Sleep and Depression Rates Among High-Risk Postpartum Women: Possible Benefits of the SNOO®
Michele L. Okun, Ph.D. & Vanessa Kohl, M.S.
University of Colorado Colorado Springs

Introduction

• Identifying risk factors for postpartum depression and anxiety is critical in order to intervene in a timely manner.
• Poor maternal sleep is a recognized risk factor for PPD.
• Infant sleep, on the other hand, is less appreciated as a potential risk factor.
• The SNOO is a robotic, responsive bassinet that helps an infant self-soothe and return to sleep without the intervention of the parents.
• In theory, fewer awakenings to attend to their infant would result in more consolidated sleep and better sleep quality for the mother.
• The SNOO may be a viable option that provides "additional support" and mitigates depression, especially for those at high risk.

Objectives

To collect longitudinal self-reported maternal sleep and mood data, as well as maternally reported infant sleep among those who used a SNOO bassinet through 6-months postpartum

Methods

• The SNOO is a robotic, responsive bassinet that calms a fussing or crying infant allowing the mother to remain asleep, perform self-care, or even eat.

• Women with a history of depression, but not currently depressed, were recruited in late gestation from across the U.S. via Facebook and word of mouth, and shipped a SNOO to use through 6 months postpartum
• IMPORTANTLY: all women were assessed during the COVID-19 pandemic
• Participants completed online questionnaires via Qualtrics monthly
  • Pittsburgh Sleep Quality Index (PSQI)
  • Insomnia Symptom Questionnaire (ISQ)
  • Edinburgh Postnatal Depression Scale (EPDS)
  • Generalized Anxiety Disorder Scale (GAD)
  • Epworth Sleepiness Scale (ESS)
  • Flinders Fatigue Scale (FFS)
  • Brief Infant Sleep Questionnaire (BISQ)
  • Infant Behavior Questionnaire (IBQ)
• Analyses were done to 1) describe maternal and infant sleep; 2) whether it changed over time; and 3) whether sleep was associated with depression and anxiety scores

Results

Data from 93 women who completed all 6-months are reported here
• Mean Age = 31.1 ± 4.3 years of age
• Gestational age at enrollment = 34.4 ± 2.0 weeks
• 76.9% Caucasian, 1.1% Black, 3.3% Asian, 11.0% Latina, and 7.7% multi-racial
• 96.7% Married/Living with Partner, 1.1% Single, 2.2% Separated/Divorced
• 92.5% College degree or higher

• Maternal Sleep

<table>
<thead>
<tr>
<th>Percentage of Women with Poor Sleep Quality Through 6 months Postpartum</th>
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| Change over time was significant (F(4.09, 327.96) = 15.44, p < .001). Percentage of women having poor sleep: Percentage changed (gH1 = -0.04, p = .61) from EPDS pre-pandemic sample: 5.5% and during COVID-19 pandemic: 9.1% (P < .001).
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| Percentage of women meeting clinical criteria for depression is 18.9%. No significant change over time. A potential benefit of the SNOO may be soothing and sleep training, allowing for fewer parental interventions, particularly at night. A potential benefit of the SNOO may be tangible or instrumental support, as it can act like “another caretaker” that "attends" to the fussing or crying infant allowing the mother to remain asleep, perform self-care, or even eat.

• Infant Sleep

To collect longitudinal self-reported infant sleep and mood data, as well as maternally reported infant sleep among those who used a SNOO bassinet through 6-months postpartum

<table>
<thead>
<tr>
<th>Percentage of Women with Anxiety Through 6 months Postpartum</th>
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| Percentage of women meeting clinical anxiety criteria: Percentage changed (gH1 = -0.04, p = .61) from EPDS pre-pandemic sample: 5.5% and during COVID-19 pandemic: 9.1% (P < .001).
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• Insomnia and Mood

Women who met criteria for insomnia had significantly higher rates of depressive symptomatology during the pandemic: (gH1 = .13, p = .03). Poor maternal sleep is a recognized risk factor for PPD. Identifying risk factors for postpartum depression and anxiety is critical in order to intervene in a timely manner. Women with a history of depression, but not currently depressed, were recruited in late gestation from across the U.S. via Facebook and word of mouth, and shipped a SNOO to use through 6 months postpartum

Conclusions

1) A substantial number of women have disturbed sleep in the postpartum. More women had insomnia and/or poor sleep quality during the pandemic than compared to women from pre-pandemic studies. However, rates of insomnia and poor sleep quality in the current study appear to be substantially lower than other comparable datasets.
2) Mothers who report that their infant’s sleep is a problem have more depressive symptomatology than those that report the sleep is not a problem. This suggests that improving infant sleep may positively affect PPD by modifying maternal perceptions. The SNOO may be a viable option to improve infant sleep and mitigate PPD risk.
3) The rate of PPD (12.7% on the EPDS) ranged from 15.6% to 17.4% through 6 months postpartum. This contrasts with global reports of postpartum women during the COVID-19 pandemic (30%–41%). Although there is no control group, these data suggest that the use of the SNOO may reduce depressive symptom reporting and/or mitigate risk for PPD in the first 6 months postpartum.
4) Having insomnia in late pregnancy was significantly associated with depressive and anxiety symptoms throughout the postpartum. We suggest that maternal sleep is both a mediating and moderating pathway between infant sleep and risk for recurrent PPD.

Acknowledgements and Contact

We would like to thank Happiest Baby, Inc for supplying the SNOO bassinet to all the participants. We would like to thank all the participants.

For further information contact: Dr. Michele Okun mokun@uccs.edu