Sleep Habits and Sleep Problems of Preschool Children in Khon Kaen Province, Thailand

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Abstract

Background: Sleep has major roles in the primary activity of the brain during early development. However almost Thai literatures about children sleep had been studied in Bangkok, thus there were difference cultures and parenting each district in Thailand.

Objectives: To study sleep habits and sleep problems of preschool children in Khon Kaen province, Thailand.

Methods: The cross-sectional study was collected from November to December 2019. Five hundred and ninety-seven questionnaires were completed by parents of preschool children from 11 preschool childcare centers, 3 kindergarten schools, 1 hospital child daycare and well child clinic at Khon Kaen University hospital.

Results: The average of total sleep durations was 11 hours 21 minutes (+78 minutes). 2-year group had longest duration and slightly declined in 3-year, 4-year and 5-year group, respectively. Mean time to make child sleep was 34 minutes (+28 minutes). Overall, 85% of children had set bedtime routine. In addition, less than half of all children presented with 35.7% did not watch tablet or media use before bedtime and 18.8 % of children had ever been time-out or punishment in their bedroom. Although bedtime resistance was found as most common problem which was 25% but caregiver reported-sleep problem was only 10.6%. Less of bedtime routines and time make child sleep more than 30 minutes was associated with bedtime resistance significantly.

Conclusion: Sleep problems are frequent in preschool children especially bedtime resistance, unfortunately result showed few concerned by caregivers. In addition, adequate bedtime routines also have positive consequences which should be provided and emphasized in all settings.

Keywords: Sleep habits • Sleep problems • Preschool children

Introduction

Sleep patterns reflect the physiologic and chronobiologic, developmental that are occurring across childhood. Insufficient quantity and poor quality of sleep result in excessive daytime sleepiness and decreased daytime alertness. Sleepy behaviors manifested as mood disturbance, somatic complaints, cognitive impairment, memory, attention, concentration, decision making, and problem solving, daytime behavior problem, hyperactivity, impulsivity, non-compliance, and academic problems [1].

Sleep problems means inadequate duration of sleep for age and sleep needs or insufficient sleep quantity. Disruption, fragmentation of sleep and poor sleep quality resulted in frequent, repetitive, and brief arousals during sleep. Sleep problems had high prevalence throughout childhood, in preschoolers found 25% to 50% [2-4]. Because parents may not always be aware of sleep problems, developmentally appropriate screening for sleep disturbances should take place in the context of every well child visit by using a simple sleep screening, e.g., the "BEARS" sleep screening tool [5].

In Thailand sleep problems found approximately 22.7-52% [6-8]. Therefore, sleep disturbances had been studied in various dimensions which most had studied in center area. However, there were differences between cultures and child rearing in each district.

The purpose of this study was to find sleep habits and sleep problems of children 2-5 year in Khon Kaen Province which in the Northeast of the country.

Material and Methods

The cross-sectional study was collected from November to December 2019. Data was collected in healthy children age 2 year to 5-year 11 month from the following sources: well child clinic Srinagarind hospital (healthy children who come for routine vaccination), kindergarten schools and child day cares in Khon Kaen province.

The questionnaire was administered by the investigator which had been done content validated. In part of sleep problems in the questionnaire was adapted from BEARS sleep screening tool. The items were modified for Thai children and care givers. Written permission from the author of the questionnaire was taken. The questionnaire covered two areas, demographic data and sleeping data. A consent form describing the study and requesting participation accompanied each questionnaire. Children were enrolled into the study only after the parents signed the consent form. Children with chronic illness, chronic lung disease, developmental delayed, neurologic condition, malnutrition heart disease and those who refused to consent were excluded from the study. Sample size was calculated before the study had begun. Total number of children required was calculated according to the formula=Z21-α/2 P (1-P)/d2, where P is the proportion of children having sleep problem, which according to the literature search is around 25% (0.25); d is the desired margin of error. Z is the critical value for alpha, for 0.05 alpha, Z is 1.96. So, the calculated sample size was 588 children.

Data was analyzed by SPSS version 26 KKU license. Percentage distribution and mean values were used for demographic data and sleep behavior questionnaire. Multivariate analysis was used to detect the independent predictors of sleep problems. The study was approved by The Khon Kaen University Ethics Committee on 7th November 2019. Ethic number HE621337.

Results

Data were collected from 11 preschool child-care centers in Khon Kaen, which 7 in Municipality, 3 kindergarten schools, which 1 was private school, 1 hospital child day care and well child clinic at Srinagarind hospital. 700 questionnaires were distributed and were received back 597 which completed forms. Response rate was 85.3%.

Children characteristics are summarized in Table 1 which stratified in 4 age groups as followed 2 year-group (age 24-35 month), 3 year-group (age 36-47 month), 4 year-group (age 48-59 month) and 5 year-group (age 60-71 month). 318 of children were male (53.3%). In 85 children were found over-nutrition which 32(5.4%) were obesity. 73 children (12.3%) had underlying diseases which involve respiratory tract were asthma 25(4.2%) and allergic rhinitis was 20 (3.4%). Children care givers were parents

67.8%. Mean age of parents was 33.47 years. Almost children slept with their care giver in same bedroom (co-sleep).

Table 1. Children characteristics.

		Age(month)				
		24-35	36-47	48-59	60-71	Total
		N=102 (%)	N=207 (%)	N=192 (%)	N=96 (%)	N=597 (%)
Sex	Male	50(49.0%)	108(52.2%)	98(51.0%)	62(64.6%)	318(53.3%)
Nutritional status	Normal	89(87.3%)	180(87.0%)	163(84.9%)	80(83.0%)	512(85.7%)
	Obesity	4(3.9%)	11(5.3%)	10(5.2%)	7(7.4%)	32(5.4%)
Underlying disease	None	88(86.2%)	187(90.3)	168(87.4)	81(84.3)	524(87.7)
	Asthma	7(6.9%)	6(2.9%)	8(4.2%)	4(4.2%)	25(4.2%)
	Allergic rhinitis	2(2.0%)	5(2.4%)	7(3.7%)	6(6.3%)	20(3.4%)
	Thalassemia	5(4.9%)	6(2.9%)	8(4.2%)	4(4.2%)	23(3.9%)
Children care giver	Parents	70(68.6%)	135(65.2%)	126(65.6%)	75(78.1%)	405(67.8%)
	Child relative	32(31.4%)	72(34.8%)	66(34.4%)	21(21.9%)	192(32.2%)
Age Care giver (y)	Parents	32.94 ± 8.2	32.54 ± 6.7	34.05 ± 6.5	34.67 ± 6.1	33.47 ± 6.9
	Child relative	53.25 ± 9.6	52.29 ± 9.9	53.41 ± 9.7	50.38 ± 10.5	52.6 ± 9.9
Co sleep in same room		101(99%)	204(98.6%)	190(99.0%)	94(97.9%)	589(98.7)

Bed-time activities of children had been divided to 6 components. Our study showed in Table 2. In 2-year group 55(53.9%) children were fed with bottle milk and still found 5(5.2%) in 5-year group. There were 174(29.1%) children did not have brush teeth before bed. In 2-year and 5-year group children had reading more than others which were 31.4% and 35.4% respectively. Almost half of children in all age group used media for their bed activities which were television 44.1% and tablet 41.4%.

Table 2. Bed-time activities.

Components		Age(month)				Total
		24-35	36-47	48-59	60-71	
		N=102 (%)	N=207 (%)	N=192 (%)	N=96 (%)	N=597 (%)
Nutrition	Bottle feed	55(53.9%)	77(37.2%)	42(21.9%)	5(5.2%)	179(30.0%)
	Cup milk	23(22.5%)	60(29.0%)	88(45.8%)	45(46.9%)	216(36.2%)
	Eat snack	8(7.8%)	17(8.2%)	19(9.9%)	10(10.4%)	54(9.0%)
Hygiene	Bath	61(59.8%)	152(73.4%)	127(66.1%)	71(74.0%)	411(68.8%)
	Teeth	67(65.7%)	143(69.1%)	142(74.0%)	71(74.0%)	423(70.9%)
Communication	Reading	32(31.4%)	39(18.8%)	49(25.5%)	34(35.4%)	154(25.8%)
	Lullabies	15(14.7%)	17(8.2%)	16(8.3%)	6(6.3%)	54(9.0%)
	Pray	14(13.7%)	27(13.0%)	39(20.3%)	22(22.9%)	102(17.1%)
	Teach homework	1(1.0%)	13(6.3%)	9(4.7%)	4(4.2%)	34(5.7%)
Physical contact	Massage	1(1.0%)	7(3.4%)	5(2.6%)	5(5.2%)	18(3.0%)
	Rocking	3(2.9%)	3(1.4%)	1(0.5%)	0	7(1.2%)

Media use	Television	41(40.2%)	93(44.9%)	82(42.7%)	47(49.0%)	263(44.1%)
	Tablet	39(38.2%)	88(42.5%)	75(39.1%)	45(46.9%)	247(41.4%)
Play	Toy play	47(46.1%)	101(48.8%)	81(42.2%)	37(38.5%)	266(44.6%)

Table 3 reported 9 items of bedtime routines. Overall, 85% of children had set bedtime routine. Bedtime and wake-up time were about the same time on school nights and non-school nights which was 80.4%. Children usually spend time outside for physical activity was 85.6%. Environment of child's bedroom found more comfortable temperature 98.5% than quiet and dark 63.7%. In addition, less than half of all children (35.7%) did not watch tablet or media use before bedtime and 18.8% of children had ever been time-out or punishment in their bedroom.

Table 3. Bedtime routines.

Component	Age(month)				Total
	24-35	36-47	48-59	60-71	
	N=102 (%)	N=207 (%)	N=192 (%)	N=96 (%)	N=597 (%)
Set bedtime routine	84(82.4%)	180(87.0%)	161(83.9%)	84(87.5%)	509(85.3%)
Bedtime and wake-up time be about the same on school and non-school nights	83(81.4%)	163(78.7%)	156(81.3%)	78(81.3%)	480(80.4%)
Child did not watch tablet or media used.	49(48.0%)	68(32.9%)	65(33.9%)	31(32.3%)	213(35.7%)
Heavy meal not in 2-hour before bedtime	91(89.2%)	191(92.3%)	183(95.3%)	90(93.8%)	555(93.0%)
Don 't use bedroom for time-out or punishment	84(82.4%)	169 (82.4%)	152(79.6%)	80(83.3%)	485(81.2%)
Child usually spends time outside for physical activity	90(88.2%)	177(85.5%)	162(84.4%)	82(85.4%)	511(85.6%)
Keep bedroom quiet and dark	68(66.7%)	140(67.6%)	119(62.0%)	53(55.2%)	380(63.7%)
Keep bedroom at a comfortable temperature	102(100%)	202(97.6%)	190(99.0%)	94(97.9%)	588(98.5%)
Keep TV out of bedroom	55(53.9%)	109(52.7%)	106(55.2%)	47(49.0%)	317(53.1%)

Mean total sleep durations was 11-hour 21 minute which in 2-year group had longest duration and slightly declined in 3-year, 4-yaer and 5-yaer group, respectively. Means day-time sleep duration was 1 hour 42 minutes, which also found longest duration in 2-year group. About nocturnal sleep was quite familiar in all age group. Furthermore, mean time to make child sleep was 34 minutes and more than 30 minutes in all age group (Table 4).

Table 4. Durations of sleep.

Component	Age(month)				Total
	24-35	36-47	48-59	60-71	
	N=102	N=207	N=192	N=96	N=597
Sleep onset latency Mean(± SD) (min)	33.97(± 26.1)	35.70(± 28.6)	36.83(± 31.2)	25.47 (± 22.5)	34.11 (± 28.3)
Nap (time)	1.10(± 0.33)	1.02(± 0.36)	0.97(± 0.31)	0.83(± 0.43)	0.99(± 0.36)
Daytime sleep	2 hr. 12 min.	1 hr. 54 min.	1 hr. 30 min.	1 hr. 7 min	1 hr. 42 min
Mean (± SD)	(± 46min)	(± 45min)	(± 43min)	(± 47min)	(± 49min)
Nocturnal sleep	9 hr. 55 min.	9 hr. 41 min.	9 hr. 37 min.	9 hr. 23 min.	9 hr 39 min
Mean (± SD)	(± 53min)	(± 45min)	(± 52min)	(± 52min)	(± 50min)
Total sleep duration	12 hr. 7min	11 hr. 35min	11 hr. 7 min	10 hr 30 min	11 hr. 21 min

Mean (± SD)	(± 60min)	(± 72min)	(± 72min)	(± 72min)	(± 78min)

Bedtime resistance was found as the most common problem which was 25.0%. Other problems were excessive daytime sleepiness, awakening during the night, irregularity of sleep duration, and snoring which data were shown in Table 5. Although lots of sleep problems found, caregivers reported their child had sleep problem was only 10.6%.

Table 5. Sleep problems.

	Age(month)				
	24-35	36-47	48-59	60-71	Total
	N=102 (%)	N=207 (%)	N=192 (%)	N=96 (%)	N=597 (%)
Bedtime resistance	26(25.5%)	54(26.1%)	47(24.5%)	22(22.9%)	149(25.0%)
Excessive daytime sleepiness	17(16.7%)	34(16.4%)	26(13.5%)	7(7.3%)	84(14.1%)
Awakenings during the night more than 1 time	32(31.4%)	32(15.5)	20(10.4%)	7(7.3%)	91(15.2%)
Irregularity of sleep duration	20(19.6%)	27(13.0%)	21(10.9%)	11(11.5%)	79(13.2%)
Snoring	21(20.6%)	38(18.4%)	23(12.0%)	15(15.6%)	97(16.2%)
Parent-reported sleep problem	10(9.8%)	20(9.7%)	23(12.0%)	10(10.4%)	63(10.6%)

However, variables that associated bedtime resistance were performed multiple logistic regression as shown in Table 6. At multiple logistic regression variables observed in bedtime resistance were an increase of one of bedtime routines was associated with a decrease bedtime resistance and time make child sleep more than 30 minutes, significantly.

Table 6. Multiple logistic regression variables observed in bedtime resistance.

	Adjusted odds ratio	P-value	95% CI
Age 24-35 months	1.025	0.996	0.602-1.835
Age 36-47 months	1.034	0.906	0.594-1.800
Age 48-59 months	0.978	0.94	0.556-1.723
Age 60-71 months	0.979	0.949	0.501-1.913
Family type	1.509	0.051	0.999-2.279
Bedtime routines	0.865	0.042	0.753-0.995
Sleep onset latency more than 30 minutes	2.079	0	1.383-3.126

In addition, Pearson Chi-Square was analyzed sleep duration, among children who had total sleep duration less than 11 hours was associated with parent-report sleep problem significantly, as shown in Table 7. This mean in children group sleep duration less than 11 hour which less than average of sleep recommendation by age9 or insufficient sleep could make concerning of parents. In contrast group of adequate sleep found bedtime resistance does not difference from insufficient sleep group.

Table 7. Factors associated with parent-report sleep problem.

	Total sleep ≥ 11 hours	Total sleep<11 hours	P-value
	N=442 (%)	N=155 (%)	
Bedtime resistance	110 (24.9%)	39 (25.2%)	0.946
Parent-report sleep problem	39 (8.8%)	24(15.5%)	0.02

Discussion

Among sleep habits in our studies, first total sleep time and nocturnal sleep time had been focused. Although total sleep time of children in this study was within range of sleep recommendation [9], but the nocturnal time sleep of all age groups was slightly lower than average sleep by age [10] which should be about 11 hours each night.

In addition, the bedtime, total sleep time, nocturnal sleep time and sleep onset latency in our study had been compared to sleep data of preschool children in other countries, Mindell et al. [11]. Almost results were similar except sleep onset latency, which in our study is slightly longer. Sleep onset latency referred to time to fall asleep of children after lights out.

Two possible causes were parents in our study had lots of bedtime activities with their children and had no limit-setting enough.

Conceptually, a bedtime routine that is longer than 30-40 minutes may also be viewed as maladaptive, as a prolonged bedtime routine may result in a later child bedtime and in turn a shorter sleep duration [12]. However, in our study sleep duration of children who had sleep onset latency more than 30 minutes did not differed from shorter sleep onset latency group (P=0.443)

Furthermore, the data was compared to previous study in Thailand Chayanont [13], sleep characteristic of children 3-6 year in Bangkok their average total sleep was 10 hours per day, which less than our study. This reflected difference cultural and lifestyle between metropolis and Northeast region, which is not hustle life as in capital city.

Co-sleeping was another difference point because almost children in our study sleep with their caregivers, which found less in capital city. This might be because of low to middle socioeconomic status and expanded families in our region. However, children could sleep in enough duration a day.

Parents and child spent time together most during bedtime, for interactive bedtime activities reading was found 25.8% compared to Thai children group shown increasing from 10%, meanwhile the number was still less than overall children which were 28% [12]. In contrast media used during bedtime was quite high. Watch television and tablet used were 44.1% and 41.4% respectively, which is similar to Mindell JA et al. [12] and also Hale et al. [14].

According to digital era, Chonchaiya et al. [15] reported 50-75% of family had at least 1 electronic screen media in child's bedroom, as in our study parent report TV in child's bedroom 53%. Longitudinal study of Vijakkhana et al. [16] show evening media exposure during infancy reduces night-time sleep at 12 months of age.

Concerning for effect of media in our children, night time sleep and total sleep duration were analyzed, however in our study result had not been difference in children between media exposure group and non-exposure group, however children in our study should be further monitor, though.

As evidences based supported about benefit of bedtime routines which included decreased bedtime resistance, more likely to get to bed on time, shorter sleep onset latency, longer nighttime sleep duration, fewer night awakenings, and decreased caregiver reported sleep problems [17-19]. In our study shown benefit either. Bedtime routines were adapted from basic principles of healthy sleep for children [1] and simply defined to caregiver. The significantly association was increasing from everyone bedtime routines shown decrease bedtime resistance (P<0.05) by multiple logistic regression analysis. Another effect variable was sleep on set latency less than 30 minutes, which showed decrease bedtime resistance significantly (P<0.05).

For concerning sleep problem, parent-reported sleep problem in our study shown slightly lower than both previous studies Sudjan [8] and Murthy et al. [20]. During typically development children sleep problem did not seem to noticeable parent until duration of children sleep had been affected. The present sample has shown that preschoolers with total sleep duration less than 11 hours were found to be associated with parents to subjectively view their child's sleep as a problem significantly. Different from other two studies Adair et al. [21] and Bayer et al. [22] shown frequent night wakings (>3) were important reasons.

Sleep problem defined as caregivers reported only one problem from BEARS questionnaire which was 54.8%. The various types of sleep problems that occur throughout childhood, in this study found bedtime resistance as most common problem which related with inconsistence of bedtime routine and not limit setting. About other problem, sleep association found in 2-year group more than half need to feed via bottle to help child fall asleep. In older group especially 5-year group nearly half of children found use media to help child fall asleep.

For parenting style and parent child relationship that could influence children sleep were not reported in this study this would be a limitation of our study. However, these should be further evaluated in the future.

Conclusion

The data in this study showed familiar sleep pattern in preschool in Thailand among each districts and other countries. However, the difference was sleep on set latency which reflected bedtime activities and environment.

Adequate bedtime routines have strong positive consequences which should be provided and emphasized in all settings.

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