

## The link between breastfeeding and postpartum depression: How providers can support families

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### Learning Objectives

- Explain the connections between unmet breastfeeding goals and postpartum depression
- Describe how postpartum depression influences development of the dyad
- Identify how the use of skin-to-skin care and sensory activities effect the emotional and physiological outcomes for the mother and infant

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### Healthy People 2020 Objectives

Ever	6 Months	12 Months	Wisconsin
<ul style="list-style-type: none"><li>• Goal: 81.9%</li><li>• 81.1%</li></ul>	<ul style="list-style-type: none"><li>• Goal: 60.6%</li><li>• 51.8%</li></ul>	<ul style="list-style-type: none"><li>• Goal: 31.4%</li><li>• 30.7%</li></ul>	<ul style="list-style-type: none"><li>• Ever 80.3%</li><li>• 6 months 58.9%</li><li>• 12 months 34.1%</li><li>• 3 months EBF 50.4%</li><li>• 6 months EBF 26.6%</li></ul>
<ul style="list-style-type: none"><li>• Goal: 46.2%</li><li>• 44.4%</li></ul>	<ul style="list-style-type: none"><li>• Goal: 25.5%</li><li>• 22.3%</li></ul>		

National Center for Chronic Disease Prevention and Health Protection, 2016.

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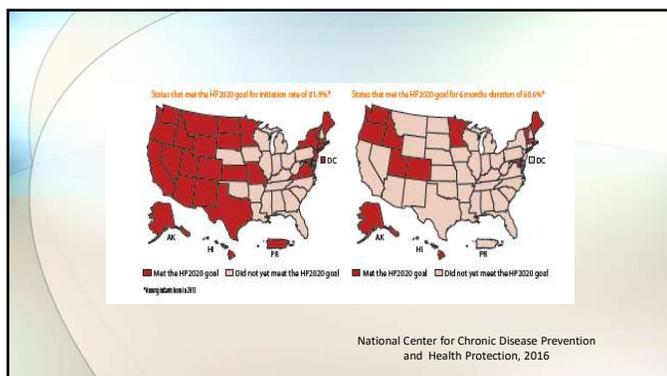
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Mothers with unmet exclusive breastfeeding goals have a more significant risk for postpartum depression (Borra, Iacovou & Sevilla, 2015)

Adjusted odds of depressive symptoms were lower among women meeting prenatal exclusive breastfeeding expectations versus those who were not meeting their goals. (Gregory, Butz, Ghazarian, Gross & Johnson, 2015)

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Mothers who changed the feeding pattern at 5 months scored significantly higher on postpartum depression screener than mothers who continued breastfeeding (Nishioka et al, 2011)

36.9% mothers bottle feeding and 12.0% breastfeeding mothers had significant odds of qualifying depressed in multiparas. (Mezzacappa and Endicott, 2007)

Breastfeeding cessation was related to an increase in postpartum depression -- especially in moms with history of anxiety and depression (Ystrom, 2013)

Women breastfeeding at 3 months had lower rates of depression at 24 months. If depressed during pregnancy, less likely to breastfeed and weaned 2.3 months earlier (Hahn-Holbrook et al., 2013)

Mothers with depressive symptoms at 3 months less likely to be BF at 6 months than women who did not report symptoms (Wollhouse, 2016)

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### Postpartum Depression

- 1/8 women are impacted by postpartum depression  
(Centers for Disease Control and Prevention, 2016)
- Can occur from birth up to 1 year after childbirth
- 18-44 years greatest risk for first onset of major depressive episode
- Symptoms include (for two weeks, most of the day)
  - Sadness, pessimism, irritability
  - Anxiety
  - Difficulties with sleep
  - Decreased energy; fatigue
  - Loss of interest in preferred activities or other people
  - All of the above interfere with daily living activities(National Institute for Mental Health, n.d.b)

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### Maternal Health Concerns

- Physiological dysregulation
- Appetite and nutrition effects
- Changes in sleep
- Cognitive changes that affect attention to self and infant safety
- Prenatal care compliance
- Increased alcohol and/or drug use
- Loss of interpersonal and financial resources
- Increased morbidity of other medical problems
- Increased risk of suicide
- Decreased capacity of maternal attachment behaviors to support infant development
  - Tactile, vocal and facial communication impacted in depressed mothers

(World Health Organization, 2016)

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### Effects of Postpartum Depression On Infants

#### Infants

- Smile Less
- Frown more
- Irritable and difficult to console
- More withdrawn
- Less responsive
- Long-term well-being of the child  
(Wisner, 2016, Matjasevich et al, 2015)
- Feeding or sleep difficulties  
(NIMH: Postpartum Fact Sheet, n.d.)

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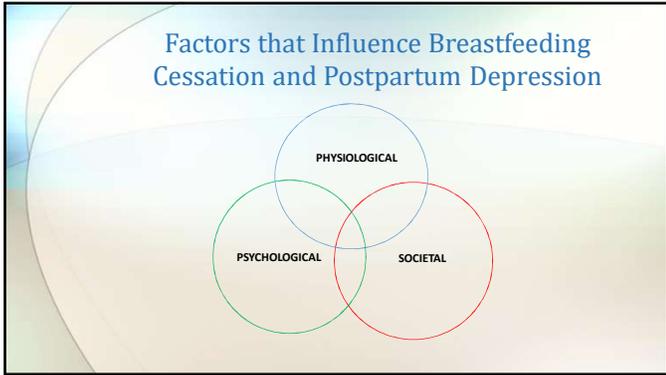
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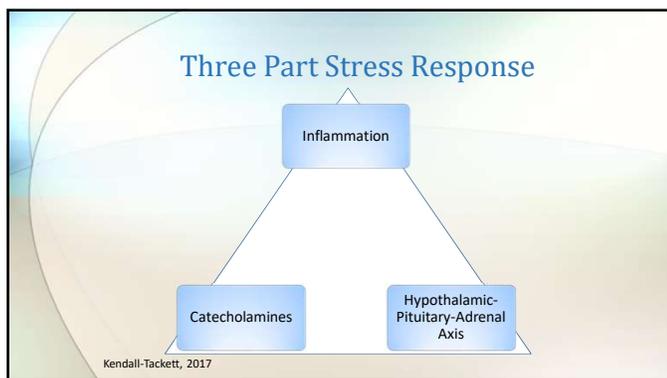
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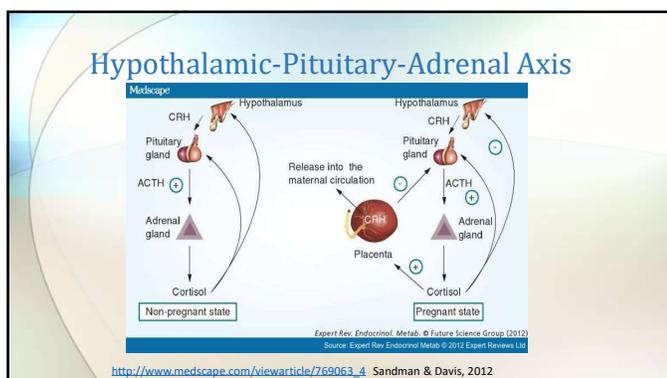
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### Physiological Reasons for Breastfeeding Cessation

- Baby has trouble sucking and latching on (53.7%/27.1%)
- Breast milk alone didn't satisfy my baby (49.7%/55.6%)\*
- I didn't have enough milk (51.7%/52.2%) (Li et al, 2008)
- Pain (Gracely et al, 2004)
  - Mothers who disliked breastfeeding were more likely to have PPD than mothers who enjoyed breastfeeding 2 months after delivery (Watkins et al, 2011)

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### Sleep

- Study of 2,830 women found that sleep was most disrupted in mothers who were depressed, had previous sleep problems, had a male infant, primipara and were not exclusively breastfeeding (mixed and/or formula feeding) (Dorheim, Bondevik, Eberhard-Gran, & Bjorvatn, 2009).
- Mothers who exclusively breastfed averaged 30-45 more minutes of sleep per night than mothers who mix feed or formula feed at 3 months postpartum (Doan, Gardiner, Gay & Lee, 2007)

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### Medications

- In certain cases, breastfeeding while the mother is taking certain antidepressants may be more beneficial than not breastfeeding at all. (Hale and Rowe, 2014)
- Risks placed on infant when mother taking antidepressants while breastfeeding were generally low) (Kendall-Tackett & Hale, 2010).
  - <10% maternal infant dose is considered "safe"
- Advise mothers to be aware in any behavioral, regulatory or physiological changes in the infant (such as fussiness, sleep or feeding difficulties)and the impact that medication has on them.

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### Psychological Factors

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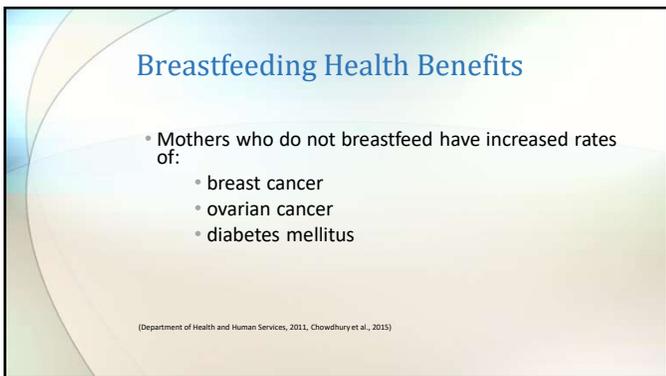
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### Breastfeeding Health Benefits

- Infants who do not breastfeed showed increased rates of:
  - Acute Ear Infections
  - Eczema (atopic dermatitis)
  - Diarrhea and vomiting
  - Hospitalization for lower respiratory tract diseases
  - Asthma
  - Childhood obesity/type 2 diabetes mellitus
  - Leukemia
  - SIDS
  - Necrotizing enterocolitis in preterm infants

(Surgeon General Call to Action to Support Breastfeeding, 2011)

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### Breastfeeding Relational Benefits

- Mothers who breastfed for 6 months demonstrate an increase in sensitive responsiveness to their infant (Tharner et al., 2012)
- More security and less attachment disorganization (Tharner et al, 2012)
- 5 months postpartum mothers who fed their infants formula milk scored significantly higher (high score referred to a negative mother-child bond) on the bonding questionnaire when compared to breastfeeding mothers (Nishioka et al., 2011)

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### Mother's Emotional Responses

- Women experience feelings of guilt, failure (Hegney et al., 2008), shame and disappointment.
- Guilt around putting their own needs before their infants (Guyer et al., 2012)
- Feelings that breastfeeding is "natural" and should be easy to manage
- Feeling of upset, anxiety or depression impacted maternal duration of breastfeeding, feelings of well-being, and perceptions of success as a mother. (Hegney et al, 2008)

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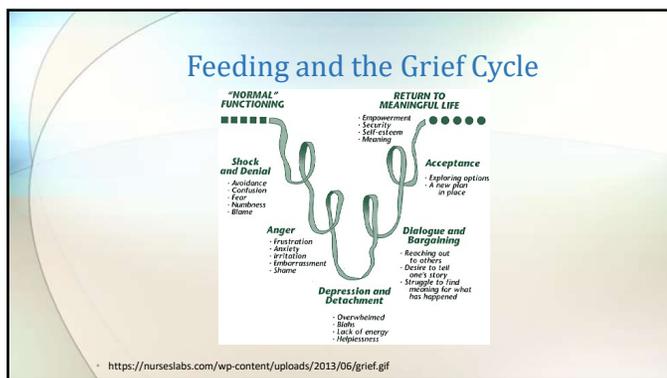
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- Risk factors associated with postpartum depression
  - Lack of emotional support
  - Decreased social community
  - Minimal practical support
  - High levels of stress
  - History of depression and/or bipolar disorder
  - History of depression during pregnancy

(Eastwood, Jalaludin, Kemp, Phung, & Barnett, 2012; Zelkowitz et al., 2014);
  
- Risk factors associated to breastfeeding cessation
  - Working full time or intending to within the first year postpartum
  - Lack of community supports
  - Poor familial support
  - Decreased professional assistance
  - History of depression
  - Depression or anxiety during pregnancy

(Kehler et al., 2009; Guyer et al., 2012)

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### Societal influences

- Individualistic culture versus collective culture (Brown, 2015)
- Single, divorced or separated mothers were more likely to use formula feedings 5 months postpartum (Nishioka 2011)
- Lower levels of education and socioeconomic status. Women lack flexibility of time pay or sanitary areas to express milk (Nishioka et al., 2011, Dagher et al., 2016).
- If offered at least 12 weeks of maternity leave, better breastfeeding outcomes were evident versus when no leave was offered at all (Mirkev, Perrine, Scanlon, 2016)

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### Genealogy of Infant Feeding

Women who have breastfeeding moms are more likely to establish and maintain breastfeeding.

At 1 month after delivery, 91.1% moms who were breastfed were breastfeeding, compared with 56.4% non-breastfed moms

Porta et al., 2016

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### Strategies

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## Screening for Depression

Edinburgh Postnatal Depression Scale (EPDS)  
Patient Health Questionnaire-9 (PHQ-9)

- **Recommended screening timeline:**
  - Initial prenatal visit
  - 28 weeks gestation
  - 2-4 weeks postpartum (or at OB 6 week postpartum visit)
  - 12 weeks postpartum
  - Consider another screening at 9-12 months postpartum (Periscope Project, 2018)

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## The Feeding Experience

- Ask mother in detail about her feeding experiences and observe feedings
  - Baby's response to feeding
  - Mother's regulatory state during feedings--Relaxing? Stressful? Scary? Enjoyable? Painful? Dreadful?
  - Quality of feeding
  - How often and how much time is spent in feeding activities or thinking about feeding
  - How and where is the baby being fed?
  - Medical history of the baby and mother
  - Social supports (family, friends, La Leche League, doulas, parent support groups)

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- Continuous 4 hours of sleep per the day
- Psychotherapy
- Light Box Therapy
- Self Care
  - Exercise, Nutrition, Asking for help

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## Skin to Skin

Tactile, skin to skin input reduced maternal anxiety, mothers felt more relaxed and demonstrated improved breastfeeding rates in the early postpartum (Moore, Anderson, Bergman, & Dowswell, 2012)

Mothers who engage in kangaroo care felt more connected to infants, better able to read infant cues, gained confidence in maternal roles (Johnson, 2007)

Infants cried less, were more interactive with caregivers, and had more stabilized blood glucose concentrations. (Moore et al, 2012). Improved infant respiration rates, (Cho et al., 2016), thermal regulation (Nyqvist et al, 2010), and had analgesic effects (Johnston et al, 2016).

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## Strategies

- Non-nutritive sucking at breast
- Switching sides during paced bottle feeding
- Milk sharing
- Skin to skin contact during feedings
- Infant massage
- Supplemental Nursing System
- Partial breast feeding

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## Partial Breastfeeding

- **Comfort, bonding, skin-to-skin benefits**
  - Mom can provide 100% of these even if very little breastmilk is being obtained during nursing.
- **Oral development**
  - The type of sucking required for breastfeeding improves your baby's oral development (even if he gets little milk).
- **Disease, allergy-prevention, immunological benefits**
  - Research has shown that the benefits of breastfeeding are generally dose-related: **the more breastmilk, the greater the benefit.** But even 50 ml of breastmilk per day (or less – there is little research on this) may help to keep your baby healthier than if he received none at all. In fact, the immunities in mom's milk have been shown to increase in concentration as the quantity of milk decreases.
- **Nutritional benefits**
  - There are components of mother's milk which cannot be duplicated – even a small quantity of these can be invaluable to your baby

Kellymom.com

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### Sensory Supports for Parent/Infant Connection

- Smell
- Touch
- Breathing together
- Sound
- Rhythm
- Visual regard

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### What can we do?

- Physiological
- Social
- Emotional

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### Resources

- **SUICIDE PREVENTION HOTLINE:** 1-800-273-TALK (8255)
- Postpartum Support International:
  - <http://www.postpartum.net/locations/wisconsin/>
- Silence Sucks
  - [www.ppdsilencesucks.com](http://www.ppdsilencesucks.com)
- Periscope Project <https://the-periscope-project.org/>
- La Leche League: <https://www.lllofwi.org/>
- Breastfeeding Support and Resources <https://kellymom.com/bf/concerns/bfhelp-find/>
- Praeclarus Press: [www.praeclaruspress.com](http://www.praeclaruspress.com)

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## Thank you!

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## References

- Borra, C., Iacovou, M., & Sevilla, A. (2015). New evidence on breastfeeding and postpartum depression: The importance of understanding women's intentions. *Maternal and Child Health Journal*, 19(4), 897-907. doi: 10.1007/s10995-014-1591-5
- Brown, A. (2016). *Breastfeeding uncovered. Who really decides how we feed our babies?* Pinter & Martin, Ltd. : UK
- Brown, A. (2015). Breast is best, but not in my back-yard. *Trends in Molecular Medicine*, 21(2), 57-59. doi: <https://doi.org/10.1016/j.molmed.2014.11.005>
- Centers for Disease Control and Prevention. (2008, August 18). Depression among women. Retrieved from <http://www.cdc.gov/reproductivehealth/Depression/index.htm>
- Centers for Disease Control and Prevention. (2016). Infant Feeding Practices Study II [Table 3]
- Cho, E. S., Kim, S. J., Kwon, M. S., Cho, H., Kim, E., Jun, E. M., & Lee, S. (2016). The effects of kangaroo care in the neonatal intensive care unit on the physiological functions of preterm infants, maternal-infant attachment, and maternal stress. *Journal of Pediatric Nursing*, 31, 430-438. doi: <http://dx.doi.org/10.1016/j.pedn.2016.02.007>
- Chowdhury, R., Sinha, B., Sankar, M. J., Taneja, S., Bhandari, N., Rollins, N., ...Martinez, J. (2015). Breastfeeding and maternal health outcomes: A systematic review and meta-analysis. *Acta Paediatrica*, 104, 96-113. doi: 10.1111/apa.13102
- Coussons-Read, M. E., Okun, M.L., Schmitt, M. P., & Giese, S. (2005). Prenatal stress alters cytokine levels in a manner that may endanger human pregnancy. *Psychosomatic Medicine*, 67, 625-631.

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## References

- Dagher, S. K., McCrory, P. M., Scheidt, D., & Bardall, K. J. (2012). Expectations of breastfeeding initiation and cessation among employed mothers: a prospective cohort study. *BMC Pregnancy Childbirth*, 12(124), 1-11. doi:10.1186/12884-012-0269-1
- Eastwood, J. G., Jalaludin, B. B., Kemp, L. A., Phung, H., Kim, E., & Barnett, B. E. W. (2012). Relationship of postnatal depressive symptoms to infant temperament, maternal expectations, social support and other potential risk factors: Findings from a large Australian cross-sectional study. *BMC Pregnancy and Childbirth*, 12(148), 1-11. doi:10.1186/1471-2393-12-148
- Eliot, L. (2000). *What's going on in there: How the brain and mind develop in the first five years of life.* New York, NY: Bantam Books.
- Guyer, J., Millward, L. J., & Berger, I. (2012). Mother' breastfeeding experiences and implications for professionals. *British Journal of Midwifery*, 20(10), 724-733.
- Graczyk, R. H., Geisser, M. E., Griesbeck, T., Grant, M. A. B., Pettko, F., Williams, D. A., & Chavez, D. J. (2004). Pain catastrophizing and neural responses to pain among persons with fibromyalgia. *Brain*, 127, 835-843. doi:10.1093/brain/aww098.35; Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/15115193>
- Gregory, E. F., Butz, A. M., Ghazarian, S. R., Gross, S. M., & Johnson, S. R. (2015). Are Unmet Breastfeeding Expectations Associated With Maternal Depressive Symptoms? *Academic Pediatrics*, 15(3), 319-325.
- Hahn-Holbrook, J., Hazelton, M. G., Dunkel-Schetter, C., & Glynn, L. M. (2013). Does breastfeeding offer protection against maternal depressive symptomatology? A prospective study from pregnancy to 2 years after birth. *Archives of Women's Mental Health*, 16(5), 411-422. doi: 10.1007/s00737-013-0348-9
- Hale, T. W., & Rowe, H. (2014). *Medications and mothers' milk* (16th ed.). Plano, TX: Hale Publishing.
- Hegarty, D., Fallon, T., & O'Brien, M. L. (2008). Against all odds: a retrospective case-control study of women who experienced extraordinary breastfeeding problems. *Journal of Clinical Nursing*, 17(9), 1182-1193. doi: 10.1111/j.1365-2702.2008.02303.x
- Johnson, A. N. (2007). The Maternal Experience of Kangaroo Holding. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, 36, 568-573. doi:10.1111/j.1552-6909.2007.00187.x

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## References

- Johnson, A. N. (2007). The Maternal Experience of Kangaroo Holding. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 36, 568-573. doi:10.1111/j.1552-8909.2007.00387.x
- Johansson, C., Campbell-Yeo, M., Disher, T., Benoit, B., Fernandes, A., Steiner, D., & Zay, R. (2016). Skin-to-skin care for procedural pain in neonates. *Cochrane Database of Systematic Reviews*, 1, 4000940. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/26469898>
- Kehlor, H. L., Chaput, K. H., Tough, S. C. (2008). Risk factors for cessation of breastfeeding prior to six months postpartum among a community sample of women in Calgary, Alberta. *Canadian Journal of Public Health*, 100(3), 276-280. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/18325107> *risk\_factors\_for\_cessation\_of\_breastfeeding\_prior\_to\_six\_months\_postpartum\_among\_a\_community\_sample\_of\_women\_in\_Calgary\_Alberta*
- Kendall-Tackett, K. A. (2017). *Depression in new mothers: Causes, consequences and treatment alternatives (2nd Edition)*. Routledge, New York.
- Kendall-Tackett, K. A., & Hale, T. W. (2010). The use of antidepressants in pregnant and breastfeeding women: A review of recent studies. *Journal of Human Lactation*, 24(2), 17-106. doi:10.1177/0890324009340207
- Labbok, M. (2008). Exploration of guilt among mothers who do not breastfeed: The physician's role. *Journal of Human Lactation*, 24(1), 80-84.
- Li, R., Fei, S. B., Chen, J., & Grummer-Strawn, L. M. (2008). Why mothers stop breastfeeding? Mothers' self-reported reasons for stopping during the first year. *Pediatrics*, 122, S69-S76. doi:10.1542/peds.2008-1129
- Majumdar, A., Murray, J., Cooper, P. J., Amadi, L., Barros, A. D., Barros, F. C. F., & Santos, J. S. (2010). Trajectories of maternal depression and offspring psychopathology at 6 years: 2004 Pelotas cohort study. *Journal of Affective Disorders*, 124, 424-430. <https://doi.org/10.1016/j.jad.2010.03.012>
- Mozzaccara, E. S., & Endicott, J. (2007). Parity mediates the association between infant feeding method and maternal depressive symptoms in the postpartum. *Archives of Women's Mental Health*, 10, 259-266. doi:10.1007/s00737-007-0207-7
- Mirkovic, K. R., Perrine, C. G., & Scanlon, K. S. (2016). Paid maternity leave and breastfeeding outcomes. *Birth*, 43(1), 223-229. doi:10.1111/birt.12220
- Moore, B. R., Anderson, G. C., Bergman, N., & Dawson, T. (2012). Early skin-to-skin contact for mothers and their healthy newborns. *Cochrane Database of Systematic Reviews*, 5. doi:10.1002/14651450.cd009103.pub1

## References

- National Center for Chronic Disease Prevention and Health Protection. (2016). Breastfeeding report card: Progressing toward national breastfeeding goals. Retrieved from <https://www.cdc.gov/breastfeeding/pdf/2016breastfeedingreportcard.pdf>
- National Institute for Mental Health. (n.d.a). Depression in women: 5 things you should know. Retrieved from <https://www.nimh.nih.gov/health/topics/depression-in-women-to-ask/index.shtml>
- National Institute for Mental Health. (n.d.b). Postpartum depression facts. Retrieved from: <https://www.nimh.nih.gov/health/publications/postpartum-depression-facts/index.shtml>
- National Institute for Mental Health. (n.d.c). What are the benefits of breastfeeding? Retrieved from <https://www.nimh.nih.gov/health/topics/postpartum-depression-facts/index.shtml>
- Nishioka, E., Haruna, M., Ota, E., Matsuzaki, M., Murayama, R., Yoshimura, K., & Murahama, S. (2011). A prospective study of the relationship between breastfeeding and postpartum depressive symptoms appearing at 1-5 months after delivery. *Journal of Affective Disorders*, 133(3), 522-529.
- Relationships between oxytocin, perinatal depression, and maternal behavior. *Hormones and Behavior*, 66, 353-360. <http://dx.doi.org/10.1016/j.yhbeh.2014.06.014>
- Nyqvist, K. H., Anderson, G. C., Bergman, N., Cattaneo, A., Charpak, N., Davanzo, R., Widstrom, A. M. (2010). Towards universal kangaroo mother care: Recommendations and report from the first European conference and seventh international workshop on kangaroo mother care. *Acta Paediatrica*, 99, 820-826.
- Ota, I. (April, 2017). The neurobiology of attachment: implications for birth and breastfeeding. [Powerpoint slides]
- Pirza, F., Muzio, A., Balgossain, G., Perduca, V., Farina, D., Spada, M., & Ponzone, A. (2016). Genealogy of breastfeeding. *European Journal of Pediatrics*, 175, 105-114. doi:10.1007/s00435-015-2664-4
- Sandman, C.A. & Davis, E.P. (2012). Neurobehavioral risk is associated with gestational exposure to stress hormones. *Expert Review of Endocrinology & Metabolism*, 7, 445-459.

## References

- Sellen, D. W. (2001). Weaning, complementary feeding, and maternal decision making in a rural east African pastoral population. *Journal of Human Lactation*, 17(3), 233-241.
- Tharner, A., Luijck, M. F. C. M., Raaij, H., Ijzendoorn, M. H., Bakermans-Kranenburg, M. J., Mol, W. A., Tjebknecht, H. (2012). Breastfeeding and its relation to maternal sensitivity and infant attachment. *Journal of Developmental & Behavioral Pediatrics*, 33(5), 396-404. doi:10.1097/DBP.0b013e3182579a33
- Vetulanji, I. (2013). Early maternal separation: A rodent model of depression and a prevailing human condition. *Pharmacological reports*, 65, 1451-1461.
- Watkins, S., Mettler-Brady, S., Zelnick, D., & Stuebe, A. (2011). Early breastfeeding experiences and postpartum depression. *Obstetrics and Gynecology*, 118(2), 214-221. doi:10.1097/AOG.0b013e31822903d3
- Winer, K. L. (2016). Postpartum mood disorders. [Powerpoint slides]
- Woolhouse, H., James, J., Gartland, D., McDonald, E., & Brown, S. J. (2016). Maternal depressive symptoms at three months postpartum and breastfeeding rates at six months postpartum: implications for primary care in a prospective cohort study of primiparous women in Australia. *Women and Birth*, 29, 381-387. doi:10.1016/j.wombi.2016.05.001
- World Health Organization [WHO]. (2016, April). Depression. Retrieved from <http://www.who.int/medicines/factsheets/fs106/en/>
- Ystrom, E. (2012). Breastfeeding cessation and symptoms of anxiety and depression: A longitudinal cohort study. *BioMed Central Pregnancy & Childbirth*, 12(36). doi:10.1186/1475-2875-12-36.
- Zelikowitz, P., Gold, L., Feeley, N., Hayton, B., Carter, C. S., Tulandi, T., Lein, P. (2014). Psychosocial stress moderates the relationships between oxytocin, perinatal depression, and maternal behavior. *Hormones and Behavior*, 66, 351-360. <http://dx.doi.org/10.1016/j.yhbeh.2014.06.014>