

The Role of Perinatal Anxiety and Depression in Breastfeeding Practices

AU1 ▶ ✓

Soledad Coo,¹ María Ignacia García,¹ Andrea Mira,^{1,2} and Verónica Valdés³

Abstract

Objective: Maternal mental health difficulties are common during the perinatal period and have a negative impact on breastfeeding practices. Most research has focused on the role of postpartum depression, whereas maternal anxiety has been less studied, despite its high prevalence. A better understanding of the mental health variables that impact breastfeeding practices is necessary to support maternal and infant health and well-being. The aim of this study is to explore the association between breastfeeding practices and maternal mental health, with an emphasis on maternal anxiety.

Materials and Methods: Two hundred twenty-nine women were followed from the third trimester of gestation to 3 and 6 months postpartum. The participants provided self-reports of depression, anxiety, and breastfeeding practices. Mental health symptoms were compared between participants who reported exclusive versus mixed breastfeeding at 3 months postpartum, and between mothers who maintained breastfeeding versus those who had weaned their infants at 6 months postpartum. Logistic regression analysis was used to explore the variables contributing to breastfeeding practices.

Results: High levels of depressive symptoms during pregnancy were associated to nonexclusive breastfeeding at 3 months postpartum. At 3 months postpartum, both high levels of anxiety and depression were associated with nonexclusive breastfeeding at that time. Logistic regression analyses revealed that exclusive breastfeeding at 3 months postpartum predicted breastfeeding continuation at 6 months after childbirth.

Conclusion: Both maternal depression and anxiety negatively impact breastfeeding practices. Early identification of maternal mental health problems during the perinatal period is relevant to promote maternal emotional well-being and to prevent breastfeeding difficulties.

Keywords: breastfeeding, depression, postpartum, anxiety

Introduction

SYMPOMS OF DEPRESSION and anxiety during the perinatal period have a negative impact on mothers and their developing infants. During pregnancy, depressive disorders affect ~11% of expectant mothers.¹ This prevalence rises during the postpartum period to 13% and 20% in high- and low-income countries, respectively.² Anxiety disorders have received less research attention, although they are also common during the perinatal period, with an estimated prevalence of 20.7%.³ Numerous reports exist on the association between maternal mental health and breastfeeding⁴; however, the directionality of this association remains unclear.

Current studies indicate that prenatal depression contributes to shorter breastfeeding duration.^{4,5} Women who

present with depressive symptoms during pregnancy wean their infants ~2.3 months earlier than nondepressed women.⁶

Ystrom studied 42,225 women and found that breastfeeding cessation was associated with antenatal levels of anxiety and depression, and that it also contributed to an increase of these symptoms in the postpartum period. These findings suggest that women with high levels of anxiety and depression during pregnancy who stop breastfeeding early are likely to have a higher risk for presenting with postpartum anxiety (PPA) and depression.⁵

Borra et al. suggest that the association between breastfeeding and postpartum depression is mediated by breastfeeding intentions and antenatal mental health. In their study, mothers who were not depressed during pregnancy had the lowest risk of developing postpartum depression if

AU2 ▶ ¹Facultad de Psicología, Universidad del Desarrollo (UDD), Santiago, Chile.

AU3 ▶ ²Facultad de Ciencias de la Rehabilitación, Universidad Andrés Bello, Santiago, Chile.

AU3 ▶ ³Lactation Committee of the Chilean Pediatric Society.

AU2. AFFILIATIONS ARE CORRECT
AU3. SANTIAGO, CHILE

they had planned to breastfeed and had succeeded. Conversely, the highest risk of developing symptoms of depression was found among women who had planned to breastfeed their infants and had not been able to do so.⁸

Breastfeeding difficulties also have an impact on mental health. A high burden of breastfeeding problems with and without comorbid physical problems has been significantly associated with poor maternal mood at 8 weeks postpartum.⁹ The effect of breastfeeding on emotional distress might be affected by the frequency with which the child is breastfed. Figuciredo et al. followed 145 women from the first trimester of pregnancy to 12 months postpartum and found a significant decrease in depression scores from childbirth to 3 months postpartum in women who maintained exclusive breastfeeding for more than 3 months.¹⁰ Hahn-Holbrook et al. found that women who breastfed more frequently at 3 months postpartum showed greater subsequent declines in depressive symptomatology over time compared with women who breastfed less frequently.⁶

The association between breastfeeding behaviors and maternal anxiety has been less explored. A recent systematic review on the impact of maternal anxiety on breastfeeding outcomes shows that there is inconclusive evidence regarding the contribution of prenatal anxiety to breastfeeding duration.¹¹ However, studies that measured PPA and breastfeeding suggest that mothers experiencing PPA are less likely to initiate breastfeeding, have a higher probability of supplementing with formula while in the hospital,^{11,12} and report shorter breastfeeding duration than non-anxious mothers.^{13,14}

In terms of stress, it has been suggested that breastfeeding is associated with increased parasympathetic nervous system modulation, greater vascular stress response, and decreased neuroendocrine response to stressors.¹⁵

Breastfeeding has an important impact on the mother's and infant's health. Infants who are breastfed, especially if it is exclusive for the first 6 months, have lower risks of gastrointestinal diseases,¹⁶ acute otitis media,¹⁷ frequency and severity of lower respiratory infection,¹⁸ lower use of antibiotics,¹⁹ reduced hospitalization,²⁰ and a lower risk of death in the first year.²¹ There is also a lower risk of sudden infant death syndrome,²² which is related to the extent of breastfeeding. Infants who were breastfed for at least 4 months have a significantly lower risk of child abuse.²³ Children who were breastfed also have a reduced risk of leukemia²⁴ and possibly a lower risk of obesity.²⁵

Women who breastfeed have many benefits to their health,²⁶ including a lower risk of mammary cancer,²⁷ ovarian cancer,²⁸ cardiovascular diseases,²⁹ and fractures due to osteoporosis.³⁰ This means that suboptimal breastfeeding has a negative effect on women's health.

A better understanding of the variables that impact breastfeeding practices is necessary to support maternal and infant health and well-being. The aim of this study is to explore the association between breastfeeding practices and maternal mental health, emphasizing less explored anxiety symptoms. We hypothesize that mental health and breastfeeding will influence each other. Specifically, we hypothesize that prenatal anxiety will negatively impact exclusive breastfeeding and breastfeeding duration and that breastfeeding difficulties will be associated with greater maternal postnatal anxiety.

Materials and Methods

Participants

Adult (>18 years old) pregnant women, who were fluent in Spanish, were invited to participate in the study. Between May 2018 and December 2019, 240 pregnant women in their third trimester of pregnancy were assessed, 10 mothers were excluded due to preterm labor and one due to cognitive disability, leaving a total of 229 women included in the study. Mothers who were excluded from the study were more likely to be single, but no other significant differences were found between these women and the rest of the participants regarding demographic and mental health variables. One hundred sixty-eight mothers were assessed again 3 months after childbirth. The remaining 61 mothers could not be contacted, could not complete the assessment at the required time, or expressed their desire to withdraw from the study. At 6 months postpartum, 153 mothers completed the assessment.

Instruments

Edinburgh Postnatal Depression Scale. This 10-item, self-report questionnaire is used for screening current (i.e., over the past week) symptoms of depression by using a four-point scale.^{31,32} This scale has been validated in Chile, with high reliability (Cronbach's $\alpha = 0.77$), sensitivity (100%), and specificity (80%).³² Cronbach's alpha was 0.86 in our sample.

Perinatal Anxiety Screening Scale. This 31-item, self-report questionnaire assesses perinatal anxiety over the past month. A total score is calculated by adding the scores of all items and indicates anxiety severity: minimal (0–20 points), mild to moderate (21–41 points), and severe (42–93).³³ The Perinatal Anxiety Screening Scale (PASS) includes four subscales, namely general worry and specific fears; perfectionism, control, and trauma; social anxiety; and acute anxiety and adjustment. The authors³³ have reported high reliability for the subscales and the total scale (Cronbach's α ranged from 0.86 to 0.96). Cronbach's alpha in our study was 0.94 for the global score.

Demographic and obstetric information. A questionnaire was developed to assess sociodemographic characteristics, history of psychopathology, and perceived social support during pregnancy with a Likert scale of 1 to 7 points. In the follow-up assessment, the questionnaire included questions about the delivery and child's health.

Procedure

We invited expectant mothers in their third trimester of pregnancy who received care from two public primary health centers in two Chilean cities (Santiago and Concepción) to participate in this study. Using a convenience sampling strategy, members of the research team approached all potential participants at the health centers while they waited for their prenatal consultation. Women who agreed to participate completed the questionnaires at the health centers or over the phone. We contacted the mothers by phone at 3 and 6 months postpartum to apply the questionnaires for the second and third assessments. Breastfeeding exclusivity and continuation were assessed at 3 months postpartum. Breastfeeding

←AU4 ✓
CITATIONS
ARE
CORRECT

ROLE OF ANXIETY AND DEPRESSION IN BREASTFEEDING

3

continuation was assessed at 6 months postpartum, since solid foods are recommended to be introduced at this time.

We referred all cases of mothers who reported high levels of depression or anxiety to the corresponding health services for assessment and treatment. Ethics approval was obtained from the Ethics Committees of the Universidad del Desarrollo and the Health Service at Concepción. All participants provided informed consent before joining the study.

Analysis

We conducted preliminary analyses to evaluate descriptive information and univariate distributions of mental health and emotion regulation variables for normality and outliers.

We conducted Chi-square analyses to explore possible associations between categorical, demographic, and obstetric variables, and maternal mental health and breastfeeding at 3 and 6 months postpartum. A series of independent samples *t*-tests assessed differences in mental health, obstetric variables, and infant health according to breastfeeding practices at 3 (Time 1) and 6 (Time 2) months after childbirth. Logistic regression analysis was used to explore the variables contributing to breastfeeding practices. We coded mental health reports from Time 1 and Time 2 as above or below the recommended cut-off scores to use them as categorical predictors to predict breastfeeding at 3 months postpartum. This set of predictors was modified by including breastfeeding at 3 months and mental health at 6 months postpartum to predict breastfeeding at 6 months after childbirth. All the variables were entered into the model by using the Enter method. All the analyses were conducted in IBM SPSS 25; we calculated bootstrap confidence intervals for *p*-values and for estimates of individual predictors in all the logistic regression analyses to minimize the effect of sampling variation.

Results

The women in the study ($N=229$) had a mean age of 28 years (standard deviation=5.38, range 18–44), all of them were Latinas, and the great majority were Chilean (81.9%). Most of the participants were either married (26.2%) or living with a partner (41%). In terms of education, 30.6% had a university degree, 22.7% had technical education qualifications, and 23.3% had completed high school. Sixty percent of the women had paid jobs (Table 1).

During the third trimester of pregnancy, 11.4% of the women screened positive for depressive symptomatology according to the Edinburgh Postnatal Depression Scale (EPDS), and 11.5% and 35.2% reported severe and moderate anxiety symptoms, respectively, according to the PASS.

Most mothers gave birth in a public hospital, had a cesarean section (51.2%), were accompanied during labor and birth by a significant person, and had immediate skin-to-skin contact with their babies. From a qualitative perspective, most mothers reported being satisfied with their birth experience and with the health professional's assistance. Most participants also reported low levels of fear and high levels of pain experienced during labor and/or childbirth (Table 2).

The percentage of mothers reporting emotional distress increased in the postpartum period, with 20% and 21.6% screening positive for depressive symptomatology according to EPDS, at 3 and 6 months postpartum, respectively. Anxiety symptoms in the postpartum period remained relatively

TABLE 1. SOCIODEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE, DURING THE THIRD TRIMESTER OF PREGNANCY

	% (N)
Age	
18–24	22.7 (52)
25–34	60.3 (138)
>35	17.0 (39)
Nationality	
Chile	81.9 (185)
Venezuela	11.1 (25)
Other Latin American countries	7.1 (16)
Marital status	
Lives with partner	41 (94)
Married	26.2 (60)
Single	13.1 (30)
Other (divorced, does not live with partner)	19.7 (45)
Educational level	
Incomplete schooling	7.9 (18)
Completed high school	21.8 (50)
Incomplete university or technical studies	17 (39)
Completed technical studies	22.7 (52)
Completed university studies	30.6 (70)
Work situation	
Gainfully employed	60.5 (138)
Social support satisfaction	
Low (1–3)	1.8 (4)
Moderate (4–5)	8.0 (18)
High (6–7)	90.2 (203)
Mental health	
History of mental health diagnosis	17.5 (40)
No history of mental health diagnosis	66.4 (152)
Currently reported emotional distress	22.7 (52)
Receiving current mental health treatment	5.7 (13)
Primiparous	
No	42.8 (98)
Yes	57.2 (131)
History of spontaneous miscarriage	
No	80.8 (185)
Yes	19.2 (44)

stable. At 3 months postpartum, 10.7% and 35.2% reported severe and moderate symptoms, respectively, according to the PASS. At 6 months postpartum, 17.8% and 29.6% of the women reported severe and moderate anxiety symptoms, respectively.

All mothers initiated breastfeeding. At 3 months postpartum, 60.5% of them were breastfeeding their infants exclusively, 32.9% combined breastfeeding with formula, and 6.6% of the children were exclusively formula fed. Sixteen percent of the mothers reported breastfeeding difficulties, primarily nipple pain and insufficient milk production.

At 6 months postpartum, 84.7% of the participants continued breastfeeding their babies. Among the mothers who discontinued breastfeeding, the most common reason reported for weaning their baby was insufficient milk production (39.1%).

According to Chi-square analyses, women who reported current mental health difficulties [$\chi^2=22.12$ (7), $p=0.00$] and undergoing current treatment ($\chi^2=6.06$ (1), $p=0.01$)

CORRECT T1 ✓

CORRECT T2 ✓

TABLE 2. CHARACTERISTICS OF BIRTH, CHILD, AND CHILDBIRTH EXPERIENCE

Gestational age	38.99 (SD=1.3) weeks
Child weight at birth	3439.61 (SD=414.5) g
Child size at birth	50.39 (SD=2.26) cm
	% (N)
Accompanied during labor	94.6 (158)
Accompanied during childbirth	95.2 (160)
Gave birth in public hospital	69.1 (114)
Type birth	% (N)
Vaginal	41.1 (69)
c-Section	51.2 (86)
Assisted vaginal birth	7.7 (13)
Immediate skin-to-skin contact	70.8 (119)
Satisfaction with birth experience	% (N)
Low (1-3)	16.7 (28)
Moderate (4-5)	20.8 (35)
High (6-7)	62.5 (105)
Degree of pain experienced during birth	% (N)
Low (1-3)	38 (63)
Moderate (4-5)	22.3 (37)
High (6-7)	39.8 (66)
Degree of fear experienced during birth	% (N)
Low (1-3)	43.5 (73)
Moderate (4-5)	28.6 (48)
High (6-7)	28.0 (47)
Satisfaction with health care professional	% (N)
Low (1-3)	4.8 (8)
Moderate (4-5)	11.9 (20)
High (6-7)	83.3 (140)

reported anxiety scores above the cut-off score (i.e., 21 points in the PASS scale). Independent-samples *t*-test analyses showed that mothers who reported symptoms of anxiety above the cut-off score also reported lower satisfaction with their birth experience [$t=2.07$ (1, 161.43), $p=0.01$]. No other significant differences in demographic and obstetric variables were found.

Breastfeeding and maternal mental health

Women who reported significantly more PASS scores (anxiety) above the normal range during the third trimester of pregnancy [$\chi^2=7.74$ (1), $p=0.006$] were more likely to be mixed feeding or had weaned their infants at 3 months postpartum. Also, women who breastfed their infants exclusively at 3 months reported fewer EPDS scores (depression) above the cut-off score (≥ 10), at 6 months postpartum [$\chi^2=4.48$ (1), $p=0.03$].

Independent-samples *t*-tests confirmed the previous results, showing that women who were not breastfeeding their infants exclusively at 3 months postpartum reported significantly higher symptoms of anxiety and depression, assessed with the EPDS, PASS during the third trimester of gestation and at 3 months postpartum, than women who breastfed exclusively. No significant differences in mental health between these groups were found at 6 months after childbirth (Table 3).

Independent-samples *t*-tests assessing differences in obstetric variables and infant health (as listed in Table 2) according to breastfeeding practices found that infants whose mothers had reported EPDS scores above the cut-off score during pregnancy had lower birthweight than newborns from nondepressed mothers [$t=-2.33$ (166), $p=0.02$]. Further, mothers whose infants had lower birthweights were more likely to mixed feed or wean them at 3 months postpartum [$t=-2.23$ (123), $p=0.27$]. No significant differences were found in terms of maternal education and occupational status.

Logistic regression analyses showed a nonsignificant trend that having a PASS score in the normal range during the third trimester of pregnancy increased the likelihood of exclusive breastfeeding at 3 months postpartum (odds ratio [OR] = 1.03, 95% confidence interval [CI] 1.00-1.05). Exclusive breastfeeding at 3 months postpartum significantly contributed to breastfeeding at 6 months (OR=21.12, 95% CI 4.62-96.56) (Table 4).

Discussion

Breastfeeding and maternal mental health are relevant for maternal well-being and infant health and development. Although converging work supports an association between breastfeeding practices and maternal depression, the role of maternal anxiety has been overlooked. We examined the relationship between maternal mental health and breastfeeding from the third trimester of pregnancy until 6 months after childbirth. As hypothesized, we found complex, bidirectional

TABLE 3. INDEPENDENT-SAMPLES *T*-TEST COMPARING MATERNAL MENTAL HEALTH ACCORDING TO BREASTFEEDING PRACTICES

Variables, 3rd Trimester	Exclusive breastfeeding, X (SD), (N=83)	Nonexclusive breastfeeding, X (SD), (N=52)	t	p
Depression (EPDS)	5.54 (4.24)	7.77(5.13)	-2.74 (133)	0.007
Anxiety (PASS)	21.39(13.18)	28.8 (16.81)	-2.89 (133)	0.005
3 Months postpartum				
Depression (EPDS)	4.2 (4.57)	6.58 (5.38)	-2.74 (133)	0.007
Anxiety (PASS)	18.89 (14.95)	24.48 (16.83)	-1.98 (133)	0.05
6 Months postpartum				
Depression (EPDS)	5.18 (5.14)	6.44 (5.38)	-1.36 (133)	0.18
Anxiety (PASS)	23.28 (18.05)	24.81 (15.48)	-0.51 (133)	0.61

EPDS, Edinburgh Postnatal Depression Scale; PASS, Perinatal Anxiety Screening Scale.

←T3 CORRECT ✓

←T4 CORRECT ✓

ROLE OF ANXIETY AND DEPRESSION IN BREASTFEEDING

5

TABLE 4. LOGISTIC REGRESSION, CONTRIBUTION OF BREASTFEEDING PRACTICES AT 3 MONTHS POSTPARTUM TO BREASTFEEDING MAINTENANCE AT 6 MONTHS POSTPARTUM

	b	95% CI for OR		
		Lower	OR	Upper
Included				
Constant	0.66			
Breastfeeding 3 months PP	3.05	4.62	21.12	96.56

$R^2=0.18$ (Cox-Snell), 0.32 (Nagelkerke). Model $\chi^2(0)=0$, $p=0.00$.

CI, confidence interval; OR, odds ratio.

✓ AU8
"PP" STANDS FOR POSTPARTUM

links between these variables. Women who reported more symptoms of both anxiety and depression during the third trimester of pregnancy were less likely to breastfeed exclusively at 3 months postpartum. Also, mothers who were not breastfeeding exclusively at 3 months postpartum reported more symptoms of both anxiety and depression when compared with mothers who breastfed exclusively during the same assessment time. At 6 months postpartum, no association between previous and current anxiety symptoms and breastfeeding continuation was found. However, mothers who had discontinued breastfeeding at 6 months postpartum reported higher symptoms of depression during this period than women who continued breastfeeding. This is consistent with previous studies that show an association between breastfeeding exclusivity and duration and maternal mental health.^{5,10}

Our results also indicate that lower infant birth weight is associated with maternal reports of depression and anxiety during late pregnancy. Earlier studies support the association between antenatal mental health and infant birth weight.³⁵ Given that low birth weight increases the probability of using formula, impact on birthweight might be one of the mechanisms by which maternal antenatal mood might impact breastfeeding.

As suggested by Zanardo et al.,³⁶ and consistent with our results, the mechanisms by which anxiety influences breastfeeding are likely to be multifactorial. Anxiety negatively impacts mother-child interactions³⁷ and diminishes breastfeeding self-efficacy.³⁸ Anxiety is also related to maternal stress, which interferes with oxytocin release,³⁹ impacting the milk ejection reflex and having a physiologically detrimental effect on breastfeeding.

Considering the high prevalence of anxiety symptoms in the perinatal period and its negative effect on maternal and infant health, mental health screening during this period should not be limited only to depressive disorders but should also include anxiety disorder screening. In addition, interventions to prevent and provide early treatment to maternal anxiety, as well as lactation counseling could make a significant, positive contribution to maternal and infant well-being.

Our study should be considered in light of limitations, many of which offer directions for future research. Our participants were mostly healthy, low-risk women, who reported limited breastfeeding difficulties and high satisfaction with the support they received. Future studies could be conducted with more diverse population samples that include high-risk women. Another limitation was that breastfeeding intention was not assessed.

Regarding the instruments we used, the PASS has been validated for its use in Chile; however, we used the international cut-off scores, since these have not yet been developed for Spanish-speaking populations.

Conclusion

Our study contributes to a deeper understanding of the complex association between breastfeeding and maternal mental health. Our findings highlight the relevance of early identification of maternal mental health problems during the perinatal period, not only to offer support and treatment to overcome maternal distress but also to prevent breastfeeding difficulties, and its negative effect on maternal mental health and children's health.

Acknowledgments

The authors would like to thank the families who participated in this study and the family health centers Santa Julia (Santiago) and Víctor Manuel Fernández (Concepción) who supported its execution. They are also grateful to Dr. Philip O. Anderson for his honest and constructive feedback on this article.

Funding Information

This study was funded by CONICYT, Grant Fondecyt No. 11170338.

References

- Howard LM, Ryan EG, Trevillion K, et al. Accuracy of the Whooley questions and the Edinburgh Postnatal Depression Scale in identifying depression and other mental disorders in early pregnancy. *Br J Psychiatry* 2018;212:50–56.
- Gavin NI, Gaynes BN, Lohr KN, et al. Perinatal depression: A systematic review of prevalence and incidence. *Obstet Gynecol* 2005;106:1071–1083.
- Fawcett EJ, Fairbrother N, Cox ML, et al. The prevalence of anxiety disorders during pregnancy and the postpartum period: A multivariate Bayesian meta-analysis. *J Clin Psychiatry* 2019;80:18r12527.
- Castro C, Figueiredo B. Breastfeeding and depression: A systematic review of the literature. *J Affect Disord* 2015; 171:142–154.
- Ystrom E. Breastfeeding cessation and symptoms of anxiety and depression: A longitudinal cohort study. *BMC Pregnancy Childbirth* 2012;12:36.
- Hahn-Holbrook J, Haselton MG, Dunkel Schetter C, et al. Does breastfeeding offer protection against maternal depressive symptomatology? *Arch Womens Ment Health* 2013;16:411–422.
- Stark E, Shim J, Ross C, et al. The impact of perinatal depression on breastfeeding rates. *Obstet Gynecol* 2018; 131:122S–123S.
- Borra C, T'acovou M, Sevilla A. New evidence on breastfeeding and postpartum depression: The importance of understanding women's intentions. *Matern Child Health J* 2015;19:897–907.
- Cooklin AR, Amir LH, Nguyen CD, et al. Physical health, breastfeeding problems and maternal mood in early postpartum: A prospective cohort study. *G Ital di Dermatologia e Venereol* 2018;21:365–374.

← AU8

10. Figueiredo B, Canário C, Field T. Breastfeeding is negatively affected by prenatal depression and reduces postpartum depression. *Psychol Med* 2014;44:927–936.
11. Hoff CE, Movva N, Rosen Vollmar AK, et al. Impact of maternal anxiety on breastfeeding outcomes: A systematic review. *Adv Nutr* 2019;10:816–826.
12. Fallon V, Groves R, Halford JCG, et al. Postpartum anxiety and infant-feeding outcomes: A systematic review. *J Hum Lact* 2016;32:740–758.
13. Adedinsewo DA, Fleming AS, Steiner M, et al. Maternal anxiety and breastfeeding: Findings from the MAVAN (Maternal Adversity, Vulnerability and Neurodevelopment) study. *J Hum Lact* 2014;30:102–109.
14. Paul IM, Downs DS, Schaefer EW, et al. Postpartum anxiety and maternal-infant health outcomes. *Pediatrics* 2013;131:1218–1224.
15. Sibolboro Mezzacappa E. Breastfeeding and maternal stress response and health. *Nutr Rev* 2004;62:261–268.
16. Lamberti L, Fischer Walker C, Noiman A, et al. Breastfeeding and the risk for diarrhea morbidity and mortality. *BMC Public Health* 2011;11:S15.
17. Asbjørn Kørvel-Hanquist, Djurhuus BD, Homøe P. The effect of breastfeeding on childhood Otitis Media. *Curr Allergy Asthma Rep* 2017;17:45.
18. Duijts L, Jaddoe VVW, Hofman A, et al. Prolonged and exclusive breastfeeding reduces the risk of infectious diseases in infancy. *Pediatrics* 2010;126:e18–e25.
19. Davisse-Paturet C, Adel-Patient K, Divaret-Chauveau A, et al. Breastfeeding status and duration and infections, hospitalizations for infections, and antibiotic use in the first two years of life in the ELFE Cohort. *Nutrients* 2019;11:1607.
20. Galton Bachrach VR, Schwarz E, Bachrach LR. Breastfeeding and the risk of hospitalization for respiratory disease in infancy: A meta-analysis. *Arch Pediatr Adolesc Med* 2003;157:237–243.
21. Sankar MJ, Sinha B, Chowdhury R, et al. Optimal breastfeeding practices and infant and child mortality: A systematic review and meta-analysis. *Acta Paediatr* 2015;104:3–13.
22. Thompson JMD, Tanabe K, Moon RY, et al. Duration of breastfeeding and risk of SIDS: An individual participant data meta-analysis. *Pediatrics* 2017;104. DOI:10.1542/peds.2017-1324
23. Strathearn L, Mamun A, Najman J, et al. Does breastfeeding protect against substantiated child abuse and neglect? A 15-year cohort study. *Pediatrics* 2009;123:483–493.
24. Amitay EL, Keinan-Boker L. Breastfeeding and childhood leukemia incidence: A meta-analysis and systematic review. *AMA Pediatr* 2015;169. DOI:10.1001/jamapediatrics.2015.1025
25. Yan J, Liu L, Zhu Y, et al. The association between breastfeeding and childhood obesity: A meta-analysis. *BMC Public Health* 2014;14. DOI:10.1186/1471-2458-14-1267
26. Chowdhury R, Sinha B, Sankar M, et al. Breastfeeding and maternal health outcomes: A systematic review and meta-analysis. *Acta Paediatr* 2015;104:96–113.
27. Feng L-P, Chen H-L, Shen M-Y. Breastfeeding and the risk of ovarian cancer: A meta-analysis. *J Midwifery Womens Heal* 2014;59:428–437.
28. Gaitskell K, Green J, Pirie K, et al.; Million Women Study Collaborators. Histological subtypes of ovarian cancer associated with parity and breastfeeding in the Prospective Million Women Study. *Int J Cancer* 2018;142:281–289.
29. Aguilar Cordero MJ, Madrid Baños N, Baena García L, et al. Breastfeeding as a method to prevent cardiovascular diseases in the mother and the child. *Nutr Hosp* 2015;31:1936–1946.
30. Crandall CJ, Liu J, Caul-ey J, et al. Associations of parity, breastfeeding, and fractures in the Women's Health Observational Study. *Obs Gynecol* 2017;130:171–180.
31. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression scale. *Br J Psychiatry* 1987;150:782–786.
32. Jadresic E, Araya R, Jara C. Validation of the Edinburgh Postnatal Depression Scale (EPDS) in Chilean postpartum women. *J Psychosom Obstet Gynaecol* 1995;16:187–191.
33. Somerville S, Dedman K, Hagan R, et al. The Perinatal Anxiety Screening Scale: Development and preliminary validation. *Arch Womens Ment Health* 2014;17:443–454.
34. Fisher J, Hammarberg K, Wynter K, et al. Assisted conception, maternal age and breastfeeding: An Australian cohort study. *Acta Paediatr Int J Paediatr* 2013;102:970–976.
35. Field T, Diego M, Hernandez-Reif M. Prenatal depression effects on the fetus and newborn: A review. *Infant Behav Dev* 2006;29:445–455.
36. Zanardo V, Gasparetto S, Giustardi A, et al. Impact of anxiety in the puerperium on breast-feeding outcomes: Role of parity. *J Pediatr Gastroenterol Nutr* 2009;49:631–634.
37. Reck C, Tietz A, Müller M, et al. The impact of maternal anxiety disorder on mother-infant interaction in the postpartum period. *PLoS One* 2018;13:e0194763.
38. Dennis CLE. Identifying predictors of breastfeeding self-efficacy in the immediate postpartum period. *Res Nurs Heal* 2006;29:256–268.
39. Stuebe AM, Grewen K, Meltzer-Brody S. Association between maternal mood and oxytocin response to breastfeeding. *J Womens Heal* 2013;22:352–361.

Please
remove this
reference

Address correspondence to: ✓
Soledad Coo ← AU6
Facultad de Psicología
Universidad del Desarrollo
Av. Las Condes 12461, of 306
Lo Barnechea
Santiago ← AU7
Chile ✓

E-mail: scoo@udd.cl

POSTAL
CODE

7590943

AUTHOR QUERY FOR BFM-2020-0091-VER9-COO_1P

- ✓ AU1: Please identify (highlight or circle) all authors' surnames for accurate indexing citations.
- AU2: Please check the correctness of authors' affiliations.
- ✓ AU3: Please provide the city, state, USA (if USA), city and country (if not USA) in affiliation "3."
- ✓ AU4: As per style, reference citation are not allowed in head levels, so moved to the text part. Please check.
- ✓ AU5: References 7 and 34 are not cited in the text. Please insert the citations in the text.
- ✓ AU6: Please mention the degree abbreviation (e.g., MS, MD, PhD) of the corresponding author.
- ✓ AU7: Please mention the zipcode of the address of correspondence.
- ✓ AU8: Please expand "PP."

✓ T1 - T4