

RESEARCH ARTICLE



Young children's sleep patterns and problems in paediatric primary healthcare settings: a multicentre cross-sectional study from a nationally representative sample

Perran Boran^{1,2} | Ahmet Ergin³ | Mahmut Caner Us² | Meltem Dinleyici⁴ | Sevtap Velipaşaoglu⁵ | Siddika Songül Yalçın⁶ | Adnan Barutçu⁷ | Gülbin Gökçay⁸ | Emel Gür⁹ | Aysu Çamurdan Duyan¹⁰ | Adem Aydın¹¹ | Gökce Celep¹² | Habip Almış¹³ | Gözdenur Savcı¹⁴ | Meda Kondolot¹⁵ | Burçin Nalbantoğlu¹⁶ | Elif Ünver Korgalı¹⁷ | Özge Yendur¹⁸ | Filiz Orhon Şimşek¹⁹ | Aysun Kara Uzun²⁰ | Özlem Bağ²¹ | Feyza Koç²² | Selda Bülbül²³

¹Department of Social Pediatrics, School of Medicine, Marmara University, Istanbul, Turkey

²Institute of Health Sciences, Social Pediatrics PhD Program, Marmara University, Istanbul, Turkey

³Division of Social Pediatrics, Department of Public Health and Department of Pediatrics, Faculty of Medicine, Pamukkale University, Denizli, Turkey

⁴Department of Social Pediatrics, Faculty of Medicine, Eskisehir Osmangazi University, Eskisehir, Turkey

⁵Department of Social Pediatrics, Faculty of Medicine, Akdeniz University, Antalya, Turkey

⁶Department of Pediatrics, Faculty of Medicine, Hacettepe University, Ankara, Turkey

⁷Department of Pediatrics, Faculty of Medicine, Cukurova University, Adana, Turkey

⁸Department of Social Pediatrics, Institute of Child Health, Istanbul University, Istanbul, Turkey

⁹Department of Social Pediatrics, Istanbul University-Cerrahpaşa Faculty of Medicine, Istanbul, Turkey

¹⁰Department of Social Pediatrics, Faculty of Medicine, Gazi University, Ankara, Turkey

¹¹Department of Social Pediatrics, Faculty of Medicine, Dokuz Eylül University, İzmir, Turkey

¹²Department of Pediatrics, Faculty of Medicine, Amasya University, Amasya, Turkey

¹³Department of Pediatrics, Adiyaman University School of Medicine, Adiyaman, Turkey

¹⁴Alacam State Hospital, Samsun, Turkey

¹⁵Department of Pediatrics, Social Pediatrics, Faculty of Medicine, Erciyes University, Kayseri, Turkey

¹⁶Department of Pediatrics, Faculty of Medicine, Namik Kemal University, Tekirdag, Turkey

¹⁷Departments of Pediatrics, Faculty of Medicine, Cumhuriyet University, Sivas, Turkey

¹⁸Department of Pediatrics, Kafkas University School of Medicine, Kars, Turkey

¹⁹Department of Social Pediatrics, School of Medicine, Ankara University, Ankara, Turkey

²⁰Ankara Children's Hematology Oncology Training and Research Hospital, University of Health Sciences, Ankara, Turkey

²¹İzmir Dr. Behçet Uz Child Hospital, İzmir, Turkey

²²Department of Pediatrics, Faculty of Medicine, Ege University, Izmir, Turkey

²³Department of Pediatrics, Faculty of Medicine, Kirikkale University, Kirikkale, Turkey

Correspondence

Perran Boran, Department of Social Pediatrics, School of Medicine, Marmara University, Fevzi Çakmak, Muhsin Yazıcıoğlu Street, No:10, 34899 Pendik, Istanbul, Turkey.
Email: drperran@yahoo.com, drperran@gmail.com

Summary

Studies describing paediatric sleep patterns are needed by taking culture into consideration. The aim of this study was to identify parent-reported sleep-wake patterns in young children and explore possible factors influencing sleep problems. The mothers of 2,434 young children enrolled from well-child outpatient

clinics in Turkey completed an online survey including sociodemographic variables, Brief Infant Sleep Questionnaire, Edinburgh Postnatal Depression Scale and Generalised Anxiety Disorder scales. Overall, young children in Turkey go to bed late (10:00 p.m.), awaken twice per night for 30 min, and obtain 11.5 h of total sleep, showing no sex-specific differences. Distinct night-time sleep patterns emerged after 18 months of age. Importantly, although currently breastfed healthy children were 3.8-times less likely to sleep through the night, total sleep duration and exclusive breastfeeding duration were higher in children who were not sleeping through the night. Overall, bedsharing was identified in 11.5%, and only room sharing was reported in 52.9%. Parental perception of a child's sleep as problematic was 35.8%. Mothers with higher educational attainment were more likely to perceive their children's sleep as a problem. Maternal depressive and anxious symptoms and a history of excessive infant crying were the determinants predicting the likelihood of both parent-perceived sleep problems and poor sleepers. The present analysis of sleep structure in infancy and toddlerhood provides reference data for well-child visits. These findings highlight the importance of considering maternal anxiety, depression and behaviour management techniques to cope with fussy infants in addressing childhood behavioural sleep problems.

KEYWORDS

breastfeeding, child, maternal anxiety, maternal depression, sleep, sleep initiation and maintenance disorders

INTRODUCTION

Behavioural sleep problems (BSPs), with a frequency of 20%–30%, are the most prevalent sleep disorder in young children aged 6–36 months (Boran et al., 2014; Cassanello et al., 2021; Mindell et al., 2013; Mindell, Lee, et al., 2017; Newton et al., 2020; Teng et al., 2012). Studies have shown an association between sleep problems and long-term adverse childhood outcomes focusing on sleep duration and persistence of sleep problems beyond 2–5 years as the measure of interest (Cremone et al., 2018; Williams et al., 2016). While the definition of sleep problems varies, frequent night waking and prolonged awake duration were considered the most common predictors of parent-reported sleep problems in young children. On the other hand, no associations were found between uninterrupted sleep and child mental or psychomotor development (Mäkelä et al., 2018; Pennestri et al., 2018).

Child age, sex, temperament, breastfeeding status, parent–child interactions, bedtime parental practices, and sociocultural factors contribute to sleep problems. Being male, low socioeconomic status, low parental educational attainment, young or old maternal age, maternal depression, marital conflict, and lack of social support have been found to be associated with sleep problems (Covington et al., 2021; Martini et al., 2017; Williamson & Mindell, 2020). Excessive infant crying has been associated with maternal anxiety disorders in infants of younger and lower educated first-time mothers (Petzoldt et al., 2016). Sleep location was also suggested to be associated with parent-perceived sleep outcomes. While bedsharing in early infancy might

facilitate breastfeeding, infants who slept in a separate room reported better sleep outcomes than those who slept in their parent's bed (Bovbjerg et al., 2018; Mindell, Leichman, et al., 2017).

Studies have demonstrated significant variations in sleep durations and sleep patterns across countries. Children in Middle East (ME) countries were found to sleep and wake later than those from predominantly Asian (PA) and predominantly Caucasian (PC) countries (Mindell, Lee, et al., 2017). Children from PA countries had later bedtimes, shorter sleep duration, and increased parental perception of sleep problems than those from PC countries (Mindell et al., 2010; Mindell et al., 2013). A recent study showed that Spanish infants and toddlers had later bedtimes, more night awakenings, and shorter night-time sleep duration than PC countries (Cassanello et al., 2021). Another study showed that Italian infants had sleep durations more similar to those of infants from PA countries rather than from other Caucasian groups (Bruni et al., 2014). The differences found were related to sociocultural differences, culturally based expectations, and different bed arrangements. Indeed, country-specific studies are needed to address sleep in individual countries. Understanding and addressing the cultural context in which children are being raised is critical to supporting their sleep health.

Well-child visits represent an important setting for addressing concerns regarding the child's sleep patterns and to screen for sleep problems. A quasi-experimental study in Turkey found that 80% of paediatricians lacked basic skills and knowledge in BSPs (Ersu et al., 2017). Sleep health awareness is increasing but evidence-based

information is lacking (Blunden & Boran, 2021). A cross-sectional study among 9-month-olds showed that 32.2% of Turkish children were poor sleepers and had late bedtimes at ~10:00 p.m. (Boran et al., 2014). Furthermore, a recent study showed that breastfeeding to sleep practices were common (Öztürk et al., 2021). The rationale for conducting this research is that BSPs are highly prevalent among Turkish children, but under recognised and untreated. Understanding the variability in sleep patterns in young children and culture-specific predictors of parent-reported sleep problems may have practical implications. Identifying normal ranges for sleep and sleep behaviours in early childhood and modifiable social and environmental factors associated with parents' perception of child sleep in Turkey may help paediatricians diagnose sleep disturbances deviating from normal patterns during well-child visits and develop prevention and sleep health education activities in young children accordingly.

The aim of this study was to describe sleep-wake patterns of young children and identify child- and family-related factors accounting for sleep problems.

METHODS

This is a descriptive cross-sectional study conducted among mothers of children aged 6–36 months, from April to June 2021, in Turkey. A sleep study group was established by the study co-ordinator (P.B.), and researchers running a well-child outpatient clinic from each region across the country were included. The study was approved by the Marmara University School of Medicine Ethics Committee (protocol identification number: 09.2021.489) and registered with Clinical Trials (NCT04926064).

Study eligibility criteria included mothers of healthy typically developing children aged 6–36 months who either visited a well-child outpatient clinic or were on the waiting list for follow-up. Exclusion criteria included children born before 37 weeks of gestational age, with congenital abnormalities, diagnosed with a neurodevelopmental disorder, who use drugs such as diphenhydramine that can affect sleep, or diagnosed with obstructive sleep apnea.

According to the formula for the known number of individuals in a population (sample formula with known number of individuals, $N = [Np(1-p)] / [(d^2/Z^2 - \alpha/2 \times (N - 1) + p \times (1-p)]$, $\alpha = 0.05$, $p = 0.32$, $d = 0.02$), the sample size to represent the population was found to be 2,089, considering the number of children aged between 6 and 36 months in the country and the estimated prevalence of behavioural insomnia being 30%. Assuming that 20% will not respond to the questionnaire, the total sample size selected was increased to 2,500. A multistage stratification was used to calculate the number of participants to be taken from provinces selected at the level of 12 regions according to Nomenclature of Territorial Units for Statistics (NUTS-1) proportional to the number of children by gender in each province. Recruitment and data collection continued until the pre-calculated sample size was reached in each region.

An online Google survey was developed on the Google platform, securing data collection by a confidential log in system that can be

completed from smartphones, tablets, or computers. The questionnaire took ~20 min to complete. It was pilot tested on 15 mothers and found to be acceptable. An invitation email containing a link to an anonymous online questionnaire was sent to the regional co-ordinators. Social paediatricians running the clinic were asked to send the online questionnaire to the contact information given to the clinic either by the mailing lists or through mobile telephones. To complete the questionnaire, respondents were asked to read the informed consent form and tick the box that was the required field.

A total of 2,434 mother-child dyads participated. We failed to have any information from the NUTS-12 region selected to be in the target population. It turned out that the NUTS-12 region was not an eligible unit, as child outpatient clinics were not active. This is considered a coverage error. To address this issue, we over recruited from the province nearest to the territory of the region to meet the sample size. The final study sample of 2,060 represented 11 NUTS regions of Turkey (Figure 1).

Measures

Sociodemographic variables

Potential predictors of sleep problems, such as child age, sex, number of children, maternal educational attainment, maternal age, and maternal employment status, were obtained. Maternal educational attainment was further dichotomised into “low” and “high” education.

There were also additional questions about history of excessive crying/fussiness and marital conflict. We dichotomised excessive crying/fussiness and marital conflict into “yes/no” variables. Current breastfeeding status was assessed by a “yes or no” question, and exclusive breastfeeding duration was asked.

Sleep

Mothers completed the expanded version of the Brief Infant Sleep Questionnaire (BISQ), which is used widely worldwide and has been translated to Turkish and shown to be reliable (Boran et al., 2014; Sadeh, 2004). The BISQ includes items about the night-time and day-time sleep duration, night awakening, wake after sleep onset (WASO) duration, bedtime, sleep onset latency (SOL), bedtime routine, bedtime difficulty, methods of falling asleep, and location of sleep over the last 2 weeks. A question on morning awakening time was also asked in this study. Bedtime was defined as initiated between 5:00 p.m. and 12:00 a.m. Maternal perception of sleep problems was dichotomised according to the expanded version of the BISQ, with a parent-reported sleep problem defined as those who had a moderate or large problem and no problem defined as those who had no problem or a very small problem based on previous studies (Sadeh, 2004; Teng et al., 2012). If the child woke up >3 times/night and woke after sleep onset (WASO) for >1 h or spent <1 SD sleep duration in the study population (10 h), then they were considered poor sleepers.

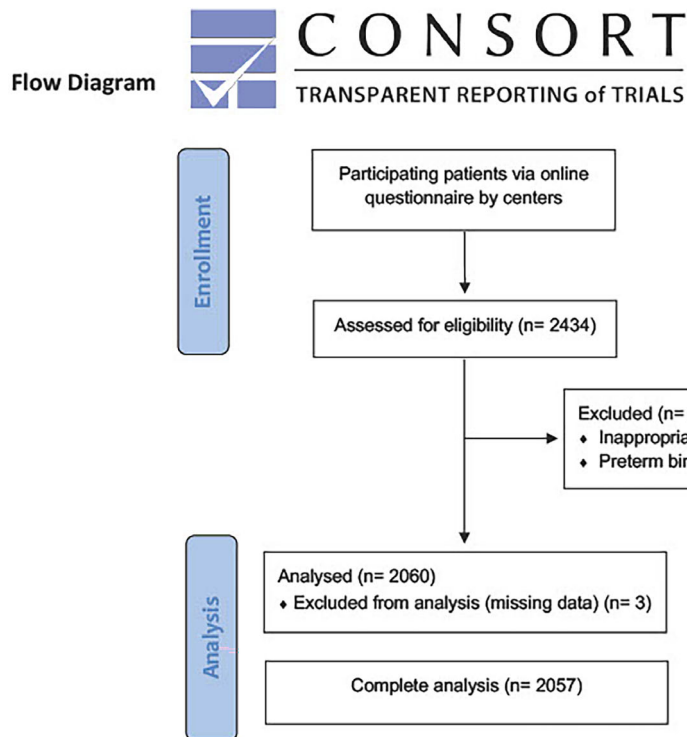


FIGURE 1 Flow diagram of the study

Sleeping for 6 h of consecutive uninterrupted sleep was used to define sleeping through the night (Henderson et al., 2011). Prolonged SOL was defined as >30 min and coded as “1”. Sleep location items from the BISQ were categorised into bedsharing and room sharing without bedsharing.

Maternal depression and anxiety

Mothers completed the Edinburgh Postnatal Depression Scale (EPDS) and Generalised Anxiety Disorder (GAD-7) scales. The EPDS is a 10-item self-administered scale developed for the detection of symptoms of psychosocial distress during the perinatal period and shows good psychometric properties (Boran et al., 2020; Cox et al., 1987; Karacam & Kitis, 2008). A cut-off score of 12 was considered positive for depressive symptomatology. The GAD-7 is a seven-item tool developed to screen for GAD and measure its severity (Spitzer et al., 2006) using a cut-off score of ≥ 8 (Konkan et al., 2013).

Statistical analyses

All analyses were conducted using IBM SPSS Statistics software (version 28.0; IBM Inc., USA). Descriptive analyses were presented using the mean and standard deviation (SD) for the continuous variables with normal distribution and the median and quartiles for the non-normally distributed data. Categorical variables were summarised by frequencies and percentages. Although sleep variables data were not normally distributed, the mean and SD were provided

as well, as they were relevant to compare with the previous studies. Responses with inappropriate or extreme data, such as night-time sleep duration <5 h or >14 h, were removed (three overall) for analyses (Mindell, Lee, et al., 2017).

As the sleep parameters and depression and anxiety scores were not normally distributed (Kolmogorov–Smirnov test), Kruskal–Wallis tests were conducted to compare these parameters among the age groups. To test the significance of pairwise differences, Bonferroni correction was used to adjust for multiple comparisons.

Differences in sleep parameters and family characteristics by sleep problems were tested using the chi-square and Mann–Whitney *U* test, as appropriate. Binary logistic regression was used to assess the associations between predictive variables and sleep problems. Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) were reported. An overall 5% type-I error level was used to infer statistical significance.

RESULTS

The mean (SD) age of the children was 18.2 (9.2) months (median 16.6 months), and approximately half of the children were male ($n = 1,078$, 52.4%). Compared with the population data of 18.5%, the present sample included a larger proportion of women who were at least university graduates (53.6%, $p < 0.001$) (Turkish Statistical Institute, 2020). Descriptive analyses of the demographic characteristics are shown in Table 1.

Figure 2 shows night-time sleep variables across age groups. Sleep-wake durations showed wide variability (Figures 2 and 4, and Table 2). There was no sex-related significant difference in sleep parameters ($p > 0.05$).

TABLE 1 Demographic characteristics of the study population (N = 2,057)

| Variable | | N (%) | Mean (SD) |
|--|------------------------|-------------|------------|
| Child age, months | Age categories | | 18.2 (9.2) |
| | 6–8 | 386 (18.8) | |
| | 9–11 | 286 (13.9) | |
| | 12–17 | 445 (21.6) | |
| | 18–23 | 358 (17.4) | |
| 24–36 | 582 (28.3) | | |
| Sex | Male | 1078 (52.4) | |
| | Female | 979 (47.6) | |
| First time mothers | Yes | 1238 (60.2) | |
| Maternal education | Less than high school | 410 (19.9) | |
| | High school | 546 (26.5) | |
| | College/university | 596 (29.0) | |
| | Graduate (MS, MD, PhD) | 505 (24.6) | |
| Maternal age, years | | | 31.2 (4.7) |
| Maternal employment status | Employed | 1004 (48.8) | |
| Marital conflict | | 162 (7.9) | |
| Exclusive breastfeeding duration, months | | | 5.1 (1.7) |
| Currently breastfed | Yes | 1083 (52.6) | |
| History of excessive crying/fussiness | Yes | 860 (41.8) | |

Means and standard deviations (SDs) are given for continuous variables, and percentages and sample sizes (n) are given for categorical variables.

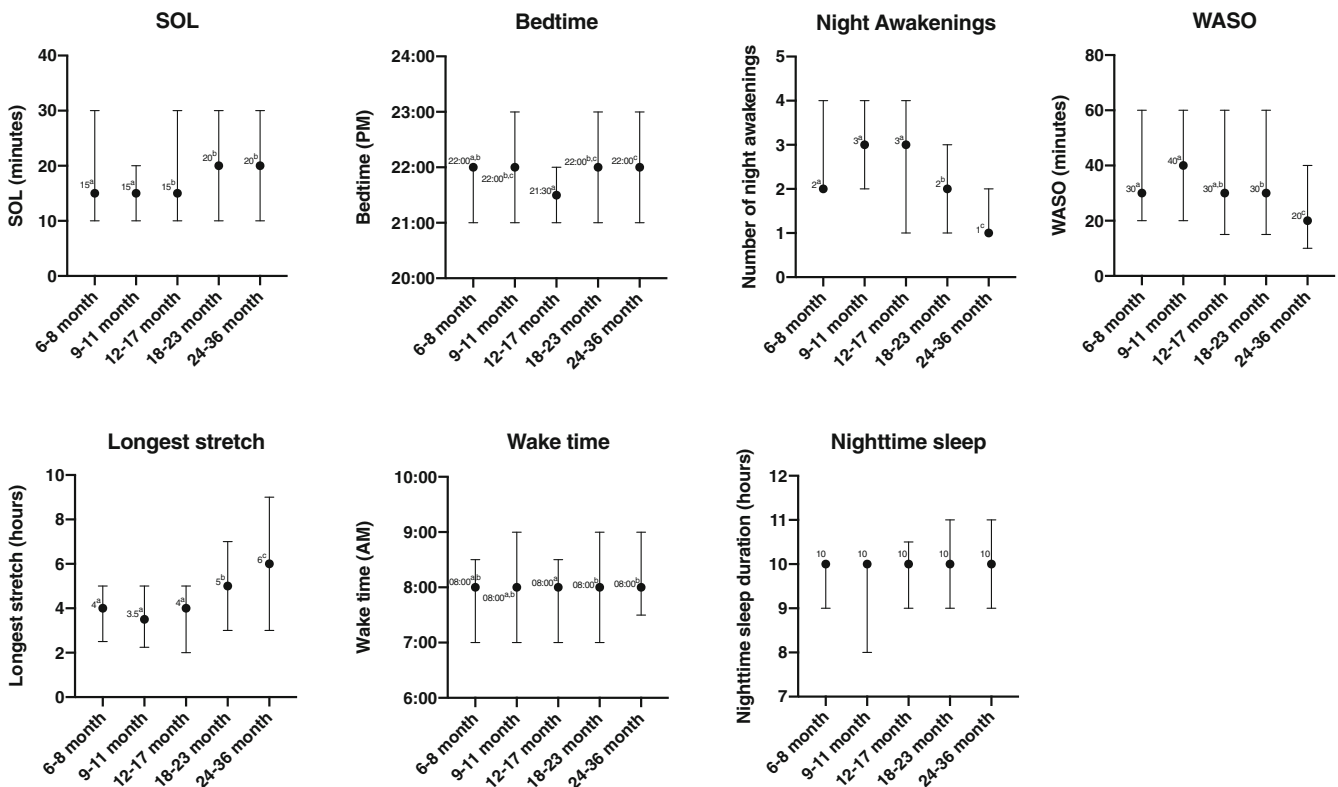


FIGURE 2 Night-time sleep variables across age groups. Each superscript letter indicates a subset of age-group categories whose proportions do not differ significantly from each other at the 0.05 level.

TABLE 2 Sleep parameters among children aged 6–36 months

| Sleep parameters | Mean (SD) | Percentiles | | | | | | |
|-------------------------------------|-----------------|-------------|-----------|-----------|------------|------------|------------|------------|
| | | 3rd | 10th | 25th | 50th | 75th | 90th | 97th |
| Bedtime hour, clock time (h) | 9:17 p.m. (3.3) | 6:51 p.m. | 8:00 p.m. | 9:00 p.m. | 10:00 p.m. | 11:30 p.m. | 11:00 p.m. | 12:00 a.m. |
| Wake up hour, clock time (h) | 7:56 a.m. (1.1) | 6:00 a.m. | 6:30 a.m. | 7:00 a.m. | 8:00 a.m. | 9:00 a.m. | 9:30 a.m. | 10:00 a.m. |
| Number of naps | 1.6 (0.9) | 0.0 | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 | 4.0 |
| Daytime sleep duration, h | 1.9 (1.0) | 0.0 | 0.7 | 1.0 | 2.0 | 2.5 | 3.0 | 4.0 |
| Night awakenings, <i>n</i> | 2.3 (1.5) | 0.0 | 1.0 | 1.0 | 2.0 | 3.0 | 5.0 | 5.0 |
| SOL, min | 20.9 (16.5) | 3.0 | 5.0 | 10.0 | 15.0 | 30.0 | 40.0 | 60.0 |
| WASO, min | 48.1 (56.1) | 0.0 | 5.0 | 15.0 | 30.0 | 60.0 | 120.0 | 240.0 |
| Longest stretch night-time sleep, h | 4.7 (3.0) | 0.5 | 0.7 | 3.0 | 4.0 | 6.0 | 10.0 | 11.0 |
| Night-time sleep duration, h | 9.6 (1.5) | 6.0 | 8.0 | 9.0 | 10.0 | 10.5 | 11.5 | 12.0 |
| Total sleep duration, h | 11.5 (1.8) | 7.6 | 9.2 | 10.5 | 11.5 | 13.0 | 14.0 | 15.0 |

SD, standard deviation; SOL, sleep onset latency; WASO, wake after sleep onset.

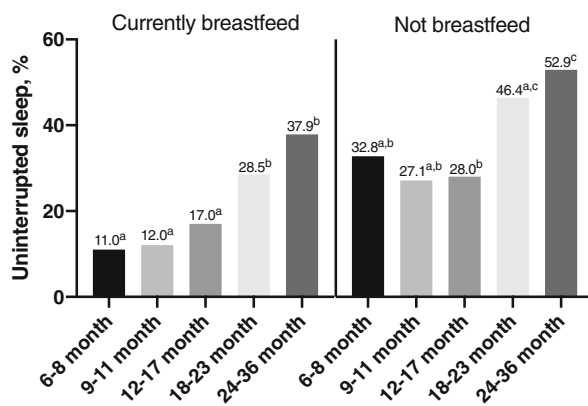


FIGURE 3 Proportion of children sleeping through the night according to breastfeeding status. Each superscript letter indicates a subset of age-group categories whose proportions do not differ significantly from each other at the 0.05 level.

Overall, longer sleep latencies were identified in 11.6% of the children, showing a significant increase after 18 months of age (8.9%^a, 7.0%^a, 11.0%^{a,b}, 15.8%^c, and 13.7%^{b,c} between 6–8, 9–11, 12–17, 18–23, and 24–36 months, respectively). Overall, short sleep duration was observed in 38.2% of the sample (17.8% in infancy and 20.4% in toddlerhood) based on age-specific reference values suggested by the consensus statement of the American Academy of Sleep Medicine (Paruthi et al., 2016).

Sleeping through the night

Overall, 30.4% of the children slept through the night for 6 h. The distribution according to age with a breakdown to breastfeeding is given in Figure 3.

Overall, 17.3% of the children currently breastfed were sleeping through the night for 6 h, compared to 44.9% of children who were not currently breastfed ($p < 0.001$). The currently breastfed children were 3.8-times less likely to sleep through the night. On the other hand, total

sleep duration was significantly better in the currently breastfed children than in non-breastfed children (11.6 versus 11.4 h, $p = 0.008$). The main difference in total sleep duration was due to an increase in daytime sleep. Exclusive breastfeeding duration was longer in children who were not sleeping uninterrupted compared to children who were sleeping through the night (5.2 versus 4.8 months, $p < 0.001$). Figure 4 shows daytime and total sleep duration across age groups.

Sleep environment

Sleep location

Overall, bed-sharing was reported in 11.5%, and room sharing without bedsharing was reported in 52.9%. The distribution according to age groups is given in Figure 5.

Sleep onset associations of breastfeeding to sleep

Overall, breastfeeding to sleep was reported in 50.4% of participants, showing age-related changes (Figure 6). Night awakenings (2.9 versus 1.6, $p < 0.001$) and WASO were significantly increased (55.4 versus 40.6 min, $p < 0.001$), but night-time sleep duration (9.6 versus 9.7 h, $p = 0.196$) was unchanged in infants breastfed to sleep compared to those who were not breastfed to sleep. Approximately 63% of the mother–child dyads who were breastfeeding to sleep was bedsharing. Breastfeeding to sleep dyads was 1.7-times more likely to bedshare ($p < 0.001$).

Maternal mood

According to the EPDS scale, 22.3% of the mothers reported experiencing symptoms of depression, and anxiety scores were above the cut-off in 17% of the mothers according to the GAD-7 scale.

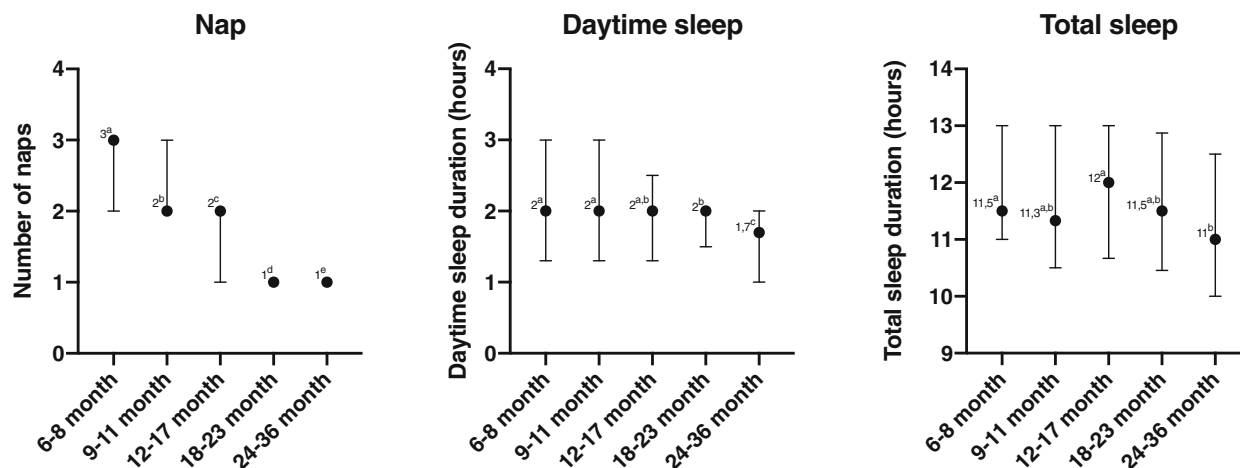


FIGURE 4 Daytime and total sleep duration across age groups. Each superscript letter indicates a subset of age-group categories whose proportions do not differ significantly from each other at the 0.05 level.

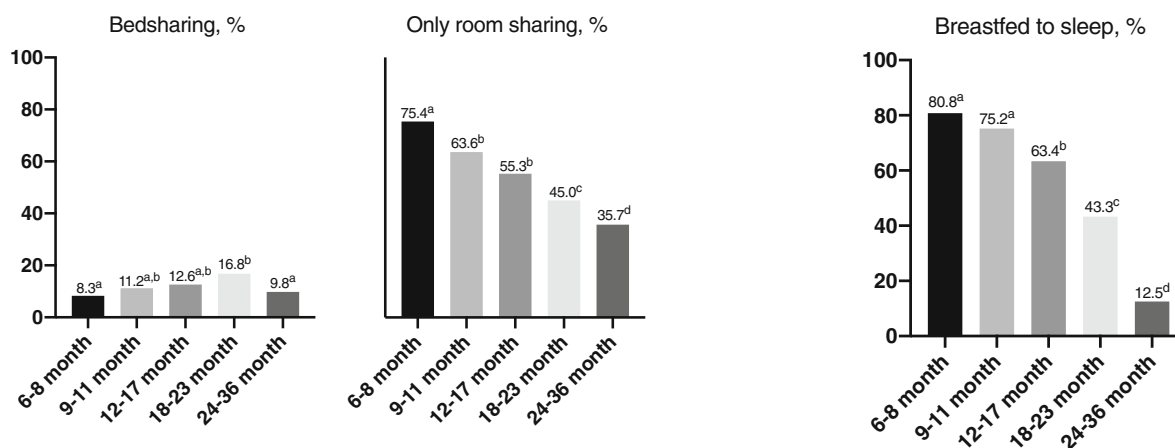


FIGURE 5 Sleep location according to age groups. Each superscript letter indicates a subset of age-group categories whose proportions do not differ significantly from each other at the 0.05 level.

FIGURE 6 Proportion of children breastfed to sleep across age groups. Each superscript letter indicates a subset of age-group categories whose proportions do not differ significantly from each other at the 0.05 level.

Sleep problems

Overall, 21.8% of the children were poor sleepers, and 35.8% of the mothers considered their child's sleep to be a problem. The distribution of sleep problems across age groups is shown in Figure 7. Maternal age was not different in children with sleep problems ($p > 0.05$).

Table 3 presents the results of the regression analysis of the factors associated with sleep problems.

Higher maternal education, history of excessive crying, breastfeeding to sleep, maternal depressive and anxious symptoms were found to be the determinants predicting the likelihood of a parent's perceived sleep problem.

However, based on the poor sleeper criteria, a history of excessive crying, maternal depressive symptoms, anxious symptoms, and children who were bedsharing were found to be the determinants predicting the likelihood of a sleep problem.

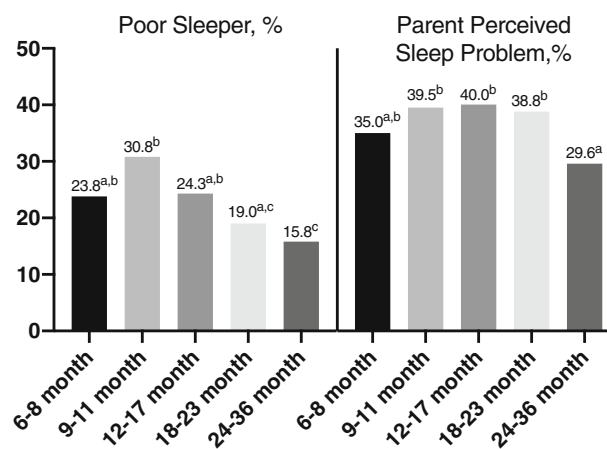


FIGURE 7 Distribution of sleep problems across age groups

TABLE 3 Distribution and comparison of the factors associated with sleep problems

| Predictor variables | Parent perceived sleep problem, n (%) | OR (95% CI) | AOR (95% CI) | Poor sleeper, n (%) | OR (95% CI) | AOR (95% CI) |
|------------------------------------|---------------------------------------|--------------------|--------------------|---------------------|--------------------|--------------------|
| Child age (months) | | | 0.99 (0.98–1.00) | | | 0.98 (0.96–0.99)** |
| <i>Child sex</i> | | | | | | |
| Male | 386 (35.8) | 0.99 (0.83–1.19) | | 235 (21.8) | 1.00 (0.81–1.24) | |
| Female | 351 (35.9) | 1.00 | | 213 (21.8) | 1.00 | |
| <i>First time mothers</i> | | | | | | |
| Yes | 472 (38.1) | 1.30 (1.08–1.56)** | 1.15 (0.94–1.41) | 254 (20.5) | 0.83 (0.67–1.03) | |
| No | 263 (32.2) | 1.00 | 1.00 | 193 (23.7) | 1.00 | |
| <i>Maternal education</i> | | | | | | |
| Higher | 457 (41.5) | 1.71(1.43–2.06)** | 1.72 (1.41–2.10)** | 238 (21.6) | 0.98 (0.79–1.21) | |
| Lower | 280 (29.3) | 1.00 | 1.00 | 210 (22.0) | 1.00 | |
| <i>Maternal employment</i> | | | | | | |
| Not-working | 374 (35.5) | 1.03 (0.86–1.23) | | 255 (24.2) | 1.00 | 1.00 |
| Working | 363 (36.2) | 1.00 | | 193 (19.2) | 1.34 (1.09–1.66)** | 1.21 (0.97–1.51) |
| <i>Marital conflict</i> | | | | | | |
| Yes | 79 (48.8) | 1.79 (1.30–2.47)** | 0.88 (0.61–1.27) | 49 (30.2) | 1.63 (1.14–2.31)** | 1.08 (0.73–1.59) |
| No | 658 (34.7) | 1.00 | 1.00 | 399 (21.1) | 1.00 | 1.00 |
| <i>History of excessive crying</i> | | | | | | |
| Yes | 384 (44.7) | 1.93 (1.61–2.32)** | 1.74 (1.43–2.12)** | 230 (26.7) | 1.64 (1.33–2.02)** | 1.46 (1.17–1.82)** |
| No | 353 (29.5) | 1.00 | 1.00 | 218 (18.2) | 1.00 | 1.00 |
| <i>Breastfed to sleep</i> | | | | | | |
| Yes | 438 (42.2) | 1.76 (1.47–2.12)** | 1.85 (1.46–2.33)** | 264 (25.5) | 1.55 (1.26–1.92)** | 1.24 (0.96–1.60) |
| No | 299 (29.3) | 1.00 | 1.00 | 184 (18.0) | 1.00 | 1.00 |
| <i>Bedsharing</i> | | | | | | |
| Yes | 109 (46.0) | 1.62 (1.23–2.12)** | 1.32 (0.98–1.77) | 69 (29.1) | 1.56 (1.15–2.11)** | 1.38 (1.00–1.89)* |
| No | 628 (34.5) | 1.00 | 1.00 | 379 (20.8) | 1.00 | 1.00 |
| <i>Room sharing</i> | | | | | | |
| Yes | 397 (36.5) | 1.06 (0.89–1.27) | | 253 (23.3) | 1.20 (0.97–1.48) | |
| No | 340 (35.1) | 1.00 | | 195 (20.1) | 1.00 | |
| <i>EPDS</i> | | | | | | |
| >12 | 277 (60.3) | 3.77 (3.03–4.67)** | 2.43 (1.84–3.19)** | 165 (35.9) | 2.61 (2.07–3.28)** | 1.99 (1.48–2.68)** |
| ≤12 | 460 (28.8) | 1.00 | 1.00 | 283 (17.7) | 1.00 | 1.00 |
| <i>GAD-7</i> | | | | | | |
| >8 | 224 (64.0) | 4.14 (3.25–5.27)** | 2.31 (1.71–3.13)** | 129 (36.9) | 2.54 (1.98–3.26)** | 1.55 (1.13–2.14)** |
| ≤8 | 513 (30.1) | 1.00 | 1.00 | 319 (18.7) | 1.00 | 1.00 |

CI, confidence interval; EPDS, Edinburgh Postnatal Depression Scale; GAD-7, seven-item Generalised Anxiety Disorder Scale; (A)OR, (adjusted) odds ratio. Each risk factor predicting sleep problems was inserted into the bivariate analysis. Factors that were statistically significant in bivariate analysis were then entered into the multiple logistic regression model.

Statistically significant variables are given in the table. * $p < 0.05$; ** $p < 0.001$.

DISCUSSION

The present study analyses sleep patterns and sleep problems in infancy and toddlerhood and provides reference data for well-child visits in Turkey. There was a large interindividual variability in sleep parameters consistent with previous international studies (Mindell et al., 2016; Paavonen et al., 2020; Sadeh et al., 2009). Overall, young

children in Turkey go to bed late (10:00 p.m.), awaken twice per night for 30 min, and obtain 11.5 h of total sleep, showing no sex-specific differences. Distinct night-time sleep patterns emerged after 18 months of age, and sleep consolidation was moderated by breastfeeding. The overall prevalence of poor sleepers decreased with age, and 35.8% of the parents defined their child's sleep as a problem. Interestingly, higher maternal education had a significant contribution

in predicting maternal perception of child sleep. The present findings suggest that a history of excessive infant crying and maternal depressive and anxiety symptoms moderate the risk of parents' perceived sleep problems.

Young children in Turkey showed the shortest sleep duration compared with those in PC, PA, and ME countries, but the difference was mainly due to shorter daytime sleep (11.5 versus 13.0, 12.3, 11.7 h, respectively) (Mindell, Lee, et al., 2017). Regarding the adequacy of sleep duration, our infants were sleeping less than the recommended amount for their age (11.7 versus 12 h) but longer than the recommended hours for toddlers (11.5 versus 11 h) (Paruthi et al., 2016). We found that total and night-time sleep durations were relatively stable, supporting previous findings (Mindell et al., 2016; Sadeh et al., 2009). They had later bedtimes (10:00 p.m.) and wake times (8:00 a.m.) compared to those from PC and PA countries but earlier compared to ME countries (Mindell et al., 2013; Mindell, Lee, et al., 2017). We found more night awakenings and longer night awakening durations compared to children from PA and PC countries (Mindell, Lee, et al., 2017). Notably, the nocturnal sleep duration of ~10 h across all age groups was similar to that in PC countries but longer than that in ME and PA countries (Mindell, Lee, et al., 2017). The number of naps decreased across age groups, to one after 18 months of age, whereas daytime sleep duration (median 2 h) was more consistent until 2 years of age, decreasing to 1.7 h after 2 years, confirming previous studies (Galland et al., 2012; Paavonen et al., 2020). In contrast to findings from the Finland study, the time to fall asleep was short and constant during the first 18 months, being ~15 min, and longer sleep latencies were identified in 11.6% of the children, showing a significant increase after 18 months of age, which may indicate bedtime resistance occurring in toddlers (Paavonen et al., 2020).

Unlike the rapid maturational changes reported from previous studies, the proportion of children who had uninterrupted sleep for 6 h was uncommon in the entire sample (30.4%), and age-related changes in sleep patterns occurred from 18 months of age, similar to the study from Finland, which confirmed that only 22.3% of children slept through the night at 8 months (Henderson et al., 2011; Paavonen et al., 2020). The highest percentage of children who had uninterrupted sleep was seen beyond 2 years, when it reached 52.9% in non-breastfed children and 37.9% in breastfed children.

Breastfeeding to sleep was the predominant strategy at bedtime and night-time waking across all age groups. The majority of children were breastfed to sleep until 18 months of age, but less than half (43.3%) were breastfed to sleep beyond 18 months, declining to 12.5% beyond 2 years. While previous work relies on sleeping through the night as a sign of developmental maturation, the relationship between child sleep and breastfeeding is important to note. Recent studies showed that psychomotor development did not differ between infants with and without fragmented sleep at 8 or 24 months of age (Mäkelä et al., 2018; Pennestri et al., 2018). Considering that high proportions of children did not sleep uninterrupted through the night and that children breastfed to sleep were less likely to sleep uninterrupted despite adequate sleep duration in this healthy sample suggests normal developmental processes. Given the association with

better health outcomes for children, our results stress the importance of maintaining breastfeeding (Organization, 2018). Tailored advice with realistic expectations should be provided for breastfed children in cultures where parental preferences emphasise breastfeeding.

Our data confirmed the high prevalence of BSPs in early childhood (Sadeh, 2004; Sadeh et al., 2009). Parents' perceived sleep problems were quite high, between 35% and 40%, during the first 2 years of life and then decreased to 29.6% beyond 2 years. Poor sleepers reached the highest prevalence of 30.8% at 9–11 months and then decreased to 19% after 18 months and to 15.8% after 2 years. The findings were similar to ME countries, higher than PC countries, and lower compared to those from PA countries (35.8% versus 36.9%, 26.3%, and 51.9%, respectively) (Mindell, Lee, et al., 2017).

Studies have suggested that maternal depressive and anxiety symptoms are associated with mothers' perception of infant sleep problems (Dias & Figueiredo, 2021; Tikotzky et al., 2021). On the other hand, a recent study found no evidence of poor sleep in infants of mothers with perinatal depression at 1 year of age using actigraphy-derived objective data (Halal et al., 2021). Our study revealed maternal depressive and anxious symptoms as the factors predicting the likelihood of both parent-perceived sleep problems and poor sleepers. Although the data do not allow the assessment of causality and the bidirectional nature of the relation makes the interpretation challenging, mothers' perception of sleep problems is important because BSPs are mainly diagnosed based on parents' subjective complaints. Thus, we might suggest that interventions for BSPs need to consider the mental health of mothers.

Research evidence suggests that parental characteristics have a significant contribution in predicting parental perception of sleep problems (Martini et al., 2017; Tikotzky et al., 2021). Our results add to the literature that higher maternal educational attainment significantly contributes to predicting the perception of sleep problems in Turkey. As we did not find a significant difference in parent-perceived sleep problems in employed mothers compared to unemployed mothers and the effect of marital conflict disappeared after including all the predictor variables, our findings might suggest that parental stress could be one reason why highly educated mothers reported more sleep problems in their children. The role of other possible contributing factors, such as career-related demands and perceived support, should be explored further in future studies.

In a recent study, difficult temperament was identified as a child risk variable predicting sleep problems (Newton et al., 2020). Likewise, a history of excessive crying during the first 3 months of life was found to be a significant predictor of both parents' perceived sleep problems and poor sleepers, suggesting that negative affectivity/temperamental factors might influence sleep problems. We used a single question of excessive crying and fussiness to assess negative temperament associations in its simplest form and found that earlier signs of difficult temperament were associated with sleep problems. More comprehensive assessments of temperament will help to better understand the influence on parental perception.

Overall bedsharing (11.5%) and room sharing (52.9%) practices were low compared to ME and PA countries, and bedsharing rates were more

similar to PC countries (11%) (Mindell, Lee, et al., 2017). The prevalence of room sharing significantly decreased from 75.4% to 35.7% in children beyond 2 years, but bedsharing remained relatively consistent, ranging from 8.3% in 6–8 month-olds to 9.8% in 24–36 month-olds. Furthermore, breastfeeding sleep dyads were 1.7-times more likely to bedshare. The association between mothers' perception of poor sleep and bedsharing disappeared when other predictors were included, suggesting that mothers who bedshare with their children might have a better perception of their child's sleep. Although it is impossible to make any comments on causality, our findings suggest that bed sharing might be associated with the maintenance of breastfeeding and may reflect culturally based decisions for bedsharing, as suggested in the literature (Ball et al., 2016; Kellams et al., 2020; Luijk et al., 2013; Ward, 2015).

A number of limitations should be addressed. First, the study was cross-sectional in design; thus, the findings were correlational. Second, failure to have any information from the NUTS-12 region may have contributed to bias of estimates. Mothers with a college degree have been reported to be most likely to exercise preventative care, such as meeting the appropriate number of well-child visits, particularly in young children (Prickett & Augustine, 2016). Given that our cohort was sampled from well-child outpatient settings, compared with the population data, the present sample included a larger proportion of highly educated mothers (Turkish Statistical Institute, 2020). Although it may have influenced the representativeness of this cohort, our results provide reference data on age-related sleep patterns during infancy and toddlerhood during well-child visits. Third, the study results were obtained from maternal self-reports, which may be less accurate than actigraphy. However, the survey questions were derived from the BISQ, which was validated against actigraphy and daily logs (Sadeh et al., 2009). Although the survey was conducted online, a sampling frame was established through the list of email addresses of the well-child outpatient clinics.

The present analysis of sleep structure in infancy and toddlerhood provides culturally sensitive normative developmental data for well-child visits and cross-cultural comparison studies. Our data will contribute to young children's normative sleep data across early childhood with a breakdown to breastfeeding. The study also provides additional evidence that only a minority of children sleep uninterrupted during the first year of life, and breastfeeding should be taken into consideration when defining normative sleep patterns in early childhood. Understanding young children's sleep patterns can help paediatricians inform parents about what to expect about child sleep and its relation to the maintenance of breastfeeding. Our findings emphasise the need to modify expectations for sleep consolidation in cultures where active participation of the mothers in night-time care by breastfeeding was encouraged. The fact that the odds of parent-reported sleep problems were increased in mothers scoring higher on depressive and anxious symptoms and excessive crying in the first few months appeared to be an indicator for sleep problems, we might suggest that family-based interventions addressing maternal mental health and behaviour management techniques to cope with fussy infants should be considered (Crawford et al., 2022; Whittingham & Douglas, 2016).

AUTHOR CONTRIBUTIONS

Perran Boran: contributed to the conception, and design of the work, acquisition of data, analysis and interpretation of data, drafting the work, revised it critically, approved the final version, agrees to be accountable for all aspects of the work related to the accuracy of any part of the work. Ahmet Ergin: contributed to the conception and design of the work, revised it critically, approved the final version, agrees to be accountable for all aspects of the work related to the accuracy of any part of the work. Mahmut Caner Us: contributed to the design of the work, acquisition of data, approved the final version, agrees to be accountable for all aspects of the work related to the accuracy of any part of the work. Meltem Dinleyici: contributed to the acquisition of data, interpretation of data, revised it critically, approved the final version, agrees to be accountable for all aspects of the work related to the accuracy of any part of the work. Sevtaç Velipaşaoğlu: contributed to the acquisition of data, revised it critically, approved the final version, agrees to be accountable for all aspects of the work related to the accuracy of any part of the work. Siddika Songül Yalçın: contributed to the acquisition of data, analysis, and interpretation of data, revised it critically, approved the final version, agrees to be accountable for all aspects of the work related to the accuracy of any part of the work. Aysu Çamurdan Duyan: contributed to the acquisition of data and interpretation of data, revised it critically, approved the final version, agrees to be accountable for all aspects of the work related to the accuracy of any part of the work. Adnan Barutçu, Emel Gür, Gülbin Gökçay, Adem Aydın, Gökçe Celep, Habip Almış, Gözdenur Savcı, Meda Kondolot, Burçin Nalbantoğlu, Elif Ünver Korgalı, Özge Yendur, Filiz Orhon Şimşek, Aysun Kara Uzun, Özlem Bağ, Feyza Koç and Selda Bülbül: contributed to the acquisition of data, approved the final version, and agree to be accountable for all aspects of the work related to the accuracy of any part of the work.

ACKNOWLEDGMENTS

The authors would like to thank the caregivers who participated in the study.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ORCID

Perran Boran  <https://orcid.org/0000-0002-9885-7656>

Mahmut Caner Us  <https://orcid.org/0000-0003-1120-3498>

Adnan Barutçu  <https://orcid.org/0000-0001-8930-1122>

REFERENCES

- Ball, H. L., Howel, D., Bryant, A., Best, E., Russell, C., & Ward-Platt, M. (2016). Bed-sharing by breastfeeding mothers: Who bed-shares and what is the relationship with breastfeeding duration? *Acta Paediatrica*, 105(6), 628–634. <https://doi.org/10.1111/apa.13354>

- Blunden, S., & Boran, P. (2021). Increasing sleep health awareness in pediatric settings: Creating opportunities for generating a more sleep-literate health care workforce. *Çocuk Dergisi*, 21(3), 293–296.
- Boran, P., Ay, P., Akbarzade, A., Küçük, S., & Ersu, R. (2014). Translation into Turkish of the expanded version of the “brief infant sleep questionnaire” and its application to infants. *Marmara Medical Journal*, 27(3), 178–183.
- Boran, P., Waqas, A., Askan, O. O., Topcu, I., Dogan, T., & Rahman, A. (2020). Screening of postpartum depression among new mothers in Istanbul: A psychometric evaluation of the Turkish Edinburgh postnatal depression scale. *BMC Research Notes*, 13(1), 355. <https://doi.org/10.1186/s13104-020-05196-x>
- Bovbjerg, M. L., Hill, J. A., Uphoff, A. E., & Rosenberg, K. D. (2018). Women who bedshare more frequently at 14 weeks postpartum subsequently report longer durations of breastfeeding. *Journal of Midwifery & Women's Health*, 63(4), 418–424. <https://doi.org/10.1111/jmwh.12753>
- Bruni, O., Baumgartner, E., Sette, S., Ancona, M., Caso, G., Di Cosimo, M. E., ... Ferri, R. (2014). Longitudinal study of sleep behavior in normal infants during the first year of life. *Journal of Clinical Sleep Medicine*, 10(10), 1119–1127. <https://doi.org/10.5664/jcsm.4114>
- Cassanello, P., Ruiz-Botia, I., Díez-Izquierdo, A., Cartanyà-Hueso, À., Martínez-Sánchez, J. M., & Balaguer, A. (2021). How do infants and toddlers sleep in Spain? A cross-sectional study. *Eur J Pediatr*, 180(3), 775–782. <https://doi.org/10.1007/s00431-020-03786-2>
- Covington, L. B., Patterson, F., Hale, L. E., Teti, D. M., Cordova, A., Mayberry, S., & Hauenstein, E. J. (2021). The contributory role of the family context in early childhood sleep health: A systematic review. *Sleep Health*, 7(2), 254–265. <https://doi.org/10.1016/j.sleh.2020.11.010>
- Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of postnatal depression. Development of the 10-item Edinburgh postnatal depression scale. *The British Journal of Psychiatry*, 150, 782–786. <https://doi.org/10.1192/bjp.150.6.782>
- Crawford, E., Whittingham, K., Pallett, E., Douglas, P., & Creedy, D. K. (2022). An evaluation of neuroprotective developmental care (NDC/possums programs) in the first 12 months of life. *Maternal and Child Health Journal*, 26(1), 110–123. <https://doi.org/10.1007/s10995-021-03230-3>
- Cremone, A., de Jong, D. M., Kurdziel, L. B. F., Desrochers, P., Sayer, A., LeBourgeois, M. K., ... McDermott, J. M. (2018). Sleep tight, act right: Negative affect, sleep and behavior problems during early childhood. *Child Development*, 89(2), e42–e59. <https://doi.org/10.1111/cdev.12717>
- Dias, C. C., & Figueiredo, B. (2021). Unidirectional and bidirectional links between maternal depression symptoms and infant sleep problems. *Journal of Sleep Research*, 30(5), e13363. <https://doi.org/10.1111/jsr.13363>
- Ersu, R., Boran, P., Akin, Y., Bozaykut, A., Ay, P., & Yazar, A. S. (2017). Effectiveness of a sleep education program for pediatricians. *Pediatrics International*, 59(3), 280–285. <https://doi.org/10.1111/ped.13147>
- Galland, B. C., Taylor, B. J., Elder, D. E., & Herbison, P. (2012). Normal sleep patterns in infants and children: A systematic review of observational studies. *Sleep Medicine Reviews*, 16(3), 213–222. <https://doi.org/10.1016/j.smrv.2011.06.001>
- Halal, C. S., Bassani, D. G., Santos, I. S., Tovo-Rodrigues, L., Del-Ponte, B., Silveira, M. F., ... Nunes, M. L. (2021). Maternal perinatal depression and infant sleep problems at 1 year of age: Subjective and actigraphy data from a population-based birth cohort study. *Journal of Sleep Research*, 30(2), e13047. <https://doi.org/10.1111/jsr.13047>
- Henderson, J. M., France, K. G., & Blampied, N. M. (2011). The consolidation of infants' nocturnal sleep across the first year of life. *Sleep Medicine Reviews*, 15(4), 211–220. <https://doi.org/10.1016/j.smrv.2010.08.003>
- Turkish Statistical Institute. (2020). *Women in statistics*. Retrieved from December 7, 2021, from <https://data.tuik.gov.tr/Bulten/Index?p=37221&dil=2>
- Karacam, Z., & Kitis, Y. (2008). The postpartum depression screening scale: Its reliability and validity for the Turkish population. *Türk Psikiyatri Dergisi*, 19(2), 187–196. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/18561051>
- Kellams, A., Hauck, F. R., Moon, R. Y., Kerr, S. M., Heeren, T., Corwin, M. J., & Colson, E. (2020). Factors associated with choice of infant sleep location. *Pediatrics*, 145(3), 1–10. <https://doi.org/10.1542/peds.2019-1523>
- Konkan, R., Senormancı, O., Guclu, O., Aydın, E., & Sungur, M. (2013). Validity and reliability study for the Turkish adaptation of the generalized anxiety Disorder-7 (GAD-7) scale. *Archives of Neuropsychiatry*, 50, 53–58.
- Luijk, M. P., Mileva-Seitz, V. R., Jansen, P. W., van IJzendoorn, M. H., Jaddoe, V. W., Raat, H., ... Tiemeier, H. (2013). Ethnic differences in prevalence and determinants of mother-child bed-sharing in early childhood. *Sleep Medicine*, 14(11), 1092–1099. <https://doi.org/10.1016/j.sleep.2013.04.019>
- Mäkelä, T. E., Peltola, M. J., Nieminen, P., Paavonen, E. J., Saarenpää-Heikkilä, O., Paunio, T., & Kylliäinen, A. (2018). Night awakening in infancy: Developmental stability and longitudinal associations with psychomotor development. *Developmental Psychology*, 54(7), 1208–1218. <https://doi.org/10.1037/dev0000503>
- Martini, J., Petzoldt, J., Knappe, S., Garthus-Niegel, S., Asselmann, E., & Wittchen, H. U. (2017). Infant, maternal, and familial predictors and correlates of regulatory problems in early infancy: The differential role of infant temperament and maternal anxiety and depression. *Early Human Development*, 115, 23–31. <https://doi.org/10.1016/j.earlhumdev.2017.08.005>
- Mindell, J. A., Lee, C., & Sadeh, A. (2017). Young child and maternal sleep in the Middle East. *Sleep Medicine*, 32, 75–82. <https://doi.org/10.1016/j.sleep.2016.11.011>
- Mindell, J. A., Leichman, E. S., Composto, J., Lee, C., Bhullar, B., & Walters, R. M. (2016). Development of infant and toddler sleep patterns: Real-world data from a mobile application. *Journal of Sleep Research*, 25(5), 508–516. <https://doi.org/10.1111/jsr.12414>
- Mindell, J. A., Leichman, E. S., & Walters, R. M. (2017). Sleep location and parent-perceived sleep outcomes in older infants. *Sleep Medicine*, 39, 1–7. <https://doi.org/10.1016/j.sleep.2017.08.003>
- Mindell, J. A., Sadeh, A., Kwon, R., & Goh, D. Y. (2013). Cross-cultural differences in the sleep of preschool children. *Sleep Medicine*, 14(12), 1283–1289. <https://doi.org/10.1016/j.sleep.2013.09.002>
- Mindell, J. A., Sadeh, A., Wiegand, B., How, T. H., & Goh, D. Y. (2010). Cross-cultural differences in infant and toddler sleep. *Sleep Medicine*, 11(3), 274–280. <https://doi.org/10.1016/j.sleep.2009.04.012>
- Newton, A. T., Honaker, S. M., & Reid, G. J. (2020). Risk and protective factors and processes for behavioral sleep problems among preschool and early school-aged children: A systematic review. *Sleep Medicine Reviews*, 52, 101303. <https://doi.org/10.1016/j.smrv.2020.101303>
- Organization, W. H. (2018). *Guideline: Counselling of women to improve breastfeeding practices*. World Health Organization.
- Öztürk, M., Boran, P., Ersu, R., & Peker, Y. (2021). Possums-based parental education for infant sleep: Cued care resulting in sustained breastfeeding. *European Journal of Pediatrics*, 180(6), 1769–1776. <https://doi.org/10.1007/s00431-021-03942-2>
- Paavonen, E. J., Saarenpää-Heikkilä, O., Morales-Munoz, I., Virta, M., Hakala, N., Polkki, P., ... Karlsson, L. (2020). Normal sleep development in infants: Findings from two large birth cohorts. *Sleep Medicine*, 69, 145–154. <https://doi.org/10.1016/j.sleep.2020.01.009>
- Paruthi, S., Brooks, L. J., D'Ambrosio, C., Hall, W. A., Kotagal, S., Lloyd, R. M., ... Wise, M. S. (2016). Consensus statement of the American Academy of sleep medicine on the recommended amount of sleep for healthy children: Methodology and discussion. *Journal of Clinical Sleep Medicine*, 12(11), 1549–1561. <https://doi.org/10.5664/jcsm.6288>
- Pennestri, M. H., Laganieri, C., Bouvette-Turcot, A. A., Pokhvisneva, I., Steiner, M., Meaney, M. J., ... Mavan Research, T. (2018).

- Uninterrupted infant sleep, development, and maternal mood. *Pediatrics*, 142(6), 1–8. <https://doi.org/10.1542/peds.2017-4330>
- Petzoldt, J., Wittchen, H. U., Einsle, F., & Martini, J. (2016). Maternal anxiety versus depressive disorders: Specific relations to infants' crying, feeding and sleeping problems. *Child: Care, Health and Development*, 42(2), 231–245. <https://doi.org/10.1111/cch.12292>
- Prickett, K. C., & Augustine, J. M. (2016). Maternal education and Investments in Children's health. *Journal of Marriage and the Family*, 78(1), 7–25. <https://doi.org/10.1111/jomf.12253>
- Sadeh, A. (2004). A brief screening questionnaire for infant sleep problems: Validation and findings for an internet sample. *Pediatrics*, 113(6), e570–e577. <https://doi.org/10.1542/peds.113.6.e570>
- Sadeh, A., Mindell, J. A., Luedtke, K., & Wiegand, B. (2009). Sleep and sleep ecology in the first 3 years: A web-based study. *Journal of Sleep Research*, 18(1), 60–73. <https://doi.org/10.1111/j.1365-2869.2008.00699.x>
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Lowe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, 166(10), 1092–1097. <https://doi.org/10.1001/archinte.166.10.1092>
- Teng, A., Bartle, A., Sadeh, A., & Mindell, J. (2012). Infant and toddler sleep in Australia and New Zealand. *Journal of Paediatrics and Child Health*, 48(3), 268–273. <https://doi.org/10.1111/j.1440-1754.2011.02251.x>
- Tikotzky, L., Volkovich, E., & Meiri, G. (2021). Maternal emotional distress and infant sleep: A longitudinal study from pregnancy through 18 months. *Developmental Psychology*, 57(7), 1111–1123. <https://doi.org/10.1037/dev0001081>
- Ward, T. C. (2015). Reasons for mother-infant bed-sharing: A systematic narrative synthesis of the literature and implications for future research. *Maternal and Child Health Journal*, 19(3), 675–690. <https://doi.org/10.1007/s10995-014-1557-1>
- Whittingham, K., & Douglas, P. (2016). “Possums”: Building contextual behavioural science into an innovative evidence-based approach to parenting support in early life.
- Williams, K. E., Nicholson, J. M., Walker, S., & Berthelsen, D. (2016). Early childhood profiles of sleep problems and self-regulation predict later school adjustment. *The British Journal of Educational Psychology*, 86(2), 331–350. <https://doi.org/10.1111/bjep.12109>
- Williamson, A. A., & Mindell, J. A. (2020). Cumulative socio-demographic risk factors and sleep outcomes in early childhood. *Sleep*, 43(3), 1–13. <https://doi.org/10.1093/sleep/zsz233>

How to cite this article: Boran, P., Ergin, A., Us, M. C., Dinleyici, M., Velipaşaoğlu, S., Yalçın, S. S., Barutçu, A., Gökçay, G., Gür, E., Çamurdan Duyan, A., Aydın, A., Celep, G., Almış, H., Savcı, G., Kondolot, M., Nalbantoğlu, B., Ünver Korgalı, E., Yendur, Ö., Orhon Şimşek, F., ... Bülbül, S. (2022). Young children's sleep patterns and problems in paediatric primary healthcare settings: a multicentre cross-sectional study from a nationally representative sample. *Journal of Sleep Research*, 31(6), e13684. <https://doi.org/10.1111/jsr.13684>