Behavioural sleep interventions in the first 6 months do not improve outcomes for mothers or infants: A systematic review

Dr Pamela Douglas MBBS FRACGP PhD IBCLC; Possums for Mothers and Babies
Associate Professor (Adjunct), Centre for Health Practice Innovation, Griffith University
Senior Lecturer, Discipline of General Practice, The University of Queensland

Associate Professor Peter Hill MBBS DRACOG PhD
School of Population Health, The University of Queensland

Background

38% of families c/o sleep problems first months of life\(^1\)
Clinical observation of disrupted parent-infant sleep with
- Disrupted circadian clocks
- Medical conditions e.g. viral infection
- High levels of maternal SNS arousal
  (poor sleep efficiency)\(^3-6\)
Unidentified feeding problems\(^2\)

\(^1\) Hiscock 2014; \(^2\) Douglas *JPCH* 2013; \(^3\) Warren et al 2006; \(^2\) Douglas *JPCH* 2013;
\(^4\) Dorheim et al 2009; \(^5\) Goyal et al 2009; \(^6\) Miller and LaRuso 2011
Background

Unidentified feeding problems
- Wakes excessively
- Feeds excessively
- Cries and fusses a lot

Feeds, sleep and crying interact and co-evolve in the first 6 months = ‘regulatory problems’\(^1\)

\(^1\)Hemmi 2011
Background

First-wave behavioural strategies are popular

- Sleep algorithms
- Graphs
- Delay responses to cues/ignore cues/respond but not as baby intends
- Don’t allow sleep in arms or at end of feeds
- Feed-play-sleep cycles
- ‘Sleep breeds sleep’
- Lists of ‘tired cues’
- Avoid overstimulation
- Quiet dark rooms during day
- Sleep in separate rooms
Background

Language of first-wave behaviourism

- poor limit-setting
- infant demand
- overstimulated
- overtired
- bad habit
- maternal anxiety
- increased risk of postnatal depression
- resists self-settling
- resists second sleep cycle
- sleep breeds sleep
- parent's intrusive bedtime behaviours
- algorithms
- graphs
- poor sleep habits for life
- difficulty resisting infant demand
The Question

Do first-wave behavioural strategies help parent-infant sleep in the first 6 months?
Method

Systematic review (PRISMA Guidelines) → 43 studies

Figure 1. Flow diagram of studies reviewed for inclusion
## Method

### Metanarrative analysis

<table>
<thead>
<tr>
<th>Authors and Year</th>
<th>Study Design</th>
<th>Sample</th>
<th>Relevant outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strohle et al 2013</td>
<td>Multi-site randomised</td>
<td>246 Canadian mother-child pairs, intervention group educated in behavioural sleep intervention by 45 min hospital session postpartum; booklet; phone support at 1, 2, 4 weeks postpartum</td>
<td>No significant differences between control and intervention groups on any outcomes at 6 and 12 weeks, including effectiveness of maternal and infant night time awakenings, Edinburgh Postnatal Depression Scale, and general sleep disturbance scores.</td>
</tr>
<tr>
<td>Cochrane et al 2010</td>
<td>Cochrane review</td>
<td>4 trials on postnatal education of behavioural sleep intervention with usable data</td>
<td>Infant crying measured in 4 trials (St James', 2005; Mayes et al., 2006; Leventhal et al., 2010) in a total of 12 different ways. Only one significant positive outcome (behavioural intervention increased length of infants of without screaming parents of an average of 24 hours).</td>
</tr>
<tr>
<td>Greenland et al 2012</td>
<td>Systematic review</td>
<td>22 studies of normal infant and child sleep duration (0-12 years) from different countries and cultures to establish global norms</td>
<td>Normal range of total sleep hours over 24 hour period: 0-2 months = 9.3±2.0; 3-6 months = 9.4±1.7; 6 months = 9.6±1.7. Lower and upper limits to range of times infant fall asleep at night: 0-2 months = 0.9-5.4; 3-6 months = 0.0-10.0. Notes that almost all infant studies do not control infant feeding despite well-known effect on infant sleep.</td>
</tr>
<tr>
<td>Giladi et al 2013</td>
<td>Narrative review</td>
<td>20 studies of varied sleep development in the first 12 months</td>
<td>% of sleep for 4 hours without waking up at night: 2 months = 70%; 4 months = 80%.</td>
</tr>
<tr>
<td>World Health Organization 2007</td>
<td>Longitudinal</td>
<td>4517 Australian mothers in The Longitudinal Study of Australian Children, nationally representative study of growth and development of children</td>
<td>Breasfeeding associated with increased night sleep and not sleeping alone at six months of age, but not with other nocturnal unsettled behaviours such as infant restlessness or problems getting back to sleep.</td>
</tr>
<tr>
<td>Price 2012</td>
<td>Longitudinal</td>
<td>235 Australian mothers recruited by community maternal and child health nurses at infant 7 months for sleep study</td>
<td>Infant sleep problems identified at single or multi-site points at 4, 8, 10, 12 and 24 months not associated with any differences at 6 years in child, maternal, or child-parent outcomes.</td>
</tr>
<tr>
<td>Lecky et al 2012</td>
<td>Longitudinal</td>
<td>10419 UK mothers enrolled in pregnancy in Avon Longitudinal Study of Parents and Children</td>
<td>Mothers who scheduled feeds at infant age 4 weeks, are not protected against postnatal-depression at 8 weeks or 33 months. Their children have poorer cognitive and academic outcomes at ages 5, 7, 11 and 14 compared to those who receive cues-based care in early infancy.</td>
</tr>
<tr>
<td>Hyde et al 2012</td>
<td>Longitudinal</td>
<td>3589 Australian mother-child pairs enrolled in Mater-University of Queensland Study of Pregnancy</td>
<td>Infant regulatory problems at 6 months are a risk factor for maternal-reported behavioural concerns at 4 and 14 years, but are unrelated to young adults’ mental health at 21 years.</td>
</tr>
<tr>
<td>Iranzadegan et al 2013</td>
<td>Longitudinal</td>
<td>130 Lithuanian mothers recruited in hospital postpartum clinic and studied to 6 months</td>
<td>Infants of mothers expressing more parent-centred and rigid attitudes towards infant-caring at 3 months have nearly three times greater risk for continuation of behavioural difficulties at 6 months.</td>
</tr>
</tbody>
</table>

### Key Findings

**Endnotes:***
- University Hospital reported a 12.9% of singleton pregnancies at 7 weeks postpartum.
- No differences in sleep (start, duration, efficiency, number of awakenings, or subjective quality) between depressed and non-depressed women, but not in sleep-limited breastfeeding or at 7 weeks postpartum. No differences in sleep problems and postpartum depression.
- Duration of sleep and self-efficacy were not associated with depression, but subjective reports of sleep latency and disturbance are associated with depression.
- Breastfeeding mothers’ global sleep quality was better than that of mothers who partially breastfed their infants, but not better than mothers who did not breastfeed at all.

**References:**
Results

Modest increase in period of time baby sleeps without waking parents

- About one less waking episode every other night$^{1-3}$

$^1$Galland et al 2012; $^2$Symon et al 2005; $^3$St James-Roberts et al 2001
Results

No improved outcomes short or long-term for

- Baby\(^1,2\)
- Mother (beyond effects of any caring intervention)\(^3\)

\(^1\)Price et al 2012; \(^2\)Hyde et al 2012; \(^3\)Olds 2006
Results

↑ SNS in mother

- Postnatal depression correlates with poor maternal sleep efficiency, not number of times of waking in the night\(^1\)\(^-\)\(^4\)

\(^1\)Warren et al 2006; \(^2\) Dorheim et al 2009; \(^3\) Goyal et al 2009; \(^4\) Miller and LaRuso 2011
Results

Breastfed babies wake more often but their mothers have longer sleep duration and better sleep quality\(^1\)

\(^1\)Doan 2014
Results

Population effects of first-wave behavioural strategies

- ↑ total amounts of infant crying\(^1-3\)
- ↑ adult sleep anxiety (CBT)\(^4,5\)
- ↓ breastfeeding rates (population level)\(^1\)
- ↑ increased risk of SIDS (population level)\(^6\)

\(^1\) James-Roberts et al 2006; \(^2\) Sirvinskiene et al 2012; \(^3\) Alvarez & St James-Roberts 1996; \(^4\) Bootzin & Epstein 2011
\(^5\) Teng et al 2011; \(^6\) Blair et al 2006
Conclusion

- First-wave behavioural strategies
  - Ineffective in short- and long-term
  - Unintended outcomes
- Cued care
  - Intention to sensibly respond to baby’s signals
  - Feeding problems underlying excessive night-waking must be identified and managed

1Doan 2014
Conclusion

Possums Sleep Intervention

For health professionals
Video discussion of this research (website)
Pre-recorded webinar (overviews)
Possums Certification 28 November 2014 Brisbane

For parents
The Discontented Little Baby Book by Dr Pamela Douglas
Becoming Mum by Dr Koa Whittingham

www.possumsonline.com