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Original Article

Parental behaviors and sleep outcomes in infants and toddlers: A cross-cultural comparison

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ABSTRACT

Background: To assess the prevalence of parental behaviors and other factors of sleep ecology and to analyze their relationships with sleep outcomes in a large sample of children ages birth to 36 months in multiple countries/regions.

Methods: Parents of 29,287 infants and toddlers (48% boys; Australia, Canada, China, Hong Kong, India, Indonesia, Korea, Japan, Malaysia, New Zealand, Philippines, Singapore, Taiwan, Thailand, United Kingdom, United States, and Vietnam) completed an internet-based expanded version of the Brief Infant Sleep Questionnaire.

Results: Overall, there is a high level of parental involvement in sleep onset and sleep maintenance for young children, with significant differences in parenting behaviors across cultural groups. For predominantly-Caucasian, the most common behavior occurring at bedtime is falling asleep independently in own crib/bed (57%), compared to just 4% of those children living in predominantly-Asian regions. Parental behaviors and sleep ecology, including parental presence at sleep onset, bedtime, and bedtime routine, significantly explain a portion of the variance in sleep patterns. Overall, parental behaviors are more highly predictive of nighttime sleep outcomes in predominantly-Caucasian regions. Finally, parental involvement in sleep onset mediates the relationship between cosleeping and sleep outcomes.

Conclusions: Overall, the best predictors of nighttime sleep are related to parental behaviors at bedtime and during the night. Furthermore, sleep disruption and decreased total sleep associated with bed sharing and room sharing are mediated by parental presence at bedtime. These findings provide additional support for addressing parental behaviors in behavioral interventions for infant and toddler sleep problems.

1. Introduction

Sleep patterns change over time for young children and differ throughout the world, with a significant portion of parents (10–75%) reporting sleep problems [1,2]. Studies to date have found that sleep problems in young children, primarily bedtime difficulties and night wakings, are often related to a lack of self-soothing. For example, Sadeh and Anders [3] developed a transactional model for self-soothing (falling asleep independently), theorizing that infant self-soothing is a key component to the development of sleep-wake patterns and results in decreased sleep disturbances and increased sleep consolidation. This model encompasses four domains, including the infant domain (e.g., gender, temperament), sleep-wake domain (e.g., longest sleep period, percent awake), caregiver domain (e.g., feeding status, parenting stress), and sleep context domain (e.g., caregiver interventions, sleep onset state, sleep location). Furthermore, a recent review of parenting and infant sleep notes that the link between parental behaviors and infant sleep is the most immediate and direct path of a transaction model, which also includes parental cognitions/psychopathology/well being, intrinsic infant factors, and cultural/environmental/social factors [4].

Results from studies of this transactional model [5] and a number of other studies have indicated the contribution of sleep-related parenting practices to sleep outcomes. For example, research has consistently demonstrated that parental involvement and lack of infant's self-soothing skills are highly associated with night wakings and difficulties falling asleep [6–8]. A recent study of 5004 infants and toddlers from the United States/Canada [2] found that parenting behaviors that encouraged independence and self-soothing (e.g., having the child fall asleep independently) were associated with extended and more consolidated sleep,

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compared to more active interactions (e.g., nursing or rocking to sleep) that were associated with shorter and more fragmented sleep.

One area that has been the focus of limited research is the impact of parenting behaviors within the context of cosleeping. For example, studies of the Sadeh and Anders model have been primarily done in solitary sleeping infants. Burnham et al. [5] found that less time out of the crib, high levels of quiet sleep, and longer parental response times to infant wakings at 3 months were the most predictive of self-soothing and resulting sleep disruptions; however, this was solely focused on solitary sleeping infants. Looking at cosleeping in general, studies have primarily found cosleeping to be associated with increased night wakings and sleep problems [9,10]. But these studies have not evaluated cosleeping within the larger context of parenting behaviors, which may be more salient. Finally, studies on the relationship between cosleeping and sleep outcomes have been conducted primarily in western countries, where these practices are typically not the norm.

As stated, the majority of studies to date that have evaluated different aspects of a transactional model have focused on young children from a narrow region of the world, primarily western countries. Furthermore, the majority of studies have not evaluated sleep-related parenting practices as well as these behaviors within the context of cosleeping (i.e., bed sharing and room sharing), which is the predominant sleep practice in many parts of the world [11] Thus, this large scale study includes more diverse geographic regions, specifically Asian countries/regions where there is a preponderance of cosleeping and where parenting behaviors related to sleep are not well documented.

Thus, the aims of the present study were (a) to assess the prevalence of sleep-related parenting behaviors in a large sample of infants and toddlers from predominantly-Caucasian and predominantly-Asian countries/regions, (b) to evaluate the links between parenting behaviors and other aspects of sleep ecology and sleep outcomes (i.e., nocturnal sleep duration, night wakings, longest sleep episode, and daytime sleep duration) and (c) to assess these relationships within the context of cosleeping.

2. Methods

2.1. Participants

Parents/caregivers (from hereon referred to as "parents") of 29,287 infants and toddlers (1073 Australia, 501 Canada, 7505 China, 1049 Hong Kong, 3982 India, 967 Indonesia, 1036 South Korea, 872 Japan, 997 Malaysia, 1081 New Zealand, 1034 Philippines, 1001 Singapore, 896 Taiwan, 988 Thailand, 4505 United States, 800 United Kingdom, and 1000 Vietnam) participated in this study. Countries/regions were grouped as either predominantly-Caucasian (P-C; Australia, Canada, New Zealand, United Kingdom, and United States) or predominantly-Asian (P-A; China, Hong Kong, India, Indonesia, Japan, Korea, Singapore, Malaysia, Philippines, Taiwan, Thailand, and Vietnam).

Children's ages ranged from birth to 36 months. Sample sizes within each country/region were evenly distributed across age groups according to the following: 0–2 month olds, 3–5 month olds, 6–8 month olds, 9–11 month olds, 12–17 month olds, 18–23 month olds, and 24–36 month olds. There were equal boys (48.1%) and girls (51.9%) across the entire sample, $\chi^2 = .53$, $p = .82$. Demographic information of the complete sample can be found in Table 1.

2.2. Procedure

All participants completed the Brief Infant Sleep Questionnaire (BISQ) [8,11]. The BISQ includes specific questions about infant daytime and nighttime sleep patterns, as well as sleep-related behaviors. Sleeping arrangements (bed sharing and room sharing) and bedtime routines were also assessed. The respondents were asked to describe their child's behavior during the last two weeks. The BISQ is well-validated with high (>.82) test–retest reliability. Sleep quality measures derived from the BISQ significantly differentiate between referred sleep-disturbed infants and controls. Furthermore, there are significant correlations between BISQ measures and measures derived from actigraphy and daily logs [8]. In addition to the BISQ, demographic information was collected, including parental age, education, employment status, and child's birth order. The complete questionnaire was translated into each respective language and back-translated to ensure appropriate translation.

All data were collected online, except for Thailand and Vietnam, where a paper-based version was completed face-to-face with a researcher. In eight countries/regions (Australia, China, India, Malaysia, Singapore, Philippines, United Kingdom, United States), the questionnaire was set as a pop-up screen at a popular parenting website (BabyCenter) and invited parents to complete a sleep survey for children ages birth to 36 months. All other countries/regions utilized a free-standing website for the survey. Recruitment in these areas was conducted via email, utilizing mailing lists obtained from local marketing firms and online advertising at other parenting sites. The online version used pull-down menus with optional responses for each presented question. Those who completed paper copies of the questionnaire were able to skip questions. Completion of the questionnaire was voluntary and parents were not offered any feedback. All participants were invited to complete a survey about their child's sleep. A few areas offered incentives for completion (e.g., free samples or gift voucher). The complete sample was collected between May and June 2006 (CA, UK, and US), September–December 2007 (AU, NZ, CN, HK, IN, ID, JP, KR, SG, MY, PH, TH, TW), and April 2008 (VN).

Table 1
Demographic characteristics.

		N	%
Child's age	0–2 months	2503	8.6
	3–5 months	3769	12.9
	6–8 months	3799	13.0
	9–11 months	3580	12.2
	12–17 months	5312	18.1
	18–23 months	4005	13.7
	24–36 months	6319	21.6
Child's sex	Girl	14,076	48.1
	Boy	15,211	51.9
Child's birth order	Only child	14,770	50.4
	Youngest child	5798	19.8
	Oldest child	7740	26.4
	Middle or a multiple child	979	3.3
Respondent	Mother	26,282	89.7
	Other	3005	10.3
Respondent's education	Post-graduate degree	4947	17.2
	College education or a college degree	11,950	41.5
	High-school degree	11,564	40.2
	Less than high-school degree	331	1.2
Respondent's employment	Full time	15,260	52.1
	Part-time	2260	7.7
	At-home parent, student status, unemployment, or other	11,767	40.2
Respondent's age range	21–24 years	1846	6.3
	25–29 years	10,873	37.1
	30–34 years	11,289	38.6
	35–39 years	4080	13.9
	Age <21 or >39	1185	4.0