



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

# Maternal Self-Efficacy Buffers the Effects of COVID-19–Related Experiences on Postpartum Parenting Stress

Hung-Chu Lin, Paula L. Zehnah, Amanda Koire, Leena Mittal, Carmina Erdei, and Cindy H. Liu

## Correspondence

Cindy H. Liu, PhD,  
Department of Pediatric  
Newborn Medicine and  
Department of Psychiatry,  
Brigham and Women's  
Hospital, Harvard Medical  
School, 221 Longwood  
Ave., Boston, MA, 02115.  
[chliu@bwh.harvard.edu](mailto:chliu@bwh.harvard.edu)

## Keywords

COVID-19 pandemic  
COVID-19–related  
experiences  
maternal self-efficacy  
parenting stress  
postpartum period  
protective factors  
psychosocial  
social support

## ABSTRACT

**Objective:** To examine the associations of maternal self-efficacy (MSE) and perceived social support with parenting stress during the postpartum period during the COVID-19 pandemic and whether these two psychosocial factors account for variance in parenting stress in addition to the effects of COVID-19–related experiences and sociodemographic factors.

**Design:** Cross-sectional survey.

**Setting:** Online survey, the Perinatal Experiences and COVID-19 Effects (PEACE) study, launched in May 2020.

**Participants:** Participants included 310 women who gave birth in the past 24 weeks.

**Methods:** The survey included self-report quantitative measures of MSE, social support, COVID-19–related experiences, parenting stress, symptoms of depression and anxiety, and a range of sociodemographic factors.

**Results:** Hierarchical multiple regression analysis indicated that MSE and social support were negatively associated with postpartum parenting stress in addition to the effects of COVID-19–related experiences, maternal symptoms of depression and anxiety, and a range of demographic factors. Furthermore, MSE interacted with COVID-19–related experiences such that higher levels of MSE mitigated the effects of COVID-19–related experiences on parenting stress.

**Conclusion:** Our findings underscore the importance of protective factors at the individual and interpersonal levels and provide insights for prevention and intervention programs aimed at mitigating postpartum parenting stress during a wide-scale disaster such as the COVID-19 pandemic.

*JOGNN*, 51, 177–194; 2022. <https://doi.org/10.1016/j.jogn.2021.12.004>

Accepted December 15, 2021; Published online December 21, 2021

Hung-Chu Lin, PhD, is a professor, Department of Psychology, University of Louisiana at Lafayette, Lafayette, LA, and a sponsored collaborator, Department of Pediatric Newborn Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, MA.

(Continued)

The postpartum period entails significant physical, psychological, and social adjustments for women as they transition from pregnancy and childbirth to motherhood (American College of Obstetricians and Gynecologists [ACOG], 2018) and for newborns as they transition from intrauterine to extrauterine life (ACOG, 2018; Lieberman et al., 2020; Morton & Brodsky, 2016; Verbiest et al., 2017). The postpartum period (defined in this study as the first 6 months after childbirth; E. S. Miller et al., 2013) can set a positive trajectory for maternal and infant health and the parent–infant relationship (ACOG, 2018; Lieberman et al., 2020). However, several factors, such as symptoms of depression and anxiety and

high levels of stress, can impair maternal caregiving (Bernard et al., 2018; Luisa et al., 2019; Thomason et al., 2014; van der Zee-van den Berg, et al., 2021) and are related to negative child health and developmental outcomes (Kingston et al., 2018; Oyetunji & Chandra, 2020; Shapiro et al., 2020; Slomian et al., 2019).

The specific stressors and challenges resulting from the COVID-19 pandemic (Brown et al., 2020) are concerning for women who give birth during this period (Brooks et al., 2020; Harville et al., 2021; Horney et al., 2012). Indeed, recent cross-sectional surveys showed greater rates of symptoms of anxiety and depression in women

### It is not clear how the COVID-19 pandemic has affected parenting stress in the postpartum period.

who were pregnant or caring for young infants during the pandemic (Davenport et al., 2020; Liu, Erdei, & Mittal, 2021; Saccone et al., 2020; Spinola et al., 2020). For example, in a sample of 524 primarily White, urban, well-educated women in the United States during pregnancy and the postpartum period, Kinser et al. (2021) found that predictors of symptoms of depression, anxiety, and stress included job and financial insecurity; worries about the health and well-being of self, infant, and family members; concerns about access to food and other supplies; and resiliency and adaptability.

Although it is reasonable to expect that the psychological toll experienced by pregnant women and those who begin to parent during the pandemic may increase parenting stress and negatively affect the ability to care for the infant, the effects of the COVID-19 pandemic on parenting stress and caregiving during the postpartum period have not been explored sufficiently. Parenting stress, originally defined by Abidin (1995) as the perceived discrepancy between parenting demands and the parent's ability and resources available to meet those demands, is associated with myriad parent and child outcomes, including child–parent attachment, child behavior problems, depression and anxiety in parents, and child maltreatment (Abidin, 1995, 2012). Two psychosocial factors, the availability of social support (Milgrom et al., 2019) and maternal self-efficacy (MSE) for parenting (Razurel et al., 2017), can buffer symptoms of depression, anxiety, and parenting stress in the early postpartum period and are worth investigation, given the potential importance of support for women during the postpartum period in the context of a global pandemic.

Social support is broadly defined as actual or perceived support received from within one's social network and includes tangible support (e.g., instrumental or informational support), emotional support (e.g., receiving empathy, affection, or caring), belonging support (e.g., having companionship and others available for socialization; Kent de Grey et al., 2018), and support from professionals (Corrigan et al., 2015). Social support can be a protective factor against perinatal depression and anxiety and

enhance maternal well-being in the postpartum period (De Sousa Machado et al., 2020; Milgrom et al., 2019; Negron et al., 2013; Razurel et al., 2013). Findings of preliminary studies suggested that loss of social support resulting from the COVID-19 pandemic, including the anticipated support of family and friends and the loss of other community support resources, significantly increased stress for women during the postpartum period (DeYoung & Mangum, 2021; Kinser et al., 2021; Molgora & Accordini, 2020). In a cross-sectional sample of 524 Italian women, Spinola et al. (2020) found that low social support, loss of financial support, avoidant coping strategies, the amount of time spent in isolation, and a woman's mental health history were associated with high levels of perceived stress and symptoms of perinatal depression. In contrast, Dib et al. (2020) found more optimal coping among 1,329 mothers in the United Kingdom who received peer, instrumental, and family support during the COVID-19 lockdown.

Perceived self-efficacy, as defined by Bandura (1982), refers to "one's own judgments of how well one can execute courses of action required to deal with prospective situations" (p. 122) and often reflects one's effort and persistence when facing obstacles or adverse experiences. These self-perceived judgements can affect one's ability to perform specific tasks competently and effectively; negative perceptions have the potential to create stress and affect performance. Perceived self-efficacy is situation specific. Maternal self-efficacy is considered a domain of parenting self-efficacy (knowledge and confidence in performing parenting tasks; Law et al., 2019; Troutman et al., 2012) that specifically addresses perceived efficacy in infant caregiving tasks (Teti & Gelfand, 1991). Maternal self-efficacy refers to an individual psychological factor that affects the parenting experience. Maternal self-efficacy in the postpartum period is inversely related to symptoms of depression, stress, and anxiety (Razurel et al., 2017) and is positively related to perceptions of the infant (Leahy-Warren et al., 2012; Troutman et al., 2012) and attunement to the infant's signals and needs (Bolten et al., 2012; Fulton et al., 2012). With a small sample ( $N = 53$ ), Xue et al. (2021) examined parenting self-efficacy and quality of life of new mothers during the COVID-19 pandemic lockdown in Switzerland. Compared to a group of parents ( $N = 58$ ) who completed the measures before and after lockdown, mothers of newborns during the lockdown reported lowered parenting self-efficacy.

Paula L. Zeanah, PhD, is the Research Director, Cecil J. Picard Center for Child Development & Lifelong Learning, University of Louisiana at Lafayette, Lafayette, LA, and a professor, College of Nursing and Allied Health Professions, University of Louisiana at Lafayette, Lafayette, LA.

Amanda Koire, MD, PhD, is a reproductive psychiatrist, Department of Psychiatry, Brigham and Women's Hospital, Harvard Medical School, Boston, MA.

Leena Mittal, MD, is the Chief of the Division of Women's Mental Health, Department of Psychiatry, Brigham and Women's Hospital, Harvard Medical School, Boston, MA.

Carmina Erdei, MD, is the Medical Director, Growth and Development Unit, Department of Psychiatry, Brigham and Women's Hospital, Harvard Medical School, Boston, MA.

Cindy H. Liu, PhD, is an assistant professor, Department of Pediatric Newborn Medicine and Department of Psychiatry, Brigham and Women's Hospital, Harvard Medical School, Boston, MA.

**Table 1: Descriptions of Measures Classified as Predictors, Outcomes, or Covariates**

Measures	Description
Predictors	
Maternal self-efficacy	Participants' perceptions of competency with regard to discrete parenting tasks, assessed using the Maternal Self-Efficacy Scale
Social support	Participants' perceptions of social support, assessed by the Multidimensional Scale of Perceived Social Support
COVID-19–related health worry	Participants' worries related to COVID-19 affecting their own health and the health of their family and friends, assessed using a four-item measure based on specific items from the Coronavirus Health Impact Survey
COVID-19–related risk worry	Participants' worries about contracting COVID-19 and the likelihood that such an infection would result in morbidity or mortality for themselves, assessed using a four-item measure
COVID-19–related resource worry	Participants' intensities of worries related to accessing and obtaining general resources during the COVID-19 pandemic, assessed using a recently developed 10-item measure
COVID-19–related grief	Participants' feelings of grief because of missed experiences during the COVID-19 pandemic, assessed using a measure with items adapted from the Inventory of Complicated Grief
Outcomes	
Parenting Stress Index	Participants' self-reported feelings toward their child and toward parenting, assessed using the Parenting Stress Index
Covariates	
Depression symptoms	Participants' self-reported frequency and severity of depression symptoms over the previous week, assessed using the Center for Epidemiologic Studies–Depression
Anxiety symptoms	Participants' self-reported frequency of anxiety symptoms over the previous 2 weeks, assessed using the Generalized Anxiety Disorder Scale
Pandemic duration	Length of time, in days, between the formal announcement of the COVID-19 pandemic in the United States (March 13, 2020) and the survey start date for the participant
Prematurity	Gestational age of less than 37 weeks at birth
NICU stay	Selected <i>yes</i> in response to “Did your baby have to stay in the NICU?” and included all levels of NICU stay (II–IV, as well as unknown)
Child age	Weeks since the child's birth
Child sex	Selection between binary options of <i>male</i> or <i>female</i>
Maternal age	Years since birth of the mother
Maternal education	Reported in four categories: <i>less than college</i> , <i>college</i> , <i>master's</i> , and <i>doctorate</i>
Maternal race	Reported in five categories: White, Black or African American, Hispanic or Latino, Asian and Pacific Islander, and other (which included survey responses for American Indian, Alaskan Native, or Native Hawaiian; biracial, multiracial; and other).
Maternal income	Reported in four categories: <\$74,999; \$75,000–\$149,000; \$150,000–\$224,999; and ≥\$225,000
Cohabiting relationship	Selected <i>cohabiting with partner/spouse</i> option in response to “What is your relationship status?”
Number of previous children	Number of currently living children born to the participant at the time of the survey

**Table 2: Sociodemographic Characteristics of the Participants (N = 310)**

Predictors	Value
Infant sex, %	
Male	48.0
Female	52.0
Infant age, weeks, <i>M (SD)</i>	18.1 (6.4)
Maternal age, years, <i>M (SD)</i>	33.8 (3.6)
Maternal race, %	
White	88.0
Black or African American	1.0
Hispanic or Latino	5.0
Asian and Pacific Islander	4.7
Other	1.3
Maternal education, %	
Less than high school or high school	9.1
College graduate	28.9
Master's degree	43.0
Doctoral degree	19.0
Household income, US\$/year, %	
<\$74,999	14.0
\$75,000–\$149,999	36.7
\$150,000–\$224,999	29.7
≥\$225,000	19.6
First pregnancy, %	
No	59.9
Yes	40.1
Multiparity, %	
No	98.7
Yes	1.3
NICU admissions, %	
No	88.7
Yes	11.3
Premature (<37 weeks), %	
No	92.0
Yes	8.0
Number of children before this birth, <i>M (SD)</i>	0.8 (1.0)

(Continued)

**Table 2: Continued**

Predictors	Value
Cohabiting with spouse/partner, %	
Yes	98.0
No	2.0
Pandemic duration, days, <i>M (SD)</i>	128.3 (32.4)

Note. Data were collected between May 21 and August 17, 2020.

Given the potential of psychosocial factors to mitigate stress during the postpartum period at the individual and interpersonal levels, it is important to understand how psychosocial factors interact with the additional pandemic stressors. The findings may inform prevention and intervention strategies to help women care for their newborns amidst significant personal and community disruption in the postpartum period. The objective of this study was to examine the associations of MSE and perceived social support with parenting stress during the postpartum period and the pandemic, as well as whether the two psychosocial factors account for variance in parenting stress in addition to the effects of COVID-19–related experiences and sociodemographic factors.

## Methods

### Design

We conducted a cross-sectional study using data derived from Wave 1 of the Perinatal Experiences and COVID-19 Effects (PEACE) study, an online survey study (*N* = 1,912) in which respondents completed a self-report questionnaire regarding the potential effects of the COVID-19 pandemic on women during pregnancy and the postpartum period. The institutional review boards of Mass General Brigham approved all data collection and analysis procedures before initiation of the study.

### Setting

Potential participants learned about the survey via e-mail distribution lists, social media, and word of mouth between May 19, 2020, and August 17, 2020. The participants responded to the survey on the online survey platform REDCap.

## Participants

Eligible participants were female, ages 18 years or older, residing in the United States, and at least 13 weeks pregnant or had given birth less than 6 months before enrollment. Participants consented to participate in the study before they responded to the online survey.

## Measures

We describe three categories of variables: predictors, outcomes, and covariates; definitions of constructs are fully detailed in Table 1.

**Predictors. Maternal self-efficacy.** We assessed MSE using a 10-item measure, the Maternal Self-Efficacy Scale (MSES; Teti & Gelfand, 1991). This measure is used to assess a woman's perception of her competencies about discrete parenting tasks. Using a 4-point Likert response format, from 1 (*not good at all/I don't understand my baby at all*) to 4 (*very good/I understand my baby almost all of the time*), participants self-reported their abilities across a variety of parenting tasks and skills. The total score corresponds to the sum of the scores of the answered items, and higher scores reflect higher levels of MSE. The total score ranges from 4 to 40. According to Teti and Gelfand (1991), the MSES showed an internal consistency reliability of .91. The Cronbach's alpha coefficient for the MSES in our study was .84.

**Social support.** We measured perception of social support using a 12-item scale, the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988). Using a 7-point scale ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*), participants respond to such statements as "I have friends with whom I can share my joys and sorrows" and "My family really tries to help me." The total score corresponds to the sum of the scores of each answered item. The total score ranges from 12 to 84, and higher scores correspond to greater levels of perceived social support. Zimet et al. (1988) reported a Cronbach's alpha coefficient estimate of internal consistency reliability of .88 and a test-retest reliability coefficient of .85. The Cronbach's alpha for MSPSS in our study was .93.

**COVID-19-related experiences.** We examined four aspects of common and new unexpected experiences brought about by the pandemic using measures described as follows. The four aspects included worries about being

**Table 3: Maternal Mental Health Symptoms, COVID-19-Related Experiences, Psychological Factors, and Postpartum Parenting Stress (N = 310)**

Variables	Mean (SD)
Mental health	
Depression symptoms (CES-D)	14.2 (9.4)
Generalized anxiety symptoms (GADS)	7.0 (5.4)
COVID-19-related experiences	
Health worries	12.5 (3.6)
Risk worries	10.8 (3.1)
Resource worries	22.4 (7.4)
Grief experiences	22.4 (4.9)
Composite score <sup>a</sup>	68.1 (15.2)
Psychosocial factors	
Maternal self-efficacy (MSES)	34.0 (3.8)
Social support (MSPSS)	67.1 (13.0)
Postpartum parenting stress	
Parenting stress (PSI)	78.8 (8.5)

Note. CES-D = Center for Epidemiologic Studies–Depression; GAD-7 = Generalized Anxiety Disorder Scale; MSES = Maternal Self-Efficacy Scale; MSPSS = Multidimensional Scale of Perceived Social Support; PSI = Parenting Stress Index.

<sup>a</sup>The composite score for COVID-19-related experiences is the summed scores from the four COVID-related variables: health, risk, worry, and grief.

infected with COVID-19 (health worry), worries about the infection likely causing morbidity or mortality (risk worry), worries about access to resources for basic needs and health care (resource worry), and feelings of grief due to missed life experiences during the pandemic (grief). We measured each aspect with items using a 5-point Likert scale. To map a more general landscape of the COVID-19 pandemic-related challenges, we created a composite index by summing the scores of the four aspects of COVID-19-related experiences.

First, we assessed participants' COVID-19-related health worry using four items from the Coronavirus Health Impact Survey (Merikangas et al., 2020). This measure is used to evaluate the intensity of worries related to COVID-19 that affect the health of the respondent and the health of the respondent's family and friends. Using a 5-point range from 1 (*not at all*) to 5 (*extremely*), participants could indicate their degree of worry

**Table 4: Zero-Order Correlations Between Study Variables (N = 310)**

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1. Infant sex (ref = male)	—																			
2. Infant age	.07	—																		
3. Maternal age	-.09	.03	—																	
4. First pregnancy (ref = no)	.03	.10	-.27*	—																
5. Multiparity (ref = no)	-.06	.04	-.11	-.10	—															
6. NICU admission (ref = no)	.00	.06	.00	.04	.14**	—														
7. Premature (ref = no)	-.01	-.09	.03	.01	.18	.44*	—													
8. Number of older children	-.05	-.12	.24*	-.69*	.14**	.01	.09	—												
9. Cohabitation (ref = no)	-.01	-.03	.03	.03	-.02	.10	.05	.17**	—											
10. Pandemic days	.05	.03	-.15**	.08	.02	.01	.02	-.11	-.07	—										
11. Depression symptoms	.00	.13**	-.08	.05	.10	.12**	.08	.03	.07	.02	—									
12. Anxiety symptoms	-.04	.09	-.09	.06	.14**	.12	.05	.00	-.01	.04	.76*	—								
13. COVID-19 health worries	-.02	.07	-.14**	.11**	.06	.09	.02	-.09	.07	.08	.46*	.49*	—							
14. COVID-19 risk worries	.01	.05	.00	.11	.13**	.14**	.09	-.02	.04	-.04	.38*	.45*	.53*	—						
15. COVID-19 resource worries	.05	.11	-.13**	.12**	.02	.12**	.00	-.07	.12**	.08	.42*	.45*	.57*	.51*	—					
16. COVID-19 grief experiences	.03	.04	-.05	.12**	-.02	.13**	.01	-.11	-.01	.13**	.46*	.44*	.50*	.36*	.56*	—				
17. COVID-19 composite	.06	.08	-.12	.14**	.05	.16**	.03	-.08	.08	.08	.52*	.55*	.77*	.68*	.89*	.78*	—			
18. Social support	.05	-.04	.00	.05	.01	.02	.05	-.11	-.15**	.02	-.38*	-.24*	-.14**	-.07	-.14**	-.12**	-.15**	—		
19. Maternal self-efficacy	.10	.08	.05	-.17†	.12**	.06	.06	.13**	-.09	.09	-.33*	-.21*	-.15†	-.09	-.16	-.16**	-.17†	.30*	—	
20. Postpartum parenting stress	.00	.10	-.09	.05	.02	.06	-.02	-.01	.02	-.02	.55*	.40*	.28*	.19	.32*	.34*	.37*	-.38*	-.56*	—

Note. ref = reference.  
\* $p < .0005$  \*\* $p < .05$  † $p < .005$ .

**Table 5: Multiple Regression Predicting Postpartum Parenting Stress Based on COVID-19–Related Experiences and Psychosocial Factors (N = 310)**

Predictor Variables	B (SE)	t	95% CI		p	R <sup>2</sup> <sub>adj</sub>	ΔR <sup>2</sup> <sub>adj</sub>
			LL	UL			
Step 1						0.24	
Intercept covariates	−0.03 (0.37)	−0.07	−0.76	0.71	.94		
Infant sex	0.04 (0.06)	0.68	−0.08	0.17	.50		
Infant age	0.08 (0.06)	1.21	−0.05	0.20	.23		
Maternal age	−0.05 (0.09)	−0.07	−0.19	0.09	.47		
First pregnancy (ref = no)	−0.04 (0.09)	−0.35	−0.22	0.15	.72		
Multiparity (ref = no)	0.07 (0.24)	0.30	−0.40	0.55	.77		
NICU admission (ref = no)	−0.06 (0.12)	−0.47	−0.29	0.18	.64		
Premature (ref = no)	0.22 (0.13)	1.75	−0.03	0.47	.08		
Number of older children	0.06 (0.09)	0.61	−0.13	0.24	.54		
Cohabiting relationship (ref = no)	0.21 (0.29)	0.73	−0.36	0.78	.46		
Maternal race (ref = White)	0.37 (0.88)	0.42	−1.36	2.10	.68		
Maternal education (ref = less than college)	−0.02 (0.19)	−0.13	−0.40	0.35	.90		
Household income (ref = <\$74,999)	−0.02 (0.10)	−0.20	−0.18	0.22	.84		
Pandemic duration	−0.07 (0.06)	−1.18	−0.20	0.05	.24		
Depression symptoms	0.55 (0.10) <sup>†</sup>	5.59	0.36	0.74	.00		
Anxiety symptoms	−0.08 (0.09)	−0.92	−0.25	0.09	.36		
Step 2						0.26	0.02 <sup>**</sup>
Intercept covariates	−0.09 (0.37)	−0.23	−0.82	0.65	.82		
Infant sex	0.06 (0.06)	0.90	−0.07	0.18	.37		
Infant age	0.06 (0.06)	1.01	−0.06	0.19	.31		
Maternal age	−0.06 (0.07)	−0.81	−0.19	0.08	.42		
First pregnancy (ref = no)	−0.00 (0.09)	−0.01	−0.19	0.19	.99		
Multiparity (ref = no)	0.08 (0.24)	0.33	−0.39	0.55	.74		
NICU admission (ref = no)	−0.04 (0.12)	−0.35	−0.29	0.20	.73		
Premature (ref = no)	0.23 (0.13)	1.79	−0.02	0.47	.08		
Number of older children	0.05 (0.10)	0.56	−0.13	0.24	.57		
Cohabiting relationship (ref = no)	−0.19 (0.29)	−0.64	−0.38	0.76	.52		
Maternal race (ref = White)	0.04 (0.35)	0.12	−0.64	0.73	.90		
Maternal education (ref = less than college)	−0.05 (0.12)	−0.40	−0.18	0.27	.69		
Household income (ref = <\$74,999)	−0.06 (0.11)	−0.57	−0.15	0.27	.57		
Pandemic duration	−0.04 (0.07)	−0.65	−0.17	0.09	.52		
Depression symptoms	0.52 (0.10) <sup>†</sup>	5.19	0.32	0.72	.00		
Anxiety symptoms	−0.15 (0.09)	−1.63	−0.34	0.03	.10		
COVID-19–related experiences	0.20 (0.08) <sup>†</sup>	2.33	0.03	0.34	.02		
Step 3						0.51	0.25 <sup>*</sup>
Intercept covariates	−0.01 (0.32)	−0.03	−0.64	0.63	.98		

(Continued)



Table 5: Continued

Predictor Variables	B (SE)	t	95% CI		p	R <sup>2</sup> <sub>adj</sub>	ΔR <sup>2</sup> <sub>adj</sub>
			LL	UL			
Infant sex	−0.03 (0.05)	−0.52	−0.13	0.08	.61		
Infant age	0.14 (0.05)**	2.69	0.04	0.25	.01		
Maternal age	−0.06 (0.06)	−0.97	−0.17	0.06	.34		
First pregnancy (ref = no)	−0.01 (0.08)	−0.02	−0.16	0.16	.98		
Multiparity (ref = no)	0.23 (0.22)	1.06	−0.67	0.20	.29		
NICU admission (ref = no)	0.12 (0.11)	1.18	0.32	0.08	.24		
Premature (ref = no)	0.07 (0.11)	0.62	−0.15	0.28	.53		
Number of older children	0.18 (0.08)†	2.23	0.02	0.35	.03		
Cohabiting relationship (ref = no)	0.52 (0.24)†	2.16	0.05	0.99	.03		
Maternal race (ref = White)	0.07 (0.28)	0.16	−0.51	0.60	.87		
Maternal education (ref = less than college)	−0.07 (0.09)	−0.91	−0.09	0.25	.37		
Household income (ref = <\$74,999)	−0.04 (0.09)	−0.54	−0.22	0.13	.59		
Pandemic duration	0.01 (0.05)	0.16	−0.10	0.12	.87		
Depression symptoms	0.30 (0.09)*	3.38	0.12	0.47	.00		
Anxiety symptoms	−0.12 (0.08)	−1.55	−0.27	0.03	.12		
COVID-19–related experiences	0.21 (0.07)*	3.32	0.08	0.34	.00		
Psychosocial factors							
Social support	−0.19 (0.06)*	−3.38	−0.30	−0.08	.00		
Maternal self-efficacy	−0.55 (0.07)*	−8.27	−0.69	−0.42	.00		
Step 4						0.52	0.01†
Intercept covariates	−0.03 (0.32)	−0.09	−0.66	0.60	.93		
Infant sex	−0.05 (0.05)	−0.50	−0.13	0.08	.62		
Infant age	0.14 (0.05)†	2.78	0.04	0.25	.01		
Maternal age	−0.05 (0.06)	−0.95	−0.17	0.06	.34		
First pregnancy (ref = no)	0.01 (0.08)	0.18	−0.14	0.17	.86		
Multiparity (ref = no)	0.27 (0.22)	−1.24	−0.07	0.16	.22		
NICU admission (ref = no)	0.14 (0.10)	1.36	−0.34	0.06	.18		
Premature (ref = no)	0.07 (0.11)	0.63	−0.14	0.28	.53		
Number of older children	0.16 (0.08)†	1.91	−0.01	0.32	.06		
Cohabiting relationship (ref = no)	−0.07 (0.24)†	1.73	−0.06	0.89	.04		
Maternal race (ref = White)	0.19 (0.28)	0.66	−0.37	0.75	.51		
Maternal education (ref = less than college)	−0.12 (0.15)	−0.80	−0.43	0.18	.43		
Household income (ref = <\$74,999)	−0.06 (0.09)	−0.65	−0.23	0.12	.52		
Pandemic duration	0.00 (0.05)	0.09	−0.10	0.11	.93		
Depression symptoms	0.31 (0.09)*	3.57	0.14	0.48	.00		
Anxiety symptoms	−0.14 (0.08)	−1.77	−0.29	0.02	.08		

(Continued)

**Table 5: Continued**

Predictor Variables	B (SE)	t	95% CI		p	R <sup>2</sup> <sub>adj</sub>	ΔR <sup>2</sup> <sub>adj</sub>
			LL	UL			
COVID-19–related experiences	0.25 (.007) <sup>†</sup>	3.75	0.12	0.39	.00		
Psychosocial factors							
Social support	−0.19 (0.06) <sup>*</sup>	−3.40	−0.30	−0.08	.00		
Maternal self-efficacy	−0.52 (0.06) <sup>*</sup>	−8.17	−0.67	−0.41	.00		
COVID-19–related experiences × maternal self-efficacy	−0.10 (0.05) <sup>†</sup>	−2.08	−0.23	−0.02	.02		

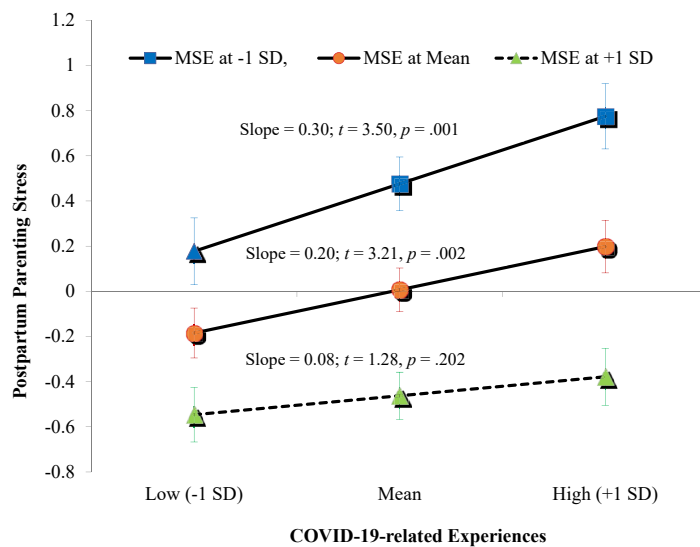
Note. All continuous variables were standardized. COVID-19–related experiences were represented by the composite score tabulated by summing the scores of the four COVID-related variables: health, risk, worry, and grief. adj = adjusted; CI = confidence interval; LL = lower level; ref = referent; UL = upper level. <sup>\*</sup>p < .0005 <sup>\*\*</sup>p < .005 <sup>†</sup>p < .05.

over the previous 2 weeks about being infected with COVID-19 personally, about family and friends being infected, and about the influence of COVID-19 on their own emotional well-being and physical health. Responses are summed, with a range of 4 to 20, and higher total scores indicate higher levels of health worry. We calculated a Cronbach’s alpha estimate of internal consistency reliability of .87 in our study.

Second, we assessed participants’ COVID-19 risk worry using a four-item measure that we developed to evaluate participants’ worries about contracting COVID-19 and the likelihood that

such an infection would result in morbidity or mortality for the participant. Example items include “COVID-19 is a life-threatening disease for me” and “I get sick more easily than other people my age,” and participants responded on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Summed response scores range from 4 to 20, with higher total scores indicating higher levels of risk worry. The Cronbach’s alpha coefficient was .69 for our study.

Third, we assessed participants’ COVID-19–related resource worry using a 10-item measure that we created. This measure evaluates the



**Figure 1.** Interaction between maternal self-efficacy (MSE) and COVID-19–related experiences predicting postpartum parenting stress. All continuous variables were standardized. Child sex, child age, maternal age, race, education, income level, whether the recent birth was the first pregnancy, multiparity, if the infant had an NICU stay, number of previous children, and cohabiting relationship were controlled. Scale units of the x- and y-axes are standard deviations of the measures,  $F = 8.89, p < .0001, R^2_{adj} = .52$ .

intensity of worries related to accessing and obtaining general resources during the COVID-19 pandemic. Using a 5-point range from 1 (*not at all worried*) to 5 (*very worried*), participants indicated their degree of concern regarding access to health care, groceries, employment, and other necessities. Summed response scores ranged from 10 to 50, and higher scores indicated higher levels of resource worry. The Cronbach's alpha coefficient was .81 for our study.

Finally, we assessed participants' feelings of grief due to missed experiences during the COVID-19 pandemic using a seven-item scale on which participants responded from 1 (*strongly disagree*) to 5 (*strongly agree*). Three of the component items were adapted from the Inventory of Complicated Grief (Prigerson et al., 1995), including "I feel stunned or dazed over what happened," "I feel that life is empty," and "I feel bitter that COVID-19 caused me to experience loss in my routines and activities." Other items in this measure were used to assess participants' emotions regarding the cancellation and deferral of experiences because of the COVID-19 pandemic, including absence of celebrations for major life events and loss of support from family and friends because of social distancing. One item on the measure was specific to the perinatal period and assessed sadness about limitations on the ability to celebrate their pregnancy or birth with loved ones. Summed scores of responses range from 7 to 35, and higher scores indicate higher levels of grief. The Cronbach's alpha coefficient for this measure was .79 in our study.

Finally, to provide an overall depiction of COVID-19–related experiences, we created an index score by summing the scores of the four aspects of COVID-19–related experiences, including health worry, risk worry, resource worry, and grief. The summed score ranged from 25 to 125, and higher scores indicated greater overall negative effects of COVID-19–related experiences. We calculated a Cronbach's alpha coefficient of .76 for the composite index score. It was this overall index score of COVID-19–related experiences that was used for the subsequent regression analysis.

**Outcomes. Parenting Stress Index.** We assessed participants' parenting-related stress using the Parenting Stress Index (PSI; Abidin, 2012). The PSI is a 36-item measure with item responses on a 5-point Likert scale from 1 (*strongly agree*) to

5 (*strongly disagree*). Items are designed to probe the extent to which the participant finds their child or the transition to parenthood difficult or not up to their expectations. Example questions include "I feel trapped by my responsibilities as a parent" and "My child's sleeping or eating schedule was much harder to establish than I expected." A total score is the sum of responses to all items and can range from 36 to 180; lower scores indicate higher levels of stress. Abidin (1995) reported an estimate of internal reliability of .91. The Cronbach's alpha coefficient for the PSI was .92 for our study.

**Covariates. Depression symptoms.** We assessed participants' symptoms of depression using the 20-item Center for Epidemiologic Studies–Depression instrument (CES-D; Radloff, 1977). The CES-D is used to evaluate self-reported frequency and severity of symptoms of depression over the previous week using a 4-point frequency-of-experience range from 0 (*rarely or none of the time, less than 1 day*) to 3 (*most or all of the time, 5–7 days*). Items assess symptoms including feelings of self-worth, sleep, appetite, and motivation, among others. Total scores may range from 0 to 60, and higher scores indicate more frequent symptoms of depression. Reported estimates of internal consistency reliability ranged from Cronbach's alphas of .85 to .90 (Radloff, 1977). We computed a Cronbach's alpha coefficient for the CES-D of .90 for our study.

**Anxiety symptoms.** We assessed participants' symptoms of anxiety using a seven-item measure, the Generalized Anxiety Disorder Scale (GADS; Spitzer et al., 2006). The GADS is used to examine self-reported frequency of symptoms of anxiety over the previous 2 weeks using a 4-point range from 0 (*not at all*) to 3 (*nearly every day*). Total scores range from 0 to 21, and higher scores indicate a higher level of anxiety. Spitzer et al. (2006) reported an internal consistency reliability estimate of .92 and a test–retest reliability coefficient of .83. The Cronbach's alpha coefficient for the GADS was .92 in our study.

**Pandemic duration.** We defined pandemic duration as the length of time in days between the formal announcement of the COVID-19 pandemic in the United States (March 13, 2020) and the survey start date for the participant.

**Multiparity.** We defined multiparity as giving birth previously to two or more viable fetuses.

**NICU stay.** We defined a NICU stay as a response of yes to the query “Did your baby have to stay in the NICU?” and included all levels of NICU stay (II–IV, as well as unknown).

## Procedures

We recruited participants through social media, including the Facebook pages of the Brigham and Women’s Hospital and community groups such as Boston Moms, the Mass General Brigham Rally (a hospital-based research study platform), and word of mouth. Participants read the consent form and consented to participate in the study before participating in the online survey. The survey took approximately 30 to 45 minutes to complete. We did not offer an incentive to participants. We used frequent attention checks and human verification to ensure data quality. Data inspection also included identifying missing responses and removing them from the data set.

## Analysis

Initial descriptive analysis indicated that the variables were normally distributed, and predictors had acceptable levels of collinearity (variance inflation factor < 5). Beyond descriptive analyses on all variables, we calculated zero-order correlations among all variables, with significance set at  $p < .05$ . After standardizing all variables, we conducted hierarchical regression analysis to examine the joint associations of COVID-19–related experiences and maternal psychosocial factors to postpartum parenting stress, in addition to the covariates (i.e., the sociodemographic variables and current mental health symptoms listed in Tables 2 and 3). Specifically, postpartum parenting stress was regressed on the covariates (Step 1), COVID-19–related experiences composite score (Step 2), and psychosocial factors (Step 3). We examined full-factorial interactions between the COVID-19 composite, MSE, and social support. We performed all analyses in the R statistical computing language and software environment, version 4.0.5 (R Core Team, 2020).

## Results

Out of the entire sample of Wave 1 participants of the PEACE study, 310 women ( $M_{\text{age}} = 33.8$  years,  $SD_{\text{age}} = 3.6$ ) reported giving birth within the defined postpartum period and, thus, were included in the current study (see Table 2). Most participants were White and college educated;

### Data showed that maternal self-efficacy mitigated the effects of COVID-19–related experiences.

close to 50% of them had household incomes of at least \$150,000 per year, and 98% cohabited with their partners. Among the infants ( $M_{\text{age}} = 18.1$  weeks,  $SD_{\text{age}} = 6.4$ ), 52% were female, approximately 60% were firstborn, and 99% were singletons. Approximately 11% of the infants required care in the NICU, and 8% were born before 37 weeks gestation. On average, respondents completed the survey approximately 128.3 ( $SD = 32.4$ ) days after the pandemic was declared a national emergency in the United States (March 13, 2020).

Table 3 shows the descriptive statistics of maternal mental health symptoms (the CES-D and GADS), COVID-19–related experiences (health worry, risk worry, resource worry, and grief), psychosocial factors (the MSES and MSPSS), and postpartum parenting stress (the PSI). As shown in Table 4, the PSI; COVID-19–related health worry, risk worry, resource worry, grief, and the composite score; psychosocial factors (the MSES and MSPSS); and mental health symptoms (the CES-D and GADS) were significantly correlated in the expected directions. Higher COVID-19–related experiences and CES-D and GADS scores were associated with higher PSI score. Higher MSPSS and MSES scores were associated with lower PSI score. None of the sociodemographic characteristics were correlated with PSI score.

We conducted a hierarchical regression analysis to examine the joint associations of COVID-19–related experiences and psychosocial factors with PSI score, in addition to the covariates (i.e., the sociodemographic factors listed in Table 2 and the CES-D and GADS scores). As shown in Table 5, sociodemographic characteristics and CES-D and GADS scores entered in Step 1 of the model significantly predicted PSI score ( $F = 5.19$ ,  $p < .001$ , adjusted  $R^2 [R^2_{\text{adj}}] = 0.24$ ), although none emerged as significant unique predictors of parenting stress. Inclusion of COVID-19–related experiences in Step 2 significantly (although with only small effect size) improved the model ( $F = 5.41$ ,  $p < .001$ ,  $R^2_{\text{adj}} = 0.26$ ,  $\Delta R^2_{\text{adj}} = 0.02$ ,  $p = .00$ ) and predicted PSI score in addition to all other variables. The inclusion of the two psychosocial factors, the MSPSS and MSE, in Step 3 also improved the model ( $F = 12.1$ ,  $p < .001$ ,

$R^2_{\text{adj}} = 0.51$ ,  $\Delta R^2_{\text{adj}} = 0.25$ ,  $p < .001$ ), with each variable uniquely contributing to the explained variance in addition to all other variables.

We next examined full-factorial interactions among COVID-19–related experiences, MSE, and MSPSS score. There was a significant interaction between COVID-19–related experiences and MSE contributing to PSI score. All other interaction terms were nonsignificant. Thus, the final model included only one second-order term, that is, the cross-product of the composite of COVID-19–related experiences and the MSES (Step 4). The results showed that COVID-19–related experiences positively predicted PSI score. Infant age and number of older children appeared to be positively associated with PSI score, while cohabiting relationships and MSPSS score showed negative associations. Score on the CES-D, but not on the GADS, was positively associated with the PSI. Notably, the MSES outweighed the MSPSS and COVID-19–related experiences for its unique association with PSI score,  $b = -0.52$ ,  $SE = 0.06$ ,  $t = -8.17$ ,  $p < .001$ . Furthermore, the inclusion of the interaction term (the cross-product of COVID-19–related experiences and the MSES) improved the model ( $F = 12.2$ ,  $p < .001$ ,  $R^2_{\text{adj}} = 0.52$ ,  $\Delta R^2_{\text{adj}} = 0.01$ ,  $p = .04$ ) and uniquely contributed to the explained variance in the PSI in addition to all other variables,  $b = -0.10$ ,  $SE = 0.05$ ,  $t = -2.08$ ,  $p = .02$ . Figure 1 summarizes the subsequent simple slope tests of the interaction, showing the predictions of the PSI from low ( $-1$  SD), mean, and high ( $+1$  SD) COVID-19–related experiences at each of the three levels of MSE ( $-1$  SD, mean, and  $+1$  SD). Specifically, as MSE increased, the strength of the association between COVID-19–related experiences and postpartum parenting stress decreased, revealing the buffer role of MSE in mitigating parenting stress.

## Discussion

Our findings show elevated parenting stress during the COVID-19 pandemic among a group of women during the postpartum period. Considering the potential detrimental effects of maternal stress on women, infants, and the family (Liu & Doan, 2020; Liu, et al., 2021), it is important to capitalize on protective factors that mitigate the stress related to the birth of a newborn, especially during a challenging global pandemic (Kinser et al., 2021; Liu, Mittal, & Erdei, 2021). Furthermore, two psychosocial factors at the individual and interpersonal levels, MSE and social support,

served as protective factors for women who experienced COVID-19–related parenting stress.

We assessed four aspects of COVID-19–related experiences, including health worry, risk worry, resource worry, and grief. These experiences were new and unexpectedly brought about by the pandemic. Each of the four aspects of COVID-19–related experiences was positively correlated with postpartum parenting stress, which suggests the multidimensional nature of pandemic experiences. To map a more general landscape of pandemic-related challenges, we compiled the four aspects of COVID-19–related experiences into a composite index that showed a clear contribution to postpartum parenting stress in addition to a range of socioeconomic factors and maternal mental health symptoms. This finding corroborates reports from studies that show how the unprecedented COVID-19 pandemic has negatively affected already taxing and challenging parenting after birth (Fernandes et al., 2021b; Molgora & Accordini, 2020; Taubman-Ben-Ari et al., 2021).

Although maternal mental health symptoms were not the primary focus of this study and were treated as covariates in the regression models, symptoms of depression and anxiety showed zero-order correlations with postpartum parenting stress. Notably, after we accounted for all other variables, only symptoms of depression uniquely contributed to postpartum parenting stress, but symptoms of anxiety did not. The findings on maternal depression are consistent with prior research that showed a link between maternal depression and postpartum parenting stress (Crugnola et al., 2016; Epifanio et al., 2015; Thomason et al., 2014; Vismara et al., 2016). Maternal depression tends to be associated with low tolerance and heightened arousal in response to distress signals from the newborn and the general demands of parenting (Bocknek et al., 2012; Feldman et al., 2009), which makes it difficult for women to feel that they are measuring up to their expectations of being parents. Such discrepancies between the expectations of parenting and women's perceived abilities to meet those expectations is at the core of the notion of parenting stress (Abidin, 1995).

In contrast to depression, symptoms of anxiety did not show a clear and direct connection to parenting stress when all other variables were accounted for. Although symptoms of anxiety during the postpartum period have been

associated with less sensitive responses to infants' cues and less optimal quality of parenting (Britton, 2011; Crugnola et al., 2016; Feldman et al., 1997; Nicol-Harper et al., 2007), some researchers did not find comparable effects of maternal anxiety on the quality of postpartum parenting when compared to symptoms of depression (Dubber et al., 2015; Edhborg et al., 2011; Tietz et al., 2014). Although further research may help more fully characterize the effects of maternal anxiety on postpartum parenting, the results of our study suggest that symptoms of depression and anxiety influence caregiving in different ways. Our findings warrant more attention to prioritizing symptoms of maternal depression when devising prevention and intervention strategies to reduce postpartum parenting stress in the context of a global pandemic.

Maternal self-efficacy and perceived social support uniquely accounted for the variance in postpartum parenting stress in addition to COVID-19-related experiences and other socioeconomic and maternal mental health covariates. Our findings underscore the important functions of the psychosocial correlates at the individual and interpersonal levels for postpartum parenting stress during the crisis of a pandemic. The main effect of perceived social support aligned with the well-documented buffering role of social support on maternal stress and adversity and the broad implications of social support and maternal well-being during the perinatal period (Barbosa-Leiker et al., 2021; Webster et al., 2011). Under nonpandemic conditions in the postpartum period, women can more easily access help through extended family, friends, childcare facilities, health care systems, and other community resources such as parenting support groups. However, amid the COVID-19 pandemic, social distancing, stay-at-home orders, and other prevention guidelines substantially changed social connections and limited women's access to otherwise available help and support (Saltzman et al., 2020; Szkody et al., 2020). As the findings of our study and those of others (Iztayeva, 2021; Miller et al., 2020) show, when the COVID-19 pandemic severely restricted other sources of social support, the cohabiting relationships with a spouse/partner were particularly beneficial to alleviate parenting stress. Increased time spent at home by a partner/spouse (because of unemployment, reduced work hours, or working from home) and, thus, a general shift toward more equally divided

childcare duties might help relieve maternal stress related to parenting (Carlson et al., 2021; Lyttelton et al., 2020). Our findings reinforce the important role that partners play in supporting the wellness of women during the postpartum period.

In times of limited sources of interpersonal support, it is also important to consider the mother's internal resources. The mother's sense of efficacy (Bandura, 1998; Bloomfield & Kendall, 2012) may effectively assuage the perceived stress of parenting during a pandemic. Our findings indeed underscore that MSE accounts for significant variance in parenting stress and that the unique variance accounted for by MSE outweighs social support and COVID-19-related experiences. Furthermore, our results suggest that MSE interacted with COVID-19-related experiences such that the negative effects of the pandemic on parenting stress significantly decreased as MSE increased. These findings support the notion that self-efficacy is a valuable resource within an individual that can maximize goal-directed outcomes during challenging circumstances (Hobfoll, 1989; Hobfoll et al., 2018). In other words, in the process of the mother's efforts to garner available resources to guard against the stress of parenting a newborn amid a pandemic, MSE, an inner psychocognitive resource, emerged as an effective means to manage parenting stress when the world outside appeared disrupted and unpredictable.

### Limitations

Several limitations of this study warrant future investigation. First, we collected data using a cross-sectional design, and the analyses were correlational in nature; it is possible that the perception of parenting stress may worsen the perception of the negative effects of the pandemic, including symptoms of depression, and undermine the sense of efficacy in parenting. Wave 2 of the PEACE study holds promise to address this limitation because data obtained at different time points may shed light on the temporal relations between study variables and provide insights for possible causal relations. Second, the current sample, which was predominantly White, well educated, and well resourced, may not represent the experiences of women from other races/ethnicities or at different income or educational levels. Additionally, women who were more stressed by the pandemic may be more likely to respond to a survey about parenting stress. Thus, the findings are not generalizable to all women and

---

**Enhancing maternal self-efficacy is important to mitigate the effects of a global pandemic for women in the postpartum period.**

---

their families across diverse backgrounds during the postpartum period. Given the increased risks of the COVID-19 infection in underserved populations in general (Gross et al., 2020) and the broad effects of the COVID-19 pandemic on maternal and perinatal health across a wide range of health, social, and economic concerns (Kotlar et al., 2021), it is essential that future researchers explore the support available to and useful for populations with fewer resources.

Although telehealth has been an effective way to provide remote maternity and postpartum services during the pandemic, lack of access to computers or smartphones, inadequate broadband Internet services, and language barriers are significant concerns (Hill & Burroughs, 2020) that can influence the ability of underresourced parents to participate in survey research. Community engagement methods, including involving community members in research design and implementation, individual and focus group interviews, and partnering with community resource and advocacy agencies are approaches more likely to yield data that more accurately reflect the needs of these communities (Burroughs et al., 2021). Finally, we did not include measures of infant temperament, which has been shown to be related to maternal mental health and perceived parenting stress (Fernandes et al., 2021a; Gray et al., 2013). Including infant temperament as a covariate would thus provide a better understanding of parenting stress during the postpartum period.

### Implications

Despite these considerations, we documented postpartum parenting stress in the context of an unprecedented global pandemic and how psychosocial correlates at the individual and interpersonal levels, that is, MSE and social support, serve as protective factors. We showed that MSE buffers the negative effects of COVID-19–related experiences on parenting stress. These findings contribute to refining our understanding of the factors conferring risk for parenting stress during the first 6 months after

childbirth. To support women in managing parenting stress during the postpartum period, it is important to assess the worries, concerns, and grief uniquely associated with the pandemic (Erdei & Liu, 2020; Liu, Mittal, & Erdei, 2021), to screen for possible symptoms of depression (Liu & Tronick, 2012, 2013), and to explore possible forms of social support as permitted by prevention regulations. Notably, interventions aimed at enhancing MSE are likely to be effective in managing parenting stress. Elements of such interventions include emphasizing that self-efficacy is a dynamic process that can be improved (Bandura, 1997), educating about what to expect in terms of infant developmental milestones (Ruchala & James, 1997), enhancing objective cognitive appraisal of their own competence in relation to the external situation, and fostering coping skills to increase the sense of mastery under challenging circumstances (Deković et al., 2010; Freisthler et al., 2021; Sanders & Woolley, 2005).

### Conclusion

COVID-19–related disruptions magnified the challenges and perceived stress in parenting a newborn. Our findings show that MSE and social support provide important psychosocial protection from COVID-19–related parenting stress at the individual and interpersonal levels in addition to COVID-19–related experiences, maternal mental health symptoms, and a range of socio-demographic factors. That MSE significantly buffers the negative effects of the COVID-19 pandemic on parenting stress underscores the importance of this inner resource of strength, particularly in times of decreased social support. Although limited in generalizability to women with fewer resources, the findings highlight a need to develop support and intervention models that enhance parenting self-efficacy as an individual source of strength for women in the postpartum period in the context of a global pandemic.

### CONFLICT OF INTEREST

The authors report no conflicts of interest or relevant financial relationships.

### FUNDING

Funded by the Mary A. Tynan Faculty Fellowship, the Family Health and Resilience Research Fund, the Weinberg and Barton Families, and a National

Institutes of Health K23 MH 107714-01 A1 award to C.H.L.



## REFERENCES

- Abidin, R. R. (1995). *Parenting stress index: Manual* (3rd ed.). Psychological Assessment Resources.
- Abidin, R. R. (2012). *Parenting stress index* (4th ed.). Psychological Assessment Resources.
- American College of Obstetricians and Gynecologists. (2018). Optimizing postpartum care: ACOG committee opinion no. 736. *Obstetrics & Gynecology*, 131(5), e140–e150. <https://doi.org/10.1097/AOG.0000000000002633>
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37(2), 122–147. <https://doi.org/10.1037/0003-066X.37.2.122>
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman and Company.
- Bandura, A. (1998). Self-efficacy. In H. Friedman (Ed.), *Encyclopedia of mental health*. Academic Press. (Reprinted from "Self-efficacy," 1994. In V. S. Ramachandran (Ed.), *Encyclopedia of human behavior* [Vol. 4, pp. 71–81]. Academic Press.)
- Barbosa-Leiker, C., Smith, C. L., Crespi, E. J., Brooks, O., Burduli, E., Ranjo, S., ... Gartstein, M. A. (2021). Stressors, coping, and resources needed during the COVID-19 pandemic in a sample of perinatal women. *BMC Pregnancy Childbirth*, 21, Article 171. <https://doi.org/10.1186/s12884-021-03665-0>
- Bernard, K., Nissim, G., Vaccaro, S., Harris, J. L., & Lindhiem, O. (2018). Association between maternal depression and maternal sensitivity from birth to 12 months: A meta-analysis. *Attachment and Human Development*, 20(6), 578–599. <https://doi.org/10.1080/14616734.2018.1430839>
- Bloomfield, L., & Kendall, S. (2012). Parenting self-efficacy, parenting stress and child behaviour before and after a parenting programme. *Primary Health Care Research & Development*, 13(4), 364–372. <https://doi.org/10.1017/S1463423612000060>
- Bocknek, E. L., Brophy-Herb, H. E., Fitzgerald, H., Burns-Jager, K., & Carolan, M. T. (2012). Maternal psychological absence and toddlers' social-emotional development: Interpretations from the perspective of boundary ambiguity theory. *Family Process*, 51, 527–541. <https://doi.org/10.1111/j.1545-5300.2012.01411.x>
- Bolten, M. I., Fink, N. S., & Stadler, C. (2012). Maternal self-efficacy reduces the impact of prenatal stress on infant's crying behavior. *Journal of Pediatrics*, 161(1), 104–109. <https://doi.org/10.1016/j.jpeds.2011.12.044>
- Britton, J. R. (2011). Infant temperament and maternal anxiety and depressed mood in the early postpartum period. *Women & Health*, 51(1), 55–71. <https://doi.org/10.1080/03630242.2011.540741>
- Brooks, S. K., Weston, D., & Greenburg, N. (2020). Psychological impact of pandemics on pregnant women: Rapid evidence review. *Public Health*, 189, 26–36. <https://doi.org/10.1016/j.puhe.2020.09.006>
- Brown, S., Doorn, J. L., Lechuga-Pena, S., Watanabe, S. E., & Koppels, T. (2020). Stress and parenting during the global COVID-19 pandemic. *Child Abuse and Neglect*, 110(Pt. 2), Article 104699. <https://doi.org/10.1016/j.chiabu.2020.104699>
- Burroughs, E., Hill, I., Taylor, K. J., Benatar, S., Haley, J. M., Allen, E. A., & Coquillat, S. (2021). *Maternal health inequities during the COVID-19 pandemic: Challenges, promising advances, and opportunities to provide equitable care* [Policy brief]. Urban Institute Health Policy Center; Robert Wood Johnson Foundation. <https://www.urban.org/sites/default/files/publication/104306/maternal-health-inequities-during-the-covid-19-pandemic.pdf>
- Carlson, D. L., Petts, R., & Pepin, J. R. (2021). Changes in US Parents' Domestic Labor During the Early Days of the Covid-19 Pandemic. *Sociological Inquiry*. <https://doi.org/10.1111/soin.12459>
- Corrigan, C. P., Kwasky, A. N., & Groh, C. J. (2015). Social support, postpartum depression, and professional assistance: A survey of mothers in the midwestern United States. *Journal of Perinatal Education*, 24(1), 48–60. <https://doi.org/10.1891/1058-1243.24.1.48>
- Crugnola, C. R., Ierardi, E., Ferro, V., Gallucci, M., Parodi, C., & Astengo, M. (2016). Mother-infant emotion regulation at three months: The role of maternal anxiety, depression and parenting stress. *Psychopathology*, 49(4), 285–294. <https://doi.org/10.1159/000446811>
- Davenport, M. H., Meyer, S., Meah, V. L., Strynadka, M. C., & Khurana, R. (2020). Moms are not OK: Covid-19 and maternal mental health. *Frontiers of Global Women's Health*, 1, Article 1. <https://doi.org/10.3389/fgwh.2020.00001>
- De Sousa Machado, T., Chur-Hansen, A., & Due, C. (2020). First-time mothers' perceptions of social support: Recommendations for best practice. *Health Psychology Open*, 7(1), Article 2055102919898611. <https://doi.org/10.1177/2055102919898611>
- Deković, M., Asscher, J. J., Hermans, J., Reitz, E., Prinzie, P., & van den Akker, A. L. (2010). Tracing changes in families who participated in the home-start parenting program: Parental sense of competence as mechanism of change. *Prevention Science*, 11(3), 263–274. <https://doi.org/10.1007/s11121-009-0166-5>
- DeYoung, S. E., & Mangum, M. (2021). Pregnancy, birthing, and postpartum experiences during COVID-19 in the United States. *Frontiers in Sociology*, 6, Article 611212. <https://doi.org/10.3389/fsoc.2021.611212>
- Dib, S., Rogeaux, E., Vazquez-Vazquez, A., Wells, J. C. K., & Fewtrell, M. (2020). Maternal mental health and coping during the COVID-19 lockdown in the UK: Data from the COVID-19 New Mum Study. *Obstetrics and Gynecology*, 151(3), 407–414. <https://doi.org/10.1002/ijgo.13397>
- Dubber, S., Reck, C., Müller, M., & Gawlik, S. (2015). Postpartum bonding: The role of perinatal depression, anxiety and maternal-fetal bonding during pregnancy. *Archives of Women's Mental Health*, 18(2), 187–195. <https://doi.org/10.1007/s00737-014-0445-4>
- Edhborg, M., Nasreen, H. E., & Kabir, Z. N. (2011). Impact of postpartum depressive and anxiety symptoms on mothers' emotional tie to their infants 2–3 months postpartum: A population-based study from rural Bangladesh. *Archives of Women's Mental Health*, 14(4), Article 307. <https://doi.org/10.1007/s00737-011-0221-7>
- Epifanio, M. S., Genna, V., De Luca, C., Roccella, M., & La Grutta, S. (2015). Paternal and maternal transition to parenthood: The risk of postpartum depression and parenting stress. *Pediatric Reports*, 7(2), Article 5872. <https://doi.org/10.4081/pr.2015.5872>
- Erdei, C., & Liu, C. H. (2020). The downstream effects of COVID-19: A call for supporting family wellbeing in the NICU. *Journal of Perinatology*, 40, 1283–1285. <https://doi.org/10.1038/s41372-020-0745-7>
- Feldman, R., Granat, A., Pariente, C., Kanety, H., Kuint, J., & Gilboa-Schechtman, E. (2009). Maternal depression and anxiety across the postpartum year and infant social engagement, fear regulation, and stress reactivity. *Journal of the American*



- Academy of Child and Adolescent Psychiatry*, 48(9), 919–927. <https://doi.org/10.1097/CHI.0b013e3181b21651>
- Feldman, R., Greenbaum, C. W., Mayes, L. C., & Erlich, S. H. (1997). Change in mother–infant interactive behavior: Relations to change in the mother, the infant, and the social context. *Infant Behavior & Development*, 20(2), 151–163. [https://doi.org/10.1016/S0163-6383\(97\)90018-7](https://doi.org/10.1016/S0163-6383(97)90018-7)
- Fernandes, D. V., Canavarro, M. C., & Moreira, H. (2021a). The mediating role of parenting stress in the relationship between anxious and depressive symptomatology, mothers' perception of infant temperament, and mindful parenting during the postpartum period. *Mindfulness*, 12, 275–290. <https://doi.org/10.1007/s12671-020-01327-4>
- Fernandes, D. V., Canavarro, M. C., & Moreira, H. (2021b). Postpartum during COVID-19 pandemic: Portuguese mothers' mental health, mindful parenting, and mother–infant bonding. *Journal of Clinical Psychology*, 77(9), 1997–2010. <https://doi.org/10.1002/jclp.23130>
- Freisthler, B., Gruenewald, P. J., Tebben, E., Shockley McCarthy, K., & Price Wolf, J. (2021). Understanding at-the-moment stress for parents during COVID-19 stay-at-home restrictions. *Social Science & Medicine*, 279, Article 114025. <https://doi.org/10.1016/j.socscimed.2021.114025>
- Fulton, J. M., Mastergeorge, A. M., Steele, J. S., & Hansen, R. L. (2012). Maternal perceptions of the infant: Relationship to maternal self-efficacy during the first six weeks postpartum. *Infant Mental Health Journal*, 33(4), 329–338. <https://doi.org/10.1002/imhj.21323>
- Gray, P. H., Edwards, D. M., O'Callaghan, M. J., Cuskelly, M., & Gibbons, K. (2013). Parenting stress in mothers of very preterm infants—Influence of development, temperament and maternal depression. *Early Human Development*, 89(9), 625–629. <https://doi.org/10.1016/j.earlhumdev.2013.04.005>
- Gross, C. P., Essien, U. R., Pasha, S., Gross, J. R., Wang, S.-Y., & Nunez-Smith, M. (2020). Racial and ethnic disparities in population-level COVID-19 mortality. *Journal of General Internal Medicine*, 35, 3097–3099. <https://doi.org/10.1007/s11606-020-06081-w>
- Harville, E. W., Beitsch, L., Uejio, C. K., Sherchan, S., & Lichtveld, M. Y. (2021). Assessing the effects of disasters and their aftermath on pregnancy and infant outcomes: A conceptual model. *International Journal of Disaster Risk Reduction*, 62, Article 102415. <https://doi.org/10.1016/j.ijdrr.2021.102415>
- Hill, I., & Burroughs, E. (2020, October 28). *Maternal telehealth has expanded dramatically during the COVID-19 pandemic: Equity concerns and promising approaches* [Policy brief]. *Robert Wood Johnson Foundation and the Urban Institute*. <https://www.urban.org/research/publication/maternal-telehealth-has-expanded-dramatically-during-covid-19-pandemic>
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513–524. <https://doi.org/10.1037/0003-066X.44.3.513>
- Hobfoll, S. E., Halbesleben, J., Neveu, J.-P., & Westman, M. (2018). Conservation of resources in the organizational context: The reality of resources and their consequences. *Annual Review of Organizational Psychology and Organizational Behavior*, 5, 103–128. <https://doi.org/10.1146/annurev-orgpsych-032117-104640>
- Horney, J., Zotti, M. E., Williams, A., & Hsia, J. (2012). Cluster sampling with referral to improve the efficiency of estimating unmet needs among pregnant and postpartum women after disasters. *Women's Health Issues*, 22(3), e253–e257. <https://doi.org/10.1016/j.whi.2012.01.002>
- Iztayeva, A. (2021). *Custodial single fathers before and during the COVID-19 crisis: Work, care, and well-being*. *Social Sciences*, 10(3), Article 94. <https://doi.org/10.3390/socsci10030094>
- Kent de Grey, R. G., Uchino, B. N., Tretter, R., Cronan, S., & Hogan, J. (2018). *Social support*. In *Oxford Bibliographies in Psychology*. <https://doi.org/10.1093/obo/9780199828340-0204>
- Kingston, D., Kehler, H., Austin, M. P., Mughal, M. K., Wajid, A., Vermeiden, L., ... Giallo, R. (2018). Trajectories of maternal depressive symptoms during pregnancy and the first 12 months postpartum and child externalizing and internalizing behavior at three years. *PLOS ONE*, 13(4), Article e0195365. <https://doi.org/10.1371/journal.pone.0195365>
- Kinser, P. A., Jallo, N., Amstadter, A. B., Thacker, L. R., Jones, E., Moyer, S., ... Salisbury, A. L. (2021). Experience of pregnant and new mothers during the first few months of COVID-19. *Journal of Women's Health*, 30(5), 654–664. <https://doi.org/10.1089/jwh.2020.8866>
- Kotlar, B., Gerson, E., Petrillo, S., Langer, A., & Tiemeier, H. (2021). The impact of the COVID-19 pandemic on maternal and perinatal health: A scoping review. *Reproductive Health*, 18, Article 10. <https://doi.org/10.1186/s12978-021-01070-6>
- Law, K. H., Dimmock, J., Guelfi, K. J., Nguyen, T., Gucciardi, D., & Jackson, B. (2019). Stress, depressive symptoms, and maternal self-efficacy in first-time mothers: Modelling and predicting change across the first six months of motherhood. *Applied Psychology: Health and Well-being*, 11(1), 126–147. <https://doi.org/10.1111/aphw.12147>
- Leahy-Warren, P., McCarthy, G., & Corcoran, P. (2012). First-time mothers: Social support, maternal parental self-efficacy and postnatal depression. *Journal of Clinical Nursing*, 21(3–4), 388–397. <https://doi.org/10.1111/j.1365-2702.2011.03701.x>
- Lieberman, A. F., Diaz, M. A., Castro, G., & Bucio, G. O. (2020). *Make room for baby: Perinatal child-parent psychotherapy to repair trauma and promote attachment*. Guilford Press.
- Liu, C. H., & Doan, S. N. (2020). Psychosocial stress contagion in children and families during the COVID-19 pandemic. *Clinical Pediatrics*, 59(9–10), 853–855. <https://doi.org/10.1177/0009922820927044>
- Liu, C. H., Erdei, C., & Mittal, L. (2021). Risk factors for depression, anxiety, and PTSD symptoms in perinatal women during the COVID-19 pandemic. *Psychiatry Research*, 295, Article 113552. <https://doi.org/10.1016/j.psychres.2020.113552>
- Liu, C. H., Mittal, L., & Erdei, C. (2021). COVID-19-related health worries compound the psychiatric distress experienced by families of high-risk infants. *Journal of Perinatology*, 41(5), 1191–1195. <https://doi.org/10.1038/s41372-021-01000-1>
- Liu, C. H., Smiley, P. A., Vicman, J. M., Wong, G. T. F., & Doan, S. N. (2021). The roles of life stress and preventive health behaviors on parent mental health during the COVID-19 pandemic. *Journal of Health Psychology*. Advance online publication. <https://doi.org/10.1177/13591053211026742>
- Liu, C. H., & Tronick, E. (2012). Do patient characteristics, prenatal care setting, and method of payment matter when it comes to provider–patient conversations on perinatal mood? *Maternal and Child Health Journal*, 16(5), 1102–1112. <https://doi.org/10.1007/s10995-011-0835-4>
- Liu, C. H., & Tronick, E. (2013). Re-conceptualising prenatal life stressors in predicting post-partum depression: Cumulative-, specific-, and domain-specific approaches to calculating risk. *Paediatric and Perinatal Epidemiology*, 27(5), 481–490. <https://doi.org/10.1111/ppe.12072>
- Luisa, A., Dau, B. T., Callinan, L. S., & Smith, M. V. (2019). An examination of the impact of fetal attachment, postpartum depressive symptoms and parenting stress on maternal sensitivity. *Infant*

- Behavior and Development*, 54, 99–107. <https://doi.org/10.1016/j.infbeh.2019.01.001>
- Lyttelton, T., Zang, E., & Musick, K. (2020). *Gender differences in telecommuting and implications for inequality at home and work*. SocArXiv. <https://doi.org/10.31235/osf.io/tdf8c>
- Merikangas, K., Milham, M., & Stringaris, A. (2020). *The coronavirus health impact survey (CRISIS)*. Child Mind Institute; NKI. <http://www.crisissurvey.org/>
- Milgrom, J., Hirshler, Y., Reece, J., Holt, C., & Gemmill, A. W. (2019). Social support—A protective factor for depressed perinatal women? *International Journal of Environmental Research and Public Health*, 16(8), Article 1426. <https://doi.org/10.3390/ijerph16081426>
- Miller, E. S., Chu, C., Gollan, J., & Gossett, D. R. (2013). Obsessive-compulsive symptoms during the postpartum period. A prospective cohort. *Journal of Reproductive Medicine*, 58(3–4), 115–122.
- Miller, J. J., Cooley, M. E., & Mihalec-Adkins, B. P. (2020). Examining the impact of COVID-19 on parental stress: A study of foster parents. *Child & Adolescent Social Work Journal*. Advance online publication. <https://doi.org/10.1007/s10560-020-00725-w>
- Molgora, S., & Accordini, M. (2020). Motherhood in the time of coronavirus: The impact of the pandemic emergency on expectant and postpartum women's psychological well-being. *Frontiers in Psychology*, 11, Article 567155. <https://doi.org/10.3389/fpsyg.2020.567155>
- Morton, S., & Brodsky, D. (2016). Fetal physiology and the transition to extrauterine life. *Clinical Perinatology*, 43(3), 395–407. <https://doi.org/10.1016/j.clp.2016.04.001>
- Negron, R., Martin, A., Almog, M., Balbierz, A., & Howell, E. A. (2013). Social support during the postpartum period: Mothers' views on needs, expectations, and mobilization of support. *Maternal and Child Health Journal*, 17(4), 616–623. <https://doi.org/10.1007/s10995-012-1037-4>
- Nicol-Harper, R., Harvey, A. G., & Stein, A. (2007). Interactions between mothers and infants: Impact of maternal anxiety. *Infant Behavior & Development*, 30(1), 161–167. <https://doi.org/10.1016/j.infbeh.2006.08.005>
- Oyetunji, A., & Chandra, P. (2020). Postpartum stress and infant outcome: A review of current literature. *Psychiatry Research*, 284, Article 112769. <https://doi.org/10.1016/j.psychres.2020.112769>
- Prigerson, H. G., Maciejewski, P. K., Reynolds, C. F., Bierhals, A. J., Newsom, J. T., Fasiczka, A., ... Miller, M. (1995). Inventory of complicated grief: A scale to measure maladaptive symptoms of loss. *Psychiatry Research*, 59, 65–79. [https://doi.org/10.1016/0165-1781\(95\)02757-2](https://doi.org/10.1016/0165-1781(95)02757-2)
- R Core Team. (2020). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. <https://www.R-project.org/>
- Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1(3), 385–401. <https://doi.org/10.1177/014662167700100306>
- Razurel, C., Kaiser, B., Antonietti, J. P., Epiney, M., & Sellenet, C. (2017). Relationship between perceived perinatal stress and depressive symptoms, anxiety, and parental self-efficacy in primiparous mothers and the role of social support. *Women Health*, 57(2), 154–172. <https://doi.org/10.1080/03630242.2016.1157125>
- Razurel, C., Kaiser, B., Sellenet, C., & Epiney, M. (2013). Relation between perceived stress, social support, and coping strategies and maternal well-being: A review of the literature. *Women & Health*, 53(1), 74–99. <https://doi.org/10.1080/03630242.2012.732681>
- Ruchala, P. L., & James, D. C. (1997). Social support, knowledge of infant development, and maternal confidence among adolescent and adult mothers. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 26(6), 685–689. <https://doi.org/10.1111/j.1552-6909.1997.tb02743.x>
- Saccone, G., Florio, A., Aiello, F., Venturella, R., Angelis, De, M. C., Locci, M., ... Sardo, A. (2020). Psychological impact of coronavirus disease 2019 in pregnant women. *American Journal of Obstetrics and Gynecology*, 223(2), 293–295. <https://doi.org/10.1016/j.ajog.2020.05.003>
- Saltzman, L. Y., Hansel, T. C., & Bordnick, P. S. (2020). Loneliness, isolation, and social support factors in post-COVID-19 mental health. *Psychological Trauma: Theory, Research, Practice and Policy*, 12(S1), S55–S57. <https://doi.org/10.1037/tra0000703>
- Sanders, M. R., & Woolley, M. L. (2005). The relationship between maternal self-efficacy and parenting practices: Implications for parent training. *Child: Care, Health, and Development*, 31(1), 65–73. <https://doi.org/10.1111/j.1365-2214.2005.00487.x>
- Shapiro, A. F., Jolley, S. N., Hildebrandt, U., & Spieker, S. J. (2020). The effects of early postpartum depression on infant temperament. *Early Child Development and Care*, 190(12), 1918–1930. <https://doi.org/10.1080/03004430.2018.1552947>
- Slomian, J., Honvo, G., Emonts, P., Reginster, J.-Y., & Bruyère, O. (2019). Consequences of maternal postpartum depression: A systematic review of maternal and infant outcomes. *Women's Health*, 15, Article 1745506519844044. <https://doi.org/10.1177/1745506519844044>
- Spinola, O., Liotti, M., Speranza, A. M., & Tambel, R. (2020). Effects of COVID-19 epidemic lockdown on postpartum depressive symptoms in a sample of Italian mothers. *Frontiers in Psychiatry*, 11, Article 589916. <https://doi.org/10.3389/fpsyg.2020.589916>
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, 166(10), 1092–1097. <https://doi.org/10.1001/archinte.166.10.1092>
- Szkody, E., Stearns, M., Stanhope, L., & McKinney, C. (2020). Stress-buffering role of social support during COVID-19. *Family Process*, 60(3), 1002–1015. <https://doi.org/10.1111/famp.12618>
- Taubman-Ben-Ari, O., Ben-Yaakov, O., & Chasson, M. (2021). Parenting stress among new parents before and during the COVID-19 pandemic. *Child Abuse and Neglect*, 117, Article 105080. <https://doi.org/10.1016/j.chiabu.2021.105080>
- Teti, D. M., & Gelfand, D. M. (1991). Behavioral competence among mothers of infants in the first year: The mediational role of maternal self-efficacy. *Child Development*, 62(5), 918–929. <https://doi.org/10.1111/j.1467-8624.1991.tb01580.x>
- Thomason, E., Volling, B. L., Flynn, H. A., McDonough, S. C., Marcus, S. M., Lopez, J. F., & Vazquez, D. M. (2014). Parenting stress and depression symptoms in postpartum mothers: Bidirectional or unidirectional effects? *Infant Behavior and Development*, 37(3), 406–415. <https://doi.org/10.1016/j.chiabu.2021.105080>
- Tietz, A., Zietlow, A. L., & Reck, C. (2014). Maternal bonding in mothers with postpartum anxiety disorder: The crucial role of subclinical depressive symptoms and maternal avoidance behaviour. *Archives of Women's Mental Health*, 17(5), 433–442. <https://doi.org/10.1007/s00737-014-0423-x>
- Troutman, B., Moran, T. E., Arndt, S., Johnson, R. F., & Chmielewski, M. (2012). Development of parenting self-efficacy in mothers of infants with high negative emotionality. *Infant*

- Mental Health Journal*, 33(1), 45–54. <https://doi.org/10.1002/imhj.20332>
- van der Zee-van den Berg, A. I., Boere-Boonekamp, M. M., Groothuis-Oudshoorn, C. G. M., & Reijneveld, S. A. (2021). Postpartum depression and anxiety: A community-based study on risk factors before, during and after pregnancy. *Journal of Affective Disorders*, 286, 158–165. <https://doi.org/10.1016/j.jad.2021.02.062>
- Verbiest, S. B., Tully, K. P., & Stuebe, A. M. (2017). Promoting maternal and infant health in the 4th trimester. *Zero to Three*, 37(4), 34–44.
- Vismara, L., Rollè, L., Agostini, F., Sechi, C., Fenaroli, V., Molgora, S., ... Tambelli, R. (2016). Perinatal parenting stress, anxiety, and depression outcomes in first-time mothers and fathers: A 3- to 6-months postpartum follow-up study. *Frontiers in Psychology*, 7, Article 938. <https://doi.org/10.3389/fpsyg.2016.00938>
- Webster, J., Nicholas, C., Velacott, C., Cridland, N., & Fawcett, L. (2011). Quality of life and depression following childbirth: Impact of social support. *Midwifery*, 27(5), 745–749. <https://doi.org/10.1016/j.midw.2010.05.014>
- Xue, A., Oros, V., Marca-Ghaemmaghami, P., Scholkmann, F., Righini-Grunder, F., Natalucci, G., ... Restin, T. (2021). New parents experienced lower parenting self-efficacy during the COVID-19 pandemic lockdown. *Children*, 8(2), Article 79. <https://doi.org/10.3390/children8020079>
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, 52(1), 30–41.