



The COVID-19 pandemic and the increase in the prevalence/incidence of post-partum depression index

A pandemia da COVID-19 e o aumento do índice de prevalência/incidência de depressão pós-parto

La pandemia de COVID-19 y el aumento de la tasa de prevalencia/incidencia de la depresión posparto

Helena Garcia dos Santos¹, Aline Longoni¹, Djiovana Zanini¹, Isabela Thurow Lemes¹, Adriano Martimbianco de Assis¹.

SUPPLEMENTARY FILE

¹ Catholic University of Pelotas (UCPEL), Pelotas - RS.

Supplementary Table 2 - Summary of selected studies on COVID-19 and Postpartum Depression.

Author	Country	Type of research study	Depression Assessment Instruments	Main Results	Conclusions
An, Chen, Wu et al. (2021)	China	Cross-sectional study	Edinburgh Postpartum Depression Scale (EPDS)	With the EPDS cut-off value of 10, the incidence of postpartum depressive symptoms was 56.9%.	Maternal postpartum depression in China was at a high level during the COVID-19 pandemic. Women aged 25–34, with a history of abortion and high stress levels were at higher risk for postpartum depression.
Bo, Yang, Chen et al. (2021)	China	Multicenter, cross-sectional study	Nine-item Patient Health Questionnaire (PHQ)-9	The prevalence of depression in pregnant and postpartum women was 27.43% (95% confidence interval [CI] = 25.01%–29.85%).	The COVID-19 pandemic was associated with an increased likelihood of mental health problems among pregnant and postnatal women. Over a quarter of the pregnant and postpartum women in China had depression during the COVID-19 pandemic.
Boekhorst, Muskens, Hulsbosch et al. (2021)	Netherlands	Cohort study	Edinburgh Postpartum Depression Scale (EPDS)	We found no increase in depressive symptoms during pregnancy nor an increase in incidence of high levels of postpartum depressive symptoms during the pandemic.	Our findings indicated that the COVID-19 pandemic induces worries in pregnant women in the Netherlands.
Brik, Sandonis, Fernandez et al. (2021)	Spain	Cohort study	Edinburgh Postnatal Depression Scale (EPDS)	Regression analysis showed that mental health disorder, Latin American origin and lack of social support were independent risk factors for anxiety symptoms in the STAs ($P = .032$, $P = .040$ and $P = .029$, respectively).	A lockdown scenario during the first wave of the SARS-CoV 2 pandemic increased the symptoms of anxiety and depression among pregnant women, particularly affecting those with less social support.
Ceulemans et al. (2021)	Ireland, Norway, Switzerland, the Netherlands, and the UK	Cross-sectional	Edinburgh Postpartum Depression Scale (EPDS)	The prevalence of major depressive symptoms ($EDS \geq 13$) was 15% in the pregnancy cohort and 13% the breastfeeding cohort.	This multinational study found high levels of depressive symptoms and generalized anxiety among pregnant and breastfeeding women during the COVID-19 outbreak.
Chrzan-Detkos, Walczak-Kozłowska, and Lipowska (2021)	Poland	Cross-sectional	Edinburgh Postpartum Depression Scale (EPDS)	A statistically significant difference in the severity of postpartum depression symptoms were observed among women making a self-assessment with EPDS scale at the beginning	The results of this study indicate that the epidemic crisis may be associated with an increased need for additional caution and

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				of the COVID-19 epidemic in Poland (M = 15.71; SD = 6.23), compared to the pre-epidemic neutral period (M = 13.56; SD = 6.46).	support of women's mental health in the postpartum period.
Durankuş, Aksu (2020)	Turkey	Cross-sectional	Edinburgh Postpartum Depression Scale (EPDS); The Beck Depression Inventory (BDI)	Among the respondents, 35.4% (n=92, case group) obtained scores higher than 13 on the Edinburgh Postpartum Depression Scale (EPDS).	This study illustrated the effects of the COVID-19 pandemic on the depression and anxiety levels of pregnant women.
Fallon, Silverio (2021)	United Kingdom UK	Cross-sectional	Edinburgh Postpartum Depression Scale (EPDS)	After accounting for current clinical diagnoses of depression or anxiety, and demographic factors known to influence mental health, only perceived psychological change occurring as a result of the introduction of social distancing measures predicted unique variance in the risk of clinically relevant maternal depression (30%) and anxiety (33%).	Prevalence rates of clinically relevant maternal depression and anxiety were extremely high when compared to both self-reported current diagnoses of depression and anxiety, and pre-pandemic prevalence studies.
Gluska, Mayer, Shiffman et al. (2021)	Israel	Cohort study	Edinburgh Postnatal Depression Scale (EPDS)	Of 421 parturients, 36 (9%) reported high Impact of PPE. Parturients with high Impact of PPE had significantly higher PPD and PTSS scores) EPDS 8.4 5.8 vs. 5.7 5.3; City BiTS 9.2 10.3 vs. 5.8 7.8, $p < 0.05$ for both).	As the use of PPE is crucial in this era of COVID-19 pandemic in order to protect both parturients and caregivers, creative measures should be taken in order to overcome the communication gap it poses.
Guvenc, Yesilcinar, Ozkececi et al. (2021)	Turkey	Cross-sectional	Edinburgh Postnatal Depression Scale (EPDS)	The prevalence of depression was 34.0%. The mean anxiety and COVID-19 knowledge scores were 42.69 ± 9.93 and 9.69 ± 1.94 , respectively. There was a statistically significant difference between the anxiety scores and depression status ($p < 0.001$) of women.	The COVID-19 pandemic has increased the incidence of depression in women in the postpartum period. It has been found that women's anxiety levels and their fear of COVID-19 infection have an impact on their depression experience.
Hiiragi, Obata, Misumi et al. (2021)	Japan	Case-control	Edinburgh Postnatal	Positive screening rates for postpartum depression did not change before and during	There was no apparent increase in maternal psychological stress due to the COVID-19

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			Depression Scale (EPDS)	the pandemic (adjusted odds ratio 1.48, 95% confidence interval 0.885–2.46).	pandemic in Yokohama, Japan. Postpartum women responded differently in settings with varied levels of disease severity and social restrictions.
Hui, Ma, Seto et al. (2021)	China	Cross-sectional	Edinburgh Postpartum Depression Scale (EPDS)	A significantly higher proportion of women had EPDS scores of ≥ 10 1 day after delivery in the post-alert group than the pre-alert group (14.4% vs 11.9%; $P < 0.05$).	Pregnant women reported more depressive symptoms in the postpartum period following the alert announcement regarding coronavirus infection in Hong Kong.
Lebel, MacKinnon, Bagshawe et al. (2020)	Canada	Cross-sectional	Edinburgh Postpartum Depression Scale (EPDS)	We found substantially elevated anxiety and depression symptoms compared to similar pre-pandemic pregnancy cohorts, with 37% reporting clinically relevant symptoms of depression and 57% reporting clinically relevant symptoms of anxiety.	This study shows concerning elevated symptoms of anxiety and depression among pregnant individuals during the COVID-19 pandemic, that may have long-term impacts on their children.
Liang, Wang, Shi et al. (2020)	China	Cross-sectional	Edinburgh Postnatal Depression Scale (EPDS)	The prevalence of PPD among women at 6–12 weeks postpartum was 30.0%. A multivariate logistic regression model identified significant factors as: immigrant women, persistent fever, poor social support, concerns about contracting COVID-19 and certain precautionary measures.	The findings suggest the need for policies and interventions to not only mitigate the psychological impacts but also target disadvantaged sub-groups of women following childbirth during the COVID-19 pandemic.
Liu, Erdei, and Mittal (2021)	USA	Cross-sectional	The Center for Epidemiologic Studies-Depression (CES-D; Radloff, 1977)	Among our respondents, 36.4% reported clinically significant levels of depression, 22.7% for generalized anxiety, and 10.3% for PTSD.	Perinatal women with pre-existing mental health diagnoses show elevated symptoms during the COVID-19 pandemic. Although causation cannot be inferred, COVID-19-related health worries and grief experiences may increase the likelihood of mental health symptoms among those without pre-existing mental health concerns.
Marino-Narvaez, Puertas-Gonzalez,	Spain	Cross-sectional	Edinburgh Postnatal	It was found that women who gave birth during the pandemic suffered higher levels of stress	Giving birth during the COVID-19 pandemic could have an impact on greater

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Romero-Gonzalez et al. (2021)			Depression Scale (EPDS)	during childbirth ($U = 2652.50$; $P = 0.040$) and gave a worse rating of the quality of care received ($U = 2703.50$; $P = 0.041$). In addition, the percentage of postpartum depression was much higher in women who gave birth during the pandemic ($\chi^2 = 4.31$; $P = 0.038$).	dissatisfaction with childbirth, as well as increasing the risk of postpartum depression.
Masters, Asipenko, Bergman et al. (2021)	USA	Cross-sectional	Edinburgh Postnatal Depression Scale (EPDS)	Of 163 participants, 80.8% perceived increased symptoms of depression and 88.8% of anxiety due to the pandemic. Positive screens for depression, anxiety, and/or PTSD at time of interview, higher education, and income were associated with increased symptoms of depression and anxiety due to the pandemic.	The pandemic has increased symptoms of perinatal depression and anxiety and impacted perceived access to care. Self-reported increases in depression and anxiety and changes to healthcare access varied by education, race/ethnicity, income, and positive screens.
McFarland, McFarland, Hill et al. (2021)	USA	Case-control	Edinburgh Postnatal Depression Scale (EPDS)	Women who gave birth in March and not in April reported higher levels of depressive symptoms than those who gave birth prior to the pandemic in our time-matched ($b = 0.09$) and month-matched ($b = 0.09$) samples.	These findings suggest that researchers and practitioners should pay special attention to signs of postpartum depression and women's adaptive coping responses in the early stages of pandemics.
Molgora, Accordini (2020)	Italy	Cross-sectional	Edinburgh Postnatal Depression Scale (EPDS)	Findings revealed a higher percentage of women than that reported in the literature scored above the clinical cut-off both during pregnancy and postpartum on a series of measures of psychological well-being, thus demonstrating that this period was perceived as particularly challenging and stressful and had significant impact on the women's wellbeing.	These findings suggest the need for developing specific interventions targeted at women who cannot benefit from the support of their partners or family.
Myers, Emmott (2021)	England	Cross-sectional	Edinburgh Postnatal Depression Scale (EPDS)	Levels of depressive symptoms, as assessed via the Edinburgh Postnatal Depression Scale, were high, with 47.5% of the participants meeting a 11 cut-off for PND.	While Western childrearing norms focus on intensive parenting, and fathers are key caregivers, our results highlight that it still "takes a village" to raise children in high-

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					income populations and mothers are struggling in its absence.
Obata, Miyagi, Haruyama et al. (2021)	Japan	Cross-sectional	Edinburgh Postnatal Depression Scale (EPDS)	The prevalence of high EPDS and K6 scores was significantly increased in pregnant women in the high than those in the low epidemic regions (EPDS: adjusted odds ratio [aOR] 1.453, 95% confidence interval [CI] 1.205–1.753; K6: aOR 1.601, 95% CI 1.338–1.918).	Decreased support due to the COVID-19 pandemic affected the psychological status of pregnant and puerperal women; hence, investing medical resources in their healthcare essential.
Oskovi-Kaplan, Buyuk, Ozgu-Erdinc et al. (2021)	Turkey	Cross-sectional	Edinburgh Postpartum Depression Scale (EPDS)	The median score obtained from the EPDS was 7 (7) and 33 (14.7%) of the women were determined to have a risk for postpartum depression.	Evaluation of the factors that affect the psychological status of pregnant and postpartum women will lead the healthcare system to improve the implementations during the COVID-19 pandemic.
Ostacoli, Cosma, Bevilacqua et al. (2020)	Italy	Cross-sectional	Edinburgh Postnatal Depression Scale (EPDS)	The prevalence of depressive symptoms was 44.2% (EPDS cut-off score ≥ 11) and the PTSS rate was 42.9% (IES-R cut-off score ≥ 24).	This study reports a high prevalence of postpartum depressive and PTSS in women who gave birth during the Covid-19 pandemic.
Pariante et al. (2020)	Israel	Cohort study	Edinburgh Postnatal Depression Scale (EPDS)	Women delivering during the COVID-19 pandemic had lower risk of having a high (> 10) or very high (≥ 13) EPDS score as compared with women delivering before the COVID-19 pandemic (16.7% vs 31.3%, $p = 0.002$, and 6.8% vs 15.2%, $p=0.014$, for EPDS ≥ 10 and EPDS ≥ 13 , respectively).	In conclusion, our study found that postpartum women delivering during the COVID-19 pandemic have lower risk for depression compared to the comparison group of women not delivering during the pandemic.
Peng, Zhang, Liu et al. (2021)	China	A multi-center longitudinal research study	Zung Self-rating Depression Scale (SDS)	The incidence of postpartum anxiety in the confirmed, suspected and control groups was 4.3%, 6.7% and 12.1%, respectively; and the incidence of postpartum depression was 39.1%, 33.3% and 30.3%, respectively. No significant difference was found with regards to	Mothers with and without COVID-19 suffered a high incidence of depression, which warrants further mental health investment for pregnant mothers during the COVID-19 pandemic.

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				maternal postpartum anxiety and depression among the three groups.	
Puertas-Gonzalez, Marino-Narvaez, Romero-Gonzalez et al. (2021)	Spain	Case-control	Edinburgh Postnatal Depression Scale (EPDS)	Women who gave birth during the pandemic had higher scores on somatization, obsessions and compulsions, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, and psychoticism. In addition, perceived stress was the common predictor of an increase in these symptoms.	Women who gave birth during the COVID-19 crisis may show greater psychological vulnerability, due to the specific situation experienced during the pandemic. The COVID-19 pandemic may have played a role in the increase in psychopathological symptoms after childbirth.
Spinola, Liotti, Speranza et al. (2020)	Italy	Cross-sectional	Edinburgh Postnatal Depression Scale (EPDS)	The prevalence of postpartum depression symptomatology among mothers was 44%, as measured through the EPDS (cut-off >12).	Besides situational factors specific to the pandemic, the results show that there are some risk factors tied to the personal history of the mother (e.g., having had a previous abortion). These data should inform and enlighten future protocols of intervention.
Suarez-Rico, Estrada-Gutierrez, Sanchez-Martinez et al. (2021)	Mexico	Cross-sectional	Edinburgh Postpartum Depression Scale (EPDS)	The prevalence (95% CI) of the postpartum depression symptoms was 39.2% (34–45%), trait anxiety symptoms were found among 46.1% (32–43%) of the participants, and moderate and high perceived stress were in 58% (52–64) and 10.9% (7.8–15) of the participants, respectively.	The prevalence of depression, anxiety, and perceived stress among postpartum Mexican women during the COVID-19 pandemic lockdown were higher than what has been previously reported in the literature.
Zanardo, Manghina, Giliberti et al. (2020)	Italy	Case-control	Edinburgh Postnatal Depression Scale (EPDS)	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, 26% of women in the COVID-19 group had a global EPDS score above 12.	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.
Zeng, Li, Sun et al. (2020)	China	Cross-sectional	Edinburgh Postnatal	A total of 625 perinatal women completed the study; of them, 195 women (31.2%, 95%CI=27.56%–34.84%) reported anxiety,	Increased attention should be paid to women who have infected friends/families/colleagues and those with previous adverse experiences

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			Depression Scale (EPDS)	120 (19.2%, 95%CI=16.10%–22.30%) reported depression, and 87 (13.9%, 95%CI=11.20%–16.64%) experienced symptoms of insomnia.	during pregnancy. Coping strategies that relieve psychological stress during the COVID-19 outbreak should be provided to prevent adverse outcomes for women and their infants.

Source: Santos HG, et al., 2024.