16

Research Article /Araştırma Makalesi

An Investigation into the Sleeping Habits of Elementary School Students during the COVID-19 Pandemic

COVID-19 Pandemisi Sırasında İlkokul Öğrencilerinin Uyku Alışkanlıklarının İncelenmesi

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Abstract:

Objective: This study was planned for the purpose of examining the sleeping habits of elementary school students during the Coronavirus pandemic by investigating their general sleeping patterns, sleep disturbances, and affecting factors.

Materials and Methods: Designed as cross-sectional research, the study included 360 parents with no health issues who had children of the ages 7-12, had the means to access the internet, and consented to participate. A Sociodemographic Information Form and the Children's Sleeping Habits Questionnaire were used for the collection of data. The distribution of descriptive statistics was expressed in numbers, frequencies, and percentages. The Kruskal-Wallis Analysis of Variance and the Mann Whitney U test were used in the assessment of the data that were not normally distributed.

Results: Almost three-fourths of the children in the study (73.6%) were found to suffer from significant sleep disturbances. We found in our study that problems with sleep varied according to sociodemographic data such as gender, the student's class at school, the presence in the child of a chronic illness and the regular use of medicine, and according to familial variables such as the number of children in the family, the parents' education, the mother's profession, family type, and the sleeping environment.

Conclusion: The present study showed that the period of the COVID-19 pandemic did change the sleep habits of children, causing them to experience sleep disturbances, delays in bedtime and waking up times, as well as other issues such as sleep anxiety.

Key Words: Child; COVID-19; sleeping habits; sleep disturbances

Özet:

Amaç: Çocukların uyku ihtiyacı, beslenme, güvenlik ve bakım gibi diğer ihtiyaçlarının karşılanması kadar önemlidir. Bu çalışma, Koronavirüs pandemisi sırasında ilkokul öğrencilerinin uyku alışkanlıklarını, genel uyku düzenlerini, uyku bozukluklarını ve etkileyen faktörleri araştırarak incelemek amacıyla planlanmıştır.

Gereç ve Yöntemler: Kesitsel bir araştırma olarak tasarlanan çalışmaya, 7-12 yaş aralığında çocuğu olan, internete erişim imkânı olan ve katılmayı kabul eden 360 ebeveyn dâhil edilmiştir. Verilerin toplanmasında Sosyodemografik Bilgi Formu ve Çocukların Uyku Alışkanlıkları Anketi kullanılmıştır. Tanımlayıcı istatistiklerin dağılımı sayılar, frekanslar ve yüzdelerle ifade edilmiştir. Normal dağılım göstermeyen verilerin değerlendirilmesinde Kruskal-Wallis Varyans Analizi ve Mann Whitney U testi kullanılmıştır.

Bulgular: Çalışmaya katılan çocukların neredeyse dörtte üçünün (%73.6) önemli uyku bozuklukları yaşadığı tespit edilmiştir. Çalışmamızda uyku sorunlarının cinsiyet, öğrencinin okuldaki sınıfı, çocukta kronik bir hastalık varlığı ve düzenli ilaç kullanımı gibi sosyodemografik verilere göre ve ailedeki çocuk sayısı, ebeveynlerin eğitimi, annenin mesleği, aile tipi ve uyku ortamı gibi ailesel değişkenlere göre farklılık gösterdiği belirlenmiştir.

Sonuç: Bu çalışma, COVID-19 pandemisi döneminin çocukların uyku alışkanlıklarını değiştirdiğini, uyku bozuklukları, yatma ve uyanma saatlerinde gecikmeler ve uyku kaygısı gibi diğer sorunları yaşamalarına neden olduğunu göstermiştir.

Anahtar Kelimeler: Çocuk; COVID-19; uyku alışkanlıkları; uyku bozuklukları

Introduction

Children's need for sleep is as important as meeting their other needs for nutrition, safety, and care. Sleep is one of the important elements in child's growth and development. While productive and adequate sleep directly affects children's growth and development as well as their cognitive skills and academic performance, sleep disturbances experienced in childhood can interfere with good health and health improvement and stand in the way of preventive health.[1–4]

The Coronavirus (COVID-19) infection that broke out in Wuhan, China in 2019 soon affected the whole world, spreading to millions of people as a pandemic, greatly affecting all aspects of people's lives and bringing about the adoption of many preventive measures and restrictions. Children had difficulty meeting their social needs during this period. In short, lives were disrupted in both the short and long term as the balance of life habits was completely altered.[5,6] It is believed that the quality of sleep of school-age children in particular and many other people in the population suffered due to the prevailing stressful conditions such as being kept at home and having to make changes to the daily routine, higher levels of anxiety, reduced exposure to sunlight, intense dependence on digital media and exposure to blue light, changes in diet, and reduced physical activity.[7]

Although negative sleep behaviors and sleep problems are common among school-age children, children can be trained to adopt proper sleep habits when parents approach them consistently in the right way. The COVID-19 pandemic disrupted school life and caused changes in methods of education while also affecting activity patterns, eating habits, the family setting and, related to these, children's sleeping habits and lifestyles. This study was planned for the purpose of examining the sleeping habits of elementary school students during the COVID-19 pandemic, looking into their general sleeping patterns, problems with sleep and affecting factors.

Methods

Participants

The research was carried out throughout Turkey using Google documents and the snowball sampling method to examine the sleeping habits of elementary school students in the Turkish population during the COVID-19 pandemic (February-April 2022). The sample size was calculated using power analysis (G*power 3.1.9.7).[8] The F-Test for Linear Multiple

Regression: When the "linear multiple regression fixed model, R^2 deviation from zero" procedure was applied to 17 variables at a medium effect size (d=0.15), 5% margin of error and a power of 80%, the size of the sample was found to be 146.[9] Designed as cross-sectional research, the study included 360 parents with no health issues who had children of the ages 7-12, had the means to access the internet, and consented to participate. Parents with more than one child were asked to fill out a form for each child. Each family filled out only one parent's form. Parents who submitted incomplete questionnaires were excluded from the study.

The snowball sampling method was implemented and the questionnaires were shared via access links with parents who had children in elementary school. To create a sampling with the snowball method, any one of the individuals in the study population is contacted. With the help of that individual, other people are contacted, who in turn then contact other people. The snowball effect is thus initiated and the sample is enlarged by means of these connecting chains of contacts. The study data was collected through snowball sampling using 'Google Documents' between February and April 2022. The researchers shared the questionnaire access links with parents of primary school-age children through the same method. The research purpose, methodology, and implementation were clearly explained in the form. The collected data from the parents were stored in a computerized environment.

Measures

Data was collected using a Sociodemographic Information Form and the Children's Sleep Habits Questionnaire.

Sociodemographic Information Form

The researchers created a Sociodemographic Information Form based on the literature that consisted of 16 questions on the children's school, gender, age, place they slept, the family's monthly income, the number of children living at home, the total number of family members at home, the education and occupation of both parents, the type of family, and the number of rooms in the house.[7,10–12]

The Children's Sleep Habits Questionnaire (CSHQ)

The Children's Sleep Habits Questionnaire (CSHQ) was developed by Owens et al. in 2000 to assess the problems children had in terms of their sleep habits and quality of sleep. The short form of the instrument comprises a total of 33 items. There are three open-ended questions in the questionnaire. The Children's Sleep Habits Questionnaire (CSHQ) is a

measure of the psychometric characteristics of preschool and school-age children that has been tested for validity and reliability and was designed by Owens et al. in 2000 to assess children's sleep habits and problems with sleeping.[13] Fiş et al. (2010) tested and established the validity and reliability of the Turkish version of the children's sleep habits questionnaire.[14] The 33-item short form has been structured in eight subscales: bedtime resistance (items 1,3,4,5,6,8), sleep onset delay asleep (item 2), sleep duration (items 9,10,11), sleep anxiety (items 5,7,8,21), night wakings (items 16,24,25), parasomnias (items 12,13,14,15,17,22,23), sleep-disordered breathing (items 18,19,20), and daytime sleepiness (items 26,27,28,29,30,31,32,33). The scale is filled out by the parents retrospectively. The parents are asked to evaluate their child's sleep habits on the basis of the previous week.

Data Analysis

The data were analyzed using the statistical program SPSS 22 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.). Descriptive statistics were presented in numbers, frequencies, and percentages. The One-Sample Kolmogorov-Smirnov test was performed and it showed that the data followed a normal distribution. The data, which were not normally distributed, were assessed using the Kruskal-Wallis Analysis of Variance and the Mann-Whitney U test. A margin of error of $p=0.05$ was used. Categorical variables were compared using the chi-squared ($\chi 2$) test, presented in both numbers (n) and percentages (%).

Ethics approval

Ethical approval for the conduct of the study was obtained from the Muğla Sıtkı Koçman University Health Sciences Ethics Committee (Protocol No. 210127, Decision No. 162). The parents who participated in the study were informed about the context of the research before data collection and their written informed consent was duly obtained. All procedures were conducted in accordance with the 1964 Declaration of Helsinki.

Results

The study results were analyzed in two parts: the sociodemographic and familial characteristics and sleeping habits of the elementary school children and in terms of the relationship between the students' sociodemographic characteristics and their sleeping habits.

Findings on Sociodemographic, Familial Characteristics and Sleeping Habits

The children of the parents in the study were of a mean age of 8.2±1.1 (min-max: 6-11) years; 52.8% (n=190) of the children were boys and 31.1% were in first grade (n=112). Among the families, 43.1% (n=155) were in the middle-income bracket. Of the families, 48.3% (n=176) had two children and 45.8% (n=165) of the families lived in a household of four. Among the mothers, 24.8% (n=89) were elementary school graduates, 52.5% (n=189) were housewives. Among the fathers, 37.2% (n=134) were university graduates, 53.3% (n=192) were employed as labourers, 10.8% (n=39) were unemployed. Of the families, 93.1% (n=335) lived in a nuclear household.

Of the children, 56.4% (n=203) lived in an apartment house, 40% (n=144) lived in a private home, and 3.6% (n=13) lived in a squatter settlement. Among the children, 64.2% (n=231) had their own room to sleep in.

Findings on the Children's Sleep Habits

According to the statements of the parents, the children's daily sleep time was an average of 9.1±0.9 (min-max:7-19) hours; they stayed awake during the night for an average of 7.7±7.4 (min-max:0-70) minutes. Of the parents, 57.8% (n=208) reported that their child's sleep habits did not change during the Covid-19 pandemic. 90% of parents reported that their children went to bed late, 28% reported that their children woke up late, 16% reported that their children's sleep time was prolonged, 10% reported that their children woke up frequently at night, and 8% reported that their children's sleep position changed.

The students' sleep habits scale mean scores are presented in Table 1. The total mean score of the students was 48.1±9.0; 73.6% (n=265) were found to have a clinically significant sleeping disturbance.

Table 1: Distribution of the Subdimensions of CSHQ Total Scores (n=265)

CSHQ subscales	Mean±SD	Min-Max
Daytime Sleepiness	13.5±4.8	6-22
Bedtime Resistance	8.7±2.8	6-18
Parasomnias	7.9±1.6	7-16
Sleep Anxiety	5.9±2.2	4-12
Sleep Duration	3.7±1.1	3-9
Night Wakings	3.5±1.0	3-8
Sleep Disordered Breathing	3.2±0.7	3-9
Sleep Onset Delay	1.3±0.5	1-3
Total CSHQ score	**48.1±9.0**	**33-83**

Findings on the Factors Affecting the Children's Sleep Habits

A comparison of the children's sleep habits scale mean scores according to various characteristics can be seen in Table 2. It was found that the sleep apnea subscale mean score showed a significant difference in terms of gender. The sleep apnea subscale mean score of female students was lower than that of the boys in the study (p=0.011. It was observed that the male students had more breathing problems during their sleep than the girls. The elementary school students displayed a significant difference between their "bedtime resistance" and "sleep anxiety" subscale scores according to their class. In the advanced analysis, we found that the significant difference in the sleep anxiety dimension stemmed from the difference in the mean scores of the 1st and 4th graders, where the first-grade students had higher sleep anxiety scores than the fourth graders (p=0.008).

The mean scores of the children with a chronic illness who were regularly taking medicine were higher in the "bedtime resistance," "sleep anxiety," and "parasomnias" subscale as well as in the overall sleep habits scale compared to those without an illness and those who were not taking medicine regularly; the difference was statistically significant.

Table 2: Comparison the Mean Scores of CSHQ According to Some Sociodemographic Characteristics (n=265)

Children's sociodemographic characteristics	n	Total CSHQ score		Bedtime resistance		Sleep onset delay		Sleep duration		Sleep anxiety		Night wakings		Parasomnias		Sleep-Disordered Breathing		Daytime sleepiness	
		mean	test	mean	test	mean	test	mean	test	mean	test	mean	test	mean	test	mean	test	mean	test
Child's gender																			
Boy	190	48.77	U:14664	8.89	U:15323	1.27	U:15497	3.81	U:14707	5.98	U:16048.0	3.67	U:15007	8.03	U:15244.5	3.35	U:14612	13.75	U:15376
Girl	170	47.46	p=0.131	8.60	p=0.394	1.33	p=0.377	3.67	p=0.093	5.95	p=0.915	3.48	p=0.157	7.90	p=0.294	3.17	p=**0.011***	13.32	p=0.431
Class (education)																			
1. graders	112	49.63	x^2: 5.502	9.26	x^2:8.995	1.30	x^2: 4.667	3.71	x^2:1.53	6.39	x^2:11.711	3.72	x^2:5.249	8.33	x^2:7.624	3.35	x^2:3.572	13.54	x^2:0.276
2. graders	81	47.72	p=0.138	8.62	p=**0.029***	1.30	p=0.198	3.72	p=0.67	5.71	p=**0.008*** a>d	3.45	p=0.198	7.70	p=0.054	3.30	p=0.311	13.87	p=0.964
3. graders	100	47.89		8.65		1.38		3.84		6.14		3.53		7.84		3.15		13.36	
4. graders	67	46.61		8.20		1.19		3.68		5.32		3.59		7.89		3.23		13.46	
Health problem																			
Yes	18	52.66	U:1934,5	10.05	U:2026.5	1.55	U:2555.0	3.55	U:2905	7.38	U: 1693.0	3.72	U: 2713.5	9.16	U: 1728.0	3.11	U:2797.5	14.11	U: 2749.0
No	342	47.92	p=**0.008***	8.68	p=**0.013***	1.29	p=0.105	3.75	p=0.644	5.89	p=**0.001***	3.57	p=0.302	7.90	p=**0.000***	3.27	p=0.286	13.52	p=0.443
Regularly taking medicine																			
Yes	16	52.50	U:1808.5	10.62	U:1643.5	1,56	U:2310.0	3.43	U:2467.5	7.25	U:1632.5	3.56	U:2622.5	8.87	U:1809.5	3.18	U:2690.0	14.00	U:2501.5
No	344	47.95	p=**0.020***	8.66	p=**0.006***	1.29	p=0.147	3.76	p=0.422	5.91	p=**0.004***	3.58	p=0.698	7.93	p=**0.008***	3.27	p=0.803	13.53	p=0.537

X^2= Kruskal Wallis Test
U= Mann-Whitney U Test
*p<0.05

A comparison of the children's sleep habits scale mean scores according to the sociodemographic characteristics of the family can be seen in Table 3. A significant difference was seen between mean scores on the parasomnia subscale according to the number of children in the family; the advanced analysis showed that this difference originated from the difference between single-child families and those with two children. The parasomnia subscale mean score in families with two children was higher than that in single-child families (p=0.036). The "night wakings" (p=0.000) and "parasomnias" (p=0.003) subscale mean scores displayed significant differences. The mean scores on the "night wakings" subscale of children whose mothers had a university or higher education were significantly higher than those whose mothers were secondary school (p=0.001) and elementary school graduates (p=0.027). The children of mothers with a university or higher degree were found to have more problems with night wakings than the children of mothers with lesser education. The mean scores of children whose mothers were working as labourers were significantly lower on the bedtime resistance (p=0.039), sleep anxiety (p=0.001) and night wakings (p=0.000) subscales compared to children whose mothers were housewives or civil servants. In the comparison of the fathers' education and the children's sleep habits, significant differences were found in the mean scores on the "sleep onset delay," "sleep duration," "sleep anxiety," "night wakings," and "parasomnias" subscales. Higher mean scores were displayed by students whose fathers were elementary school graduates in the "sleep onset delay" subscale, by students whose fathers were secondary school graduates in the "sleep duration," and by students whose fathers were university graduates on the "night wakings" and "parasomnias" subscales. Those students whose fathers were secondary school graduates had lower mean scores on the "sleep anxiety" subscale. Students whose fathers were working as labourers had higher mean scores than those whose fathers were civil servants on the "sleep onset delay" (p=0.024) and "sleep duration" (p=0.019) subscales.

Table 3: Comparison the Mean Scores of CSHQ According to Some Socio-demographic Characteristics of the Family (n=265)

Family sociodemographic characteristics	n	Total CSHQ score		Bedtime resistance		Sleep onset delay		Sleep duration		Sleep anxiety		Night wakings		Parasomnias		Sleep-Disordered Breathing		Daytime sleepiness	
		mean	test	mean	test	mean	test	mean	test	mean	test	mean	test	mean	test	mean	test	mean	test
Income rate																			
Income less than expenses	130	48.10	x^2:0.285	8.67	x^2:3.119	1.36	x^2:2.182	3.91	x^2:3.927	5.86	x^2:2.845	3.43	x^2:3.315	7.82	x^2:1.276	3.30	x^2:0.441	13.71	x^2:0.250
			p=0.867		p=0.210		p=0.336		p=0.140		p=0.241		p=0.191		p:0.802				p=0.882
Income equals expense	155	48.49		9.09		1.26		3.61		6.19		3.68		8.00		3.25		13.38	
Income more than expenses	75	47.54		8.20		1.28		3.73		5.70		3.64		8.16		3.21		13.61	
Number of children living at home																			
Single child	71	47.9	x^2:0.690	8.66	x^2:0.138	1.25	x^2:1.082	3.97	x^2:2.733	5.92	x^2:0.774	3.52	x^2:4.027	7.87	x^2:6.466	3.23	x^2:0.938	13.47	x^2:0.084
2 children	174	48.62	p=0.708	8.83	p=0.933	1.29	p=0.582	3.65	p=0.255	6.05	p=0.679	3.68	p=0.134	8.15	p=**0.039*** b>a	3.31	p=0.625	13.62	p=0.959
3 children and higher	115	47.59		8.68		1.34		3.74		5.87		3.46		7.75		3.21		13.48	
Number of people living in the house																			
2	11	47.90	x^2:1.032	9.36	x^2:0.144	1.45	x^2:2.931	4.09	x^2:7.840	6.18	x^2:0.962	3.72	x^2:4.070	8.45	x^2:3.343	3.18	x^2:5.518	11.45	x^2:3.286
3	69	48.46	p=0.793	8.55	p=0.986	1.20	p=0.402	3.95	p=**0.049***	5.82	p=0.810	3.57	p=0.254	7.92	p=0.342	3.34	p=0.138	14.07	p=0.350
4	165	48.16		8.80		1.29		3.60		6.06		3.66		8.07		3.32		13.34	
5 and higher	115	47.98		8.75		1.36		3.80		5.91		3.46		7.80		3.14		13.73	
Mother's education level																			
Primary school	89	48.37	x^2:1.060	8.65	x^2:0.338	1.35	x^2:4.477	3.97	x^2:6.805	5.83	x^2:5.355	3.41	x^2:18.156	7.87	x^2:13.864	3.28	x^2:3.243	13.97	x^2:1.492
Middle school	82	47.46	p=0.787	8.70	p=0.953	1.39	p=0.214	3.74	p=0.078	5.70	p=0.148	3.36	p=**0.000*** d>b d>a	7.68	p=**0.003*** d>b d>a	3.26	p=0.356	13.59	p=0.684
High school	76	47.46		8.50		1.22		3.68		5.78		3.55		7.78		3.18		13.73	
University and higher	113	48.96		9.04		1.25		3.61± 1.13		6.39		3.90		8.38		3.30		13.06	

X2= Kruskal-Wallis Test
U= Mann-Whitney U Test
*p<0.05

Table 3. Continued

Family sociodemographic characteristics	n	Total CSHQ score		Bedtime resistance		Sleep onset delay		Sleep duration		Sleep anxiety		Night wakings		Parasomnias		Sleep-Disordered Breathing		Daytime sleepiness	
		mean	test	mean	test	mean	test	mean	test	mean	test	mean	test	mean	test	mean	test	mean	test
Mother's occupation																			
Housewife	189	48.88	x^2:5.203	8.96	x^2:6.467	1.32	x^2:0.045	3.80	x^2:3.826	6.22	x^2:13.057	3.59	x^2:15.753	8.07	x^2:22.048	3.26	x^2:1.571	13.62	x^2: 0.202
Employee	60	45.50	p=0.074	8.01	p=**0.039***	1.30	p=0.978	3.76	p=0.148	5.03	p=**0.001*** c>b	3.20	p=**0.000*** a>b	7.23	p=**0.000*** c>b	3.20	p=0.456	13.75	p=0.904
Civil servant	111	48.35		8.79	a>b	1.27		3.63		6.04	a>b	3.78	c>b	8.18		3.29		13.32	
Father's education level																			
Primary school	67	49.46	x^2:3.363	9.16	x^2:5.663	1.44	x^2:11.023	3.95	x^2:12.053	6.44	x^2:15.325	3.44	x^2:19.953	7.98	x^2:12.881	3.26	x^2:1.077	13.74	x^2:2.088
Middle school	63	46.90	p=0.339	8.26	p=0.129	1.33	p=**0.012*** a>d	3.95	p=**0.007*** b>d	5.12	p=**0.002*** d>b a>b	3.22	p=**0.000*** d>b	7.42	p=**0.005*** d>b	3.26	p=0.783	14.30	p=0.554
High school	96	48.17		8.71		1.36		3.75		5.93		3.52		7.98		3.32		13.57	
University and higher	134	48.08		8.80		1.17		3.54		6.15		3.87		8.20		3.22		13.08	
Father's occupation																			
Unemploye	39	47.84	x^2:3.511	8.94	x^2:0.712	1.25	x^2:7.453	3.71	x^2:7.903	6.23	x^2:0.354	3.56	x^2:2.451	7.94	x^2:0.543	3.41	x^2:2.642	12.76	x^2:4.283
Employee	192	48.73	p=0.173	8.79	p=0.701	1.38	p=**0.024*** b>c	3.85	p=**0.019*** b>c	5.93	p=0.838	3.50	p=0.294	7.91	p=0.762	3.27	p=0.267	14.08	p=0.118
Civil servant	129	47.38		8.64		1.20		3.58		5.94		3.72		8.06		3.20		13.00	
Coexistence of parents																			
Yes	335	48.15	U:4014.5	8.72	U:3688.0	1.28	U:3421.5	3.73	U:3614.5	5.96	U:4139.5	3.59	U:4108.5	7.93	U:3622.5	3.25	U:4081.5	13.65	U:3481.0
No	25	48.16	p=0.730	9.12	p=0.312	1.56	p=**0.042***	3.92	p=0.190	6.08	p=0.921	3.44	p=0.848	8.52	p=0.199	3.40	p=0.730	12.12	p=0.158

X^2= Kruskal-Wallis Test
U= Mann-Whitney U Test
*p<0.05

When compared according to the type of household the children lived in, a significant difference was found in the mean scores on the "sleep duration" (p=0.002) and "drowsiness during the day" (p=0.033) subscales (Table 4). Children living in a private home had longer sleep durations and more drowsiness during the day than children living in an apartment. Children who lived and slept with their whole family in a single room had lower mean scores on the "bedtime resistance" subscale compared to those who had more rooms in the house (p=0.042). Children who had their own room had lower mean scores in the "sleep onset delay" subscale compared to children who did not have their own room; their "night wakings" (p=0.002) subscale mean scores were higher, however (p=0.002).

Table 4: Comparison the Mean Scores of CSHQ According to Some Characteristics of the House Where the Family Lives (n=265)

Home features	n	Total CSHQ score		Bedtime resistance		Sleep onset delay		Sleep duration		Sleep anxiety		Night wakings		Parasomnias		Sleep-Disordered Breathing		Daytime sleepiness	
		mean	test	mean	test	mean	test	mean	test	mean	test	mean	test	mean	test	mean	test	mean	test
Home type																			
Apartment	203	47.58	x^2:4.117	8.76	x^2:0.126	1.27	x^2:0.73	3.61	x^2:12.221	6.09	x^2:2.662	3.61	x^2::2.030	7.93	x^2:3.584	3.26	x^2:3.126	13.02	x^2:6.845
Private	144	49.12	p=0.128	8.72	p=0.939	1.33	p=0.694	3.90	p=**0.002*** b>a	5.84	p=0.264	3.58	p=0.362	8.09	p=0.167	3.29	p=0.209	14.34	p=**0.033*** b>a
Slum	13	46.38		8.92		1.46		4.07		5.46		3.23		7.23		3.00		13.00	
Number of room																			
1	14	44.35	x^2:7.476	7.28	x^2:9.902	1.07	x^2:9.093	3.78	x^2:7.295	5.00	x^2:8.357	3.28	x^2:3.282	7.85	x^2=2.656	3.64	x^2:7.203	12.42	x^2:2.159
2	71	50.49	p=0.113	9.33	p=**0.042***	1.49	p=0.059	4.02	p=0.121	6.21	p=0.079	3.50	p=0.512	8.35	p=0.617	3.45	p=0.126	14.11	p=0.707
3	113	47.59		8.63		1.26		3.734		5.9		3.53		7.92		3.23		13.29	
4	123	47.38		8.63		1.28		3.61		5.72		3.62		7.82		3.17		13.49	
5 and higher	39	49.35		8.94		1.23		3.66		6.71		3.84		7.92		3.15		13.87	
Own child room																			
Yes	231	47.98	U:14555	8.76	U:14875.5	1.23	U:12780.5	3.67	U:13313.5	6.09	U:13446	3.71	U:12499	7.98	U:14380.5	3.23	U:14173	13.27	U:13594
No	129	48.46	p=0.716	8.74	p=0.979	1.42	p=**0.003***	3.86	p=0.054	5.74	p=0.111	3.35	p=**0.002***	7.94	p=0.531	3.32	p=0.209	14.05	p=0.167

X^2= Kruskal Wallis Test
U= Mann-Whitney U Test
*p<0.05

The relationships between sleep disturbances and sociodemographic characteristics are provided in this paragraph. No significant differences were found between sleep disturbances and the child's sex, child's age, grade at school, having their own room and changes in sleeping habits during the pandemic period ($p > 0.05$).

Discussion

In this study, which we conducted to identify the general sleep habits of elementary school children during the COVID-19 pandemic, their sleep disturbances and affecting factors, 42.2% of the families said that their child's sleeping habits had changed during the pandemic, that their daily sleep time was 9.1 hours, and that they stayed awake for an average of 7.7 minutes during the night. The literature indicates that the COVID-19 pandemic led to changes in the time that school-age children went to sleep and in the duration of their sleep.[2,5,15–17] Due to the social isolation imposed in order to decrease the rate of infection and protect individuals at risk, children and their families had to stay at home, with school classes continuing online and daily routines such as sleeping and eating habits many changes.

In our study, we found that sleep disturbances were at a clinically significant level in almost three-fourths of the children (73.6%). It can be seen that this rate represents a significant rise over what studies had found prior to the pandemic. In a similar study carried out in Turkey, the rate of sleep disturbances is reported as 55.5%.[29] Sleep disturbances were also reported in studies by Amizadeh et al. (2021),[18] where the authors reported a rate of 26.7% for elementary school children and by Lewien et al. (2021) who disclosed that 22.6% of children and 20% of youth suffered from sleep disturbances.[19] It is known that the COVID-19 pandemic was responsible for the change children experienced in their bedtimes, sleep times and waking up times, and that the act of falling asleep was prolonged, and also that schoolchildren slept more than they had been doing before the pandemic. The decrease in outdoor activities during the pandemic, the long hours spent in front of the screen and the increase in the use of social media are all factors that reduce the quality of a child's sleep, even though the child may be sleeping for longer durations.[20] It has been shown that engaging in outdoor activities is associated with reducing the risk of insufficient sleep in children.[21] Besides reduced outdoor activities, the inability to go out at all, the pressure of long-distance learning, and the absence of social interactions on a personal level has led to the need for the excessive use of technological devices.[22] Social isolation has led to lesser engagement in outdoor activities and an increase in pent-up energy, along with an increase in

sedentary behavior such as watching TV and using social media. This is believed to have reduced children's sleep time and quality of sleep.

We found significant differences in our study between the CSHQ subscales in terms of variables such as a child's class, the presence of a chronic disease and the regular use of medication. We found that male children had a higher incidence of breathing problems than female children, that children with chronic illnesses and those who take medications regularly displayed more bedtime resistance and experienced higher levels of parasomnia and sleep anxiety compared to those without chronic illnesses and those who were not taking any medication. Furthermore, first-grade students exhibited more sleep anxiety and bedtime resistance than the students in the last grade of elementary school. Prior to the pandemic, boys were found to have more frequent sleep disturbances, studies indicate that girls experienced more sleep disturbances during the period of isolation.[15,23] While Curatola et al. (2022) reported no difference between genders in terms of sleep disturbances,[24] Lewien et al. (2021) revealed that girls were more liable to experience sleep disturbances.[19] Baptista et al. (2021) demonstrated that during the COVID-19 pandemic, some children experienced sleep apnea, disruptions in transitioning into sleep or wakefulness, extreme drowsiness among other sleep disturbances, asserting that this was a result of the changes made in the children's daily routines.[25] That children with a chronic disease who need to take medications as a result should have problems with sleep is an expected outcome. The child's level of anxiety about the COVID-19 pandemic may have been exacerbated because of the chronic illness. Children witnessing the state of patients under intensive care or hearing of pandemic-related deaths either in their immediate environment or through the media become fearful for their own health and the health of their family members, particularly becoming worried that one of their loved ones could die. Since anxiety is contagious, it is estimated that sleep disturbances can be more prevalent among children with parents who are experiencing anxiety and worries due to the pandemic.[16,26] There are studies that have pointed to the significant relationships between mothers' anxiety and the quality of sleep of their child.[17,27] It is believed that children of mothers who experienced insomnia during the COVID-19 crisis had reduced sleep quality and durations. Some researchers assert in their studies that sleep disturbances are more common in younger children than in older ones.[28,29] The results of the our study support previous research, as we found that younger children in first grade had higher mean scores on the subscales of bedtime anxiety and bedtime resistance. This finding may be connected with the fact that first grade pupils were already having problems with adjusting to school during

the pandemic, that parents need to monitor the sleep patterns of younger children more than they would older children, since children in the older age groups are able to go to bed and sleep by themselves.

We found significant differences in our study between CSHQ mean scores in terms of the variables such as the number of children in the family, parents' education, mother's occupation, and the family type. Children who were one of two siblings had higher mean scores than only children in the parasomnia subscale, those with mothers with a university degree had higher scores in the subscales of night wakings and parasomnia compared to children whose mothers had an elementary or middle school education. We observed that sleep disturbances showed differences according to the parents' education and occupation. It was surprising to see that there was no difference in sleep disturbances according to the family's level of income. Dondi et al. (2021) reported a significant relationship between children's sleep disturbances and economic anxiety in the household, worries about putting food on the table, and the parents' finding the pandemic challenging.[30] It is thought that social, economic and psychosocial factors can be instrumental in sleep disturbances. Even though a family may not have experienced a change in their state of employment during the pandemic, perceptions of economic instability and employment insecurity may act as a risk factor in patterns of falling asleep and maintaining the sleep cycle. The stress parents experience may have a direct effect on the quality of sleep of their children. In particular, the children of health workers who played an active role in the management of the pandemic are expected to be experiencing more chronic stress, anxiety and sleep disturbances. Moreover, an important outcome of our study had to do with the children of separated or divorced parents. Our study revealed that children of separated or divorced parents had more frequent problems with falling asleep. A similar study also showed that the children of separated parents showed more of a bedtime resistance than the children of married parents who were together.[24] It is believed that childhood experiences may be associated with various health outcomes, including sleep disturbances, in adolescents and adults later in life.

One of the determinants of sleep disturbances in children is the environment in which the child sleeps. Our study found that children living in private homes had longer sleep durations and more daytime drowsiness compared to those living in apartments. Children who slept in their own bedrooms had less trouble falling asleep, but they woke up more frequently at night. Children who slept with their parents showed less of a bedtime resistance. For proper sleep hygiene and a high quality of sleep, children need a quiet, dimly lit, tranquil space and

their own bed in an environment that is used only for sleeping and where there is no television, tablets, telephones or other electronic devices. It is believed that some sleep disturbances can be avoided if children and their families are educated regarding sleep habits and learn how to develop a sleeptime ritual and how to focus on sleep hygiene.

We found no significant relationship in our study between sociodemographic characteristics and clinical sleep disturbances. In a study similar to ours that was conducted in Turkey, it was shown that clinical sleep disturbances showed significant differences according to variables such as the child's age, family relations, and with respect to the pandemic, in terms of whether parents had been in close contact with someone who had COVID-19, whether the parents felt fearful, apprehensive, and helpless because of COVID-19, and if there was a household member who had tested positive for COVID-19.[29]

Limitations

Our study had limitations. One limitation was that sleep disturbances were evaluated based on parental reporting. Including objective measurements of sleep disturbances and self-reporting by children, in addition to parental reporting, may strengthen study results. Another limitation was the use of the snowball sampling method and being restricted to only 360 parents. One limitation of this study is that the sample could not be observed longitudinally, preventing a comparison of pre-pandemic and post-pandemic results.

Conclusion

The study found that the COVID-19 pandemic affected children's sleep habits, resulting in sleep disturbances, delayed bedtimes and wake-up times, and sleep anxiety. Our study revealed that sleep problems were influenced by various sociodemographic factors, including gender, student's class, presence of chronic illness, and regular use of medication. Additionally, familial variables such as number of children, parents' education level, mother's profession, family type, and sleeping environment also played a role. To improve the quality of children's sleep, it is recommended to be aware of changes in sleep habits early on, screen for and evaluate sleep problems in schools, provide incentives for physical activities and sports, enlist the support of school administrations, urge adolescents with irregular sleep patterns to keep a sleep diary to regulate their sleep and monitor their performance, work cooperatively with parents and teachers to talk with students with sleep problems or poor sleep quality and provide education programs on this matter for both families and students. Action plans should be designed for specific age groups in this context. It is currently unclear

whether the sleep irregularities detected will persist beyond the COVID-19 pandemic. Therefore, conducting longitudinal research based on children's self-reporting with different sample groups to identify sleep problems would make a valuable contribution to the literature.

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Conflicts of interest

The authors declare no conflict of interest.

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