 0.19 ± 0.36 ; $P<0.001$) and depression (0.58 ± 0.54 vs 0.35 ± 0.45 ; $P=0.001$).

4 | DISCUSSION

The present study found that women giving birth during a period of COVID-19 quarantine measures adopted in a hotspot area in northeastern Italy between March 8 and May 3, 2020, presented higher EPDS scores compared with a control group of mothers who gave birth during the same period the previous year. Furthermore, almost 30% of mothers in the COVID-19 group had a global EPDS score above 12, which may lead to a higher risk of postnatal depression. Analysis of three EPDS subscales revealed significantly higher scores for anhedonia and depression in the COVID-19 study group, highlighting the additional beneficial tools within the EPDS that may allow better understanding of the spectrum of various negative psychological issues that the COVID-19 pandemic might arouse among pregnant women and new mothers.

The present findings suggest that postpartum psychological responses during the COVID-19 pandemic may be mediated by EPDS symptoms that are severe enough to predict a higher risk of postnatal depression. Therefore, pregnant women giving birth during the COVID-19 pandemic represent a high-risk, vulnerable population that needs to be carefully followed to minimize postpartum mental dysfunction, as previous studies have reported following natural disasters.¹⁶ Medical and mental healthcare interventions should be carried out immediately to prevent deterioration of maternal psychological health, which is made more severe by social containment than reported for previous natural disasters.¹¹

These data may have some clinical relevance. Pregnancy can be a stressful time for many expectant mothers¹⁷; however, the COVID-19 crisis is adding a new layer of worry about how the pandemic will

TABLE 2 Edinburgh Postnatal Depression Scale, anhedonia, anxiety, and depression subscale scores of mothers who gave birth between March 8 and May 3, 2020 (COVID-19 study group) and mothers who gave birth during the same period in the previous year (control group).^a

Scale	COVID-19 study group	Control group	P value
n=192	91 (47.4)	101 (52.6)	
EPDS total score	8.5 ± 4.6	6.34 ± 4.1	<0.001
EPDS subscale analysis			
Anhedonia	0.60 ± 0.61	0.19 ± 0.36	<0.001
Anxiety	1.28 ± 0.61	1.14 ± 0.73	0.141
Depression	0.58 ± 0.54	0.35 ± 0.45	0.001
EPDS global score >12	26 (28.6)	12 (11.9)	0.006

Abbreviation: EPDS, Edinburgh Postnatal Depression Scale.

^aValues are given as mean \pm SD or number (%).

impact the birth of their baby. Research has shown fairly consistent evidence that exposure to a variety of stressors during pregnancy is associated with increased risk of postpartum depression symptoms and emotional problems.¹⁸ Women in the COVID-19 group reported various negative psychological emotions, such as anhedonia and depression, and had a higher risk of postpartum depression shown by EPDS scores above 12 in one in three mothers. Postpartum depression is the result of a dynamic interplay between biological, psychological, and social risk factors,¹⁹ all of which may be amplified during the current COVID-19 pandemic.

To our knowledge, this is the first study to assess EPDS scores in a sample of women giving birth in an area severely affected by COVID-19. WHO declared that "Containment of COVID-19 is feasible and must remain the top priority for all countries."²⁰ Nevertheless, concerns about exposure to COVID-19, combined with physical distancing and containment recommendations, may adversely affect the thoughts, emotions, and functioning of new mothers, thereby worsening depressive symptoms. The present study used the EPDS scale and subscale analysis of this group of women because they were regarded as a susceptible population.²¹ The COVID-19 pandemic has become a further example of a catastrophic event that might cause symptoms of postpartum depression.

We recognize several limitations to this study. Although EPDS score and anhedonia, anxiety, and depression subscale scores were used to study the psycho-emotional distress in mothers giving birth during the COVID-19 pandemic, we did not confirm the diagnosis of postpartum depression in our sample using specific criteria defined in the medical literature.²² Given its small sample size, this study may have been underpowered to demonstrate a significant effect of the COVID-19 pandemic on neonatal birth weight. Questions remain regarding the significance of these findings for clinical practice.²³ Furthermore, an intrinsically observational study such as this cannot guarantee that the observed relationships represent causal factors. Finally, the study sample is limited, geographically specific, and not generalizable. However, this should not invalidate the results because the general demographic variables were similar among the groups. Literature on this subject is limited; therefore, the present study makes an important contribution to understanding the impact of a natural infectious calamity on pregnant women.

In conclusion, the results of our study indicate that quarantine and hospital containment measures adopted in a COVID-19 hotspot area in northeastern Italy had a strong psycho-emotional impact on women giving birth during this period, as indicated by increased EPDS scores and anhedonia and depression subscale scores in the immediate postpartum period. Concerns about risk of exposure to COVID-19, combined with quarantine measures, can worsen depressive symptoms and adversely affect the thoughts, emotions, and functioning of new mothers.

AUTHOR CONTRIBUTIONS

VZ carried out the study. GS and LS participated in study design. VM and LG participated in study design and coordination. MV helped draft the manuscript. All authors read and approved the final manuscript.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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