Sleep Habits and Factors Associated with Sleep Problems Among Children in Southeastern Turkey

Güneydoğu Anadolu Bölgesindeki Çocuklarda Uyku Alışkanlıkları ve Uyku Problemleri ile İlişkili Faktörler

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ABSTRACT Objective: Sleep has an important role in child development and is necessary for supporting optimal health for lifetime. This study examined the sleep habits of children in southeastern Turkey and certain risk factors that contribute to sleep problems. **Material and Methods:** The study included 300 parents who visited the paediatric outpatient department of Gaziantep University Hospital and agreed to complete the questionnaire. The questionnaire was based on the significant variables found in a review of the previous literature on childhood sleep, and was examined tested in a pilot study. Statistical significance was determined as $p<0.05$. **Results:** The ages of the children (171 males, 129 females) included in the study ranged from 1 month to 12 years (median age 2.0 years). Fifty-three percent (128) of the children experienced night waking, 38.0% (114) had difficulty falling asleep and 39.3% (118) demonstrated bedtime resistance. Difficulty in falling asleep and bedtime resistance were more common among children whose parents did something to soothe them when they woke up crying, and whose bedtime varied each night ($p<0.05$). Night waking was affected by factors such as soothing the child when waking up crying, irregular bedtime and sleeping during the daytime ($p<0.05$). Parents were more likely to soothe the children who slept in the same room ($p<0.001$). The mean night sleep duration was longer among children whose parents did preparations before sleeping ($p=0.010$). **Conclusion:** Sleep problems are very common in childhood. Certain factors such as irregular bedtime routines, varying bedtimes, and soothing activities are important factors in the development of sleep problems. Therefore, sleep problems and sleep quality should be assessed in routine visits to the paediatrician.

Key Words: Sleep; child; Turkey; parasomnias

ÖZET Amaç: Çocuk gelişiminde önemli bir role sahip olan uyku, yaşam boyunca sağlıklı olmak açısından gereklidir. Bu çalışmada, Güneydoğu Anadolu bölgesindeki çocukların uyku alışkanlıkları ve uyku problemlerinin gelişimine katkıda bulunan bazı risk faktörlerinin belirlenmesi amaçlandı. **Gereç ve Yöntemler:** Çalışmaya Gaziantep Üniversitesi Tıp Fakültesi Çocuk Sağlığı ve Hastalıkları Anabilim Dalı polikliniklerine başvuran ve anket formunu doldurmayı kabul eden 300 aile dâhil edildi. Anket formu, çocukluk çağı uykusu hakkında daha önce yayımlanan literatürlerdeki önemli değişkenler incelenerek hazırlandı ve bir pilot çalışma ile soruların anlaşılabilirliği incelendi. Çalışmada $p<0.05$ değeri istatistiksel olarak anlamlı kabul edildi. **Bulgular:** Çalışmaya alınan çocukların (171 erkek, 129 kız) yaşları 1 ay-12 yaş arasında değişmekteydi (ortanca yaş 2,0 yıl). Çocukların %53'ünde (128) gece uyanmaları, %38'inde (114) uykuya dalma zorluğu ve %39,3'ünde (118) yatağa gitmeye direnme söz konusuydu. Uykuya dalma zorluğu ve yatağa gitmeye direnme, gece ağlayarak uyandığında sakinleştirilmeye çalışılan ve her gece farklı saatlerde uyuyan çocuklarda daha fazla görülmekteydi ($p<0,05$). Gece uyanmaları, ağlayarak uyanan çocuğun sakinleştirilmeye çalışılması, her gece farklı saatlerde uyuma ve gündüz uykusu uyuma gibi faktörlerden etkilenmekteydi ($p<0,05$). Çocukla aynı odada uyuyan ebeveynlerde sakinleştirme aktivitelerine daha fazla rastlanmaktaydı ($p<0,001$). Uyumadan önce hazırlık yapılan çocuklarda uyku süresi daha uzundu ($p=0,010$). **Sonuç:** Çocukluk çağında uyku problemleri hayli yaygındır. Uyku zamanı rutinlerinin düzensiz oluşu, her gece farklı saatlerde uyuma ve sakinleştirme aktiviteleri, uyku problemlerinin gelişiminde önemli faktörlerdir. Bu nedenle rutin çocuk izlemi vizitlerinde pediatristler tarafından çocukların uyku kalitesi ve uyku problemleri sorgulanmalıdır.

Anahtar Kelimeler: Uyku; çocuk; Türkiye; uyku bozuklukları

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Sleep has an important role in child development and is necessary for supporting optimal health for lifetime. Sleep not only affects physical, behavioural and emotional development but also plays an important role in cognitive development, including learning and attention. Cultural, genetic, environmental and social factors are of crucial importance in the development of sleep habits.[1-3]

Sleep problem is among the most common reasons to visit the paediatricians.[4] Twenty-five percent of children experience sleep problems during childhood and night waking/bedtime resistance is reported most commonly.[1,5] Sleep problems may persist if not adequately managed and may lead to health issues in children such as obesity, insulin resistance, cardiovascular/immune system disorders, anxiety, and depression.[1,6,7]

The most common way of obtaining information about the sleep habits of children is through observation of the families.[8-10] Identifying sleep characteristics such as the duration of sleep and bedtime/daytime sleep habits is very important in understanding sleep-related problems.[11] However, sleep problems in childhood may remain undetected during routine visits and little is known about how parents describe/report sleep problems in their children.[12]

Since sleep problems are reported to be associated with health functions, determination of sleep habits and patterns in children, identification of risk factors that could have an effect on sleep problems and educating parents on this issue have become increasingly important. The aim of this study was to assess the sleep habits in the general paediatric population in Southeastern Turkey and to examine the risk factors that may contribute to sleep problems.

MATERIAL AND METHODS

This study included 300 parents with children aged 1 month-12 years who visited the paediatric outpatient department of Gaziantep University Hospital between June and December 2008 and agreed to complete the questionnaire. The sample size was estimated using a power calculation based on other studies.[8,11,13-16] The minimum sample size was determined as 190 persons at 80% power level with an α error of 5%. The study was approved by the local ethics committee.

QUESTIONNAIRE

The questionnaire was developed by two centres (İstanbul University and Gaziantep University) based on the significant variables found in a review of the previous literature on childhood sleep[8,11,13-16] and was tested in a pilot study. The previous studies reported sleeping problems like bedtime resistance, number of night-time waking, difficulty in falling asleep, difficulty maintaining sleep, sleeping in the parental bed at night, sleep onset time, mean sleep duration at night, napping, daytime sleep duration, and total sleep duration.[8,11,13-16] After receiving information on the aim of the study, then each parent completed the questionnaire. For illiterate parents, the nurse completed the questionnaire by interviewing the parents. The questionnaire included 68 items. The first part of the questionnaire included demographic information such as the child's age, gender, birth week, birth weight, number of siblings, parents' age, parents' education level and employment, family structure and type of house. The second part questioned the child's sleep habit and related factors such as duration of daytime sleep, number of nighttime waking, duration of sleep, difficulty falling asleep and bedtime resistance, regular sleeping time at night, soothing activities by parents when the child wakes-up, method of going to sleep, place where the infant sleeps.

Since sleep habits and sleep problems change considerably from infancy to older age, subjects were examined in 5 groups according to the age.

STATISTICAL ANALYSIS

All statistical data were analyzed using the Statistical Package for the Social Sciences Program, SPSS 13.00 for Windows (SPSS Inc., Chicago IL, USA). Frequency distributions were determined and mean numeric values ± standard deviations or case numbers were given as percentages (%). Different personal, familial, and environmental factors were compared with respect to sleep problems using the

chi-square test. The independent samples t-test was used to determine differences between groups for continuous variables and the Pearson's correlation relationship was used between pairs of continuous variables.

Logistic regression analysis was used to demonstrate the factors that affect sleep problems. The variables that were influencing sleep problems in children were selected from our study. Dependent variables were sleep problems, difficulty in falling asleep, bedtime resistance, and night waking. The independent variables were soothing activity, varying bedtimes each night, and duration of daytime sleep. Statistical significance was determined as $p<0.05$.

RESULTS

The study included 300 parents. The age of the children ranged from 1 month-12 years (median age 2.0 years). One hundred seventy-one (57%) children were male and 129 (43%) were female. The average age of the mothers and fathers was 29.3 ± 5.7 years (17-47) and 33.6 ± 6.7 years (19-67), respectively. Subjects were examined in 5 groups according to age [0-6 months (51/300, 17.0%); 6-12 months (38/300, 12.7%); 13-24 months (41/300, 13.6%); 2-5 years (95/300, 31.7%); 6 years and older (75/300, 25.0%)].

Thirty-eight percent (114) of the children experienced difficulty in falling asleep at least once a week, 39.3% (118) demonstrated bedtime resistance at least one night per week, and 52.7% (158) experienced a night waking problem at least once a week.

Fifty-seven percent (170) of the parents answered "yes" to the question, "Do you do something to soothe your child when he/she wakes up crying?". Among the parents who soothed their child, strategies included breastfeeding (44, 25.7%), talking to the child (35, 20.5%), giving milk or food (32, 18.7%), and holding the child on their lap (25, 14.6%). Difficulty in falling asleep, bedtime resistance and night waking were more common among children older than 2 years whose parents did something to soothe them when they woke up crying at night (Table 1).

Mean sleep duration at night was 8.3±1.9 hours (3-12 hours). Seventy percent (210) of the children had regular bedtimes every night. Sleep problems such as difficulty in falling asleep, bedtime resistance and night waking were less common among children older than 2 years whose bedtime was consistent each night (Table 1).

Sixty-six percent (196) of the children slept during daytime every day. Mean daytime sleep duration was 2.6±1.7 hours (1-6 hours). Difficulty in falling asleep and night waking were more common among children older than 2 years who fell asleep during daytime every day (Table 1). When daytime sleep frequency increased, night waking frequency also increased ($r= 0.368$, $p<0.001$). A negative correlation was found between daytime sleep duration and night sleep duration ($r=-0.201$, $p<0.001$).

There was no relationship between sleep problems (difficulty in falling asleep, bedtime resistance, night waking) and soothing, sleeping time each night, and daytime sleeping in children aged 0-12 month.

Most of the children (169, 56%) slept in the same room with their parents, but in separate beds, 28.0% (84) slept in their own room with a sibling, and 7.7% (23) slept in their parents' bed. Sleep problems such as difficulty falling asleep and night waking were more common among children who slept in their parents' room (same room: 80/114, 70.2%; separate rooms: 107/186, 57.5%; $p=0.028$; same room: 112/158, 70.9%; separate rooms: 75/142, 52.8%, $p=0.001$; respectively). Parents were more likely to soothe the children who slept in the same room (same room: 124/187, 66.3%; separate rooms: 46/113, 40.7%, $p<0.001$) than those who slept in their own rooms.

The majority of families (247, 82%) did routine preparations before sleeping. The most common practice was to feed the child (145, 48.3%), followed by changing the diaper (100, 33.3%), taking the child to bed (88, 29.3%), singing a lullaby (72, 24%), rocking the cradle (72, 24%), and holding the child on their lap (71, 23.7%). The mean night sleep duration was longer among children

TABLE 1: The relationship between sleep problems and soothing, sleeping time, and daytime sleeping according to the age group.

		13-24 months		
		Difficulty falling asleep (n/total, %)	Bedtime resistance (n/total, %)	Night waking (n/total,%)
Soothing the child when waking up	Yes	17/23, 73.9%	11/23, 22.2%	17/23, 73.9%
	No	3/18, 16.7%	4/18,47.8%	8/18, 44.4%
	p	<0.001	0.091	0.055
Regular sleeping time each night	Yes	11/28, 39.3%	7/28, 25.0%	16/28, 57.1%
	No	9/13, 69.2%	8/13, 61.5%	9/13, 69.2%
	p	0.074	0.038	0.460
Daytime sleep every day	Yes	19/35, 54.3%	14/35, 40.0%	24/35, 68.6%
	No	1/6, 16.7%	1/6, 16.7%	1/6, 16.7%
	p	0.089	0.273	0.026
	2-5 years			
Regular sleeping time each night	Yes	22/66, 33.3%	26/66, 39.4%	27/66, 40.9%
	No	16/29, 55.2%	23/29, 79.3%	21/29, 72.4%
	p	0.045	<0.001	0.005
Daytime sleep every day	Yes	30/60, 50.0%	34/60, 56.7%	34/60, 56.7%
	No	8/35, 22.9%	15/35, 42.9%	14/35, 40.0%
	p	0.009	0.194	0.117
	6 years older			
Soothing the child when waking up	Yes	8/28, 28.6%	9/28, 32.1%	15/28, 53.6%
	No	4/47, 8.5%	8/47, 17.0%	7/47, 14.9%
	p	0.047	0.130	<0.001
Regular sleeping time each night	Yes	7/58, 12.1%	8/58, 13.8%	16/58, 27.6%
	No	5/17, 29.4	9/17, 52.9%	6/17, 35.3%
	p	0.086	0.002	0.539
Daytime sleep every day	Yes	6/24, 25.0%	5/24, 20.8%	12/24, 50.0%
	No	6/51, 11.8%	12/51, 23.5%	10/51, 19.6%
	p	0.145	0.795	0.007

TABLE 2: Distribution and comparison of sleep problems in children according to age groups.

	0-6 months (n/total, %)	7-12 months (n/total, %)	13-24 months (n/total, %)	2-5 years (n/total, (%)	6 years and older (n/total, %)	p
Difficulty falling asleep	24/51,* 47.1%	20/38, † 52.6%	20/41, ‡ 48.8%	38/95, # 40.0%	12/75, 16.0%	<0.001
Bedtime resistance	18/51, 35.3%	19/38, † 50.0%	15/41, 36.6%	49/95, # 51.6%	17/75, 22.7%	0.002
Night waking	35/51, * 68.6%	28/38, † 73.7%	25/41, ‡ 61.0%	48/95, # 50.5%,	22/75, 29.3%	0.001
Waking up crying at night	35/51, * 68.6%	25/38, † 65.8%	26/41, ‡ 63.4%	56/95, # 58.9%	23/75, 30.7%	<0.001

*: Significant 6 years and older versus 0-6 months age group

†: Significant 6 years and older versus 7-12 months age group

‡: Significant 6 years and older versus 13-24 months age group

#: Significant 6 years and older versus 2-5 years

whose parents made such preparations before sleeping (8.5±1.9 hrs) compared to other children (7.9±1.4 hrs) (p=0.010, t: -2.612).

Distribution and comparison of sleep problems among children according to age groups were shown in Table 2. Night waking (r=-0.255, p=0.01)

and daytime sleep duration (r=-0.14, p=0.04) decreased with age, while sleep duration at night increased with age (r=+0.199, p<0.001). A negative correlation was determined between the age of the children and the daytime sleep frequency (r=-0.338, p<0.001).

No relationship was found between sleep problems and breastfeeding, gender or the educational level of the parents.

Logistic regression analysis of factors that were determined to influence the sleep problems in children showed that difficulty in falling asleep was more common among children whose parents did something to soothe them when they woke up crying [Odds ratio (OR) 2.418; 95% confidence interval (CI) 1.390-4.205; p=0.002] and whose bedtime varied each night (OR 2.004; 95% CI 1.151-3.491; p=0.014). Some factors such as soothing the child when he/she wakes-up crying (OR 1.825; 95% CI 1.090-3.057; p=0.022) and varying sleeping times each night (OR 3.158; 95% CI 1.860-5.361; p<0.001) were more effective in the development of bedtime resistance. Night waking was affected by factors such as doing something to soothe the child when waking up crying (OR 1.751; 95% CI 1.026- 2.988; p=0.040), varying sleeping times every night (OR 2.327; 95% CI 1.315-4.120; p=0.004) and sleeping during daytime (OR 2.121; 95% CI 1.204-3.739; p=0.009). All models were statistically significant (p<0.05).

DISCUSSION

In the present study, the prevalence of night waking was 68.6% during the first 6 months of life and 73.7% at 7-12 months, and its frequency thereafter decreased with age. Changes occur in infant sleep patterns at 4-6 months and at 10-12 months and with the occurrence of circadian rhythm at around 4 months, children begin to have a sound sleep of 7 hours.[9,17,18] Night waking frequency was reported in the United States as 35%, in Switzerland as 30.8%, and in Australia as 17.8%.[19-21] In our study, night waking was more common than reported in the literature. Night waking is the best predictor of "severe sleep problem" during childhood.[22] Previous studies showed that night waking problems in children were related to the child's nature, family, cultural differences, and stressful life conditions.[5,23] The frequency of night waking is also related to breastfeeding, sleeping in the same room with the parents, bottle-feeding, taking the child to the parental bed, and regular fulfilment of bedtime routines.[14,24,25] In the present study, practices such as breastfeeding, giving milk or food, and soothing the child on lap if waking crying at night were very common. Night waking problems were more common among children growing up with such practices. In the literature, the lower frequency of night waking than in our study may be attributed to the unawareness of parents of night waking due to sleeping in separate rooms. In our study, most of the children slept in the same room with parents, and those parents may have reported increased night waking because of increased awareness from stimuli of children.

Difficulty falling asleep was reported in 15-40% of infants, preschoolers or adolescents.[15,17,26,27] The frequency of difficulty falling asleep in this study was 47.1%, 52.6% and 40.0% among 0-6, 7-12 month-old children and in preschoolers, respectively. The various results reported from different countries show that cultural, ethnic and familial factors have an effect on the development of sleep behaviour in children.[5] Behaviours such as giving food or drink to children, sleeping together in the mother's bed, and taking the child out of bed to make him/her comfortable, have negative impacts on night terror, total sleep duration, and difficulty falling asleep.[15] Moore reported that if the parents brought the child into the bed, he/she would eventually be unable to fall asleep without a parent. The child likely will also have difficulty returning to sleep independently during normative night waking.[6] Consistent with the literature, difficulty falling asleep was determined to be more common among children soothed by parents when awaking at night, in our study. These findings suggest that parental behaviours may play an important role in the development of sleep problems in children.

The frequency of bedtime resistance in school-age children is reported as 10-20%.[28,29] In Switzerland, bedtime resistance was reported as 18.6% and

8.3% in 3-year and 9-year old children, respectively.[21] In our study, bedtime resistance was present in 51.6% and 22.7% of 2-5 years old and school-age children, respectively. Interestingly, our study also demonstrated that bedtime resistance was more common in children whose parents practiced sooting activities when waking up crying and who had varying sleeping times each night. Factors such as familial irregularities at bedtime are effective on bedtime resistance, and this is suggested to account for for the different rates reported in various studies.[8]

Practicing regular bedtime routines will reduce bedtime difficulties and night wakings.[4] The discrepancies in different studies are due to parental perceptions of whether sleep behaviours are considered problematic or normal. Parental cognition and perceptions regarding childhood sleep are shaped by their cultural values, beliefs and by experience with their own child. Cultural norms affect the sleep habits of children according to seasonal, religious, spiritual and social factors. These norms determine the line between normal and problematic sleep. Parents in Asian countries are 6.5 times more likely to define their child's sleep as a severe sleep problem.[5,8,22,24,25]

Sleeping in the parental bed during the night causes some changes in children's sleep patterns such as decreased difficulty in falling asleep and increased night waking. In addition, sleeping in the parental bed is a risk factor for sleeping less than 6 hours.[15,21,30] Simard et al. reported that, as the needs of the children sleeping with their mother were met immediately, the children could not develop self-comfort abilities when they encountered stress.[15] The frequency of sleeping in the parental bed is reported as 5-15% in various studies[11,20,21,31] and 7.7% in our study. In the present study, most of the children slept in the same room with their parents but in separate beds. This result may be related to the cultural practices in Southeastern Turkey. Culture plays an important role in determining parental practices and expectations about children's sleep. Inter-cultural comparisons will also help to understand the interaction of culture and biology in sleep regulation. Co-sleeping (sleeping in the parental room or bed) is suggested to be mainly influenced by environmental factors and family habits. Our study showed that parents were more likely to soothe the children who slept in the same room and soothing activities increased sleep problems such as difficulty falling asleep, bedtime resistance, and night waking. These findings highlight the important role of parental behaviours on sleep problems in children.

While it is very difficult to determine the actual sleep duration in children, bedtime is an important factor in determining sleep duration.[32] Sleep duration at night is determined by the period between bedtime and waking up during which children remain in the bed.[11,21] In the present study, the mean sleep duration at night was 8.3±1.9 hours at all ages (3-12 hrs). Sleep duration at night increased with age as a result of decreasing daytime sleep duration in 1 year old children.[7] Studies from different countries and different age groups reported the night-time sleep duration as 7.7±1.3 to 11.7±1.0 hours.[9,11,13,14,33] Behaviours such as breastfeeding, sleeping in the same room and the same bed with parents or siblings, bottle-feeding when the child wakes up at night, and bringing the child to the parents' bed reduce sleep duration.[14,30] An interesting finding of our study is the longer mean night sleep duration among children whose parents did preparations before sleeping. Mindell et al demonstrated that total night sleep duration was associated with bedtime, falling asleep independently, and having a consistent bedtime routine.[25] Children who sleep in a separate room are significantly more likely to fall asleep independently than their counterparts who sleep in their parents' room.[25] Because, the shorter sleep duration when sleeping in the same room with parents may be due to the lack of falling asleep independently. In addition, common practices in our study such as feeding when waking at night and holding the child on the lap may account for the short sleep duration. Moreover, the date of the study is also extremely important. Sleep duration varies according to the child's age and birth year because of change in cultural habits and beliefs by families over the years.

This study has some limitations. First, sample size was small and the age groups covered a wide range. Second, children's sleep habits were assessed by report from parents rather than objective instruments. However, other studies on childhood sleep habits, the results of which were compared with ours, were also parental report studies, and our findings are similar to the results of other studies. This is a preliminary study for the assessment of children's sleep habits. Further studies are needed including a larger sample size, specific age groups, and in different regions in Turkey.

In conclusion, sleep problems are very common in childhood. Certain factors such as irregular bedtime routines, irregular sleeping times each night, and soothing activities are factors in the development of sleep problems. While these problems decrease with age, they might become chronic, thus affecting the quality of life and requiring medical and psychological therapy. Paediatricians should be aware of sleep disorders and risk factors originating from the parents and child. Thus, we recommend assessing sleep problems and sleeping quality during routine visits to the paediatrician.

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