Original Article

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Bedtime Parenting Practices Associated with Social-emotional Competence in Thai Infants

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Abstract:

Objective: We aimed to determine the association between bedtime parenting practices and infant social-emotional competence (SEC).

Material and Methods: Data from a birth cohort called: Prospective Cohort Study of Thai Children, were analyzed. Information on bedtime parenting and infant's sleep information were collected at 3 and 12 months of age. Modified Infant-Toddler Social and Emotional Assessment (MITSEA) were used to measure the SEC at 12 months of age. All participating infants with a MITSEA score >75th percentile were classified as having high SEC. The association between bedtime parenting practices and high SEC were analyzed using multiple logistic regression.

Results: Data from 2,109 infants were analyzed (male:female=1:1). Median age of mothers was 26 years. Ninety-two percent of caregivers shared a bed with their infants, at either their 3rd- or 12th-month-visits. Two-thirds of the caregivers reported bed sharing at both visits. About 70.0% of caregivers fed their infants until the infant fell asleep, and about two-thirds responded to infant's awakening with milk feeding. Infants who were never fed until falling asleep were more likely to have high SEC, compared with infants who were always fed until sleep (odds ratio 1.49; 95% confidence interval 1.14, 1.96). Bed sharing showed no association with a high SEC. Older, female mothers, higher socioeconomic status and quality time were associated with a high SEC.

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Conclusion: The bedtime parenting practice associated with a high SEC was: "non-feeding until falling asleep". Bed sharing, which was a popular practice in this cohort, showed no association with high SEC.

Keywords: bedtime, infant, parenting, sleep, social-emotional competence

Introduction

Social-emotional competence (SEC) is an ability comprising of self-regulation, social awareness, social problem solving and prosocial behaviors.[1] While small children learn their social-emotional skills through a mutual interaction with caregivers and peers, infants develop their SEC through an interaction between neuromaturation and reciprocity with their caregiver.[2] Studies show that SEC has gained more attention, because it is related to healthy lifestyles, success, happiness and quality of life.[1-3]

Sleep patterns can reflect the maturation in a child's self-regulation.[2,3] Sleep consolidation begins in the early infancy period. Typical infants are able to self-sooth, and regulate their sleep at ages between 6 weeks to 3 months old.[2-4] Sleep problems impact not only the child development and behaviors[4-9], but also disturb maternal sleep and increase maternal distress.[10,11] Norwegian and Australian cohorts found an association between low sleep quality at preschool age and poorer socio-emotional health at school age.[7,8] The social-emotional issues are not observed if the sleep problem resolves before 4 years of age, suggesting potential benefit of early intervention.[8]

Bedtime parenting and child rearing styles vary among cultures.[12-15] Common bedtime routines in Western countries include feeding, bathing, reading bedtime story and letting children sleep by themselves.[12,15] Bed-sharing is not recommended in Western countries, as it is associated with an increased risk of sudden infant death syndrome as well as behavioral problems.[14,15] In Thailand; however, parents sharing a bed with their infant is very common.[13,16]

An infant's sleep pattern develops through parent-infant interconnection[2,17,18]; however, which parenting style should be recommended is debatable. On one hand, limiting parental involvement in sleep training (*i.e.* gradual extinction and bedtime fading) may promote infant's self-regulation.[4,18,19] On the other hand, encouraging prompt response to the infant's cues at bedtime may help reduce infant and parental distress.[20-22]

There has been limited evidence concerning the link between bedtime parenting and childrens SEC. Cultural-specific bedtime practices may result in different impacts on a child's SEC. Hence, we aimed to determine whether bedtime parenting in the infancy period was associated with SEC. Finding bedtime practices that promote SEC may change recommendations regarding bedtime parenting in countries with similar contexts.

Material and Methods

Participants

The present study analyzed data from a Thai birth cohort called: Prospective Cohort Study of Thai Children (PCTC). The PCTC was an observational, community-based study designed to follow all fetuses from the 28 to 38 weeks gestational age, from four selected districts (namely: Panomtuan District in Kanchanaburi, Thepa District in Songkla, Kranuan District in Khon Kaen and Muang District in Nan) in different regions of Thailand and the Bangkok metropolitan area. The 5 study sites were chosen considering socio-economic factors and feasibility of long-term follow-up. All children born between October, 2000

and November, 2002, in the selected sites, were recruited and followed-up. Data from home-visits at age 21 days, 28 days, 3 months, 6 months, and 12 months were gathered by trained field research assistants. After standardization among study sites, all research assistants followed the interviewing instructions, and used specific questionnaires for each home visit.

Measures

Social-emotional competence

Social-emotional competence was measured using the Modified Infant-Toddler Social and Emotional Assessment (MITSEA) at the 12-month-visit. MITSEA for 12-month-old children comprised of 26 items and 6 components (i.e. compliance, attention, imitation/play, mastery motivation, empathy and prosocial peer relations). Cronbach's alpha of MITSEA, Thai version was 0.89.[23] The caregiver was asked to take one MITSEA card at a time. Each card contained a statement indicating a child's behavior, e.g., "imitate pat-a-cake or wave bye-bye". Then the parent placed each card into one of 4 boxes, which were labeled as follows: Very True/Often, Somewhat True/Sometimes, Not True/Rarely and No Opportunity. These were scored 2, 1, 0, and NA, respectively. Having a MITSEA score >75th percentile of the study population was classified as having "High SEC".

Bedtime parenting

At 3-month and 12-month-visits, the main caregiver was asked about his/her bedtime parenting within two weeks prior to the interview. Questions included bed sharing, main bedtime activities used to introduce infant's sleep (e.g. "feeding until the infant fell asleep", "holding until the infant fell asleep"), and activities used to respond to night awakening of the infant. In the analysis, each bedtime practice was then classified into 4 groups, these being: "never", "at 3-month-visit only", "at 12-month-visit only" and "at both visits".

Covariates

Potential confounders collected were demographic data, infant's sleep information and child rearing. Data on day care attendance, breastfeeding, and the bedtime caregiver were gathered at both 3 and 12-month-visits. Infant's sleep information included number of night awakenings and naps per day. Maternal contingent responsiveness was measured at the 3-month-visit, by observing mutual interactions between mother and infant during feeding time. The mutual interactions of interest consisted of gentle holding, soft touching, eye contact, smiling, reciprocal conversation and relaxing interaction. A trained observer gave a score from 1-4 for each interaction, using a rubric score with a clear description. A total score >75th percentile of the study population was classified as: "High contingent response". Data on "Quality time" was collected at the 3-month visit, by asking about quality activities. Regularity of strolling, playing with toys and singing with infants were labeled, and scored as: never (0 point), some days (1 point) or every day (2 points). A Total score higher than the 75th percentile of the study population was considered as "High quality time".

The PCTC study was approved by the Ethical Committee, Ministry of Public Health. All families were informed about the study procedures and potential risks before giving written consent. This present, retrospective study was further approved by the Ethics Committee of the Faculty of Medicine, Prince of Songkla University, Songkhla, Thailand (COA 60-333-01-1). This analysis did not receive any grant from funding agencies in the public, commercial or not-for-profit sectors.

Statistical analysis

Univariate analysis was performed and independent variables, which related to the dependent variable (p-value from chi-square statistics <0.20) or were potential confounders, were selected. Stepwise multiple logistic regression was applied to determine an association between bedtime practices and high SEC. Multicollinearity and interaction terms between bedtime practice and each covariate were checked prior to the model fitting. The final model contained all interesting variables, with minimum Akaike information criterion value. Only records with complete data of the relevant variables were used in the analysis. Robustness of the study was subsequently checked by comparing baseline characteristics of analyzed children and children excluded due to missing data. The results were presented as adjusted odds ratio (aOR), with a 95% confidence interval. The level of significance between the high SEC group and low SEC group was a defined p-value from Wald test and LR test <0.05. All analyses were applied by using R program version 3.5.3.[24]

Results

Figure 1 shows a flow of the number of participants excluded before final analysis. There were 4,245 live births during the enrollment period. Infants with prematurity, low birth weight, significant perinatal problems and twins were excluded. After we excluded the records with missing data of interest, there were 2,109 records with complete data at the 12-month-visit.

Baseline characteristics of participants

Male and female ratio was equal. Most infants were raised by mothers (Table 1). About half of the parents had a secondary school level education, and less than 10.0% had completed any higher education. About one third of fathers were unemployed, and one third of caregivers reported a negative financial balance.

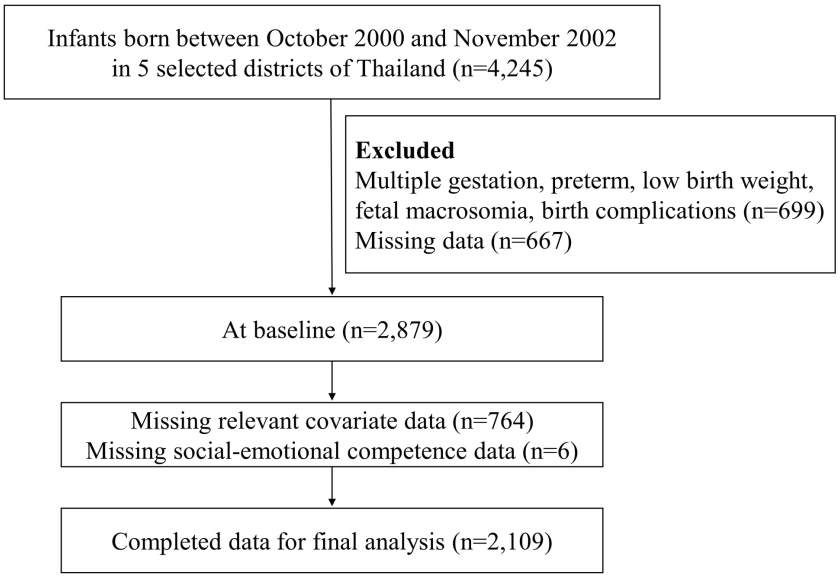

Figure 1 Flow of study participants

Table 1 Baseline characteristics of participants (n=2,879)

Characteristics	Number (%)
Males	1,420 (49.3)
First child	1,266 (44.3)
Paternal age (years), median (IQR)	30 (25.0, 35.0)
Maternal age (years), median (IQR)	26 (22.0, 31.0)
Father's education	
Primary school	1,194 (47.3)
Secondary school and vocational school	1,044 (41.3)
Bachelor's degree and higher	221 (8.7)
Mother's education	
Primary school	1,380 (48.3)
Secondary school and vocational school	1,087 (38.0)
Bachelor's degree and higher	280 (9.8)
Father's occupation	
Unemployed	886 (34.9)
Own business	220 (8.7)
Company employee and government officer	1,428 (56.3)
Mother's occupation	
Unemployed	651 (22.7)
Own business	1,221 (42.6)
Company employee and government officer	731 (25.5)
Mother as a bedtime caregiver at age 3 months	2,434 (85.6)
Mother as a bedtime caregiver at age 12 months	2,270 (80.7)
Number of family members	
2-3	430 (15.3)
4-5	1,302 (46.3)
>5	1,079 (38.4)
Monthly family income (THB), median (IQR)	8,333 (4,312.5, 16,166.7)
Adequate income, n (%)	1,802 (62.9)
Regularly live together	2,552 (89.3)
Attending day care at age 3 months	281 (9.9)
Attending day care at age 12 months	594 (21.1)
Breastfeeding at age 3 months	2,183 (77.4)
Breastfeeding at age 12 months	1,469 (53.3)
Infant's temperament	
Easy temperament	1,268 (45.0)
Slow to warm-up temperament	442 (15.7)
Difficult temperament	184 (6.5)
Mixed type temperament	921 (32.7)

IQR=interquartile range, THB=Thai Baht

Infant's sleep characteristics

Most infants had night awakenings before 12 months of age (Table 2). Approximately, 75.0% of them had persistent night awakening at both visits. Over 40.0% took a nap more frequently than a typical 3-month-old infant. We checked and found a significant correlation between night awakening and frequency of naps: more frequent napping was associated with night awakening. To reduce the co-linearity effect, only the night awakening variable was used as a covariate in our multivariate analysis.

Table 2 Infant's sleep characteristics and bedtime parenting (n=2,879)

Infant's sleep characteristics	Number (%)
Night awakening (n=2,463)	
Never	16 (0.6)
At 3 month-visit only	608 (24.7)
At 12 month-visit only	39 (1.6)
At both visits	1,800 (73.1)
Naps at 3 months (n=2,511)	
2-3 times/day	1,404 (55.9)
4-5 times/day	998 (39.7)
≥6 times/day	94 (3.7)
Bedtime parenting	
Bed-sharing (n=2,783)	
Never	212 (7.6)
At 3 month-visit only	118 (4.2)
At 12 month-visit only	664 (23.9)
At both visits	1,789 (64.3)
Feeding until infant fell asleep (n=2,782)	
Never	812 (29.2)
At 3 month-visit only	556 (20.0)
At 12 months-visit only	475 (17.1)
At both visits	939 (33.8)
Feeding as a response to infant's awakening (n=2,465)	
Never	97 (3.9)
At 3 month-visit only	555 (22.5)
At 12 month-visit only	174 (7.1)
At both visits	1,639 (66.5)

Bedtime parenting

Bed sharing

At 3 months old, almost 70.0% of parents shared a bed with their infants, and about 30.0% slept in a separate bed from their infants; but in the same room (Table 2). Percentage of bed sharing increased to 88.0% at the 12-month-visit. Less than 10.0% of parents never shared a bed with their infant. The median frequency of night awakening in infants, who shared a bed with the caregiver, was 3 [interquartile range (IQR) 2, 3] per night,

which was not different from the infants who did not share a bed.

Feeding until infant fell asleep

About half of the parents fed their infant until the infant fell asleep, at both 3-month and 12-month-visits. About 30.0% denied this practice at both visits.

Feeding as a response to infant's awakening

When 3-month-old infants woke up during the night, almost 90.0% of parents helped sooth the infant back to sleep by feeding the infant. Two-thirds of parents practiced this at both visits.

Social-emotional competence

MITSEA was assessed in 2,818 infants at 12 months of age. Median SEC score was 0.97 (IQR 0.78, 1.18). Females had higher SEC scores than males [odds ratio (OR) 1.26; 95% CI 1.01, 1.55] i.e. females median SEC was 0.97 (IQR 0.79, 1.20), and the male median SEC was 0.95 (IQR 0.77, 1.15). This statistically significant difference is primarily a function of a large sample size; the magnitude of the difference is small and not likely to be clinically important. Seven hundred and eleven infants were classified as being in the "high SEC" group, as their SEC score was more than the 75th percentile of study population.

Association between bedtime parenting and high SEC

Multiple logistic regression (Table 3) found that female, first born infant, older maternal age, higher parental education and high-quality time were associated with high SEC.

Regarding the bedtime parenting, infants never fed until the infant fell asleep had about a 1.5 greater chance to have high SEC compared with infants always fed until falling asleep (OR 1.49; 95% CI 1.14, 1.96). Bed-sharing and night awakening feeding showed no significant association with high SEC.

Table 3 Multiple logistic regression predicting high social-emotional competence (n=2,109)

Variables	High SEC Number (%)	Low SEC Number (%)	aOR (95%CI)	Pa
Female (ref: male)	391 (55.0)	1,041 (49.4)	1.26 (1.01, 1.55)*	<0.05
Maternal age (ref: <20 years)				<0.05
20-29 years	387 (55.0)	1,190 (56.7)	2.19 (1.41, 3.40)***	
30-39 years	241 (34.3)	595 (28.4)	2.38 (1.44, 3.94)***	
≥40 years	26 (3.7)	46 (2.2)	2.38 (1.03, 5.48)*	
Paternal age (ref: <20 years)				NS
20-29 years	244 (39.9)	907 (48.4)	0.77 (0.37, 1.58)	
30-39 years	277 (45.3)	729 (38.9)	1.07 (0.50, 2.27)	
≥40 years	76 (12.4)	186 (9.9)	1.19 (0.52, 2.71)	
Mother's edu ≥2°school (ref: <2°)	437 (62.2)	902 (43.0)	1.48 (1.15, 1.92)***	<0.05
Father's edu ≥2°school (ref: <2°)	400 (65.4)	841 (45.1)	1.47 (1.14, 1.90)***	<0.05
Maternal occupation (ref: unemployed)				<0.05
Officer	190 (27.0)	527 (25.1)	1.41 (0.96, 2.09)	
Own business	370 (52.5)	812 (38.7)	1.88 (1.33, 2.66)***	
Paternal occupation (ref: unemployed)				NS
Officer	371 (60.6)	1,020 (54.4)	1.08 (0.82, 1.42)	
Own business	75 (12.3)	139 (7.4)	1.06 (0.67, 1.67)	

Table 3 (continued)

Variables	High SEC Number (%)	Low SEC Number (%)	aOR (95%CI)	Pa
First born (ref: no)	345 (49.2)	891 (42.6)	1.35 (1.05, 1.73)*	<0.05
Breastfed at 1 year (ref:bottle fed)	509 (74.4)	1,680 (81.1)	1.10 (0.82, 1.46)	NS
High contingent responses (ref: no)	157 (27.4)	360 (19.9)	1.21 (0.94, 1.55)	NS
High quality time (ref: no)	293 (50.3)	564 (29.9)	1.74 (1.39, 2.16)***	<0.05
Night awakening (ref: at both ages)				NS
Never	7 (1.2)	8 (0.4)	1.61 (0.43, 6.05)	
At 3 months only	149 (25.7)	458 (24.5)	1.23 (0.91, 1.66)	
At 12 months only	15 (2.6)	24 (1.3)	1.20 (0.52, 2.75)	
Bedtime parenting				
Bed-sharing (ref: never)				NS
At 3 months only	19 (2.7)	99 (4.8)	0.48 (0.23, 1.02)	
At 12 months only	145 (20.9)	514 (24.8)	0.95 (0.60, 1.50)	
At both ages	484 (69.8)	1,294 (62.4)	0.95 (0.62, 1.46)	
Feed until infant fell asleep (ref: at both ages)				<0.05
Never	257 (37.1)	550 (26.5)	1.49 (1.14, 1.96)*	
At 3 months only	143 (20.6)	408 (19.7)	1.05 (0.77, 1.43)	
At 12 months only	97 (14.0)	374 (18.1)	0.94 (0.68, 1.30)	
Feed to respond to infant's arousal (ref: never)				NS
At 3 months only	126 (21.7)	426 (22.7)	1.10 (0.59, 2.03)	
At 12 months only	52 (9.0)	121 (6.5)	1.40 (0.70, 2.82)	
At both visits	373 (64.3)	1,261 (67.3)	1.18 (0.64, 2.18)	

Pa=P from LR test, aOR=adjusted odds ratio, CI=confidence interval, NS=non-significant, SEC=social-emotional competence, ref=reference
P from Wald test (*p-value<0.050, **p-value<0.010, ***p-value<0.001)

Discussion

We found an association between social-emotional competence and a specific bedtime parenting practice. At 1 year of age, infants who had never been fed until falling asleep had higher SEC than infants always receiving bedtime feeding until sleep. High SEC was also associated with female, older aged mothers, high socioeconomic status and high quality-time. Bed sharing, which was the most common bedtime parenting practice in this study, did not show an association with high SEC.

Inducing sleep by feeding the infant, until the infant fall asleep, may be unfavorable for child social-emotional development. Our results showed that infants who were always fed until sleep had lower SEC than those who had never, or were partly been fed until falling asleep. Rather than responding to an infant's cue, some caregivers fed their infant whether or not he or she was hungry. We hypothesize that feeding to introduce sleep suggested either a permissive or an authoritarian parenting style. Previous studies showed that either a permissive parenting style (high affection and low behavioral control) or an authoritarian parenting style might be related to poor emotional regulation strategies in children.[25,26] Feeding infants when they do not feel hungry might disrupt an infant's self-regulation, which is the crucial factor in social-emotional development.[27]

Social emotional competence of children depends on both the individual's factors (e.g. temperament, resilience and cognitive ability) and external factors (e.g. stress, child-rearing and culture).[1,3] Our findings support previous studies, showing that higher socioeconomic status is related to better child developmental outcomes and SEC.[1,28] Being a mature (older) mother and spending high-quality time with infants are also linked to having high SEC.

Bed sharing is not recommended in Western countries, because it may increase parental involvement[15,27] and infant's night awakening.[15,29] Previous studies reported that bed sharing is related to a child's emotional problems.[14,30] However, bed sharing was the most common bedtime parenting practice in our study, partly due to the popularity of breastfeeding in this cohort. More than half of our cohort mothers continued their breastfeeding for least 12 months. Many Thai parents share a bed with small infants; due to the convenience of nursing, and they feel more reassured about the safety of their infants.[31] Although, bed sharing is not endorsed by recommendations in Western countries, this practice is widely held in developing countries, including Thailand.[14] In our study, the frequency of night awakening in infants, who shared a bed with the caregiver, was not different from the infants who did not share a bed. Bed sharing did not show an association with high SEC of our infants.

Although, the sample size was large and included children from 5 different regions in Thailand, almost 25.0% of eligible participants were excluded from the analysis, due to missing data for relevant variables, which may have led to a sampling bias. The analyzed group had a higher proportion of unemployed mothers than the missing group. There is a chance that our cohort infants might have poorer SEC compared with the general population. However, any potential exclusion bias in the multivariate analysis was reduced by using the 75th percentile of SEC score as a cut-off point. Another possible limitation was information bias. Information regarding infant's behaviors and night awakening were subjectively measured. It is hard to differentiate awakening and physiologic movement during sleep. Temperament is a known moderator of the relations between parenting styles and children's emotional development[32,33], but we did not put this in the multivariate analysis; due to the collinearity between temperament and SEC.

Despite the limitations mentioned above, our findings found a bedtime practice potentially promoting the infants' SEC. In this study, recall bias was minimized due to the prospective cohort design. The information was collected over the 7 days prior to each house visit. The caregivers were not aware of the specific study objectives during the interview.

For future study, details of bedtime routines and parental intervention for infant's night awakening should be studied. Feeding to introduce infant's sleep as a bed-time routine may result in a different outcome from feeding until the infant falls asleep. Objective assessment, such as video recording and actigraphy, should be applied to increase internal validity of measures. Long-term follow-up is also recommended.

Conclusion

This study illustrates the importance of bedtime parenting on the SEC of infants. Non-feeding until the infant fell asleep was associated with high SEC. Our findings also pointed out the difference of parenting, including bedtime practices among cultures.

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Conflicts of interest

The authors have no conflicts of interest to declare.

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