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The Effects of Problematic Media Tools Use on Sleep Habits in Children: A Primary School-based Study

Problemli Medya Araçları Kullanımının Çocuklarda Uyku Alışkanlıkları Üzerine Etkileri: İlkokul Temelli Bir Araştırma

Musa Özsavran, Tülay Kuzlu Ayyıldız*, Betül Akkoç**

Zonguldak Bülent Ecevit University Ahmet Erdoğan Health Services Vocational School, Department of Child Care and Youth Services, Zonguldak, Turkey
**Zonguldak Bülent Ecevit University Faculty of Health Sciences, Department of Nursing, Zonguldak, Turkey*
***Zonguldak Bülent Ecevit University Health Sciences Institute, Zonguldak, Turkey*

Abstract

Objective: The frequent use of media tools among children in almost all aspects of daily life affects their sleep patterns negatively. This study was conducted to determine the effects of problematic media use on sleep habits in children.

Materials and Methods: This research was conducted as a descriptive and cross-sectional study. The sample of the study consisted of 370 students enrolled in primary schools in the provincial center of Zonguldak in Turkey. The data were collected face-to-face or via Google forms online based on the preferences of the parents of the children. The data collection instruments included a personal information form, the problematic media use measure (PMUM), and the children's sleep habits questionnaire (CSHQ).

Results: The mean CSHQ score of the children was 63.77±10.23, while their mean PMUM score was 17.80±7.80. The mean age at which the first media tools were purchased for the children was 6.18±2.37. The mean PMUM scores of the children varied significantly based on their genders (p=0.009) and the employment statuses of their mothers (p=0.021). A positive and significant relationship was found between the mean CSHQ and PMUM scores of the children (r=0.214; p<0.001).

Conclusion: This research shows that media tools should be used in a controlled manner in primary school children. This is necessary both for the child to acquire a healthy sleep habits and to prevent diseases that may occur due to this reason.

Keywords: Children, primary school, problematic media use, sleep habits

Öz

Amaç: Medya araçlarının çocuklar arasında günlük hayatın hemen her alanında sıklıkla kullanılması uyku düzenlerini olumsuz etkilemektedir. Bu çalışma, çocuklarda problemli medya kullanımının uyku alışkanlıklarına etkisini belirlemek amacıyla yapılmıştır.

Gereç ve Yöntem: Bu araştırma tanımlayıcı ve kesitsel bir araştırma olarak yapılmıştır. Araştırmanın örneklemini Türkiye'nin Zonguldak il merkezindeki ilköğretim okullarına kayıtlı 370 öğrenci oluşturmaktadır. Veriler, çocukların ebeveynlerinin tercihlerine göre yüz yüze veya Google forms aracılığıyla çevrimiçi olarak toplanmıştır. Veri toplama araçları arasında kişisel bilgi formu, problemli medya kullanma ölçeği (PMKÖ) ve çocuk uyku alışkanlıkları anketi (ÇUAA) yer almaktadır.

Bulgular: Çocukların ÇUAA puan ortalaması 63,77±10,23, PMKÖ puan ortalaması 17,80±7,80 olarak bulunmuştur. Çocukların ilk medya araçlarını satın aldıkları yaş ortalaması 6,18±2,37'dir. Çocukların PMKÖ puan ortalamaları cinsiyetlerine (p=0,009) ve annelerinin çalışma durumuna (p=0,021) göre anlamlı farklılık göstermiştir. Çocukların ÇUAA ve PMKÖ puan ortalamaları arasında pozitif ve anlamlı bir ilişki bulundu (r=0,214; p<0,001).

Sonuç: Bu araştırma, medya araçlarının ilkokul çağındaki çocuklarda kontrollü kullanılması gerektiğini göstermektedir. Bu hem çocuğun sağlıklı bir uyku alışkanlığı kazanması hem de bu nedenle oluşabilecek hastalıkların önlenmesi için gereklidir.

Anahtar Kelimeler: Çocuklar, ilkokul, problemli medya kullanımı, uyku alışkanlıkları

Introduction

With the advancements in technology, visual media tools have become indispensable for children, especially those born in the era of technology, with their expanding usage areas. Some of these visual media tools may be listed as television, computers, tablets, and smartphones. The connection of these tools to the internet is also very important for children. Children, who can take care of almost everything online, spend long amounts of time with these devices.[1] Studies conducted

Address for Correspondence/Yazışma Adresi: Musa Özsavran PhD, Zonguldak Bülent Ecevit University Ahmet Erdoğan Health Services Vocational School, Department of Child Care and Youth Services,, Zonguldak, Turkey
Phone: +90 372 261 33 47 **E-mail:** ozsavranmusa@gmail.com **ORCID-ID:** orcid.org/0000-0001-9008-900X
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in various countries have shown that media use is becoming increasingly more prevalent among children, and the time spent in front of screens increases every year.[2-5] The American Academy of Pediatrics recommends keeping children under the age of 2 away from visual media tools as much as possible, limiting media use to 1-2 hours for children aged between 2 and 5 as long as these children are allowed to watch quality programs/content under parental supervision, and keeping this time limited to at most 2 hours for children older than 6 years old.[6] Various studies have demonstrated that the usage of media tools to a higher extent than recommended may lead to emotional, physical, and mental problems in children. Some problems that emerge in relation to long-term screen usage include negative outcomes such as obesity, unhealthy dietary habits, vision disorders, loneliness, social isolation, anxiety, aggression, attention problems, increased prevalence of impulsive behaviors, distortions in the perception of reality, low academic success, and reduced levels of creative thinking.[7] Evidence showing that the use of digital technologies affects sleep negatively is constantly accumulating. It was reported that sleep durations decreased with an increase in habits of keeping televisions, computers, or mobile phones in bedrooms in the early childhood period.[8] Other potential causes of shorter sleep among children include difficulty falling asleep after exposure to videos and games that involve violence during technological device usage and the prevention of melatonin secretion due to the blue light emitted by screens.[9] Similarly, using technology during the day may have an impact on how well you sleep at night. Technology use during the day results in shorter sleep durations and longer sleep onset times. Sleep length and the use of technological devices were found to be correlated.[10] Because poor or inadequate sleep habits affect the mental state, behaviors, academic success, and growth and development rates of children negatively, it is important to focus on the facilitation of a quality sleep pattern in children.[11] Due to the limited studies in this age group, this study aimed to investigate the effects of problematic media use on sleep habits in primary school children.

Research Questions

1. Do the descriptive characteristics of children affect their sleep habits?
2. Do the descriptive characteristics of children affect their problematic media use?
3. Is there a connection between children's sleep patterns and problematic media use?

Materials and Methods

Design

This is a descriptive and cross-sectional study.

Population and Sample

Between December 2022 and March 2022, this survey was conducted at primary schools in the Turkish province of Zonguldak. The study's participants were parents of the 4,680 students who were enrolled at primary schools in the provincial center connected to the Zonguldak Provincial Directorate of National Education. It was established that a minimum of 355 parents should be included in the study based on the formula employed for a known population (https://www.calculator.net/sample-size-calculator.html), and the parents of 370 students were contacted. Primary school 2nd, 3rd and 4th grade students were included in the study. Simple random sampling method was used in the selection of the schools included in the research. Three primary schools in Zonguldak city center were determined by lottery and included in the sample. The number of students to be taken from each school was determined by stratifying according to the number of students in the school. The students in the classes determined by lottery method from each grade level constituted the sample of the research.

Data Collection Instruments

Personal information form: This form, which was prepared by the researchers, consisted of two parts. The first part included 12 questions on the sociodemographic characteristics of the children and their parents, whereas the second part included 5 questions on the visual media use and sleep characteristics of the children.

Problematic media use measure (PMUM): The scale was developed by Domoff et al.[12] to identify problematic media usage in children in the age group of 4-11. The 9-item short form of the scale has a unidimensional structure. It is a 5-point Likert-type scale where each item is scored from 1 (never) to 5 (always). The total score of PMUM is obtained by summing the scores of all items. High scores indicate the presence of problematic usage. The scale, which is filled out by parents based on the behaviors of their children, does not measure the problematic usage of a specific media tool, but it measures the problematic usage of visual media tools in general (e.g., television, computer, tablet, phone), namely screen addiction. The Cronbach's alpha coefficient for the short form of the scale was reported as 0.93.[12] The Turkish validity study of the scale was conducted by Furuncu and Öztürk.[13] In this study, the Cronbach's alpha coefficient of the short form of the scale was found as 0.785.

Children's sleep habits questionnaire (CSHQ): CSHQ was created by Owens et al.[14] in 2000 to examine children's sleep patterns and sleep-related issues. The short variant of the CSHQ has 33 items. The scale's items assess factors like procrastination at bedtime, sleep latency, sleep duration, anxiety during sleep, nighttime awakenings, parasomnias, disturbed breathing while sleeping, and dysfunction throughout the day. The scale is retroactively completed by parents. The parent is asked to evaluate their child's sleeping patterns throughout the past week. The cut-off point on the scale is 41, and scores above this value are regarded as "clinically significant". Fiş et al.[15] examined the scale's validity in Turkish. In this study, the Cronbach's alpha coefficient of the scale was found as 0.796.

Data Collection

The data were collected face-to-face or online via Google forms based on the preferences of the parents.

Ethical Aspect of the Study

To conduct the study, approval was obtained from the Human Research Ethics Committee of Zonguldak Bülent Ecevit University (approval number: 394, date: 30.11.2021), and permission was received from the schools where the data would be collected.

Participant consent: Informed consent was obtained from the parents of the children who would be enrolled in the study before they were informed of the study's purpose and methods. The parents who would participate in the study were given the assurance that their private information would be kept private and that the data gathered would only be used for the intended aims of the study.

Statistical Analysis

The Statistical Package for the Social Sciences (SPSS) 25.0 package program was used to statistically analyze the study's data in a computer setting. Descriptive statistics like percentage distributions and mean values were employed, and the Kolmogorov-Smirnov test was done to see if the data were normally distributed. Based on a few characteristics, the children's problematic media use levels and sleep patterns were compared using an independent samples t-test, and correlation analyses were used to determine the links between the variables. Numerical variables are indicated with standard deviation values after the mean. The level of statistical significance was accepted as $p<0.05$.

Results

The mean age of the children was found as 8.12±1.53, the mean age of their mothers was 36.35±6.11, the mean age of their fathers was 39.14±6.29, and the mean number of their siblings was 1.49±1.08. While 51.9% of the children (n=192) were male, 48.1% (n=178) were female. It was found that 96.8% of the parents of the children (n=358) were married. While 35.7% of the mothers (n=132) had university or higher degrees, 37.8% of the fathers (n=140) had university or higher degrees. Homemakers constituted 64.9% of the mothers (n=240), and 46.2% of the fathers (n=171) were working as laborers. It was found that 88.1% of the participants (n=326) had nuclear families (Table 1). The most frequently used visual media tools by the children were television (31.9%, n=118), mobile phones (31.3%, n=116), and tablets (29.5%, n=109) (Table 2). The mean age at which the first media tools were purchased for the children was determined as 6.18±2.37. The mean CSHQ score of the children was found as 63.77±10.23, whereas their mean PMUM score was 17.80±7.80. The mean PMUM scores of the children varied significantly based on their genders (p=0.009) and the employment statuses of their mothers (p=0.021). The mean scores of the male children and those whose mothers were working were higher in comparison to the mean scores of the female children and those whose mothers were not working. It was determined that the mean CSHQ scores of the children varied significantly based on the working statuses of their fathers, and the mean score of the children whose fathers were not working was higher than that of those whose fathers were working (p=0.005) (Table 3). A positive, significant, and weak relationship was identified between the mean CSHQ and PMUM scores of the children (r=0.214; p<0.001). Accordingly, problematic media usage would lead to a significant increase in the prevalence of sleep problems among the children.

Table 1. Sociodemographic characteristics of the children and their parents

Characteristics	n	%
Gender of children		
Female	178	48.1
Male	192	51.9
Marital status of parents		
Married	358	96.8
Single (divorced)	12	3.2
Mother's education status		
Illiterate	6	1.6
Primary school	75	20.3
Secondary school	68	18.4
High school	89	24.0
University or higher	132	35.7
Father's education status		
Illiterate	2	0.5
Primary school	56	15.2
Secondary school	54	14.6
High school	118	31.9
University or higher	140	37.8
Mother's occupation		
Civil servant	77	20.8
Laborer	20	5.4
Retired	3	0.8
Unemployed	240	64.9
Other	30	8.10
Father's occupation		
Civil servant	110	29.7
Laborer	171	46.3
Retired	16	4.3
Unemployed	7	1.9
Other	66	17.8
Family type		
Nuclear family	326	88.1
Extended family	32	8.7
Fragmented family	12	3.2
Total	**370**	**100**

Table 2. Media tools used by the children

Tools	n	%
Television	118	31.9
Mobile phone - smartphone	116	31.3
Tablet	109	29.5
Computer (desktop or notebook)	21	5.7
Video game console (e.g., PlayStation)	6	1.6
Total	**370**	**100**

Table 3. Comparisons of PMUM and CSHQ scores based on some characteristics of the children and their parents

Characteristics	PMUM X±SD	CSHQ X±SD
Gender		
Female (178)	16.70±7.45	63.24±9.78
Male (192)	18.80±7.99	64.26±10.61
p-t	**0.009-2.607**	0.338-0.957
Mother's education status		
Illiterate (6)	18.66±9.6	71.0±13.52
Primary school (75)	17.76±8.17	64.46±10.54
Secondary school (68)	17.50±7.34	64.94±10.50
High school (89)	17.76±8.43	62.35±8.79
University or higher (132)	17.95±7.38	63.40±10.56
p-t	0.987-0.138	0.307-3.609
Father's education status		
Illiterate (2)	11.50±2.12	72.50±20.50
Primary school (56)	16.78±7.49	65.67±11
Secondary school (54)	16.16±7.48	63.38±8.97
High school (118)	18.19±8.41	62.70±9.80
University or higher (140)	18.58±7.45	63.94±10.55
p-t	0.275-3.880	0.365-3.248
Order of birth		
First child (216)	18.04±7.97	64.27±10.83
One of the middle children (38)	18.34±8.16	61.50±9.03
Last child (116)	17.13±7.35	63.59±9.37
p-t	0.590-1.056	0.212-3.103
Marital status of parents		
Married (358)	17.67±7.77	63.75±10.22
Single (12)	21.41±7.90	64.33±10.77
p-t	0.07-149.5	0.807-205.0
Mother's working status		
Working (127)	19.08±8.26	63.33±9.71
Not working (243)	17.12±7.48	64.0±10.49
p-t	**0.021-2.312**	0.536-0.605
Father's working status		
Working (347)	17.74±7.67	63.30±9.76
Not working (23)	18.57±9.70	70.91±14.13
p-t	0.927-394.5	**0.005-260.5**
Family type		
Nuclear family	17.65±7.73	63.47±10.04
Extended family	17.93±8.38	66.65±11.67
Fragmented family	21.41±7.90	64.33±10.77
p-t	0.199-3.228	0.280-2.545
Most frequently used media tool by children		
Television	15.59±6.61	62.30±9.36
Notebook or desktop computer	18.21±6.73	61.78±11.95
Tablet	16.86±7.25	65.26±10.02
Mobile phone	21.36±8.64	64.18±9.96
Video game console (e.g., PlayStation)	13.00±1.00	75.00±32.94
p-KW	0.278-5.095	0.639-2.533

PMUM: Problematic media use measure, KW: Kruskal-Wallis test, CSHQ: Children's sleep habits questionnaire, SD: Standard deviation

Discussion

This study was conducted to determine the effects of problematic media use among children on their sleep habits. Consequently, it was determined that the mean PMUM scores of the children whose parents were included in the study varied significantly based on their genders and their mothers' working statuses, while their mean CSHQ scores varied significantly based on the working statuses of their fathers. A positive, significant, and weak relationship was identified between the mean CSHQ and PMUM scores of the children. In this study, the mean age at which the first media tools were purchased for the children was determined as 6.18±2.37. Previous studies have determined that the age of visual media use among children has dropped substantially.[16-18] Kulakci-Altintas[18] reported that 81.8% of children in the age group of 0-3 were using at least one technological device, and the age of first media consumption dropped down to preschool ages. The further decrease in the ages of using media tools among children by almost every year in previous studies was in parallel with the results of this study. In this study, the most frequently used visual media tools by the children were television, mobile phones, and tablets. Previous studies also reported mobile phones[19] and tablets[20] as the most frequently used visual media tools in children. Among students who participated in the study by Ergin et al.[16], 79.8% were found to own mobile phones. While a study that was conducted at the beginning of the 2000s identified the most frequently used visual media tool as television[21], with the development of technology and increased purchasing power today, it is seen that television has been replaced by mobile phones/smartphones and tablets. The common finding of our study and other studies was that television, mobile phones, and tablets were frequently used visual media devices. In our study, there was a significant difference in the mean PMUM scores of the children based on gender, and the male children had a higher mean score than the female children. Koyuncuoğlu[22] also reported that male children spent more time in front of a screen. Çelik[23] and McArthur et al.[24], on the other hand, stated that there was no significant difference between male and female children in terms of screen usage times. In this study, it was determined that the mean PMUM scores of the children varied depending on the working statuses of their mothers, and the mean score of the children whose mothers were working was significantly higher than that of the children whose mothers were not working. This result was thought to be related to the potential lack of sufficient supervision of the children's media use by their working mothers. A positive, significant, and weak relationship was found between the mean CSHQ and PMUM scores of the children whose parents were included in this study. Accordingly, problematic media usage would lead to a significant increase in sleep problems. This issue leads to problems in the performance of activities of daily living, adaptation problems, and difficulty falling asleep at night.[25-27] Previous studies similarly indicated that the presence of computers or mobile phones in the bedrooms of children and

the use of media tools in bed before sleep led to sleep latency and shortened sleep duration.[8,28] Jiang et al.[28] found long durations of playing games on mobile phones to be associated with shorter sleep durations and sleeping at later hours. Cespedes et al.[8] reported that sleep durations decreased along with increased habits of keeping computers or mobile phones in the bedrooms of children in the early childhood period. Consequently, according to the results of our study, considering the realization that the rates of problematic media usage are constantly increasing, it may be expected to encounter the necessity to deal with screen addiction, which is a new form of addiction, and this will lead to an increase in sleep problems on a psychopathological level. Families should warn their children about problematic media usage behaviors. Social media usage should also be limited and under parental supervision.

Conclusion

This study revealed that there is both a positive and statistically significant relationship between problematic media use and sleep problems in primary school children. It was found that children's problematic media use differed according to their gender and working status of their mothers, and the mean scores of boys and children whose mothers worked were higher. It is possible to conclude that when the use of media tools decreases and internet use increases, the amount and quality of sleep will deteriorate.

Ethics

Ethics Committee Approval: To conduct the study, approval was obtained from the Human Research Ethics Committee of Zonguldak Bülent Ecevit University (approval number: 394, date: 30.11.2021), and permission was received from the schools where the data would be collected.

Informed Consent: Informed consent was obtained from the parents of the children who would be enrolled in the study before they were informed of the study's purpose and methods. The parents who would participate in the study were given the assurance that their private information would be kept private and that the data gathered would only be used for the intended aims of the study.

Authorship Contributions

Concept: T.K.A., Design: M.Ö., T.K.A., Data Collection or Processing: T.K.A., B.A., Analysis or Interpretation: M.Ö., T.K.A., B.A., Literature Search: M.Ö., T.K.A., B.A., Writing: M.Ö., T.K.A., B.A.

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