

ORIGINAL ARTICLE

Investigation of the Impact of COVID-19 Pandemic Process on Sleep Habits of Children and Adolescents

COVID-19 Pandemi Sürecinin Çocuk ve Ergenlerin Uyku Alışkanlıklarına Etkisinin Araştırılması

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ABSTRACT

Background/Aims: The aim of this study is to investigate the effect of the COVID-19 pandemic process on sleep habits and problems in children.

Methods: The study included mothers of children and adolescents aged 0-18 who applied to the Afyon Health Sciences University Child Health and Diseases Clinic for outpatient healthcare services between May 15 and June

15, 2020. A structured questionnaire was administered to mothers who volunteered to participate in the study to evaluate their children's sleep habits before and after the pandemic and their opinions on the reasons for the change in their children's sleep habits.

Results: A total of 457 children, 237 girls (51.9%) and 220 boys (48.1%) participated in the study. The mean age of the participants was 10.03±4.4 years (Min:1 - Max:18). The average sleep time before the pandemic was 9.5 hours, and the average sleep time was 10 hours during the pandemic. A delay of 1 hour and 42 minutes was found between bedtime before the pandemic and bedtime during the pandemic (<0.001). A delay of 2 hours and 20 minutes was detected between the morning wake-up time before the pandemic and the morning wake-up time during the pandemic (<0.001). Compared to the pre-pandemic period, the presence of technological devices in the sleeping room increased significantly during the pandemic process, the problems of resisting lying down, having difficulty in lying down alone, falling asleep and teeth grinding problems were significantly increased, and the presence of pre-sleep preparation was significantly reduced (<0.001).

Conclusions: This study showed that during the COVID-19 pandemic, the sleep habits of children and adolescents changed significantly compared to the pre-pandemic period, and some sleep problems increased. It is important for clinicians to guide parents and children on healthy sleep habits when living conditions are changing and challenging, such as during a pandemic.

Keywords: Sleep, Pandemic, COVID-19, Child, Adolescent

ÖZ

Amaç: Bu çalışmanın amacı COVID-19 pandemi sürecinin çocuklardaki uyku alışkanlıkları ve sorunlarına etkisini araştırmaktır.

Gereç ve Yöntemler: Araştırma Afyon Sağlık Bilimleri Üniversitesi Çocuk Sağlığı ve Hastalıkları Kliniğine 15 Mayıs ve 15 Haziran 2020 tarihleri arasında, ayaktan sağlık hizmeti almak için başvuran, 0-18 yaş aralığında çocuk ve ergenlerin anneleri dahil edildi. Çalışmaya gönüllü olarak katılan annelere, çocuklarının pandemi öncesi ve sonrası uyku alışkanlıklarını ve çocuklarının uyku alışkanlıklarındaki değişimin nedenlerine ilişkin görüşlerini değerlendirmek amacıyla yapılandırılmış bir anket uygulandı.

Bulgular: Çalışmaya 237 kız (%51.9) 220 erkek (%48.1) toplam 457 çocuk katıldı. Katılımcıların yaş ortalaması 10.03±4.4 yıl (Min:1 - Max:18) idi. Pandemi öncesi uyku süresi ortalama 9,5 saat, pandemi süresince uyku süresi ortalama 10 saat saptandı. Pandemi öncesinde yatma saati ile Pandemi sürecinde yatma saati arasında 1 saat 42 dk gecikme bulundu (<0.001). Pandemi öncesinde sabah uyanma saati ile Pandemi sürecinde sabah uyanma saati arasında 2 saat 20 dk gecikme saptandı (<0.001). Pandemi öncesi döneme göre Pandemi sürecinde uyku odasında teknolojik alet varlığı belirgin artmış, yatağa yatmakta direnç gösterme, yalnız yatmakta zorlanma, uykuya dalmakta zorlanma ve uykuda dış gıcırdatma sorunları belirgin artmış, uyku öncesi hazırlık belirgin azalmış saptandı (<0.001).

Sonuç: Bu çalışma, COVID-19 pandemisi sırasında çocuk ve ergenlerin uyku alışkanlıklarının pandemi öncesine kıyasla belirgin değiştiğini ve bazı uyku sorunlarının arttığını gösterdi. Klinikyenlerin pandemi gibi yaşam koşullarının değiştiği ve zorlaştığı durumlarda ebeveynlere ve çocuklara sağlıklı uyku alışkanlıkları konusunda rehberlik etmesi önemlidir.

Anahtar Kelimeler: Uyku, Pandemi, COVID-19, Çocuk, Ergen

Introduction

Since December 2019, healthcare systems around the world have been struggling with an increasing number of cases linked to the Viral respiratory syndrome outbreak that emerged in China (1). The cause of this syndrome is a new strain from the Coronavirus family and is called '2019 novel coronavirus (2019-nCoV), SARS-CoV-2 or COVID-19 (2). In China, COVID-19

has affected children ages 3 months to 17 years old, the majority of whom have been in close contact with infected people or are members of a family where the infection is clustered (3). Although it is thought that children are less affected by the COVID-19 epidemic than adults, the first reports from China reported that the epidemic affected children and adolescents

psychologically and caused behavioral problems. It has been reported that children are no different from adults in terms of the dramatic impact of the COVID-19 pandemic, and that they face negative experiences such as fear, uncertainty, physical and social isolation, and missing school. Fear of asking questions about the epidemic and the health status of their relatives, sleep problems such as nightmares, decreased appetite, physical disorders, agitation and inattention, overindulgence and separation problems are among the main psychological problems investigated in children in this process (4).

Beyond a situation where the main goal is to rest, sleep is now defined as a time of repair. Sleep takes approximately one-third of human life. It is known that the sleep-wake cycle varies with age, while a newborn baby sleeps 16-20 hours a day, this period decreases to 6.5 hours on average in an adult. As we get older, the rhythmicity of sleep deteriorates and night wakings and sleep disorders become more common (5). Studies reveal that nearly a quarter of children have sleep problems (6). It is stated that inappropriate sleep habits and the resulting insufficient sleep duration have become widespread in children and have become a public health problem. Decrease in good sleep time and the need to sleep during the day can affect children's physical and spiritual life, school success, and family relationships (7). According to a study, it was determined that during the pandemic, factors such as unrestricted sleep schedules, worsening sleep quality, more flexible sleep/wake routines, prolonged daytime naps, increased screen exposure, reduced daylight exposure, decreased physical activity, increased sedentary behaviors, reduced social interactions, and heightened stress and anxiety contributed to sleep disorders (8).

The aim of this study is to investigate the effect of the COVID-19 pandemic process on sleep habits and problems in Turkish children.

Materials And Methods

Study design

This cross-sectional descriptive study was carried out in a university hospital between 15 May and 15 June 2020. Healthy children aged 0-18 years and their mothers who applied to the outpatient clinic were included in the study. Children with a history of chronic physical or mental illness were excluded from the study.

Data collection

A structured questionnaire was applied to mothers who volunteered to participate in the research. With this questionnaire form, children's sociodemographic characteristics, sleep habits before and during the pandemic, sleep problems, parents' ability to set rules for these habits, children's compliance and the reasons for the difficulties they experienced were questioned. Mothers' opinions on the reasons for the change in their children's sleep habits during the pandemic were also examined.

Statistical analysis

SPSS 23 program was used to analyze the data. The data obtained were evaluated with descriptive statistics (arithmetic mean, median, standard deviation, percentage distributions). When comparing the average between groups, first the suitability for normal distribution was evaluated with the Kolmogorov Smirnov Test. It was determined that the variables did not comply with normal distribution. Mann Whitney U test was used in bivariate independent groups where parametric conditions were not met, and Wilcoxon test was used in bivariate dependent groups. McNemar chi-square test was used in dependent groups in the analysis of categorical variables. In all tests, the statistical significance level $p < 0.05$ was considered significant.

Ethics Committee Approval: This study was approved by the Afyonkarahisar Health Sciences University Ethics Committee.

Results

A total of 457 children, 237 girls (51.9%) and 220 boys (48.1%), participated in the study. The mean age of the participants was 10.03 ± 4.4 years (Min: 1 - Max: 18). Sociodemographic characteristics of the children are given in Table 1.

Table 1. Sociodemographic characteristics of children

	N=457	n(%)
Age	≤5 years	78 (17.1)
	5-10 years	155 (33.9)
	10-15 years	144 (31.5)
	≥15 years	80 (17.5)
Gender	Female	237 (51.9)
	Male	220 (48.1)
Maternal age	<35 years	123 (26.9)
	≥35 years	334 (73.1)
Paternal age	<35 years	53 (11.6)
	≥35 years	404 (88.4)
Maternal Education	<high school	134 (29.3)
	≥high school	323 (70.7)
Paternal Education	<high school	121 (26.5)
	≥high school	336 (73.5)
Residence	Province	396 (86.7)
	District	61 (13.3)

Family type	Nuclear	419 (91.7)
	Extended	38 (8.3)
Number of children	1	109 (23.8)
	2	255 (55.9)
	≥3	93 (20.3)
Maternal occupation during pandemic	Going to work	69 (15.1)
	Working at home due to flexible work schedule	91 (19.9)
	No	297 (65.0)
Paternal occupation during pandemic	Going to work	205 (44.9)
	Working at home due to flexible work schedule	117 (25.6)
	No	135 (29.5)
Maternal Caregiver during pandemic	Parents	395 (86.4)
	Relatives	21 (4.6)
	Nursemaid	20 (4.4)
	Alone	20 (4.4)
Sharing the sleeping room	Single	262 (57.3)
	With sibling	152 (33.3)
	With parents	43 (9.4)

The mean sleep duration before the pandemic (9.5 hours) was found to be significantly shorter than the average sleep duration during the pandemic period

pandemic period ($p < 0.001$), while there was no difference before the pandemic ($p > 0.05$). Sleep durations were found to be significantly longer (< 0.001) in those who shared the same room with their parents before the pandemic.

When the status of the mother and father being a healthcare professional was questioned in terms of sleep duration of their children, it was found that the sleep duration was statistically significantly shorter in those whose mothers were healthcare professionals during the pandemic compared to those who were not healthcare professionals ($p < 0.001$), while no such difference was found if the father was a healthcare professional.

While the mean bedtime before the pandemic was 22:23 (earliest 20:00-latest 03:00), the mean bedtime during the pandemic was 20:05 (earliest 20:30-latest 07:00), and a delay of 1 hour and 42 minutes was found in bedtime (< 0.001). Before the pandemic, the mean morning wake-up time was 07:50 (earliest 05:00-latest

Table 2. Comparison of sleep habits of children and adolescents before and during the pandemic

		During pandemic		p
		Yes	No	
Technological device presence in the sleeping room, n=457	Before pandemic	Yes	206 (97.6%)	0.002
		No	225 (91.5%)	
Preparation before sleep, n=457	Before pandemic	Yes	335 (94.1%)	0.024
		No	93 (92.1%)	
Resistance to falling asleep, n=457	Before pandemic	Yes	112 (87.5%)	<0.001
		No	250 (76.0%)	
Trouble sleeping alone, n=457	Before pandemic	Yes	82 (95.3%)	0.003
		No	352 (94.9%)	
Trouble falling asleep, n=457	Before pandemic	Yes	54 (75.0%)	<0.001
		No	322 (83.6%)	
Grinding teeth in sleep, n=457	Before pandemic	Yes	23 (71.9%)	0.021
		No	424 (99.8%)	

(10 hours) ($p < 0.001$). When it was evaluated whether there was a difference in sleep duration according to gender, it was found that sleep duration was significantly longer in girls than in boys during the

13:00), while during the pandemic period the average wake-up time was 10:10 (earliest 06:00-latest 17:00), and a delay of 2 hours and 20 minutes was detected in the wake-up time (< 0.001).

Comparison of the sleep habits of children and adolescents before the pandemic and during the pandemic is given in Table 2. Compared to before the pandemic, the presence and number of technological devices in the room where the child slept increased significantly during the pandemic ($p=0.002$). When children's bedtime routines were questioned, it was seen that the frequency of implementing bedtime routines decreased significantly during the pandemic compared to before the pandemic ($p=0.024$). When children's sleep problems were questioned, it was determined that problems such as resistance to going to bed at bedtime, difficulty sleeping alone, difficulty falling asleep and teeth grinding during sleep increased significantly during the pandemic compared to before the pandemic ($p<0.001$, $p=0.003$, $p<0.001$, $p=0.021$, respectively). No significant difference was observed in problems such as difficulty sleeping in the dark, going to someone else's bed at night, waking up frequently at night, delirium, sleepwalking, night terrors, nightmares, snoring, and bedwetting ($p>0.05$).

Mothers' opinions about changes in the sleep habits of children and adolescents and the problems experienced before and during the pandemic are given in Table 3.

Table 3. Mothers' views on the reasons for the change in sleep habits of children and adolescent during the pandemic

Reasons reported by mothers, n=457	n(%)
I don't care as we have similar problems	74 (16.1)
I am flexible as we are always at home during this period	227 (49.6)
I think the need for sleep is reduced as her physical activity decreases	135 (29.5)
I make a rule for my child to have a sleep routine	116 (25.3)
We are more tolerant due to the difficulty of the process	195 (42.6)
We cannot intervene because we work in the workplace	15 (3.2)
Same as before the pandemic	26 (5.6)

Discussion

On January 30, 2020, the World Health Organization declared the global outbreak of 2019 novel coronavirus (COVID-19) disease a major international public health emergency (9). The first case in Turkey was diagnosed on March 11, 2020, a little later than other European countries. As of this date, schools and nurseries were closed on March 12 as a result of the

national pandemic measures taken by the scientific committee in Turkey. A curfew was imposed on those under the age of 20 on April 3 (10). During the curfew, some citizens in strict quarantine were reported to be at risk of less exposure to sunlight than usual, especially in homes with small windows and no outdoor space, while many are at risk of less exercise due to the cancellation of regular sports activities and limited opportunities to leave the house (11). Similarly the rate of children doing regular sports before the pandemic was found to have decreased during the pandemic period in our study.

There need to be a bedtime and sleep time table that gives a developmentally suitable quantity of sleep. Bedtime need to coincide with the kid's natural sleep onset time. A regular nightly bedtime will assist reinforce the circadian clock and assist the kid go to sleep extra easily (12). In the present study, it was found that sleep duration was longer during the pandemic period, and there was a significant delay between the bedtime and wake-up times of children before the pandemic and during the pandemic. In a study conducted during the quarantine period, it was observed that children's bedtime and wake-up times shifted to later hours, and their sleep patterns and sleep quality deteriorated (13). In contrast, it was reported that total sleep time and sleep quality increased in adolescents during the restrictions during the pandemic period (14). Adolescents tend to sleep later than pre-adolescents due to the hormonal changes they experience. For this reason, it is known that in school settings where face-to-face education is provided, adolescents' total sleep hours on weekdays and weekends are different, and they sleep less than their normal sleep hours on weekdays (15). It has been observed that the elimination of going to school, especially in the morning, due to the pandemic enables adolescents to sleep longer, wake up later and wake up in a later circadian phase (16). In addition, they stayed away from the stressors in the school environment during online education (17).

Behavioral sleep problems in children (behavioral insomnia) include bedtime denial or resistance, late sleep onset, and nighttime awakenings requiring parental intervention. All of these problems are not uncommon in the pediatric population and often negatively impact the quality of life of children and caregivers. Although most children experience temporary insomnia occasionally, more persistent insomnia increases the risk of mood and behavior

problems, academic failure, and even worsening health-related conditions (18). In a study conducted during the pandemic period, it was observed that the most common sleep disorders were bedtime resistance, delay in falling asleep, and night awakenings (19). Similarly, in our study, we observed that the problems of resistance to bedtime, difficulty sleeping alone, difficulty falling asleep, and teeth grinding during sleep increased significantly during the pandemic compared to before the pandemic.

Establishing a regular bedtime ordinary is beneficial for all signs of behavioral insomnia (bedtime resistance, extended sleep onset, and night time wakings) (20). The routine have to ultimate approximately twenty to forty five mins and consist of 3 to 4 enjoyable activities, for instance bathing, putting on pajamas, and reading a story; must not contain televisions or other electronic devices (21). When we questioned the sleep routines of children in our study, it was seen that they abandoned their sleep routines significantly during the pandemic compared to before the pandemic, and the presence and number of technological devices in the room where the child slept increased significantly during the pandemic. It has been also reported that not using electronic devices with light-emitting screens, such as smartphones, laptops, and gaming systems, at least one hour before lights out can increase sleep duration and improve daytime functionality. It was strongly recommended that these devices be kept out of the bedroom, especially at night (22). A study conducted during the pandemic period showed that children's screen time and playing digital games increased significantly (23). In our study, it was thought that the increase in the presence of technological devices in the sleeping room may be a result of both the increase in children's screen exposure during the pandemic period and the continuation of online education at home.

Daytime sleepiness may be a symptom of a sleep disorder or another disease and is observed as a tendency to sleep during daytime hours. Excessive daytime sleepiness can significantly affect people's quality of life (19). In our study, we found that daytime sleepiness decreased significantly compared to before the pandemic. This may be due to children being more inactive at home and their need for sleep decreasing, and can be considered among the positive effects of the pandemic.

There are external factors that interfere with parents' or caregivers' ability to set clear limits both during

the day and at bedtime. These factors may include emotional stress, mental illness, distraction from other responsibilities, or long working hours (24). Environmental factors, such as a child sharing a bedroom with a parent, siblings, or other family members living in the home (e.g., grandparents), can negatively impact sleep patterns by impairing parents' ability to set rules (24). In our study, when mothers' opinions were questioned about the change in sleep habits in children during the pandemic, it was revealed that mothers were more tolerant about sleep habits rules. Moreover, when the conditions of the rooms where the children participating in our study slept were evaluated, it was seen that 57.3% of them were sleeping alone, 33.3% were sharing the same room with their siblings, and 9.4% were sharing the same room with their parents.

Study Limitations

This study had some limitations. First, because this study was a descriptive cross-sectional study and the sample was small, the generalizability of the results is limited. Second, because this is a self-report survey study, it may contain biases such as exaggeration, concealment, and short-term memory biases. The third limitation is that standard scales were not used to evaluate sleep habits due to the wide age range of the participants.

Conclusion

This study showed that during the COVID-19 pandemic, children and adolescents' sleep habits have changed significantly compared to before the pandemic, and some sleep problems have increased.

Recognizing and reducing sleep problems is an important responsibility of healthcare professionals in terms of child health. It is important to guide parents and children in terms of healthy sleep habits. In this way, children can develop coping skills against possible risks to their sleep habits during humanitarian crises such as pandemics, where life habits change and become difficult.

Conflict of Interest

The authors declared that they had no conflict of interest during the preparation and publication of this article.

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