Associations Between Infant Sleep & Postpartum Maternal-Infant Bonding Among Mothers with Opioid Use Disorder

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Background

• Infant sleep difficulties negatively impact maternal mental health, paternal sleep quality, and the bonding experience
• Bonding is especially important among postpartum individuals with opioid use disorder as this population is associated with impaired caregiving & reduced maternal behaviors
• Opioid-exposed neonates are reported to have greater sleep deprivation, disorganization, and fragmentation

Hypothesis: Poor infant sleep is associated with lower levels of maternal-infant bonding among people with OUD

Methods

Study Design
• Retrospective cohort study
• Recruited from multiple clinics throughout Ohio
• Inclusion criteria: >18 years old
• Between 6–24 months postpartum
• Received medications for OUD (methadone, buprenorphine) at any point during pregnancy

Survey Design
• Survey co-designed by individuals with lived experience of OUD during pregnancy
• Maternal-infant characteristics
• Postpartum experiences
• Postpartum Bonding Questionnaire (PBQ)

Survey Data
• Higher score indicate bonding impairment
• Subscales:
  - Impaired bonding
  - Rejection of infant and pathological anger
  - Infant-focused anxiety
  - Incipient abuse

Statistical Analysis
• Chi-square analysis to detect characteristics and experiences that had strong associations with a total PBQ score in the top quartile (poor bonding)
• Literature search and concept mapped (DAG) to determine covariates and mediators (Figure 1)

Results

Table 1. Unadjusted and Adjusted Models between Infant Sleep Problems and Total PBQ Score

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1 β (95% CI)</th>
<th>Model 2 β (95% CI)</th>
<th>Model 3 β (95% CI)</th>
<th>Model 4 β (95% CI)</th>
<th>Model 5 β (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOWS diagnosis</td>
<td>4.34 (-0.49, 9.17)</td>
<td>3.36 (-1.55, 8.27)</td>
<td>3.55 (-1.44, 8.54)</td>
<td>3.65 (-1.50, 8.66)</td>
<td></td>
</tr>
<tr>
<td>Financially insecure</td>
<td>5.03 (-0.09, 10.16)</td>
<td>4.06 (-1.32, 9.44)</td>
<td>3.87 (-1.87, 9.60)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abuse</td>
<td>6.30 (3.74, 8.86)</td>
<td>4.33 (1.78, 10.44)</td>
<td>4.24 (1.98, 10.45)</td>
<td>0.73 (-4.28, 7.74)</td>
<td></td>
</tr>
</tbody>
</table>

*Model 1 is an unadjusted linear regression between self-reported infant sleep problems and total PBQ score. Subsequent models added covariates of interest that are all adjusted for one another in each model. β is the average difference in total PBQ score between those who reported the stated variable and those who did not. 

Table 2. Mean Increase in PBQ Subscale Scores based on Infant Sleep Problems at 6 Months Postpartum

<table>
<thead>
<tr>
<th>Variable</th>
<th>β, SD</th>
<th>CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBQ Total</td>
<td>10.40 ± 2.30 (5.83, 14.96)</td>
<td>&gt;0.001*</td>
<td></td>
</tr>
<tr>
<td>PBQ Bonding</td>
<td>4.68 ± 1.06 (2.57, 6.78)</td>
<td>&gt;0.001*</td>
<td></td>
</tr>
<tr>
<td>PBQ Rejection</td>
<td>2.65 ± 0.73 (1.19, 4.10)</td>
<td>&gt;0.001*</td>
<td></td>
</tr>
<tr>
<td>PBQ Anxiety</td>
<td>2.94 ± 0.52 (1.92, 3.97)</td>
<td>&gt;0.001*</td>
<td></td>
</tr>
<tr>
<td>PBQ Abuse</td>
<td>0.08 ± 0.24 (-0.39, 0.55)</td>
<td>0.742</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions

• In this pilot study among postpartum individuals with OUD, those who reported difficult sleep problems had higher scores of impaired bonding, even after adjusting for several factors of interest
• Improving infant sleep may yield increased maternal-infant bonding in families with OUD
• Future studies should increase the sample size and include observational and interview-based mixed methods

References


Clinical Relevance

Given the importance of infant sleep on maternal mental health and maternal-infant bonding, and the increased prevalence of infant sleep problems among infants with opioid exposure, sleep education should be more strongly considered when counseling new parents with OUD.

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