

# Relationship Between Sleep Habits and Maternal Psychopathology in Children with and without Autism Spectrum Disorder

## Otizm Spektrum Bozukluğu Olan ve Olmayan Çocuklarda Uyku Alışkanlıkları ile Maternal Psikopatoloji Arasındaki İlişki

Alperen Bıkmazer<sup>1</sup> , Esra Altınbilek<sup>1</sup> , Fetanet Beyza Gürel<sup>2</sup> , Fulya Bakır<sup>1</sup> , Bilgihan Bıkmazer<sup>3</sup> ,  
Vahdet Görmez<sup>1</sup> 

<sup>1</sup>Istanbul Medeniyet University Faculty of Medicine, Department of Child and Adolescent Psychiatry and Mental Health, Istanbul, Türkiye

<sup>2</sup>Bogazici University, Faculty of Education, Department of Guidance and Psychological Counseling, Istanbul, Türkiye

<sup>3</sup>Health Sciences University, Zeynep Kamil Gynecology and Pediatrics Training and Research Hospital, Department of Pediatric Neurology, Istanbul, Türkiye

ORCID ID: A.B. 0000-0001-8219-8185; E.A. 0000-0002-6113-4614; F.B.G. 0000-0001-7294-4500; F.B. 0000-0001-7375-5779; B.B. 0000-0003-1974-8951; V.G. 0000-0002-2704-9520

**Citation/Atf:** Bıkmazer A, Altınbilek E, Gürel FB, Bakır F, Bıkmazer B, Görmez V. Relationship between sleep habits and maternal psychopathology in children with and without autism spectrum disorder. Çocuk Dergisi - Journal of Child 2022;22(3):159-165. <https://doi.org/10.26650/jchild.2022.1111942>

### ABSTRACT

**Objective:** The aim of this study was to examine the relationship between sleep habits and maternal psychopathology in children with autism spectrum disorder, and to compare them with children with developmental delay and typically developing children.

**Materials and Methods:** In this cross-sectional study, 131 children aged 18-42 months who applied to the neurodevelopmental delay clinic were evaluated. The Childhood Autism Rating Scale was administered by a clinician. Child Sleep Habits Questionnaire and Symptom Checklist 90 were filled in by mothers.

**Results:** Children with Autism Spectrum Disorder were found to have more sleep onset delay and sleep anxiety than children with developmental delay and typical development. A relationship was found between sleep problems in children and psychiatric problems of mothers.

**Conclusion:** A comprehensive evaluation including sleep problems and parental mental health evaluation while performing neurodevelopmental evaluation provides important data both in the diagnosis and the rehabilitation processes.

**Keywords:** Autism, maternal psychopathology, sleep habits

### ÖZ

**Amaç:** Bu çalışmanın amacı otizm spektrum bozukluğu olan çocuklarda uyku alışkanlıkları ile anne psikopatolojisi arasındaki ilişkiyi incelemek ve gelişimsel gecikmesi olan çocuklar ve tipik gelişim gösteren çocuklar ile karşılaştırmaktır.

**Gereç ve Yöntem:** Bu kesitsel araştırmada, nörogelişimsel gecikme kliniğine başvuran 18-42 ay arasındaki 131 çocuk değerlendirilmiştir. Klinisyen tarafından Çocukluk Otizmi Derecelendirme Ölçeği uygulanmıştır. Anneler tarafından Çocuk Uyku Alışkanlıkları Anketi ve Belirti Tarama Listesi 90 doldurulmuştur.

**Bulgular:** Otizm Spektrum Bozukluğu olan çocuklarda uykuya geçişte gecikme ve uyku anksiyetesinin gelişimsel gecikmesi olan ve tipik gelişim gösteren çocuklardan daha fazla olduğu bulunmuştur. Çocuklarda uyku problemleri ile annelerin psikiyatrik problemleri arasında ilişki saptanmıştır.

**Sonuç:** Nörogelişimsel değerlendirme yapılırken uyku problemleri ve ebeveyn ruh sağlığı değerlendirmesini de içeren kapsamlı bir değerlendirme hem tanı hem de rehabilitasyon sürecinde önemli veriler sağlamaktadır.

**Anahtar Kelimeler:** Otizm, maternal psikopatoloji, uyku alışkanlıkları

### INTRODUCTION

As sleep is an essential element for growth, healthy sleep is highly critical for physical and cognitive development in the early years of life. Although adequate sleep involves many parameters, it is mainly characterized by sleep duration. The

National Sleep Foundation recommends 11 to 14 hours sleep per day for toddlers aged 12 to 24 months (1). Just as sleep duration, sleep onset, continuity, and sleep-wake patterns are other factors along with various extrinsic and intrinsic factors for sleep quality (2). Since difficulties in sleep impact the growth and well-being of children (3), poor sleeping habits

**Corresponding Author/Sorumlu Yazar:** Alperen Bıkmazer E-mail: [alperenbıkmazer@yahoo.com](mailto:alperenbıkmazer@yahoo.com)

**Submitted/Başvuru:** 05.05.2022 • **Revision Requested/Revizyon Talebi:** 04.07.2022 • **Last Revision Received/Son Revizyon:** 05.07.2022 •

**Accepted/Kabul:** 02.08.2022 • **Published Online/Online Yayın:** 06.12.2022



This work is licensed under Creative Commons Attribution-NonCommercial 4.0 International License

and sleep problems are among the major concerns of the early years. Maternal sleep habits, co-sleeping (4), family chaos (5), and culture (6) are some of the extrinsic factors found related to sleep difficulties. A variety of longitudinal studies present several potential outcomes linked to early sleep problems, especially behavioral problems. Sleep problems are also found to be linked with the poorer mental health of caregivers, which is mainly led by the cumulative parental stress related to sleep difficulties (7). Studies reveal that the parents of children with poor sleep habits are more prone to stress and depression when compared to control groups (3,8,9). Studies denote that the pathways between child sleep problems and parental mental health is not unidirectional, however, the direction of this pathway is still uncertain in the literature (7). It is mostly hypothesized that sleep problems exacerbate maternal psychopathology, however, the presence of sleep problems could also be longitudinal outcomes of maternal psychopathology (9,10). For example, in a longitudinal study with pregnant mothers, it is found that prenatal depression and anxiety predict the sleep disturbance of toddlers at the ages of 18 months and 30 months, even after controlling the postnatal mood (11). Similarly in another study, higher levels of maternal depression at 15 and 24 months predicted greater duration of child awakenings at 24 and 36 months (10). However, a longitudinal study conversely finds that having cry-fuss or sleep problems in the first 2 years at more than 3 previous time points contributes significantly to parental distress with 2.8% of variance (12). Regardless of the direction of the causal link, the literature clearly shows us that maternal mental health is a potential indicator or risk factor for sleep problems. Therefore, it is a fact that poor sleep habits might signal many problems, including some risk factors for the well-being of both the child and caregivers.

Although sleep problems are prevalent in all pediatric populations, there is a higher frequency in samples with autism spectrum disorder (ASD) (13). Difficulties in settling to sleep, night waking (14) and shorter sleep duration (15,16) are main sleep problems found to be correlated with autism severity (17). Some studies considered these difficulties as the very early signs of ASD in toddlerhood (18). In one of these longitudinal studies, the sleep problems experienced by toddlers at 18-months-old were predicted by the autistic symptoms at the ages 3 and 4 (19). It is also shown that maternal stress is associated with sleep problems of children with ASD, even after controlling for autistic severity and maternal sleep (8). Since studies have revealed the significant link between sleep problems and ASD symptoms, early sleep problems should be taken into consideration in terms of early interventions and maternal mental health should also be investigated in this context

Considering the link between sleep problems and maternal mental health, an additional examination is needed to delineate the role of signs and symptoms of ASD in toddlerhood. The current study aimed to examine the relationship between sleep characteristics and problems, and the presence of ASD diagnosis; to identify which factors played a role in the path to

sleep problems in toddlers without ASD diagnosis; to examine the role of maternal psychopathology in relation to early signs and symptoms of autism and sleep problems in toddlers aged between 18 to 36 months.

## METHODS

### Participants

The sample consists of 131 children aged 18 to 42 months referred to the clinic for neurodevelopmental delays (CND) at the department of child and adolescent psychiatry at Istanbul Medeniyet University. Referrals to the CND are of children mainly with suspected autism spectrum disorder from primary care centers or by pediatricians. The clinic is chaired by a senior child and adolescent psychiatrist (AB) and the staff includes a resident (trainee) child psychiatrist, a clinical psychologist, and a child development specialist. In the present study, a total of 131 young children who had undergone a thorough assessment including a medical checkup to exclude impairment in hearing and motor deficit, psychiatric examination, family assessment structured interviews and use of age-appropriate developmental and social-emotional measures. As a result of the assessment, the sample was divided into 3 groups. According to the clinical examination and rating scales, the group that met the autism spectrum disorder diagnosis criteria was ASD (Autism Spectrum Disorder), the group having difficulties in language development and social communication skills but did not meet the autism spectrum disorder diagnosis criteria was DD (Developmental Delay), and the group who did not have any language and social communication problems was TD (Typical Development). Children with neurological problems such as epilepsy and motor deficits were excluded. The study protocol was approved by the Istanbul Medeniyet University Research Ethics Committee (approval number 2021/0227). Informed consent was obtained from the mothers. The study was conducted in accordance with the principles of the Declaration of Helsinki.

### Measures

**Socio-demographic Form:** This questionnaire, which consists of questions about the child's perinatal and developmental history, was created by the study team in order to collect information about the age, education level, occupation, income and marital status of the parents, the number of children, and familial physical and mental illness history.

**The Childhood Autism Rating Scale (CARS):** The Childhood Autism Rating Scale (20) is a behavioral rating scale used for assessing the symptoms of autism spectrum disorders. It consists of 14 items which assess autism associated behaviors and another item for rating general impression of childhood autism. Items are scored on a scale ranging from one to four; the lowest scores are associated with no impairment. Total scores below 30 indicate that the individual is in the non-autistic range. The CARS is adapted into Turkish, and it is found to be a valid and reliable assessment instrument (21).

**The Children's Sleep Habits Questionnaire (CSHQ):** The CSHQ is a parent-report, sleep-screening instrument which is helpful at collecting information about children's sleep habits and sleep problems. It was originally designed for children ages 4 to 10 years (22); but in a recent study, the researchers found that CSHQ is also clinically useful for the screening of sleep problems in toddlers (23). CSHQ has 56 items related to common sleep behaviors, and each question was asked in relation to the previous week. 52 items are rated on a three-point Likert scale (rarely [0–1 night per week]; sometimes [2–4 nights per week]; and usually [5–7 nights per week]). The subscales of CSHQ include Bedtime Resistance, Sleep Onset Delay, Sleep Duration, Sleep Anxiety, Night Waking, Parasomnias, Daytime Sleepiness and Sleep Disordered Breathing. A total CSHQ score above 41 may indicate sleep problems in young children. A Turkish validity and reliability study of the scale was conducted in 2010 (24).

**The Symptom Checklist-90-Revised (SCL-90-R):** Developed by Derogatis (25), this is a multidimensional, 90-item self-report symptom inventory designed to screen psychological symptoms and psychological distress. It identifies a range of psychological symptoms and psychopathological features on nine subscales: somatization, obsessive compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Respondents score each item which bothered them on a Likert scale of 0 (not at all) to 4 (extremely). Higher scores mean that the symptoms are more severe. A Turkish validity and reliability study of SCL-90-R was conducted by Kilic (26).

### Statistics

All analyses were performed using the SPSS 21.0 statistical software (Chicago, IL, USA). The groups were compared in terms of demographic characteristics and sleep habits by using chi-square tests for categorical variables, and ANOVA or Kruskal-Wallis test for continuous variables. Pearson's or Spearman's correlation coefficients were used to detect a relationship between continuous variables. A two-tailed P-value of 0.05 was considered to be statistically significant.

### RESULTS

The study sample consisted of 131 toddlers in three groups: autism spectrum disorder (ASD) (n= 36), developmental delay (DD) (n=42), and typical development (TD) (n=53) groups. Male: Female ratio was similar among groups. The three groups did not differ regarding age, familial psychiatric disorder history, familial speech and language delay history and gestational age. However, maternal employment status and newborn weight was significantly different among the groups. It was reported to be lowest in Group ASD (p=0.01 and p=0.033 respectively) (Table 1 and Table 2).

Sleep habits are listed in Table 3. The remarkable findings were the CSHQ sleep onset delay, and CSHQ sleep anxiety scores were significantly higher in Group ASD (p=0.002 and p=0.044 respectively). In addition, the mean CSHQ total score in all three groups was above the cut-off score of 41.

**Table 1: Sociodemographic characteristics of sample**

	N (%)	Mean±SD
Gender		
Male	95 (72.5)	
Female	36 (27.5)	
Age (months)		27.76±6.58
Age of father		36.97±5.54
Age of mother		34.06±5.61
Maternal education status		
Illiterate	2 (1.5)	
Primary school	44 (33.6)	
High school	32 (24.4)	
University	50 (38.2)	
Paternal education status		
Illiterate	1 (0.8)	
Primary school	33 (25.2)	
High school	45 (34.4)	
University	48 (36.6)	
Family income		
<300 USD	22 (16.8)	
300-600 USD	52 (39.7)	
600-1000 USD	21 (16)	
>1000 USD	30 (22.9)	
Number of children		
1	54 (41.2)	
2	53 (40.5)	
3 and above	23 (17.6)	
Familial physical disease history	43 (32.8)	
Familial psychiatric disorder history	22 (16.8)	
Gestational smoking	16 (12.2)	
High-risk pregnancy	43 (32.8)	
Newborn complications	56 (42.7)	
Incubator history	32 (24.4)	
Gestational age		38.02±2.43
≤37	35 (28.2)	
38-42	88 (71)	
>42	1 (0.8)	
Types of delivery		
Vaginal delivery	28 (21.4)	
C-section	81 (61.8)	
Newborn weight (g)		3210.62±575.58
Breastfeeding duration (months)		14.62±8.6
Groups		
ASD	36 (27.5)	
DD	42 (32)	
TD	53 (40.5)	

USD: United States Dollar ASD:Autism spectrum disorder DD:Developmental delay TD:Typical development

There was no significant difference in terms of maternal psychopathology in all three groups. There was a correlation between SCL-90 subtest scores and CSHQ subtest scores. In particular, SCL-90 anxiety and obsession-compulsion subtest scores were significantly correlated with all CSHQ subtest scores (Table 4).

**Table 2. Descriptive statistics for group characteristics**

	ASD n (%)	DD n (%)	TD n (%)	p
Gender				
Male	25 (69.4)	35 (83.3)	35 (66)	0.153
Age (months)	29.83±7.12	27.5±6.48	26.55±6.04	0.095
Maternal employment	<b>5 (13.9)</b>	19 (45.2)	20 (37.7)	0.01
Familial psychiatric disorder history	8 (22.2)	9 (22.5)	5 (9.6)	0.171
Family history of speech and language delay	11 (30.6)	22 (57.9)	22 (42.3)	0.058
Gestational smoking	4 (11.1)	6 (15.4)	6 (11.3)	0.808
High-risk pregnancy	13 (36.1)	14 (35.9)	16 (30.8)	0.829
Newborn complications	14 (38.9)	20 (51.3)	22 (41.5)	0.508
Incubator history	9 (25)	12 (30.8)	11 (21.2)	0.579
Gestational age ≤37	10 (31.3)	16 (40)	9 (17.3)	0.051
Types of delivery				
C-section	18 (64.3)	25 (78.1)	38 (77.6)	0.370
Newborn weight (g)	2999.17±475.39	3203.62±648.44	3340.49±540.35	0.033
CARS	28.68±7.04	17.33±1.44	15.31±0.26	<0.0001

ASD:Autism spectrum disorder DD:Developmental delay TD:Typical development CARS:The Childhood Autism Rating Scale

**Table 3. Sleep Characteristics Comparison Between Groups**

	ASD (n:36)	DD (n:42)	TD (n:53)	p
	Mean (SD)			
Sleep onset time	22:57 (1:27)	22:28 (1:06)	22:20 (1:16)	0.099
Sleep onset after 22:00	22 (61.1)	26 (61.9)	21 (39.6)	0.048
Morning wake-up	9:06 (1:11)	8:51 (1:07)	9:01 (1:11)	0.643
Sleep duration	10.88 (1.71)	11.29 (1.34)	11.2 (1.77)	0.571
CSHQ Bedtime Resistance	12.47 (3.08)	11.9 (2.49)	11.83 (2.97)	0.56
CSHQ Sleep Onset Delay	<b>2.11 (0.85)</b>	1.6 (0.8)	1.49 (0.7)	0.002
CSHQ Sleep Duration	4.97 (2.25)	4.12 (1.4)	4.23 (1.69)	0.303
CSHQ Sleep Anxiety	<b>7.39 (2.07)</b>	7.1 (1.6)	<b>6.47 (1.66)</b>	0.044
CSHQ Night Wakings	4.61 (1.34)	4.45 (1.13)	4.58 (1.2)	0.955
CSHQ Parasomnias	8.92 (2.42)	8.71 (1.73)	8.51 (1.83)	0.608
CSHQ Daytime Sleepiness	10.92 (2.47)	10.74 (1.9)	10.47 (1.99)	0.75
CSHQ Sleep Disordered Breathing	3.39 (0.87)	3.26 (0.66)	3.23 (0.64)	0.638
CSHQ Total	52.97 (8.76)	49.98 (6.19)	49.26 (7.16)	0.124

ASD:Autism spectrum disorder DD:Developmental delay TD:Typical development CSHQ: The Children's Sleep Habits Questionnaire

**DISCUSSION**

In this study, the relationship between sleep habits and maternal psychopathology in toddlers was investigated. Delay in transition to sleep and sleep anxiety were found to be more common in children with autism spectrum disorder. At the same time, while no relationship was found between maternal psychopathology and the presence of autism, a significant relationship was found between toddler sleep problems and the presence of autism.

In the study, children who were referred for a diagnostic examination because they showed autism spectrum symptoms were evaluated, and 27.5% were diagnosed with ASD, and 32% had developmental problems that did not meet the diagnostic criteria for ASD. 40.5% were toddlers with typical development without any developmental problems. At the same time, it is noteworthy that the mean CSHQ score in all three groups was above the threshold value of 41. Although this finding is consistent with previous studies (27,28), the mean CSHQ score in children with typical development in our study was similar to that

**Table 4: Correlations Between CSHQ and SCL-90**

		SOM	OC	IPS	DEP	ANX	HOS	PHO	PAR	PSY	GSI
CSHQ Bedtime Resistance	rho	0.315	0.373	0.305	0.365	0.328	0.361	0.168	0.352	0.265	0.374
	p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001
CSHQ Sleep Onset Delay	rho	0.179	0.169	0.113	0.114	0.173	0.152	0.078	0.070	0.085	0.150
	p	0.041	0.054	0.200	0.194	0.048	0.084	0.377	0.425	0.336	0.087
CSHQ Sleep Duration	rho	0.129	0.177	0.122	0.152	0.174	0.071	0.075	0.050	0.211	0.164
	p	0.143	0.043	0.165	0.084	0.047	0.422	0.392	0.572	0.016	0.061
CSHQ Sleep Anxiety	rho	0.244	0.288	0.192	0.262	0.255	0.203	0.104	0.243	0.151	0.263
	p	0.005	0.001	0.028	0.003	0.003	0.020	0.236	0.005	0.086	0.002
CSHQ Night Wakings	rho	0.287	0.197	0.242	0.292	0.285	0.309	0.154	0.275	0.251	0.312
	p	0.001	0.024	0.005	0.001	0.001	<0.001	0.079	0.001	0.004	<0.001
CSHQ Parasomnias	rho	0.312	0.411	0.333	0.387	0.304	0.356	0.337	0.391	0.368	0.415
	p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
CSHQ Daytime Sleepiness	rho	0.211	0.278	0.285	0.323	0.248	0.238	0.102	0.306	0.276	0.302
	p	0.015	0.001	0.001	<0.001	0.004	0.006	0.244	<0.001	0.001	<0.001
CSHQ Sleep Disordered Breathing	rho	0.108	0.172	0.187	0.153	0.161	0.153	0.113	0.151	0.173	0.170
	p	0.219	0.050	0.033	0.080	0.065	0.082	0.199	0.085	0.048	0.052
CSHQ Total	rho	0.361	0.433	0.356	0.430	0.396	0.420	0.219	0.391	0.356	0.448
	p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.012	<.001	<0.001	<0.001

CSHQ: The Children's Sleep Habits Questionnaire SCL-90:Symptom Checklist-90 SOM:Somatization OC:Obsessive compulsion IPS:Interpersonal sensitivity DEP:Depression ANX:Anxiety HOS:Hostility PHO:Phobic anxiety PAR:Paranoid ideation PSY:Psychoticism GSI: Global Severity Index

of children with ASD, unlike previous studies (29,30). A possible explanation for this situation might be: The group that we defined as typically developing children in our current study may not be an accurate representation of the normal population, as they do not have developmental problems but are referred to the clinic with certain problematic behaviors and suspicion of autism. Sleep problems can affect psychosocial development and behaviors in typically developing children (31,32). One of the reasons for the developmental and behavioral problems of the children referred in our study could also be sleep-related problems.

In our study, delay in transition to sleep and sleep anxiety were found to be more common in children with ASD. In a study conducted by Goldman (33) with 1856 children aged 3-18 years, it was determined that children with ASD in the toddler period had higher bedtime resistance, delayed transition to sleep, parasomnia, sleep anxiety, and night waking scores than the scores in the CSHQ normative sample. Similarly, in the study of Doo and Wing (34) with children with autism and developmental delay, parasomnia and sleep transition problems (i.e., bedtime resistance) were found to be the most common sleep problems. Problems with initiating and maintaining sleep are common in children with autism (13,35,36). However, as in our study, previous studies are also based on parental reporting. For this reason, parents of children with ASD may over-report sleep problems, and data based on objective measurements may be different than they are (37). However, despite this difference, the close relationship

between autism and sleep problems is confirmed by various studies (38). In addition, the typically developing group in our study did not consist of a normal population sample but consisted of children with suspected autism who were referred for differential diagnosis. The fact that these children also have sleep problems may be the reason why there is no significant difference in other subscales of CSHQ.

In our study, unlike previous studies, no difference was found between the groups in terms of maternal psychopathology. In the latest meta-analysis, it has been reported that psychiatric problems, especially depression and anxiety, are more common in mothers of children with ASD than in the general population (39). The fact that the study sample did not include the community population and that children with ASD were not yet diagnosed may be among the reasons for this. The follow-up of the parents of children diagnosed with ASD in terms of psychopathology may reveal different results in the future.

In our study, a correlation was found between parental psychopathology and sleep problems. The relationship between maternal stress and child sleep problems has also been shown in previous studies (38,40). Sleep problems in children can pave the way for an increase in the stress level of mothers and, therefore, the development of psychopathology. In a study, it was found that sleep problems in children predicted maternal stress when maternal sleep level and autism severity were controlled (8). Some studies suggest that this relationship

may be bidirectional. Mental problems in mothers affect the mother-child relationship, the mother's mental problems are reflected on the child, and in this case, it may cause sleep problems in the child (9,10). Although there was a relationship between sleep problems and maternal psychopathology in our study, the cause-effect relationship was not evaluated.

Our study has limitations. The cross-sectional study does not provide sufficient data to explain the link between ASD and child sleep problems and maternal psychopathology. In addition, considering that sleep habits may also be affected by mental disorders, the absence of psychiatric evaluation other than developmental evaluation in our study may constitute another limitation. As discussed before, the fact that our study sample consisted of children who were referred with the suspicion of autism shows that typically developing children may not exactly match the normal population. In addition, no external evaluation was made for the life stresses that the mothers were exposed to, except for the maternal psychopathology data obtained with the SCL-90. It is possible that maternal stress is a confounding factor in the scale findings.

In addition to these, our study also has strengths. First of all, this study is the first to examine ASD, maternal psychopathology and sleep disorders together in a Turkish sample. The sample diagnosed with ASD for the first time is also a factor that strengthens the findings of the study, because the burden on parents during the stigmatization and rehabilitation process observed in children with ASD did not have a confounding effect on psychopathology. In addition, clinical observations made it possible to evaluate children who were referred with the suspicion of autism in three categories, and children with developmental delay were separated from children with autism diagnosis. Thus, comparative data between groups could be obtained. Finally, the significant relationship between suspected ASD and sleep problems in children is expected to provide an important perspective in the field of early intervention.

As a result, a comprehensive evaluation including environmental factors such as parental psychopathology and sleep problems while performing neurodevelopmental evaluation in toddlers will help in the diagnosis process, prevent unnecessary diagnosis, and provide valuable information for the psychosocial rehabilitation and well-being of the child and mother.

**Ethics Committee Approval:** This study was approved by the Istanbul Medeniyet University Research Ethics Committee (approval number 2021/0227).

**Informed Consent:** Written consent was obtained from the participants.

**Peer Review:** Externally peer-reviewed.

**Author Contributions:** Conception/Design of Study- A.B., E.A., V.G.; Data Acquisition- A.B., E.A., F.B.; Data Analysis/Interpretation- A.B., B.G., V.G., B.B.; Drafting Manuscript- A.B., B.G., F.B.; Critical Revision of Manuscript- V.G., F.B., E.A.; Final Approval and Accountability- A.B., E.A., B.G., F.B., B. A., V.G.

**Conflict of Interest:** Authors declared no conflict of interest.

**Financial Disclosure:** Authors declared no financial support.

**Etik Komite Onayı:** Bu çalışma İstanbul Medeniyet Üniversitesi Araştırma Etik Kurulu tarafından onaylanmıştır (onay numarası 2021/0227).

**Bilgilendirilmiş Onam:** Katılımcılardan bilgilendirilmiş onam alınmıştır.

**Hakem Değerlendirmesi:** Dış bağımsız.

**Yazar Katkıları:** Çalışma Konsepti/Tasarım- A.B., E.A., V.G.; Veri Toplama- A.B., E.A., F.B.; Veri Analizi/Yorumlama- A.B., B.G., V.G., B.B.; Yazı Taslağı- A.B., B.G., F.B.; İçeriğin Eleştirel İncelemesi- V.G., F.B., E.A.; Son Onay ve Sorumluluk- A.B., E.A., B.G., F.B., B.B., V.G.

**Çıkar Çatışması:** Yazarlar çıkar çatışması beyan etmemişlerdir.

**Finansal Destek:** Yazarlar finansal destek beyan etmemişlerdir.

## REFERENCES

1. Hirshkowitz M, Whiton K, Albert SM, Alessi C, Bruni O, DonCarlos L, et al., National Sleep Foundation's updated sleep duration recommendations: final report. *Sleep Health* 2015;1(4):233-43. doi: 10.1016/j.sleh.2015.10.004.
2. Sadeh A, Anders TF. Infant sleep problems: Origins, assessment, interventions. *Inf Mental Health J* 1993;14(1):17-34. doi: 10.1002/1097-0355(199321)14:1<17::AID-IMHJ2280140103>3.0.CO;2-Q
3. Lam P, Hiscock H, Wake M. Outcomes of infant sleep problems: a longitudinal study of sleep, behavior, and maternal well-being. *Pediatrics* 2003;111(3):e203-7. doi: 10.1542/peds.111.3.e203.
4. Covington LB, Armstrong B, Black MM. Perceived toddler sleep problems, co-sleeping, and maternal sleep and mental health. *J Dev Behav Pediatr* 2018;39(3):238-45. doi: 10.1097/DBP.0000000000000535.
5. Boles RE, Halbower AC, Daniels S, Gunnarsdottir T, Whitesell N, Johnson SL. Family chaos and child functioning in relation to sleep problems among children at risk for obesity. *Behav Sleep Med* 2017;15(2):114-28. doi: 10.1080/15402002.2015.1104687.
6. Mindell JA, Sadeh A, Wiegand B, How TH, Goh DY. Cross-cultural differences in infant and toddler sleep. *Sleep Med* 2010;11(3):274-80. doi: 10.1016/j.sleep.2009.04.012.
7. Sadeh A, Tikotzky L, Scher A. Parenting and infant sleep. *Sleep Med Rev* 2010;14(2):89-96. doi: 10.1016/j.smr.2009.05.003.
8. Hoffman CD, Sweeney DP, Lopez-Wagner MC, Hodge D, Nam CY, Botts BH. Children with autism: Sleep problems and mothers' stress. *Focus on Autism and Other Developmental Disabilities* 2008;23(3):155-65. doi: 10.1177/1088357608316271.
9. Meltzer LJ, Mindell JA. Relationship between child sleep disturbances and maternal sleep, mood, and parenting stress: a pilot study. *J Fam Psychol* 2007;21(1):67-73. doi: 10.1037/0893-3200.21.1.67.
10. Warren SL, Howe G, Simmens SJ, Dahl RE. Maternal depressive symptoms and child sleep: models of mutual influence over time. *Dev Psychopathol* 2006;18(1):1-16. doi: 10.1017/S0954579406060019.

11. O'Connor TG, Caprariello P, Blackmore ER, Gregory AM, Glover V, Fleming P; ALSPAC Study Team. Prenatal mood disturbance predicts sleep problems in infancy and toddlerhood. *Early Hum Dev* 2007;83(7):451-8. doi: 10.1016/j.earlhumdev.2006.08.006.
12. Wake M, Morton-Allen E, Poulakis Z, Hiscock H, Gallagher S, Oberklaid F. Prevalence, stability, and outcomes of cry-fuss and sleep problems in the first 2 years of life: prospective community-based study. *Pediatrics* 2006;117(3):836-42. doi: 10.1542/peds.2005-0775.
13. Krakowiak P, Goodlin-Jones B, Hertz-Picciotto I, Croen LA, Hansen RL. Sleep problems in children with autism spectrum disorders, developmental delays, and typical development: a population-based study. *J Sleep Res* 2008;17(2):197-206. doi: 10.1111/j.1365-2869.2008.00650.x. Erratum in: *J Sleep Res* 2012;21(2):231.
14. Hoffman CD, Sweeney DP, Gilliam JE, Apodaca DD, Lopez-Wagner MC, Castillo MM. Sleep problems and symptomology in children with autism. *Focus on Autism and Other Developmental Disabilities* 2005;20(4):194-200.
15. DeVincent CJ, Gadow KD, Delosh D, Geller L. Sleep disturbance and its relation to DSM-IV psychiatric symptoms in preschool-age children with pervasive developmental disorder and community controls. *J Child Neurol* 2007;22(2):161-9. doi: 10.1177/0883073807300310.
16. Schreck KA, Mulick JA, Smith AF. Sleep problems as possible predictors of intensified symptoms of autism. *Res Dev Disabil* 2004;25(1):57-66. doi: 10.1016/j.ridd.2003.04.007.
17. Robinson AM, Richdale AL. Sleep problems in children with an intellectual disability: parental perceptions of sleep problems, and views of treatment effectiveness. *Child Care Health Dev* 2004;30(2):139-50. doi: 10.1111/j.1365-2214.2004.00395.x.
18. Cohen S, Conduit R, Lockley SW, Rajaratnam SM, Cornish KM. The relationship between sleep and behavior in autism spectrum disorder (ASD): a review. *J Neurodev Disord* 2014;6(1):44. doi: 10.1186/1866-1955-6-44.
19. Verhoeff ME, Blanken LME, Kocevskaja D, Mileva-Seitz VR, Jaddoe VVW, White T, et al. The bidirectional association between sleep problems and autism spectrum disorder: a population-based cohort study. *Mol Autism* 2018;9:8. doi: 10.1186/s13229-018-0194-8.
20. Schopler E, Reichler RJ, DeVellis RF, Daly K. Toward objective classification of childhood autism: Childhood Autism Rating Scale (CARS). *J Autism Dev Disord* 1980;10(1):91-103. doi: 10.1007/BF02408436.
21. İncekaş Gassaloğlu S, Baykara B, Avcil S, Demiral Y. Çocukluk Otizmi Derecelendirme Ölçeği Türkçe Formunun Geçerlik ve Güvenilirlik Çalışması [Validity and Reliability Analysis of Turkish Version of Childhood Autism Rating Scale]. *Türk Psikiyatri Derg* 2016;27(4):266-74.
22. Owens JA, Spirito A, McGuinn M. The Children's Sleep Habits Questionnaire (CSHQ): psychometric properties of a survey instrument for school-aged children. *Sleep* 2000 15;23(8):1043-51.
23. Goodlin-Jones BL, Sitnick SL, Tang K, Liu J, Anders TF. The Children's Sleep Habits Questionnaire in toddlers and preschool children. *J Dev Behav Pediatr* 2008;29(2):82-8. doi: 10.1097/dbp.0b013e318163c39a.
24. Perdahlı Fis N, Arman A, Ay P, Topuzoglu A, Gueler AS, Imren SG, et al., The validity and the reliability of Turkish Version of Children's Sleep Habits Questionnaire. *Anatolian J of Psychiatry* 2010;11(2):151-60.
25. Derogatis LR, Lipman R, Covi L. SCL-90 Administration, scoring and procedures manual-I for the R (revised) version and other instruments of the Psychopathology Rating Scales Series. Chicago: Johns Hopkins University School of Medicine, 1977.
26. Kılıç M. Belirti Tarama Listesi (SCL-90-R)'nin geçerlilik ve güvenilirliği. *Türk Psikolojik Danışma ve Rehberlik Dergisi* 1991;1(2):45-52.
27. Cibralic S, Kohlhoff J, Wallace N, McMahon C, Eapen V. A systematic review of emotion regulation in children with autism spectrum disorder. *Research in Autism Spectrum Disorders* 2019;68:101422.
28. Reynolds AM, Soke GN, Sabourin KR, Hepburn S, Katz T, Wiggins LD, et al. Sleep problems in 2- to 5-year-olds with autism spectrum disorder and other developmental delays. *Pediatrics* 2019;143(3):e20180492. doi: 10.1542/peds.2018-0492.
29. Hodge D, Hoffman CD, Sweeney DP, Riggs ML. Relationship between children's sleep and mental health in mothers of children with and without autism. *J Autism Dev Disord* 2013;43(4):956-63. doi: 10.1007/s10803-012-1639-0.
30. Richdale AL, Schreck KA. Examining sleep hygiene factors and sleep in young children with and without autism spectrum disorder. *Research in Autism Spectrum Disorders* 2019;57:154-62.
31. Hoyniak CP, Bates JE, McQuillan ME, Staples AD, Petersen IT, Rudasill KM. Sleep across early childhood: implications for internalizing and externalizing problems, socioemotional skills, and cognitive and academic abilities in preschool. *J Child Psychol Psychiatry* 2020;61(10):1080-91. doi: 10.1111/jcpp.13225.
32. Mindell JA, Leichman ES, DuMond C, Sadeh A. Sleep and social-emotional development in infants and toddlers. *J Clin Child Adolesc Psychol* 2017;46(2):236-46. doi: 10.1080/15374416.2016.1188701.
33. Goldman SE, Richdale AL, Clemons T, Malow BA. Parental sleep concerns in autism spectrum disorders: variations from childhood to adolescence. *J Autism Dev Disord* 2012;42(4):531-8. doi: 10.1007/s10803-011-1270-5.
34. Doo S, Wing YK. Sleep problems of children with pervasive developmental disorders: correlation with parental stress. *Dev Med Child Neurol* 2006;48(8):650-5. doi: 10.1017/S001216220600137X.
35. Horiuchi F, Kawabe K, Oka Y, Nakachi K, Hosokawa R, Ueno SI. The association between autistic traits and sleep habits/problems in toddlers. *Dev Neuropsychol* 2020;45(7-8):485-95. doi: 10.1080/87565641.2020.1865357.
36. Liu X, Hubbard JA, Fabes RA, Adam JB. Sleep disturbances and correlates of children with autism spectrum disorders. *Child Psychiatry Hum Dev* 2006;37(2):179-91. doi: 10.1007/s10578-006-0028-3.
37. Cortesi F, Giannotti F, Ivanenko A, Johnson K. Sleep in children with autistic spectrum disorder. *Sleep Med* 2010;11(7):659-64. doi: 10.1016/j.sleep.2010.01.010.
38. Levin A, Scher A. Sleep problems in young children with autism spectrum disorders: A study of parenting stress, mothers' sleep-related cognitions, and bedtime behaviors. *CNS Neurosci Ther* 2016;22(11):921-7. doi: 10.1111/cns.12651.
39. Schnabel A, Youssef GJ, Hallford DJ, Hartley EJ, McGillivray JA, Stewart M, et al. Psychopathology in parents of children with autism spectrum disorder: A systematic review and meta-analysis of prevalence. *Autism* 2020;24(1):26-40. doi: 10.1177/1362361319844636.
40. Bonis S. Stress and parents of children with autism: A review of literature. *Issues Ment Health Nurs* 2016;37(3):153-63. doi: 10.3109/01612840.2015.1116030.