Sleep Behavior of Children Born Preterm and Its Relationship with Parental Sleep Quality

Prematüre Çocukların Uyku Davranışları ve Ebeveyn Uyku Kalitesi ile İlişkisi

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ABSTRACT

Objective: We aimed to evaluate the sleep characteristics of children born preterm and the relationship between these characteristics and parental sleep quality.

Material and Methods: In this cross-sectional study, the parents of children born preterm were administered the Child Sleep Habits Questionnaire (CSHQ) and Pittsburgh Sleep Quality Index (PSQI).

Results: The study included 89 children born preterm with a current mean age of 38.7±55 months. According to the CSHQ, 95.5% of children had a sleep disorder. According to the PSQI, 48.9% of the mothers, 35.3% of the fathers had poor sleep quality. Maternal and paternal total PSQI scores were significantly correlated (r=0.373, p=0.030). In regression analysis of factors that may affect total CSHQ score, sleep disorder was found to be associated with low maternal education, hemiplegia, no smoking in the home (p=0.001, p<0.001and p<0.001 respectively). When factors that may affect total PSQI score were examined by regression analysis, the odds of poor sleep quality were 5.5 times higher in mothers with a high education level, 4 times higher in mothers with a history of multiple pregnancy (p=0.006 and p=0.027).

Conclusion: Our study revealed a high rate of sleep disorder in children with a history of preterm birth and high rates of poor sleep quality among their parents.

Key Words: Behaviors, Child, Parental, Premature, Sleep

ÖZ

Amaç: Prematüre doğan çocukların uyku özelliklerini ve bu özellikler ile ebeveyn uyku kalitesi arasındaki ilişkiyi değerlendirmeyi amaçladık.

Gereç ve Yöntemler: Bu kesitsel çalışmada prematüre doğan çocukların ebeveynlerine Çocuk Uyku Alışkanlıkları Anketi (ÇUAA) ve Pittsburgh Uyku Kalitesi İndeksi (PUKİ) uygulandı.

Bulgular: Çalışmaya mevcut yaş ortalaması 38.7±55 ay olan preterm doğan 89 çocuk dahil edildi. ÇUAA'ya göre çocukların %95.5'inde uyku bozukluğu vardı. PUKİ'ye göre annelerin %48.9'u, babaların ise %35.3'ünün uyku kalitesi kötüydü. Anne ile babanın toplam PUKİ puanları arasında anlamlı korelasyon vardı (r=0.373, p=0.030). Toplam ÇUAA puanını etkileyebilecek faktörlerin regresyon analizinde uyku bozukluğunun anne eğitiminin düşük olması, hemipleji, evde sigara içilmemesi ile ilişkili olduğu belirlendi (sırasıyla p=0.001, p<0.001, p<0.001). Toplam PUKİ puanını etkileyebilecek faktörler regresyon analizi ile incelendiğinde, uyku kalitesinin kötü olma ihtimali eğitim düzeyi yüksek olan annelerde 5.5 kat, çoğul gebelik öyküsü olan annelerde 4 kat daha yüksekti (p=0.006 ve p=0.027).

Sonuç: Çalışmamız, preterm doğum öyküsü olan çocuklarda yüksek oranda uyku bozukluğu olduğunu ve ebeveynlerinde yüksek oranda uyku kalitesinin kötü olduğunu ortaya koydu.

Anahtar Sözcükler: Davranış, Çocuk, Ebeveyn, Prematüre, Uyku

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INTRODUCTION

Sleep problems are common in children, reported at rates of 20-30% (1). The prevalence of prematurity, defined as birth before 37 weeks of gestation, is reported to be approximately 10-12% (2,3). There are few studies and limited data on the sleep behaviors of children born preterm and their effects on the sleep quality of their parents (4-6). In this study, we aimed to evaluate the sleep behaviors of children with a history of prematurity and the relationship between these behaviors and their parents' sleep quality.

MATERIALS and METHODS

In this observational, cross-sectional study, the Children's Sleep Habits Questionnaire (CSHQ) and Pittsburgh Sleep Quality Index (PSQI) were administered between January and June 2023 to the parents of children with a history of preterm birth at Ali Kemal Belviranlı Maternity and Children's Hospital or Konya City Hospital (7-11).

The parents of children between 2 months and 18 years of age who were being followed up in the pediatric neurology outpatient clinic of Ali Kemal Belviranlı Maternity and Children's Hospital and Konya City Hospital for a history of prematurity were included in the study after providing written informed consent. Any children or parents unwilling to participate in the study were excluded.

Demographic and clinical data were collected from patient files, and sleep-related data were collected by administering a survey to the parents in the pediatric neurology outpatient clinic or sending the survey home to be completed and returned. Both parents of each child included in the study were asked to complete the sleep questionnaires. The response rate was 98.9% among the mothers (n=88) and 38.2% for the fathers (n=34).

Data Collection Tools

Children's Sleep Habits Questionnaire: The CSHQ was developed by Owens et al. (7) to investigate children's sleep behaviors and sleep-related problems. The scale consists of 8 subscales (sleep anxiety, bedtime resistance, delayed sleep onset, sleep duration, night awakenings, parasomnias, sleep-disordered breathing, and daytime sleepiness) with a total of 33 items. Parents complete the scale retrospectively based on their child's sleep habits over the previous week. Most items in the scale are coded by the frequency of the behavior as usually (3 = 5-7 times/week), sometimes (2 = 2-4 times/week), or rarely (1=0-1 times/week). Six items (1,2,3,10,11, and 26) are reverse coded and two items (32 and 33) are coded as 0 = not sleepy, 1 = very sleepy, and 2 = falls asleep. Total scores above the cut-off (41 points) are regarded as indicative of clinically significant sleep disorder. The CSHQ also includes 3 open-ended questions about the child's usual bedtime, total sleep time, and time spent awake at night (7). The CSHQ questionnaire has been demonstrated to be valid and reliable for children aged 2 months to 18 years (7-9). The Cronbach's alpha value of the CSHQ was reported as 0.78 (7,8).

Pittsburgh Sleep Quality Index: The PSQI is a self-report measure consisting of 7 subscales (subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction) with 19 items. A total score higher than 5 indicates poor sleep quality and was shown to have a diagnostic sensitivity of 89.6% and specificity of 86.5% (10,11). The Cronbach's alpha value of the PSQI was reported as 0.83 (10).

In addition to these assessments, sociodemographic characteristics such as age, sex, parental consanguinity, presence of siblings, parental education level, family structure (nuclear/extended), daily media use, and clinical data such as gestational age at birth, physical examination findings, and neurological development were recorded on a patient information form.

For statistical comparison, children born at a gestational age of 34 to 37 weeks were grouped as late preterm, and those born before 34 weeks of gestation were grouped as early preterm (12-14).

The study received ethics committee approval from Karatay University (date: 30.12.2022, meeting no: 12, decision no: 2022/029).

Statistical Analysis:

The data were analyzed using IBM Statistical Package for the Social Sciences, version 23.0 (SPSS Inc., Armonk, NY, IBM Corp., USA) The Shapiro-Wilk and Kolmogorov-Smirnov tests were used as normal distribution tests. Mann-Whitney U test was used for pairwise comparisons of quantitative data that were not normally distributed. Chi-square test, Yates correction, and Fisher's exact test were used to compare categorical variables between the groups. Robust regression analysis was used to examine the variables affecting children's sleep scores, as the dependent variable did not show a normal distribution. Binary logistic regression analysis was used to examine risk factors associated with maternal and paternal sleep disturbance. Significance was accepted at $p<0.050$.

RESULTS

The study included 89 children (57.3% girls) with a mean age of 38.7±55 months. Their clinical features are summarized in Table I. The mean sleep durations were 9.8±2.6 hours for the children, 7.4±1.7 hours for mothers, and 7.5±1.2 hours for fathers, and 95.5% of the children had sleep disorder according to the CSHQ cut-off value. Most of the children went to sleep between 22:00 and 22:59 (41.6%) and woke up between 07:00

Table I: Demographic and Clinical Characteristics

Characteristic	
Parental consanguineity *	13 (14.6)
Parents are married*	83 (93.3)
Maternal education level (high school or lower)*	70 (78.7)
Paternal education level (high school or lower)*	73 (82.0)
Maternal employment status (working)*	10 (11.2)
Paternal employment status (working)*	85 (95.5)
Smoking in the home*	38 (42.7)
Nuclear family*	75 (84.3)
Early preterm*	63 (70.8)
Asphyxiation*	5 (5.6)
Multiple pregnancy*	16 (18.0)
In vitro fertilization*	8 (9)
Advanced maternal age at birth (>35)*	9 (10.1)
Prenatal problem*	40 (45)
Mode of delivery (cesarean section)*	76 (85.4)
Parent-child shared bedroom*	74 (83.1)
History of intrauterine growth restrictio*	7 (7.9)
Microcephaly*	8 (9)
Malnutrition*	8 (9)
Short stature*	6 (6.7)
Normal prognosis*	37 (41.6)
Developmental delay*	23 (25.8)
Gross motor delay*	18 (20.2)
Fine motor delay*	14 (15.7)
Cognitive delay*	6 (6.7)
Language-related delay*	16 (18)
Social or individual/self-care delay*	8 (9)
History of seizure*	8 (9)
History of jaundice*	39 (43.8)
Retinopathy of prematurity*	8 (9)
Patent ductus arteriosus*	1 (1.1)
Atrial septal defect*	2 (2.2)
Ventricular septal defect*	3 (3.4)
History of neonatal pneumonia*	31 (34.8)
Abnormality on brain MRI*	16 (18)
PVL on brain MRI*	8 (9)
EEG abnormality (focal)*	2 (2.2)
Concomitant psychopathology*	4 (4.5)
Presence of hemiplegia*	6 (6.7)
Epilepsy*	4 (4.5)
Length of stay in neonatal intensive care unit (days)†	21.5 ± 27.1
Breastfeeding duration (months) †	8.0 ± 6.9
Daily media usage (hours) †	1.6 ± 2.7

:** *n(%),* **†:** *mean±SD,* ***EEG: *Electroencephalography,* ***PVL:*** *Periventricular leukomalacia*

and 07:59 (40.4%). Based on the PSQI cut-off value (>5), sleep quality was poor in 48.9% of the mothers and 35.3% of the fathers. Compared to the late preterm group, children in the early preterm group had a higher rate of sleep disorder (98.4%) and rates of poor sleep quality were higher in their mothers (49.2%) and fathers (37%) according to total PSQI score. Both mothers and fathers most frequently went to sleep between 23:00 and 23:59 (36.4% and 32.4%, respectively) and woke up between 07:00 and 07:59 (33% and 38.2%, respectively). The children's sleep behaviors and their parents' sleep quality are summarized in Table II.

According to Spearman correlation analysis, total CSHQ score was not significantly correlated with the total PSQI scores of mothers or fathers, whereas a statistically significant correlation was observed between parents' total PSQI scores (r=0.373, p=0.033).

The regression analysis of factors that may be associated with the children's total CSHQ scores and maternal and paternal total PSQI scores included the sociodemographic and clinical characteristics shown in Table I. In robust regression analysis of factors affecting total CSHQ scores, the generated regression model was found to be statistically significant (F=2.992; p<0.001). The results of the model indicated that sleep scores were 3.8 points higher in girls than boys (p=0.004). Sleep scores were also associated with parental education, with scores 6.8 points higher for children with a maternal education level of high school or below compared to university or higher (p=0.001) and 5.5 points lower for children with a paternal education level of high school or below compared to university or higher (p=0.006). Total sleep scores were 5.8 points lower in the children of working mothers compared to not working mothers (p=0.004) and 6.3 points lower for those with smoking in the home compared to those without (p<0.001). Conception by in vitro fertilization (IVF) was associated with a 9.2-point decrease in total sleep score (p=0.002), whereas prenatal problems were associated with a 3.7-point increase in total sleep score (p=0.005). In terms of development, total sleep scores were 6.6 points lower in children with current short stature compared to those of normal height (p=0.009), 6.5 points lower in children with gross motor delays compared to those without (p=0.006), and 4.9 points higher in children with language-related delays compared to those without (p=0.034). The total sleep score of those with a history of neonatal pneumonia was 3.8 points higher than those with no history of neonatal pneumonia (p=0.010) and 12.9 points higher in children with hemiplegia than in those without hemiplegia (p<0.001). With the established model, independent variables explained 68.5% of the dependent variable. In particular, we observed a relationship between sleep disorder and low maternal education, hemiplegia, and no smoking in the home (Table III).

When the factors that may affect maternal PSQI total score were examined by univariate binary logistic regression analysis,

Table II: Characteristics of the Sleep Behaviors of Children and Sleep Quality of Parents

	Early Preterm*	Late Preterm*	Entire population*
Children's Sleep Habits (CSHQ)			
Duration of Night Wakings (min)	20.1±25.3	13.5±11.7	18.2±22.4
Total Sleep Time (hours)	9.6±2.5	10.1±2.8	9.8±2.6
Total CSHQ Sleep Score	50.6±5.1	50.1±6.7	50.5±5.6
CSHQ Subscale Scores			
Daytime Sleepiness	12.2±2.1	11.9±2.7	12.1±2.3
Sleep-Disordered Breathing	3.6±1	3.7±0.9	3.6±1
Parasomnias	8.9±1.6	9.1±2.1	8.9±1.8
Night Wakings	5.6±1.3	5.7±1.4	5.6±1.4
Sleep Anxiety	6.6±1.2	7.4±2.4	6.8±1.6
Sleep Duration	3.6±0.9	4.1±1.2	3.7±1
Sleep Onset Delay	1.6±0.6	1.4±0.6	1.6±0.6
Bedtime Resistance	9.6±2.7	11.2±3	10±2.9
Parental Sleep Quality (PSQI)			
Sleep onset delay (min)			
Mother	14.6±17.3	26.2±29.8	17.9±22
Father	17.2±15.4	12.1±8.6	16.2±14.3
Nighttime sleep duration (h)			
Mother	7.5±1.7	7.2±2	7.4±1.7
Father	7.5±1.3	7.4±0.7	7.5±1.2
Total PSQI score			
Mother	5±2.6	6.1±4.1	5.3±3.1
Father	4±2	3.1±1.8	3.8±2
PSQI Subscale Scores			
Subjective Sleep Quality			
Mother	0.9±0.7	1.2±0.9	1±0.8
Father	0.9±0.5	0.9±0.7	0.9±0.6
Sleep Delay			
Mother	0.9±0.8	1.2±0.9	1±0.9
Father	0.7±0.9	0.3±0.8	0.7±0.9
Sleep Duration			
Mother	0.8±0.9	0.9±1.2	0.9±1
Father	0.3±0.6	0.1±0.4	0.3±0.5
Habitual Sleep Efficiency			
Mother	0.3±0.8	0.8±1.3	0.5±1
Father	0.2±0.4	0±0	0.1±0.3
Sleep Disturbances			
Mother	1.3±0.6	1.2±0.7	1.3±0.6
Father	1.1±0.3	1.1±0.7	1.1±0.4
Use of Sleep Medication			
Mother	0.1±0.3	0±0	0.1±0.3
Father	0±0	0±0	0±0
Daytime Dysfunction			
Mother	0.5±0.6	0.7±0.9	0.5±0.7
Father	0.7±0.9	0.7±1	0.7±0.9

***:** *mean±SD*

we determined the odds of poor sleep quality were 5.5 times (1/0.182) higher in mothers with high education level (university or higher) than in mothers with low education level (high school or lower) (p=0.006). In addition, mothers with multiple pregnancy had a 4-fold higher risk of poor sleep quality than those without (p=0.027) (Table III).

When factors that may affect paternal PSQI total score were examined by univariate binary logistic regression analysis, none of the possible risk factors were found to be significantly associated with sleep quality.

DISCUSSION

In our study, 95.5% of the children had poor sleep habits according to the CSHQ. According to the PSQI, 48.9% of the mothers and 35.3% of the fathers had poor sleep quality. Regression analysis of factors that may affect total CSHQ score showed that sleep disorder was found to be associated with low maternal education, hemiplegia, and no smoking in the home. Regression analysis of factors that may affect total PSQI score showed that the odds of poor sleep quality were 5.5 times higher in mothers with a high education level and 4

Table III: Regression analysis results of factors associated with CSHQ (Robust regression) and PSQI (Logistic regression) Scores

Variables	Estimate	SE	p	95% CI	
				Lower	Upper
Children's CSHQ Total Sleep Score					
Sex *	3.778	1.269	0.004	1.231	6.326
Maternal education level†	6.827	2.009	0.001	2.794	10.859
Paternal education level†	-5.508	1.921	0.006	-9.364	-1.653
Maternal employment status ‡	-5.770	1.929	0.004	-9.642	-1.897
Smoking in the home §	-6.265	1.571	<0.001	-9.419	-3.111
Conception by in vitro fertilization§	-9.213	2.741	0.002	-14.716	-3.710
Prenatal problem§	3.661	1.232	0.005	1.188	6.135
Current height‖	-6.566	2.422	0.009	-11.429	-1.703
Gross motor delay§	-6.531	2.270	0.006	-11.088	-1.974
Language-related delay §	4.876	2.241	0.034	0.377	9.375
History of neonatal pneumonia§	3.832	1.435	0.010	0.952	6.713
Presence of hemiplegia§	12.748	3.339	<0.001	6.044	19.452
Maternal PSQI Total Sleep Quality Score					
Maternal education level†	0.182	0.614	0.006	0.055	0.606
Multiple pregnancy§	3.968	0.624	0.027	1.167	13.493

0= Female 1= Male, †0 = high school or below, 1 = university or higher, ‡0= working 1= not working, §0=yes 1=no, ‖0= short or long 1= normal* ***Estimate:* *β1 values for Robust regression and OR values for Logistic regression,* ***CSHQ:*** *Children's Sleep Habits Questionnaire,* ***PSQI:*** *Pittsburgh Sleep Quality Index,* ***SE:*** *Standart Error,* ***CI:*** *Confidence interval*

times higher in mothers with a history of multiple pregnancy. Our study revealed a high rate of poor sleep habits in children with a history of preterm birth and a high rate of poor sleep quality in their parents.

Developments in neonatal intensive care have led to an increase in the proportion of surviving preterm infants, the number of which is steadily increasing according to the World Health Organization (15). In our sample, approximately 70% of the children were early preterm, 41.6% had a normal prognosis, gross motor delay was the most common type of developmental delay (20.2%), and 6.7% developed hemiplegia. The most common cardiac pathology was ventricular septal defect (3.4%), while the rates of patent ductus arteriosus (PDA), retinopathy of prematurity (ROP), and epilepsy were 1.1%, 9%, and 4.5%, respectively. Although the prevalence of PDA is reported to be over 50% in preterm infants ≤28 weeks gestational age, this rate was 1.1% in our sample of mostly early preterm infants at a mean age of approximately 3 years, suggesting that PDAs close by 3 years of age (16). Furthermore, compared to a reported ROP rate of 27% in a study to 115 preterm infants, a lower proportion of patients in our study had ROP (9%), suggesting improved in the neonatal unit (17). Based on a study reporting the incidence of epilepsy as 102 per 100 000 in children up to 12 months of age, 50 per 100 000 in childhood, and 20 per 100 000 in adolescence, the 4.5% rate of epilepsy in our study supports existing evidence that epilepsy is more common in preterm children (18,19). Our findings of hemiplegia in 6.7%, developmental delay (most commonly gross motor delay) in 25.8%, and cognitive delay in 6.7% of the children in our study are also consistent with literature data indicating increased cerebral palsy and cognitive delay in preterm children (20-26).

In general, this study found a sleep disorder in 95.5% of a sample of preterm children at a mean age of approximately 3 years, 57% of whom were girls. According to the literature which reports sleep disorders in 20-30% of children, sleep disorder is significantly more common in preterm children, especially in those born early preterm (98.4%) (1). In addition, although parental sleep quality did not correlate with child sleep disorder, the parental sleep quality scores were correlated with each other. Moreover the rates of poor sleep quality were higher in the mothers (48.9%) and fathers (35.3%) of early preterm children. Finally, significant factors associated with sleep disorder in children born preterm were low maternal education, hemiplegia, and no smoking in the home, whereas high education level and history of multiple pregnancy were factors associated with poor maternal sleep quality.

The preterm children in our study had sleep and wake times consistent with those in the literature, but their mean CSHQ total sleep score of 50.5±5.6 was high compared with other studies evaluating the sleep characteristics of preterm children using the CSHQ (4-6, 27). When the CSHQ scores in our study were compared with those in previous studies, the scores for bedtime resistance, sleep anxiety, parasomnias, and daytime sleepiness scores were lower; the scores for sleep onset delay and sleep duration were similar, and the scores for nocturnal awakenings and sleep-disordered breathing scores were higher than those in the literature (6, 27). Accordingly, our study emphasizes that overall sleep disorders may be more common in preterm children and that higher CSHQ scores may be associated with more frequent nighttime awakenings and sleep-disordered breathing. Compared with previous studies in which sleep disturbances were reported in 20-60% of children and 71-89% of preterm children, the higher percentage of

sleep disorder (95.5%) in our study may be related to the small sample size (1,6,27,28).

The mean sleep duration of the preterm children in our study was 9.8±2.6 hours, which is shorter than the mean sleep duration reported in the literature for both term and preterm children (5).

In the literature, gastroesophageal reflux, vomiting, loud snoring, difficulty breathing, sleeping in the parents' room, maternal smoking, gestational age at birth, and number of siblings are the main clinical conditions identified as associated with sleep disorder in children according to the CSHQ (6). When we evaluated the effects of the clinical conditions in Table I on sleep disorder according to the CSHQ by regression analysis, we found a relationship between sleep disorder and low maternal education, presence of hemiplegia, and the absence of smoking in the home. Although there are not many studies in the literature examining factors associated with sleep disorders in preterm infants, we believe that maternal education and early detection and intervention of hemiplegia are important in terms of preventing sleep disorders in children born preterm. However, because the relationship between sleep problems and low maternal education, the presence of hemiplegia, and no smoking in the home may be related to our small sample size, studies in larger populations are needed to further clarify these relationships.

In our study, the mean nighttime sleep duration was 7.4±1.7 hours for mothers and 7.5±1.2 hours for fathers, which is longer than the 6.4±1.7 hours reported in the literature for the mothers of children born preterm (4). When the sleep quality of the parents was evaluated according to the PSQI cut-off point, poor sleep quality was detected in 48.9% of the mothers and 35.3% of the fathers, with higher rates in the early preterm group (49.2% and 37%, respectively) compared to the late preterm group. The total PSQI score was 5.3±3.1 for mothers and 3.8±2 for fathers, indicating better sleep quality compared with literature data reporting a total PSQI score of 7.9±3.6 for mothers of children born preterm. Parents in our study most frequently reported falling asleep between 23:00 and 23:59 (36.4% of mothers, 32.4% of fathers) and waking up between 07:00 and 07:59 (33% of mothers, 38.2% of fathers). These findings are consistent with reports in the literature that mothers go to sleep at 23:28 and wake up on average at 07:20 (4, 29).

When the sleep quality subscale scores of the parents of children born preterm were compared with the literature, we noted that mothers had lower subjective sleep quality, sleep delay, sleep duration, habitual sleep efficiency, use of sleep medication, and daytime dysfunction scores and higher sleep disturbance scores than in the literature, whereas fathers had lower scores on all subscales than in the literature (5).

Accordingly, although the rate of poor sleep quality was generally high among mothers and fathers of children born preterm in our study, compared to the PSQI total and subscale scores reported in the literature for the mothers of preterm children, our sample had better parental sleep quality, but sleep disturbances were more common among the mothers in our study than in the literature (4). Correlation analysis in our study revealed a significant relationship between maternal and paternal PSQI total scores (r=0.373, p=0.033), indicating that the sleep quality of mothers and fathers is correlated.

The results of our univariate binary logistic regression analysis showed that the odds of poor sleep quality according to the maternal PSQI total sleep quality score was 5.5 times higher in mothers with a university education or higher compared to those with a high school education or lower (p=0.006) and 4 times higher in mothers with multiple pregnancies compared to those without (p=0.027) (Table III).

Little is known about the sleep of mothers and fathers of preterm infants, because there are not many studies on this subject in the literature. The mothers and fathers of preterm infants in our study had sleep and wake schedules consistent with the literature, but our study provides novel findings in terms of the correlation in the sleep quality of mothers and fathers, the higher sleep disturbance scores in the mothers of preterm children, and the association between multiple pregnancy and high maternal education level and increased risk of poor maternal sleep quality.

Our study had a cross-sectional design and evaluated the 3-year clinical history, current sleep behavior, and parental sleep status of children born preterm, an area in which data are scarce in the available literature. However, the small number of participants and the absence of control group are limitations of our study. Nevertheless, we believe that determining sleep behaviors, characteristics, and quality in preterm children and their parents is important in defining and resolving sleep-related health problems in this growing population.

CONCLUSION

Our study revealed a high rate of sleep disorder in children with a history of preterm birth (especially early preterm) and a high rate of poor sleep quality in their parents. These findings highlight the relationship between preterm birth and children's and parents' sleep and demonstrate the need for more comprehensive studies in this area.

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