Title: Babies in boxes and the missing links on safe sleep: Human evolution and cultural revolution

Running title: The missing links on safe sleep

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Abstract:

Concerns about bedsharing as a risk for Sudden Infant Death Syndrome and other forms of sleep-associated infant death have gained prominence as a public health issue. Cardboard "baby-boxes" are increasingly promoted to prevent infant death through separate sleep, despite no proof of efficacy. However, baby-boxes disrupt "breastsleeping" (breastfeeding with co-sleeping), and may undermine breastfeeding. Recommendations enforcing separate sleep are based on twentieth century Euro-American social norms for solitary infant sleep and scheduled feedings via bottles of cow's milk-based formula, in contrast to breastsleeping, an evolutionary adaptation facilitating the survival of mammalian infants for millennia. Interventions that aim to prevent bedsharing, such as the cardboard baby box, fail to consider the implications of evolutionary biology or of ethnocentrism in sleep guidance. Moreover, the focus on bedsharing neglects more potent risks such as smoking, drugs, alcohol, formula feeding and poverty. Distribution of baby boxes may divert resources and attention away from addressing these other risk factors and lead to a false sense of security wherein we overlook that Sudden Unexplained Infant Deaths (SUID) also occur in solitary sleep environments. Recognizing breastsleeping as the evolutionary and cross-cultural norm entails re-evaluating our research and policy priorities, such as providing greater structural support for families, supporting breastfeeding and safe co-sleeping, investigating ways to safely minimize separation for formula-fed infants, and mitigating the potential harms of mother-infant separation when breastsleeping is disrupted. Resources would be better spent addressing such questions rather than on a feel-good solution such as the baby box.

Keywords: Sudden Infant Death, Breast Feeding, Infant Formula, Sleep, Infant Behavior, Mothers

Key Messages:

Cardboard “baby-boxes” are increasingly promoted to prevent infant death through solitary sleep, despite no proof of efficacy. Such interventions are based on recent cultural innovations of solitary infant sleep and scheduled bottle-feeding with cow’s milk-based formula. However, boxes disrupt the evolutionary adaptation of breastfeeding with co-sleeping - “breastsleeping”, may undermine breastfeeding, and divert resources away from addressing more potent risk factors for infant death. Instead of distributing boxes, we should consider sleep and breastfeeding as one integrated evolutionary process, develop support for safe breastsleeping, and examine the consequences of mother-infant separation.

Text:

Concerns about bedsharing as a risk for Sudden Infant Death Syndrome and other forms of sleep-associated infant death have gained prominence as a public health issue. Most recently, interest in the cardboard "baby box" as a way to promote separate sleep has grown enormously, with baby box distribution programs now being instituted in several US states. However, the baby-box and guidelines around infant sleep must be re-evaluated when placed in an evolutionary and socio-historical context. The baby boxes and current infant sleep guidelines that emphasize the avoidance of bedsharing fail to consider the potential harmful consequences of mother-infant night-time separation, including its impact on breastfeeding.

For generations, conventional wisdom has held that "sleeping like a baby" means that babies sleep long, deeply, and alone. These assumptions, and expert medical advice around infant sleep, were predicated upon and reinforced by nighttime separation of mothers and babies and scheduled infant feeding via carefully measured amounts of formula in bottles derived from the milk of the cow. These practices, however, are recent Euro-American historical inventions (Wolf, 2003, Tomori, 2014). The species-specific norm for infant feeding is breastfeeding, and breastfeeding comprises a sum total of human behavior that is more than just nutrition. Indeed, anthropologists James McKenna and Lee Gettler have argued that "The mother's body provides the only environment to which the human neonate infant is adapted" (McKenna and Gettler, 2015). Breastfeeding cannot be separated from other infant activities such as sleeping, or being held or carried.

Drawing on data showing the mutually reinforcing relationship of breastfeeding and shared mother-infant sleep, McKenna and Gettler coined the term "breastsleeping" to connote that breastfeeding and (safe) co-sleeping are part of the same process (McKenna and Gettler, 2015). By recognizing breastsleeping as an evolutionary adaptation that has contributed to the survival of our species, and the ethnocentrism entailed in much of current U.S. and western infant sleep guidance, we must completely reframe how we examine current public health interventions and research questions on this topic.

The distribution of "baby boxes," cardboard boxes filled with baby supplies which, when emptied, can be used as an infant sleeping environment, is an increasingly popular intervention introduced in North America and elsewhere to promote separate sleep, and is generally paired with some form of education on safe sleep. Baby box programs are based on a Finnish government program initiated in the 1930s in which baby clothes and related items were given to mothers who attended prenatal appointments. The boxes also provided a safe place outside of parents' beds for infants to sleep, especially in homes that might have only rudimentary furniture (Rosenberg, 2016), as poverty was common.

Although U.S. initiatives assume that sleeping in the boxes has resulted in lower infant mortality, no evidence to date supports this assumption. Experts in recent media reports have questioned the underlying reasons for the significant drops in infant mortality in Finland which were observed over the period since the boxes were introduced (Hafner, 2017, Cassin, 2017) and note that less than half of Finnish babies currently sleep in the boxes (Hafner, 2017). Indeed, the nearby nations of Sweden, Norway, and Iceland never

introduced baby boxes but have had similarly low infant mortality rates (Organisation of European Co-operation and Development, 2016). They share with Finland universal health care systems, social safety nets, and paid maternity leave policies. Moreover, while many baby box initiatives claim that the Finnish program was designed to combat poverty-associated infant mortality, it was actually designed to incentivize women to get screened and treated for prenatal syphilis, which was an epidemic at that time (Weeks, 2016). Furthermore, in most U.S. programs it is assumed the distribution of baby boxes for infant sleep only confers advantages. Few questions have been raised about how these boxes may affect breastfeeding mothers and infants, or introduce new hazards. The distribution of baby boxes also fails to consider the evolutionary context of normal nighttime infant behavior, reinforces cultural historical norms about nighttime mother-infant separation and artificial feeding, and may inadvertently undermine breastfeeding.

Baby boxes promote a separate sleep surface, following longstanding guidelines from the American Academy of Pediatrics (AAP) against bedsharing, even though AAP experts are not necessarily endorsing the boxes (Cassin, 2017). In its most recent infant sleep guidelines from October 2016, the AAP continues to recommend separate sleep surfaces for all mothers and babies, including those who are breastfeeding (Task Force On Sudden Infant Death, 2016). The AAP guidelines are historically predicated on the assumption that the normative culture is one where infants sleep alone and are fed artificially. These assumptions are reflected in the fact that the AAP issues separate guidelines for breastfeeding and for infant sleep. The AAP has recently acknowledged that proximity to mother matters for health (Feldman-Winter et al., 2016, Task Force On Sudden Infant

Death, 2016), and that breastfeeding matters for health (American Academy of Pediatrics and Section on Breastfeeding, 2012), but they are each discussed only as risk reduction strategies in guidance on reducing childhood morbidity and mortality. If breastsleeping were treated as the norm, these guidelines would be integrated, and instead, we would be asking about the risks of separation from mother, not solely the risks of sleeping with one's infant. The AAP is considering mother-infant behavior in the context of only the last century or so of U.S. and Western European history, not in an evolutionary context where breastsleeping has been the norm and a survival strategy for not only humans but also primates and many other mammals. However despite a cultural revolution, maternal-infant biology that was forged in our evolutionary past has not altered in the most recent 100 years.

Much of the attention on preventing sleep-associated infant deaths has focused on bedsharing, despite this being of debatable to no increased risk when other risk factors are absent (Bartick and Smith, 2014, Blair et al., 2014, Blabey and Gessner, 2009). The leading risk factors for sleep-associated sudden and unexpected infant deaths include parental smoking, sleeping prone, falling asleep with an infant on a sofa or recliner, sharing a bed with an adult who is under the influence of drugs or alcohol, and formula feeding (Bartick and Smith, 2014). If it is an independent risk factor at all, the risk of bedsharing is tiny in comparison to the above-mentioned risks (Bartick and Smith, 2014, National Institute of Health Care and Excellence, 2015). In an attempt to reduce Sudden Infant Death Syndrome (SIDS), the U.S. medical establishment has come down hard on bedsharing, with multiple public health campaigns aimed at discouraging the practice.

The "ABC" campaigns are especially popular: infants should sleep Alone, on their Back, in a Crib. Attention to the other risk factors is essentially neglected, even though they carry more substantial risks for infant death. In contrast, the latest UK guidance acknowledges that there is insufficient evidence to say that bed-sharing causes SIDS and offers information on the elimination of bed-sharing hazards, not of bed-sharing itself (Ball, 2017 (in press)).

The "Back to Sleep" campaign (to place babies in the supine position for sleep) has been associated with a reduction in sleep-related infant deaths, a decline that began even prior to the 1992 campaign (Pelligra et al., 2005). Yet it is important to note that sleeping prone is not in the behavioral repertoire of normal human breastsleeping infants (McKenna and Gettler, 2015, Richard et al., 1996), and this important recommendation arose out of the recent cultural context of solitary sleep and artificial feeding, in which infants were frequently placed prone alone in their cribs. In the only video study done comparing bedsharing formula feeding and breastfeeding infants, the formula feeding infants were more likely to have their heads placed level with their mother's face, while the breastfeeding infant's head was placed at breast-level, and the breastfeeding mothers spent more time turned towards their infants, who also faced their mothers, whereas the formula fed infants spent more time sleeping on their backs (Ball, 2006). Despite what appears to be potential risks for suffocation from pillows in this small study among the formula fed bedsharing infants, another recent study found that bedsharing (even with formula feeding infants included) was not associated with increased risk of death in the absence of other risk factors (alcohol, drugs, sofa-sleeping) (Blair et al., 2014). More

research is needed to know if the different bedsharing positioning contributes to any increased risk of SUID in formula feeding infants, and, if so, if bedsharing with formula feeding infants could be done in such a way that could minimize such risk.

In addition, because separate sleep can undermine breastfeeding, and baby boxes promote separate sleep, the boxes could hinder contact between breastfeeding mothers and infants and lead to early weaning. Research shows that bedsharing breastfeeding mothers nurse their infants 5.75 times during the night (often without realizing it), compared to 2.5 times a night for moms and babies who do not share a bed (McKenna et al., 1997). This increased breastfeeding is especially important for mothers to maintain a robust milk supply (Hartmann et al., 1998) and remain anovulatory so that her children are widely spaced (Labbok et al., 1997).The perception of low milk supply is one of the most important reasons women give for stopping breastfeeding (Ball et al., 2016). Persuading mothers not to breastsleep through separate sleep and baby boxes may thus undermine milk supply, and result in difficulty attaining breastfeeding goals (Ball, 2003). Early weaning puts both the mother's and the infant's health at risk (Bartick et al., 2016, Chowdhury et al., 2015, Victora et al., 2016).

It is important to look at current infant sleep recommendations in their historical, physiological and cultural context. Human milk is digested very quickly, and the rapidly growing infant needs to eat every two to three hours (De Carvalho et al., 1983, Casiday et al., 2004). Such a feeding pattern would be difficult if the infant were not in constant contact with his breastfeeding mother, day and night. Indeed, ethnographic studies have

shown that in traditional cultures all over the world, mothers and babies are in prolonged contact, being carried by day, sleeping together at night, and nursing at will for the first several months (Barry and Paxson, 1971). After that, infants remain in contact with other caregivers. Even with the return to breastfeeding over the last few decades in the US and the growing emphasis on breastfeeding in the public health literature, we have often grown focused on how formula differs from the components of breast milk, and on the delivery of expressed milk. In doing so, we miss the connection that breastfeeding is about physical and emotional contact as much as it is about the milk itself.

Contrast the human physiologic pattern of frequent feeding with that of cows, the primary source of food upon which artificial feeding is based. On some farms, nursing calves are separated from their mothers and are routinely allowed to suckle only two or three times a day (Conneely et al., 2014, Bar-Peled et al., 1997, Alvarez-Rodriguez et al., 2009). The higher protein in the cows' milk allows these calves to grow normally while nursing far less frequently than a human infant would require. Having one-fourth the protein content of cows' milk (Hernell, 2011), human milk is digested very quickly, and the rapidly growing infant needs to eat every two to three hours, and will awaken to do so. Differences in milk composition may be why we see that baby humans fed cows' milk products are less arousable from sleep than babies who nurse from their mothers (Tikotzky et al., 2010). This difference in arousal levels may partly explain the higher risk of Sudden Infant Death Syndrome in infants who are fed formula (Horne et al., 2004). The differences between breastmilk and the composition of cow's milk based

formula may also explain why parents of formula fed infants report more consolidated sleep (Ramamurthy et al., 2012).

Concerns about infant sleep, which were virtually absent in the 17th and 18th centuries, seem to have arisen as a result of the development of solitary infant sleep in the late 19th and especially the early 20th centuries as an ideal among certain middle class cultural groups, facilitated by medical experts (Stearns, Rowland and Giarnella 1996). Medical experts also played a crucial role in the normalization of scheduled artificial feeding, cemented by the growing number of mothers giving birth in hospitals and the industrial production and marketing of cows' milk based breast milk substitutes. In the 1917 edition of a popular manual (Holt, 1917) which became the basis of the Infant Care pamphlet distributed by the government to millions of parents, Dr. Emmett Holt recommended that babies sleep in nurseries separate from their mothers, and that they be fed only once or twice during the night through the first four months, and then once between four and seven months (Tomori, 2017 (in press)-b). Thereafter, they were not to be fed at all during the nighttime. If infants awoke during the night, and were not scheduled for a feeding, they were to "cry it out" for up to two to three hours. Experts like John Watson and Benjamin Spock further developed these ideas about "training" infant to sleep alone by "crying it out." As late as 1976, Dr. Benjamin Spock (first published in 1946) wrote that a healthy one-month old infant should be able to sleep through the night, and should be left to cry for up to half an hour if he woke; and as late as 1992, wrote about the "tyranny" of children who would not fall asleep when put down alone in the crib (Spock and Rothenberg, 1992). Dr. Richard Ferber further popularized sleep training starting in

1980, purposely leaving infants alone for progressively longer periods to "cry it out" (Ferber, 2006, Tomori, 2014).

"Crying it out" occurs in a context in which western parents have come to seeing crying infants as normal, in a society where infants are routinely separated from direct physical contact with their caregivers both at night and in daytime. Yet anyone who has spent time in the developing world, particularly Africa, where infants are carried and strollers are not a part of life, will have witnessed that it is rare to see a baby crying in public (Bleah and Ellett, 2010). Even in the US, as hospitals become Baby-Friendly and infants are kept in proximity and skin-to-skin, one of us (MB) frequently hears staff at many hospitals make remarks such as, "we never hear crying any more. Our unit is so much more quiet now." Hospital staff frequently note that the unusual sound of baby crying on units that have eliminated maternal-infant separation will trigger their immediate concern, whereas before such crying was often disregarded and thought of as normal. Such observations illustrate the cultural context in which acceptability of crying and infant distress occurs where separation of mothers and infants is also considered normal; it is not until mothers and babies are routinely together that one realizes that crying appears unusual and people become more sensitized to the sound of a distressed, crying infant.

While "cry it out" is hotly contested among parents, various forms of "sleep training" and the emphasis on "self-soothing" and "sleeping through the night" remain prominent in parenting advice in 2017. SIDS is now added to the list of reasons why infants should not share a bed with their parents, and other reasons have taken more of a back seat. At the

same time, cultural worries also linger in many parents' discomfort with sharing a bed with their babies and their concerns about needing to get their babies to sleep through the night in their own room (Tomori, 2014). In the 2016 AAP guidelines, room-sharing has been emphasized as a risk reduction for SIDS, but even this recommendation has received some backlash (Fallon, 2016) in a context where "sleeping through the night" in the baby's own room is considered necessary to achieve "independence" (Tomori, 2014).

Finally, in addition to safety concerns about the need for separate sleep, most public health guidelines, including the AAP guidelines, ignore the role of poverty in sleep-related infant death. The risk of such death is higher in socioeconomically disadvantaged families in the UK, although they are less likely to share a bed with their infants (Blair et al., 2010). In the US, rates of SIDS are higher among black and Hispanic infants than in whites, groups who have lower income levels on average, and the higher SIDS rate that is partially explainable due to lower rates of any and exclusive breastfeeding in both groups after the post-partum period (Bartick et al., 2017).

Thus, given that breastsleeping is the evolutionary and cross-cultural norm, we must ask another fundamental question: What, if any, are the consequences of separating parents from infants? Does it harm children and/or parents when we assume that babies can and should sleep apart from their parents? Could a separate sleep surface cause other harms besides the undermining of breastfeeding? Could sleeping in a baby box cause harm just from mother-infant separation itself?

We know that separation from maternal skin-to-skin contact for even an hour can have profound physiological stress on two-day old infants (Morgan et al., 2011). Research in a small study of 4 to10 month old infants also shows that after separation in a separate room for sleep, infant and maternal levels of the stress hormone cortisol are high and the mothers respond to the infant's cries and signs of distress. However after a few nights of separation for sleep, the infant cortisol levels remained high, indicating physiologic stress, even though they no were no longer crying and appeared to "self-settle." In contrast, the mothers' cortisol levels decreased and were no longer correlated with those of their infants – reflecting that they were unaware of their infants' stress and were out of sync with them (Middlemiss et al., 2012). Prolonged childhood stress can create long term changes in brain architecture, and behaviors that could even be passed on to the next generation, in a phenomenon known as "toxic stress"(Shonkoff et al., 2012). We do not know if the stress caused by separation, such as that seen in newborns, would abate over time, or how much stress would need to occur in an infant to result in brain changes associated with "toxic stress." At the very least, we cannot assume that enforced separate sleep is without harm to the infant through the repeated stress of being separated from the only environment he has ever known and to which he is uniquely adapted. Finally, separation may also make it difficult for parents to address other potential threats. For instance, research shows anecdotal reports of parents saving their children from acute life threatening events that would have gone undiscovered that the children been sleeping alone (McKenna and Volpe, 2007).

In addition to safety concerns about bedsharing, modern questions have arisen around the values surrounding parenting that affect assumptions about sleep practices: Should the parents' needs be subsumed by those of their children? When we look cross-culturally, not every culture sees keeping the child in contact with the parent as a conflict. Breastsleeping does not inherently constitute a greater burden on parents, nor does it have to correspond with a parenting philosophy where mother's needs are subsumed to those of the child. Parents just get more rest (Doan et al., 2007, Montgomery-Downs et al., 2010), even though co-sleeping mothers may experience more sleep fragmentation (Volkovich et al., 2015). Many breastsleeping mothers are simply not aware of how many times they nursed their babies throughout the night, since they were not fully awake (Gottlieb, 2004, Morelli et al., 1992, Tomori, 2014). Bedsharing breastfeeding mothers spend more time in stage 1 and 2 sleep (lighter sleep) and less time in stage 3 and 4 sleep (deeper sleep) than solitary sleeping breastfeeding mothers (Mosko et al., 1997), which may facilitate responsiveness to the infant. When some babies awaken frequently to nurse, mothers may find it unpleasant, but do not perceive it as problematic (Gottlieb, 2004, Tomori, 2017 (in press)-a). Mothers are also not usually left to care for their infants alone and to be completely responsible for all other tasks right after birth. There may be periods of mandated rest for the first 40 days or so and often there are others to help support mothers and care for infants and young children (Eberhard-Gran et al., 2017).

Breastfeeding helps mothers and infants both quickly fall asleep due to hormones released in the in the mother's brain (oxytocin) and hormones in the milk itself, yet both mother an baby are easily aroused, which is not the case if the pair are not breastfeeding

(Blyton et al., 2002, Horne et al., 2004). In breastsleeping dyads, their sleep cycles are synchronized, and the infants' airway is naturally protected from blankets and pillows by the infant's position with his head across from mother's breasts, her arm and shoulder forming a natural barricade from a potentially smothering pillow (Ball, 2006).

We see that breastsleeping is an elegant dance between mother and infant. Both mother and child benefit from the close physical contact and increased breastfeeding, physical warmth and emotional connection. This process, honed through millennia, cannot happen with a baby in a box. While it may seem like a simple, if costly, solution to give out baby boxes, we should not expect this to solve sleep-related infant mortality problems, when the key underlying problems are access to health care, poverty, and lack of support for breastfeeding, or for smoking and substance use cessation programs. Spending proportional resources on the most important risk factors for infant death, such as smoking, substance use, and formula feeding are likely to have greater impact than a feel-good solution like a box. If resources are diverted from these efforts to baby boxes, and if emphasis on sleeping in the boxes comes at the expense of breastfeeding, the boxes may have the potential to increase both maternal and child morbidity and mortality if they result in early weaning (Chowdhury et al., 2015, Victora et al., 2016, Bartick et al., 2016). Further, discouraging breastsleeping may have other developmental harms to the infant from stress that have not yet been studied.

Moving forward, our frame of reference in determining risk and public policy to manage risk must be normative human physiology, not an artificial intervention based on the

physiology of solitary sleeping infants being fed the milk of another species in a bottle. We should address how we can better support safe breastsleeping, and investigate the potential harms of disrupting breastsleeping and mother-infant separation. We should also develop advice specific for parents of formula feeding infants and support them in safely achieving closer human contact. Moreover, we need to be able to offer flexible guidance for families who combine breastfeeding and formula feeding and who are transitioning from breastfeeding to formula feeding. Finally, we must address the role of poverty and lack of paid family leave in supporting new parents and the roles these may play in infant and maternal mortality related to breastfeeding and sleep-related infant death. Instead of getting more babies into boxes, nighttime infant care guidance informed by evolutionary theory and cross-cultural practices should foster greater opportunities for safe connection for all infants and their families.

References

Alvarez-Rodriguez J., Palacio J., Casasus I., Revilla R. & Sanz A. (2009) Performance and nursing behaviour of beef cows with different types of calf management. *Animal* **3,** 871-878.

American Academy of Pediatrics & Section on Breastfeeding (2012) Breastfeeding and the use of human milk. *Pediatrics* **129,** e827-841.

Ball H. (2006) Parent-infant bed-sharing behavior : Effects of feeding type and presence of father. *Hum Nat* **17,** 301-318.

Ball H.L. (2003) Breastfeeding, bed-sharing, and infant sleep. *Birth* **30,** 181-188.

Ball H.L. (2017 (in press)) The Atlantic Divide: Contrasting UK and US recommendations on co-sleeping and bedsharing. *J of Human Lactation*.

Ball H.L., Howel D., Bryant A., Best E., Russell C. & Ward-Platt M. (2016) Bed-sharing by breastfeeding mothers: who bed-shares and what is the relationship with breastfeeding duration? *Acta Paediatr* **105,** 628-634.

Bar-Peled U., Robinzon B., Maltz E., Targari H., Folman Y., Bruckental I., et al. (1997) Increased weight gain and effects on production parameters of Holstein Calves that were allowed to suckle from birth to six weeks. *Journal of Dairy Science* **80,** 2523-2528.

Barry H. & Paxson L.M. (1971) Infancy and early childhood: Cross-cultural codes 2. *Ethnology* **10,** 466-508.

Bartick M. & Smith L.J. (2014) Speaking out on safe sleep: evidence-based infant sleep recommendations. *Breastfeed Med* **9,** 417-422.

Bartick M.C., Jegier B.J., Green B.D., Schwarz E.B., Reinhold A.G. & Stuebe A.M. (2017) Disparities in Breastfeeding: Impact on Maternal and Child Health Outcomes and Costs. *J Pediatr* **181,** 49-55 e46.

Bartick M.C., Schwarz E.B., Green B.D., Jegier B.J., Reinhold A.G., Colaizy T.T., et al. (2016) Suboptimal breastfeeding in the United States: Maternal and pediatric health outcomes and costs. *Matern Child Nutr*.

Blabey M.H. & Gessner B.D. (2009) Infant bed-sharing practices and associated risk factors among births and infant deaths in Alaska. *Public Health Rep* **124,** 527-534.

Blair P.S., Heron J. & Fleming P.J. (2010) Relationship between bed sharing and breastfeeding: longitudinal, population-based analysis. *Pediatrics* **126,** e1119-1126.

Blair P.S., Sidebotham P., Pease A. & Fleming P.J. (2014) Bed-sharing in the absence of hazardous circumstances: is there a risk of sudden infant death syndrome? An analysis from two case-control studies conducted in the UK. *PLoS One* **9,** e107799.

Bleah D.A. & Ellett M.L. (2010) Infant crying among recent African immigrants. *Health Care Women Int* **31,** 652-663.

Blyton D.M., Sullivan C.E. & Edwards N. (2002) Lactation is associated with an increase in slow-wave sleep in women. *J Sleep Res* **11,** 297-303.

Casiday R.E., Wright C.M., Panter-Brick C. & Parkinson K.N. (2004) Do early infant feeding patterns relate to breast-feeding continuation and weight gain? Data from a longitudinal cohort study. *Eur J Clin Nutr* **58,** 1290-1296.

Cassin E. (2017) Do baby boxes really save lives? In: BBC News Magazine. BBC, London.

Chowdhury R., Sinha B., Sankar M.J., Taneja S., Bhandari N., Rollins N., et al. (2015) Breastfeeding and maternal health outcomes: a systematic review and meta-analysis. *Acta Paediatr* **104,** 96-113.

Conneely M., Berry D.P., Murphy J.P., Lorenz I., Doherty M.L. & Kennedy E. (2014) Effects of milk feeding volume and frequency on body weight and health of dairy heifer calves. *Livestock Science* **161,** 90-94.

De Carvalho M., Roberson S., Friedman A. & al. e. (1983) Effect of frequent breastfeeding on early milk production and infant weight gain. *Pediatrics* **72,** 307-311.

Doan T., Gardiner A., Gay C.L. & Lee K.A. (2007) Breast-feeding increases sleep duration of new parents. *J Perinat Neonatal Nurs* **21,** 200-206.

Eberhard-Gran M., Garthus-Niegel S., Garthus-Niegel K. & Eskild A. (2017) Postnatal Care: A Cross-Cultural and Historical Perspective. *Archives of Women's Mental Health* **13,** 459-466.

Fallon J. (2016) New Parents Need No Sleep, Apparently: Recommendations to keep baby in same room as Mom and Dad seem a bit much. In: HealthZette. Ingraham Media, Washington, DC.

Feldman-Winter L., Goldsmith J.P., Committee On F., Newborn & Task Force On Sudden Infant Death S. (2016) Safe Sleep and Skin-to-Skin Care in the Neonatal Period for Healthy Term Newborns. *Pediatrics*.

Ferber R. (2006) *Solve Your Child's Sleep Problems: The All-Time Best Selling Classic.* Simon and Schuster, New York.

Gottlieb A. (2004) *The Afterlife is Where We Come From: The Culture of Infancy in West Africa.* University of Chicago Press, Chicago.

Hafner J. (2017) Baby boxes are all the buzz, but are they bunk? In: USA Today. Gannett, McLean, VA.

Hartmann P.E., Sherriff J.L. & Mitoulas L.R. (1998) Homeostatic mechanisms that regulate lactation during energetic stress. *J Nutr* **128,** 394S-399S.

Hernell O. (2011) Human milk vs. cow's milk and the evolution of infant formulas. *Nestle Nutr Workshop Ser Pediatr Program* **67,** 17-28.

Holt L.E. (1917) *The Care and Feeding of Children: A Catechism for the Use of Mothers and Children's Nurses.* D. Appleton, New York and London.

Horne R.S., Parslow P.M., Ferens D., Watts A.M. & Adamson T.M. (2004) Comparison of evoked arousability in breast and formula fed infants. *Arch Dis Child* **89,** 22-25.

Labbok M.H., Hight-Laukaran V., Peterson A.E., Fletcher V., von Hertzen H. & Van Look P.F. (1997) Multicenter study of the Lactational Amenorrhea Method (LAM): I. Efficacy, duration, and implications for clinical application. *Contraception* **55,** 327-336.

McKenna J., Mosko S. & Richard C. (1997) Bedsharing promotes breastfeeding. *Pediatrics* **100,** 214-219.

McKenna J.J. & Gettler L.T. (2015) There is no such thing as infant sleep, there is no such thing as breastfeeding, there is only breastsleeping. *Acta Paediatr* **105,** 17-21.

McKenna J.J. & Volpe L.E. (2007) Sleeping With Baby: An Internet Based Sampling of Parental Experiences, Choices, Perceptions, and Interpretations in a Western Industrialized Context. *Infant and Child Development* **16,** 359-385.

Middlemiss W., Granger D.A., Goldberg W.A. & Nathans L. (2012) Asynchrony of mother-infant hypothalamic-pituitary-adrenal axis activity following extinction of infant crying responses induced during the transition to sleep. *Early Hum Dev* **88,** 227-232.

Montgomery-Downs H.E., Clawges H.M. & Santy E.E. (2010) Infant feeding methods and maternal sleep and daytime functioning. *Pediatrics* **126,** e1562-1568.

Morelli G.A., Rogoff B., Oppenhein D. & Goldsmith D. (1992) Cultural variation in infants' sleeping arrangements: questions of independence. *Developmental Psychology* **28,** 604-613.

Morgan B.E., Horn A.R. & Bergman N.J. (2011) Should neonates sleep alone? *Biol Psychiatry* **70,** 817-825.

Mosko S., Richard C. & McKenna J. (1997) Maternal sleep and arousals during bedsharing with infants. *Sleep* **20,** 142-150.

National Institute of Health Care and Excellence (2015) Postnatal care up to 8 weeks (CG37), updated 2014 recommendations on co-sleeping and sudden infant death syndrome. Manchester, UK.

Organisation of European Co-operation and Development (2016) OECD Data: Infant mortality rates. OECD, Paris.

Pelligra R., Doman G. & Leisman G. (2005) A reassessment of the SIDS Back to Sleep Campaign. *ScientificWorldJournal* **5,** 550-557.

Ramamurthy M.B., Sekartini R., Ruangdaraganon N., Huynh D.H., Sadeh A. & Mindell J.A. (2012) Effect of current breastfeeding on sleep patterns in infants from Asia-Pacific region. *J Paediatr Child Health* **48,** 669-674.

Richard C., Mosko S., McKenna J. & Drummond S. (1996) Sleeping position, orientation, and proximity in bedsharing infants and mothers. *Sleep* **19,** 685-690.

Rosenberg E. (2016) Why Finland's Newborns Sleep in Cardboard Boxes. In: New York Times. New York Times, New York.

Shonkoff J.P., Garner A.S., Committee on Psychosocial Aspects of C., Family H., Committee on Early Childhood A., Dependent C., et al. (2012) The lifelong effects of early childhood adversity and toxic stress. *Pediatrics* **129,** e232-246.

Spock B. & Rothenberg M.B. (1992) *Dr. Spock's Baby and Child Care: The Century's Greatest Bestseller.* Pocket Books, New York.

Task Force On Sudden Infant Death S. (2016) SIDS and Other Sleep-Related Infant Deaths: Updated 2016 Recommendations for a Safe Infant Sleeping Environment. *Pediatrics* **138**.

Tikotzky L., G D.E.M., Har-Toov J., Dollberg S., Bar-Haim Y. & Sadeh A. (2010) Sleep and physical growth in infants during the first 6 months. *J Sleep Res* **19,** 103-110.

Tomori C. (2014) *Nighttime Breastfeeding: An American Cultural Dilemma.* Berghahn Books, New York.

Tomori C. (2017 (in press)-a) Breastsleeping in Four Cultures: Comparative Analysis of a Biocultural Body Technique. In: Breastfeeding: New Anthropological Approaches. (eds C. Tomori, A.E. Palmquist & E. Quinn). Routledge, Abington, NY.

Tomori C. (2017 (in press)-b) Changing Cultures of Nighttime Breastfeeding and Sleep in the US. In: Social Experiences of Breastfeeding: Building Bridges Between Research, Policy and Practice. (eds S. Dowling, D. Pontin & K. Boyer). Policy Press, Bristol.

Victora C.G., Bahl R., Barros A.J., Franca G.V., Horton S., Krasevec J., et al. (2016) Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *Lancet* **387,** 475-490.

Volkovich E., Ben-Zion H., Karny D., Meiri G. & Tikotzky L. (2015) Sleep patterns of co-sleeping and solitary sleeping infants and mothers: a longitudinal study. *Sleep Med* **16,** 1305-1312.

Weeks C. (2016) North American 'baby box' initiatives are a far cry from Finland's universal program. In: The Globe and Mail. Globe and Mail, Toronto.

Wolf J.H. (2003) Low breastfeeding rates and public health in the United States. *Am J Public Health* **93,** 2000-2010.