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Cassandra L. Pattinson, PhD, Shannon Edmed, PhD, Simon S. Smith, PhD, Pamela S. Douglas, PhD

PII: S0022-3476(23)00045-8

DOI: https://doi.org/10.1016/j.jpeds.2023.01.012

Reference: YMPD 13335

To appear in: *The Journal of Pediatrics*

Received Date: 19 December 2022

Accepted Date: 25 January 2023

Please cite this article as: Pattinson CL, Edmed S, Smith SS, Douglas PS, Questioning the Effectiveness of Behavioural Sleep Interventions for Infants, *The Journal of Pediatrics* (2023), doi: https://doi.org/10.1016/j.jpeds.2023.01.012.

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Cassandra L Pattinson*, PhD[1,2], Shannon Edmed, PhD[1,3], Simon S Smith, PhD[1,2,3], Pamela S Douglas, PhD[4,5,6]

[1]Institute for Social Science Research, The University of Queensland, Australia

[2]ARC Centre of Excellence for the Digital Child, The University of Queensland, Australia

[3]ARC Centre of Excellence for Children and Families over the Life Course, The University of Queensland, Australia

[4]Medical Director, Possums & Co. pameladouglas.com; possumsonline.com

[5]General Practice Clinical Unit, The University of Queensland, Australia

[6]School of Nursing and Midwifery, Griffith University

***Correspondence to**: Cassandra L Pattinson, PhD, Institute for Social Science Research, The University of Queensland, Australia. Email: c.pattinson@uq.edu.au, Ph: +61 7 3346 7807

Shannon Edmed, PhD, Institute for Social Science Research, The University of Queensland, Australia. Email: s.edmed@uq.edu.au, Ph: +61 7 3365 4546

Simon Smith, PhD, Institute for Social Science Research, The University of Queensland, Australia. Email: simon.smith@uq.edu.au Ph: +61 7 334 67812

Pamela Douglas, PhD, Clinical Practice Unit, The University of Queensland, Australia. Email: p.douglas1@uq.edu.au Ph: +61 7 334 55014

No Conflicts of Interest or Financial Disclosures.

Dear Editor,

Kahn et al (2022) conclude in the Original Article "Implementation of Behavioral Interventions for Infant Sleep Problems in Real-world Settings" (1) that Behavioural Sleep Interventions (BSIs) were not linked with "negative outcomes, providing additional evidence for their safety and effectiveness." This conclusion is surprising.

Firstly, the authors did not investigate child outcomes other than current night-time sleep. No short- or long-term potential adverse consequences were examined for the child. Self-reported parent outcomes (i.e. parent-infant bonding, parent depression, and parent sleep) were examined, relying on retrospective parental perception over the preceding period of up to 12 months. Secondly, one of the author's indicators of effectiveness considered only night-time infant sleep duration, not 24-hour infant sleep duration. We are highly concerned about the following.

1. **This study appears to investigate infants who sleep in an environment which is inconsistent with international recommendations for infant sleep risk minimisation for infants under six months of age.** The average age of the infant studied is 5.3 months. The Nanit monitor is promoted as technology which protects infant safety. Such monitoring is required for infants who sleep in a room separate from adults. The study does not aim to investigate whether Nanit use for such a young sample increases (or decreases) the risk of Sudden Unexpected Death of an Infant. The exclusion of room-sharing or co-sleeping families may in part explain the high proportion of parents (64%) who reported using BSIs.
2. **The reliability of Nanit auto-videosomnography findings is not established.** The validity of Nanit auto-videosomnography has been tested in only 7 infants aged 0-24months, which is a highly variable age bracket in terms of infant sleep and

development. The study used Nanit to measure night-time sleep duration, number of night awakenings, and number of parental night-time crib visits. Although they report significance (p-values), it is unclear if the differences are clinically meaningful. For example, a mean difference of 0.43-0.48 in night-time awakenings, i.e. less than one night-time awakening is likely not to be clinically meaningful.

3. **This study gives no information about 24-hour infant sleep.** Sleep in infants younger than 18 months is multiphasic (i.e. typically includes one or more daytime sleep episodes) but the fixed position of Nanit means that 24-hour sleep, and sleep which occurs outside the crib environment (including time spent with caregivers) is not captured.
4. **The influence of Nanit 'sleep coach' is unclear.** The Nanit provides user feedback and 'sleep tips' on sleep strategies through the 'sleep coach' in the device's corresponding application. The extent to which parents interacted with this app and followed the tips provided is not clarified. It is possible that parents who are motivated to change their child's sleep behaviour through the implementation of BSIs utilise or implement these tips differently to parents who do not use BSIs. The 'effectiveness' of the BSIs may in fact be the result an unmeasured factor such as these 'sleep coach' tips.
5. **No attempt is made to define whether or not the infant had a sleep problem prior to implementation of BSIs.** The authors claim that paediatric insomnia is problem for 15-20% of infants, yet the application of any diagnostic criteria, and the number of children who meet this criterion in the study is not provided.
6. **The study may be influenced by commercial drivers which are not fully declared.** The study, funded by Nanit, investigates 2,090 parents who self-purchased and used

the Nanit commercial baby monitor for at least 4-nights, not necessarily consecutively. The study investigates well-educated, middle to high class families who were able to afford the Nanit (RRP $459USD) and may therefore not be representative beyond this population. Further, one author's affiliation with the for-profit company WINK, which specialises in selling sleep courses and e-books regarding infant sleep, is not declared as a potential conflict of interest.

Current research provides evidence of adverse impacts of extinction methods, either unmodified or modified, on infant well-being (e.g., attachment, cortisol levels, self-regulation skills, breastfeeding outcomes, sleep safety). There is also evidence that parental anxiety may be exacerbated by the implementation of unmodified or modified extinction methods (2–5). Furthermore, multiple systematic reviews suggest that unmodified and modified extinction methods do not impact on the frequency of infant night waking (6,7).

We share Kahn et al's concern that sleep problems may be distressing for parents and that strategies to address sleep problems, or the mismatch between parent sleep needs and baby sleep physiology, are needed (4,8–11). However, Kahn et al's interpretation of cross-sectional, retrospective data from a self-selected group using a specific technological device, in a study funded by the makers of this device, lacks rigour. Overstatement of the research findings risks negative impacts on children and families.

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