

# The Effect of Feeding Method on Sleep Duration, Maternal Well-being, and Postpartum Depression

Kathleen Kendall-Tackett, Ph.D., IBCLC, RLC, FAPA<sup>1</sup>  
Zhen Cong, Ph.D.<sup>2</sup>  
Thomas W. Hale, Ph.D.<sup>3</sup>

Share this:  

*When a breastfeeding mother is depressed-or even at risk for depression-she is often advised to supplement with formula so that she can get more sleep. Results of recent studies suggest, however, that exclusively breastfeeding mothers actually get more sleep than their mixed- or formula-feeding counterparts. The present study examines the relationship between feeding method, maternal well-being, and postpartum depression in a sample of 6,410 mothers of infants 0-12 months of age. Our findings revealed that women who were breastfeeding reported significantly more hours of sleep, better physical health, more energy, and lower rates of depression than mixed- or formula-feeding mothers. Further, there were no significant differences on any measure between mixed- and formula-feeding mothers, suggesting that breastfeeding is a qualitatively different experience than even mixed feeding.*

**Keywords:** Breastfeeding, postpartum depression, maternal sleep, maternal well-being  
*Clinical Lactation*, 2011, Vol. 2-2, 22-26

Postpartum depression is a serious health issue that requires an evidence-based response. Unfortunately, mothers sometimes receive advice that is contrary to the available evidence. An example of this is when new mothers are advised to supplement with formula, avoid nighttime feedings, or to wean altogether to lower their risk of depression. One popular book on postpartum depression advises mothers to sleep apart from their infants for 8.4 hours per day, and supplement if necessary to lower their depression risk (Bennett, 2007).

Sleep in a separate area away from the baby and the adult on duty. Use earplugs and a white noise machine...if necessary. The goal is to make sure that you aren't hearing the baby or other noises so you can achieve uninterrupted sleep (p. 204).

This approach has also been used in a hospital-based program, which allows women at risk for depression to stay in the hospital for up to five days postpartum. In this program, infants room out, breastfeeding women are encouraged to pump and/or use formula for night feedings, and benzodiazepines are used to encourage

consistent nighttime sleep onset during the first week (Ross, Murray, & Steiner, 2005).

Unfortunately, people who offer this advice often fail to recognize breastfeeding may be important to the mother, not only as a way to feed her baby—but as a way to help her cope with depression, as this mother describes (Kendall-Tackett, 2010).

When my first was born, I was completely overwhelmed with the feeling of being her primary caregiver. I had no family or friends in the area, and my husband had to go back to work when she was 5 or 6 days old. I had panic attacks, and felt like there was no way I was up to being the kind of parent she deserved. Breastfeeding was going well though, and it was often the only thing that I felt like I was doing right...(p. 62).

At first glance, advising mothers to supplement so they can get more rest appears reasonable. But is this approach effective? The evidence, so far, suggests that it is not. In previous studies, it is often the exclusively breastfeeding mothers who get more sleep. For example, a study of 133 new mothers and fathers at three months postpartum found that exclusively breastfeeding mothers slept 40 minutes longer than mixed- or formula-feeding mothers (Doan, Gardiner, Gay, & Lee, 2007). In another study, “not exclusively breastfeeding” was a risk factor for both sleep problems and postpartum depression in a study

<sup>1</sup> Department of Pediatrics, Texas Tech University School of Medicine, Amarillo, [kkendallt@aol.com](mailto:kkendallt@aol.com)

<sup>2</sup> Department of Human Development & Family Studies, Texas Tech University

<sup>3</sup> Department of Pediatrics, Texas Tech University School of Medicine, Amarillo

of 2,830 women at 7 weeks postpartum (Dorheim, Bondevik, Eberhard-Gran, & Bjorvatn, 2009). Consistent with these findings, a recent review of 49 studies found that breastfeeding actually lowers mothers' risk for postpartum depression (Dennis & McQueen, 2009).

Three recent studies found that new mothers' perception of their sleep was a better predictor of fatigue and depression than objective sleep measures. For example, women were significantly more likely to report fatigue if they perceived that their sleep quality was poor and their sleep time was short compared with women who were less fatigued in a sample of 109 postpartum mothers (Rychnovsky & Hunter, 2009). Another study included 45 new mothers from Melbourne, Australia who were at low risk for postpartum depression (Bei, Milgrom, Ericksen, & Trinder, 2010). The researchers found that perceived sleep quality was more strongly related to postpartum depression than actual sleep time. Similarly, Caldwell and Redeker (2009) found that self-reported sleep accounted for more variance in psychological distress than objective sleep measures in 115 inner-city women from New Haven, Connecticut.

The purpose of the present study is to examine the impact of feeding method on mothers' reported or perceived hours of sleep, maternal fatigue and well-being, and depression in a large sample of mothers in the first postpartum year.

## Method

### *Study Participants*

There were 6,410 who participated in the Survey of Mothers' Sleep and Fatigue in 2008-2009, representing 59 countries. [For a full description of the study participants, see (Kendall-Tackett, Cong, & Hale, 2010).] [http://www.clinicallactation.org/article.php?id=5&journal\\_id=1](http://www.clinicallactation.org/article.php?id=5&journal_id=1)

### *Sample Recruitment*

The sample was recruited via announcements and flyers distributed to WIC Breastfeeding Coordinators, U.S. State Breastfeeding Coalition Coordinators, Lactation Consultants and La Leche League Leaders. The investigators described the study and asked for assistance in recruiting mothers. Flyers and cards were distributed electronically and via hard copy, with a Web link for the survey. This survey was open to all mothers with babies 0-12 months of age, regardless of feeding method.

### *Survey Development*

The research questions were taken from the 253-item Survey of Mothers' Sleep and Fatigue. The questions were predominantly close-ended in format and were developed for this study via open-ended interviews with mothers and feedback from mothers and healthcare professionals.

### *Survey Questions for Present Analysis*

Feeding method was assessed with a series of questions about how and what babies were fed. For the present analysis, an overall summary question was used where mothers selected from one of three options:

Since your baby was born, did you breastfeed, formula feed, or both breast and formula feed?

There were 4,774 mothers who indicated that they were breastfeeding only, 1,125 mothers who were mixed feeding, and 176 mothers who indicated that they were formula feeding.

Mothers were asked to indicate how many hours they slept in an average night. They were also asked to rate their daily energy and overall physical well-being on a five-point Likert scale. Depressed mood, anhedonia and overall depression was assessed via the Patient Health Questionnaire-2, a two-item screening tool for depression (Gjerdingen, Crow, McGovern, Miner, & Center, 2009). Each symptom (depressed mood and anhedonia) was rated on a scale of 0 to 3. The combined score indicated depression risk, with a higher score indicating greater risk. Means were reported for each of the three feeding groups.

### *Data Collection*

Data were collected via an online survey that was available on the Texas Tech University Department of Pediatrics website. A screening question asked for the baby's age. If the response was 12 months or less, the mother was allowed to continue the survey. The survey and data collection procedure was reviewed and approved by the Texas Tech University School of Medicine Institutional Review Board.

### *Data Analysis*

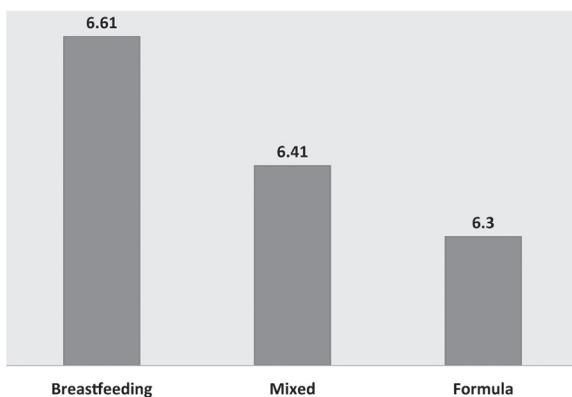
Data were analyzed using one-way analysis of variance (ANOVA) and  $X^2$  using SPSS version 18.0. Planned contrasts were performed on all ANOVA data comparing breastfeeding mothers to both mixed- and formula-

feeding, and comparing mixed- and formula-feeding mothers to each other.

## Results & Discussion

### Hours of Sleep

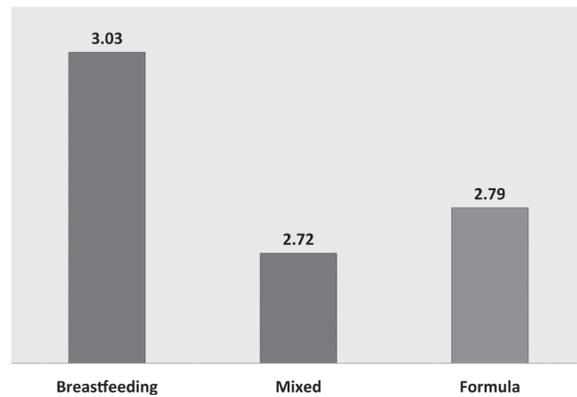
Our results indicated that feeding method significantly affected the number of hours mothers reported that they sleep ( $F(2)=15.55$ ,  $p<.001$ ). Planned contrasts revealed that breastfeeding mothers reported significantly more hours of sleep ( $M=6.61$ ) than either mixed- ( $M=6.41$ ) or formula-feeding mothers ( $M=6.3$ ;  $p<.001$ ). There was no significant difference between the mixed- and formula-feeding mothers ( $p>.05$ ).



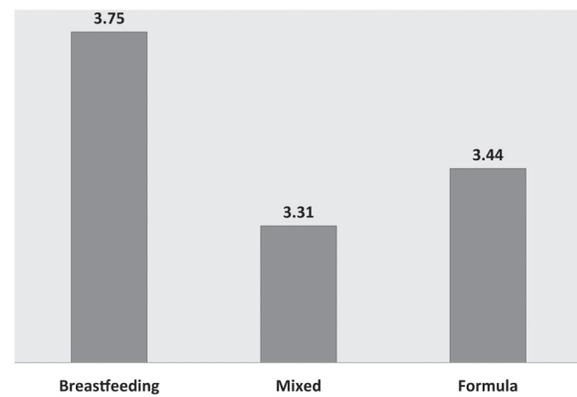
**Figure 1**  
Total number of hours mothers sleep

### Mothers' Physical Wellbeing

Consistent with the findings on sleep duration, our results also revealed that feeding method had a significant effect on mothers' reported daily energy ( $F(2)=46.9$ ,  $p<.001$ ). Again, planned contrasts revealed that breastfeeding mothers reported significantly more daily energy ( $M=3.03$ ) than their mixed- ( $M=2.72$ ) or formula-feeding counterparts ( $M=2.79$ ;  $p<.001$ ). There was no significant difference between mixed- and formula-feeding mothers ( $p>.05$ ). In addition, feeding method influenced mothers' reported overall physical health ( $F(2)=78.03$ ,  $p<.001$ ). Planned contrasts revealed that breastfeeding mothers reported significantly better physical health ( $M=3.75$ ) than mixed- ( $M=3.31$ ) or formula-feeding mothers ( $M=3.44$ ;  $p<.001$ ). The difference between mixed- and formula-feeding mothers was not significant ( $p>.05$ ). Finally, a significantly smaller percentage of breastfeeding mothers (37%) reported that the amount of sleep was negatively affecting their health than mixed- (50%) or formula-feeding mothers (49%;  $\chi^2(2)=71.79$ ,  $p<.001$ ).



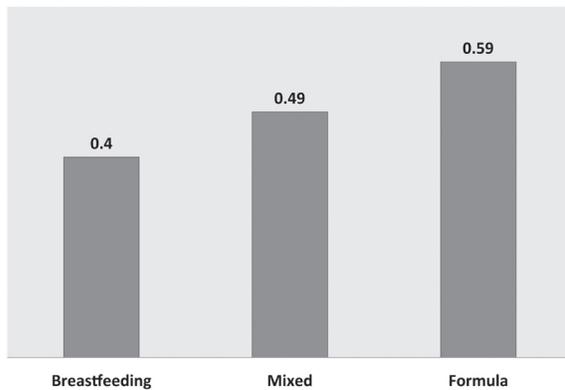
**Figure 2**  
Maternal self-reported energy on most days



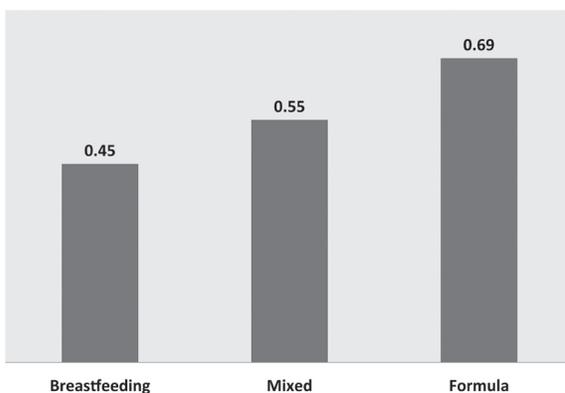
**Figure 3**  
Mothers' overall rating of their physical health

### Maternal Depression

Feeding method also influenced mothers' reports of depressed mood, or feeling down, depressed or hopeless ( $F(2)=13.53$ ,  $p<.001$ ). Planned contrasts revealed that breastfeeding mothers ( $M=0.40$ ) were significantly less likely to report depressed mood than mixed- ( $M=0.49$ ) or formula-feeding mothers ( $M=0.59$ ), and that mixed-feeding mothers were not significantly different than formula-feeding mothers ( $p>.05$ ). Similarly, feeding method influenced the level of anhedonia ( $F(2)=13.27$ ,  $p<.001$ ), and planned contrasts showed that breastfeeding mothers were significantly less likely to report anhedonia ( $M=0.45$ ) than mixed- ( $M=0.55$ ) or formula-feeding mothers ( $M=0.69$ ,  $p<.001$ ). Mixed-feeding mothers did not show significant difference in anhedonia compared to formula-feeding mothers ( $p>.05$ ).



**Figure 4**  
Mothers' reports of feeling down, depressed and hopeless



**Figure 5**  
Mothers' reports of anhedonia

Feeding method also influenced total score on the Patient Health Questionnaire-2 (PHQ-2;  $F(2)=17.23$ ,  $p<.001$ ). Planned contrasts revealed that breastfeeding mothers had significantly lower total scores on the PHQ-2 ( $M=0.85$ ) than mixed- ( $M=1.04$ ,  $p<.001$ ) or formula-feeding mothers ( $M=1.28$ ,  $p<.001$ ). The difference between mixed- and formula-feeding mothers was not significant ( $p>.05$ ).

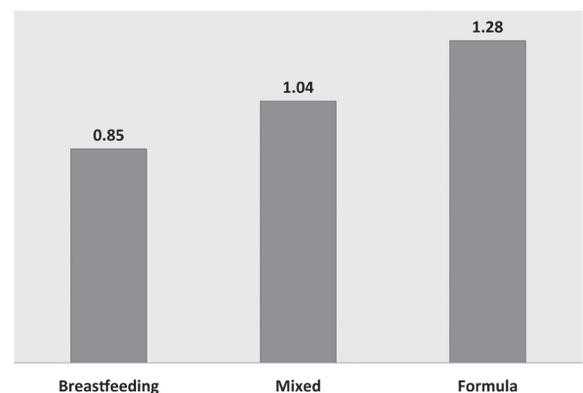
## Conclusions

Results in the present study are consistent with findings from previous studies. Breastfeeding mothers reported longer total sleep time, more daily energy, and better physical health than their formula- or mixed-feeding counterparts. They also reported lower rates of depression.

Our findings indicate that breastfeeding mothers were qualitatively different than mixed- or formula-feeding mothers on all the variables included in the present study. Mixed- and formula-feeding mothers did not differ from

each other on any of the measures. Exclusive formula feeding—or even supplementing with formula—actually decreased the total number of hours of sleep mothers reported. It also influenced their overall well-being, and increased their risk of depression. Our findings are similar to those of Doan and colleagues (2007), who noted the following.

Using supplementation as a coping strategy for minimizing sleep loss can actually be detrimental because of its impact on prolactin hormone production and secretion. Maintenance of breastfeeding as well as deep restorative sleep stages may be greatly compromised for new mothers who cope with infant feedings by supplementing in an effort to get more sleep time. (p. 201)



**Figure 6**  
Maternal depression on the PHQ-2

In summary, breastfeeding does not appear to make women more fatigued. On the contrary, the opposite seems to be true. From these data, we concluded that supplementing or weaning actually decreases women's total sleep time, lowers their sense of well-being, and increases their risk of depression. Given the findings from our study and previous research, we conclude that advising women to supplement, or wean entirely, to lessen their risk of depression is not medically sound. Indeed, if women follow this advice, they may actually increase their risk of both extreme fatigue and depression.

## References

- Bei, B., Milgrom, J., Ericksen, J., & Trinder, J. (2010). Subjective perception of sleep, but not its objective quality, is associated with immediate postpartum mood disturbances in healthy women. *Sleep*, 33(4), 531-538.

- Bennett, S. (2007). *Postpartum depression for dummies*. Hoboken, NJ: Wiley Publishing.
- Caldwell, B. A., & Redeker, N. S. (2009). Sleep patterns and psychological distress in women living in an inner city. *Research in Nursing & Health*, 32, 177-190.
- Dennis, C.-L., & McQueen, K. (2009). The relationship between infant-feeding outcomes and postpartum depression: A qualitative systematic review. *Pediatrics*, 123, e736-e751.
- Doan, T., Gardiner, A., Gay, C. L., & Lee, K. A. (2007). Breastfeeding increases sleep duration of new parents. *Journal of Perinatal & Neonatal Nursing*, 21(3), 200-206.
- Dorheim, S. K., Bondevik, G. T., Eberhard-Gran, M., & Bjorvatn, B. (2009). Sleep and depression in postpartum women: A population-based study. *Sleep*, 32(7), 847-855.
- Gjerdingen, D., Crow, S., McGovern, P., Miner, M., & Center, B. (2009). Postpartum depression screening at well-child visits: Validity of a 2-question screen and the PHQ-9. *Annals of Family Medicine*, 7(1), 63-70.
- Kendall-Tackett, K. A. (2010). Breastfeeding beats the blues. *Mothering*, Sept/Oct, 60-69.
- Kendall-Tackett, K. A., Cong, Z., & Hale, T. W. (2010). Mother-infant sleep locations and nighttime feeding behavior: U.S. data from the Survey of Mothers' Sleep and Fatigue. *Clinical Lactation*, 1(1), 27-30.
- Ross, L. E., Murray, B. J., & Steiner, M. (2005). Sleep and perinatal mood disorders: A critical review. *Journal of Psychiatry & Neuroscience*, 30, 247-256.
- Rychnovsky, J., & Hunter, L. P. (2009). The relationship between sleep characteristics and fatigue in healthy postpartum women. *Women's Health Issues*, 19, 36-44.

## Depression in New Mothers



## Possible Interventions for Fatigued New Mothers

Our findings indicate that breastfeeding mothers get more sleep and are less fatigued than mothers who supplement or wean. However, breastfeeding mothers can still be quite fatigued and may need some additional intervention to help prevent or treat depression.

### Some Approaches You Might Suggest

- Brainstorm with the mother on some strategies to help her cope with fatigue (e.g., encourage her to accept offers of help or access new sources of support).
- Treat depression.
- Use cognitive-behavioral sleep interventions [[click here to learn more](#)]
- Use medications [[click here to learn more](#)]
- If taking sleep medications, mothers should not bedshare with their infants.
- If mother has a trauma history, [The Post-Traumatic Insomnia Workbook](#) will likely be a helpful resource.

### Rule Out Physical Conditions

Severe fatigue may also be caused by an underlying physical condition. To rule out physical conditions, the following tests may be helpful.

- Blood work to rule out hypothyroidism, anemia, autoimmune disease, low-grade infection, or vitamin D deficiency
  - TSH, T3, T4, CBC, ESR (Sed rate), vitamin D
- Possible sleep study to rule out sleep-breathing and sleep-movement disorders

If limiting feedings does become necessary, a stretch of 4-5 hours will meet mental health goals and be less disruptive of breastfeeding. To learn more about postpartum depression and sleep, [click here](#).