

# Internet Addiction of School-Age Children and the Effects of Daily Habits

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## Abstract

**BACKGROUND/AIMS:** Internet use among school-age children has increased, and the age at first contact with a mobile device has decreased. Although the elucidation of the risks and health problems due to excessive internet usage by parents and health professionals has led to children developing a perspective on and normalized the comprehension of classes that are accessed through the internet at home. All previous studies focused only on limited age groups, such as preschool, adolescents, and adults (university students).

**MATERIALS AND METHODS:** This study was conducted at a tertiary research hospital in April-October 2019 with the participation of parents of 320 children who were given a questionnaire in addition to the Young Internet Addiction Test-Short Form.

**RESULTS:** The data revealed that 33% of children had first contact with mobile devices between the age of 5 and 9. It was found that 18.4% of respondents had problematic internet use and 7.2% had internet addiction. Moreover, while 26% of the children postponed toilet use while engaged with mobile devices, 6% experienced digestion problems, 31% encountered eye-related complaints, 6% had urinary problems, and 22% had musculoskeletal problems due to internet usage. When parents considered their children's daily self-hygiene or self-needs, 11% indicated that their children tended to postpone these issues significantly in terms of IA.

**CONCLUSION:** To the best of our knowledge, this study is the first to include a school-age population aged 7-18 years. Therefore, our objective was not only to research the sociodemographic features, the duration spent on the virtual environment, the frequency and type of virtual media use, but also to evaluate the current situation of IA among children, raising awareness due to the health and security risks that IA may cause and to highlight the prevention of those risks, Internet usage must be examined on healthy child visits to identify the effects on children's and adolescents' physical and mental health.

**Keywords:** Children, game addiction, internet addiction, social media, self-care

## INTRODUCTION

The virtual environment has gradually become widespread due to tablet use in schools as the age of children who have access to mobile devices decreases. It is considered that internet use causes physical, sentimental, material, and sexual abuse, especially due to inappropriate content, and causes postponement in sleep and toilet use as well as

self-care routines in addition to affecting eating habits, social activities, eye-related health, and musculoskeletal health in children's lives.<sup>1</sup> Not only is the body mass index (BMI) affected, but daily activities are also lessened as habits of snacking in front of the monitors develop, and the risk of obesity due to exposure to food advertisements increases accordingly.<sup>2,3</sup>

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In sleep, the brain engages new ideas and sustains their permanent existence in memory. The common use of portable electronic devices and lack of sleep due to placing monitors in children's bedrooms has appeared to affect 30% of children aged between 1 and 3 years and most school-age children and adolescents in the United States.<sup>4</sup> It is known that 72% of the population is an active internet user and spends approximately 7 hours and 15 minutes on the internet daily, with 2 hours and 46 minutes on social media through a device such as a mobile phone/tablet, etc.<sup>5</sup>

Game addiction, on the other hand, is identified as an attached behavior that draws attention when gaming is prioritized and could cause traumatic indications in the absence of gaming in ICD-11. It is also classified as slight, medium, and heavy in case it lasts for a year depending on its effects on daily life.<sup>6</sup> At the latest status of the world due to the COVID-19 pandemic, children have developed a perspective on and normalized the comprehension of classes that are accessed through the internet at home. Although the elucidation of the risks and health problems due to excessive internet usage by parents and health professionals is crucial, unfortunately, there are major inefficiencies in the pediatric literature on this topic. All previous studies have focused only on a limited age group, such as preschool or adolescents, and even have focused on the adult group (university students) over the age of 18. In addition, only one study mentioned problems related to internet addiction. All studies regarding IA have focused on adolescents and university-age young adults, and no similar study is not found concentrating on children aged 7-18 years.<sup>7-9</sup> Therefore, to raise awareness of the health and security risks that IA may cause and highlight the prevention of those risks, our objective was not only to research the sociodemographic features, the duration spent on the virtual environment, the frequency and type of virtual media use, including the effects on children aged 7-18 years but also to evaluate the current situation of IA among children.

## MATERIALS AND METHODS

Voluntarily applied at a tertiary research hospital between April and October 2019, 320 parents of children— of whom made their applications with the company of one or both parents—are included within the study based on the approval of the ethical boards. This study was approved by the University of Health Sciences Türkiye, Ankara Children's Hematology Oncology Training and Research Hospital Clinical Research Ethics Committee (approval number: 2019-078). Informed consent was obtained. Following the literature scan, the attendants conducted a face-to-face interview technique, which was supported by a 63-step questionnaire with multiple choices and questions about how internet use is actualized.<sup>4,10,11</sup> In the first part of the questionnaire, the socio-demographic features, educational level of the family, level of income, employment status of the parents, ages at first contact with mobile devices, technological means of the attendants, social media use features and contents of the shares of children, internet usage and features, and the level of knowledge of the parents regarding the risks of internet use were observed. In the second part, the problems they encountered due to the internet and their reactions, the effects of internet use on toilet-use routine, eating habits, musculoskeletal problems, deprivation symptoms and characteristics (if any), sleep orders and duration, the effects of internet use on sleep disorders, eye-related problems due to internet use, weight perceptions, academic success, social activities and relations, and the effects of internet use on daily hygiene activities and self-care routine were observed. Finally,

a 12-question Young Internet Addiction Test—Short Form (YIAT-SF) was applied to identify the internet addiction level by summing the total points at the end of the test to score the level. Ones who had a total score of below 30 were classified among "normal internet use," while the ones between 30 and 37 were classified among "problematic internet use" whereas values above 37 were classified among "internet addiction" levels.<sup>10,12</sup> This study did not include any person who was not a volunteer, was below 7 years old and above 18 years old, had neuromotor or growth retardation, was visually or hearing impaired, or had any chronic illnesses.

## Statistical Analysis

Throughout the statistical analysis, descriptive features of the variables were identified and checked for normality. In the comparison of the two groups, the Student's t-test was used for normally distributed numeric variables, whereas the Mann-Whitney U test was used for non-normally distributed numeric variables. In cases in which more than two variables were compared, ANOVA was conducted on normally distributed variables, and the Kruskal-Wallis test was conducted on non-normally distributed variables. The chi-square test was used to evaluate categorical variables. The analysis was completed using the SPSS 20 software, and  $p < 0.05$  was considered significant.

## RESULTS

The children in our study were 53% girls and 48% boys. The age average was remarked as  $12 \pm 3.2$  and 36.6% of the children continued in primary school, 30% in secondary school, and 33.1% in high school. We classified the participants according to age groups; three groups: primary school (age 7-10), middle school (age 11-14) and high school (age 15-18) to understand their different habits and attitudes according to age. 36.6% of the children continued to primary school, 30% in secondary school, and 33.1% in high school. There was no statistical significance regarding age.

According to the YIAT-SF test, the data showed that 74.4%, 238 of the children had normal internet use; 18.4%, 59, had problematic internet use; and 7.2%, 23, had internet addiction. In other words, 25.6% of children, that is every one child in four, have either problematic internet use or IA.

87.4% of families had a low monthly income. The academic levels, employment status, and family incomes of the participating families are summarized in Table 1. A significant relationship was not found between educational levels, employment status, parental income, and IA ( $p > 0.05$ ). The results indicated that 33% of the children had their first contact with mobile devices at ages varying between 5 and 9 years, and a significant relationship was found between the age at first contact and IA ( $p < 0.001$ ). The results indicate that 81% of the participants had internet connections at home and 53% had social media accounts. A significant relationship was observed between YouTube accounts and IA was present ( $p < 0.001$ ). Participating children had not made any shares by 38% ( $n=114$ ), shared photographs [14% ( $n=41$ )], videos [11% ( $n=34$ )], or other posts [4% ( $n=12$ )]. A significant relationship was found between the frequency of posting through social media accounts, sharing videos and IA was found ( $p < 0.001$ ). Internet usage and sharing features of school-age children are indicated in Table 2.

There was a significant relationship between having a mobile phone or tablet for their own home and Internet access at home and IA ( $p < 0.05$ ).

Table 1. The academic levels, employment status, and family incomes of the participating families			
<b>Educational status of the participating parent</b>			
	Illiterate	1	0.4%
	Literate	3	1.3%
	Primary education	33	13.9%
	Secondary school education	38	16%
	High school	73	30.7%
	University undergraduate	68	28.6%
	University	22	9.2%
<b>Employment status of the participating parent</b>			
	Employed	126	52.9%
	Unemployed	112	47.1%
<b>Other parent's educational status</b>			
	Illiterate	2	0.8%
	Literate	2	0.8%
	Primary school	44	18.5%
	Secondary school	38	16%
	High school	54	22.7%
	University undergraduate	77	32.4%
	University	21	8.8%
<b>The other parent's employment status</b>			
	Employed	184	77.3%
	Unemployed	54	22.7%
<b>Monthly average income (\$)</b>			
	Low	104	43.7%
	Middle	107	44.9%
	High	27	11.3%

Table 2. Internet usage and sharing of school-age features		
<b>The place of internet connection:</b>	<b>Number</b>	<b>Percentage</b>
Home	204	85.70%
Internet cafe	3	1.30%
Cafe/mall/restaurant etc.	6	2.50%
Visit	11	4.60%
Other	28	11.80%
<b>Use of computer, tablet and internet without permission:</b>		
Yes	97	40.70%
No	141	59.20%
<b>Use of internet outside of house:</b>		
Yes	103	43.30%
No	135	56.70%
<b>If the answer is yes; where?</b>		
Home visit	55	23.10%
Internet cafe	6	2.50%
Shopping	22	9.20%
School	41	17.20%
Other	39	16.40%

Table 2. Continued		
<b>The place of internet connection:</b>	<b>Number</b>	<b>Percentage</b>
<b>The device connected to the internet</b>		
His/her own computer	23	9.70%
His/her own laptop	27	11.30%
Smart TV	25	10.50%
Family computer	13	5.50%
Family laptop	31	13.00%
Tablet	75	31.50%
Game console (playstation, X-box etc.)	14	5.90%
Phone	187	78.60%
<b>Accompanying the child while using the internet:</b>		
Yes	189	79.40%
No	49	20.60%
<b>Location of the device connected to the internet:</b>		
Hall	121	50.80%
Living room	47	19.70%
Bedroom	7	2.90%
Child's room	31	13.00%
Other	32	13.40%
<b>Child protection program on the device</b>		
Yes	103	43.30%
No	106	44.50%
<b>Age of first connection to the internet:</b>		
Within the first 1 year	3	1.30%
2 <sup>nd</sup> age	1	0.40%
Between 2-5 years	31	13.00%
In Kindergarden	14	5.90%
Primary school	145	60.90%
Secondary school	38	16.00%
High school	6	2.50%
<b>The time the child spends on a mobile device during the day:</b>		
Less than 1 hour	82	34.50%
1 hour	43	18.10%
2 hours	54	22.70%
3 hours	33	13.90%
4 hours and more	26	10.90%
<b>The time the child spends on a mobile device during the night:</b>		
Less than 1 hour	172	72.30%
1 hour	43	18.10%
2 hours	15	6.30%
3 hours	4	1.70%
4 hours and more	4	1.70%
<b>The aim of internet connection:</b>		
Making homework and studying	180	75.60%
Watching videos	159	66.80%
Playing games	135	56.70%
Chatting (WhatsApp, messenger etc.)	73	30.70%
Visiting social networking site	35	14.70%
Sending mails	7	2.90%

Table 2. Continued

The place of internet connection:	Number	Percentage
Setting up an information program to the link in the e-mail	4	1.70%
Sending SMS	13	5.50%
Downloading or watching music or movies	98	41.20%
Shopping	16	6.70%
Using credit card information	4	1.70%
Sharing address and phone information	1	0.40%
Sharing own photos	29	12.20%
Posting a photo that is not his/her own	5	2.10%
Meeting and talking with the chatted people outside	9	3.80%
Sharing game or social media account passwords with friends	9	3.80%
Sharing a special family situation	2	0.80%
Other	6	2.50%
<b>Her/his gamefriends from internet:</b>		
Alone	135	56.70%
Friends	118	49.60%
Siblings	21	8.80%
Online game players	11	4.60%
Unknown	15	6.30%

On the other hand, a significant relationship was found between children using the internet without permission and sharing information at places other than home ( $p<0.05$ ) and internet use duration ( $p<0.001$ ). Additionally, a significant relationship was found between connecting to the internet for playing games, sharing credit card information, self-images, game and social account passwords, sharing the private status of the family, address and phone information, and IA ( $p<0.001$ ).

It was found that 40% of the parents had not guided their children on what to do when they encountered a serious problem on the internet. The questionnaire indicated a significant relationship between advertisement exposure, encountering a negative situation online ( $p<0.001$ ), and IA ( $p<0.05$ ). Furthermore, there was a significant relationship between exposure to inappropriate content, gossiping, and humiliation, and IA ( $p<0.05$ ). In addition, 7 children were abused, 5 were financially damaged, 3 were emotionally abused, and one was sexually harassed. The children shared the negative situation or asked for help from an older brother, sister, or friend, which was significant for IA ( $p<0.05$ ). Making friends over the internet and IA were also related ( $p<0.001$ ).

When parents were questioned regarding their perception of weight, 68.1% ( $n=162$ ) stated as normal, 16.8% ( $n=40$ ) as overweight, and 15.1% ( $n=36$ ) as slim. When children's height and weight were evaluated according to the percentile by age; it was classified that 35.9% ( $n=115$ ) were slim, 55% ( $n=176$ ) were normal, 5.9% ( $n=19$ ) were overweight/pre-obese, and 3.1% ( $n=10$ ) were obese. Hence, BMI calculations were not significantly related to IA ( $p>0.05$ ). However, there was a significant relationship between junk food consumption during internet use and IA ( $p<0.001$ ).

Moreover, 26% of the parents reported that their children postponed toilet use when occupied by mobile devices, while 8% reported digestive problems. Depending on internet use, 31% of the children experienced

eye-related problems, such as eye inflammation, burning, and pain, and these problems were significantly related to IA ( $p<0.001$ ). According to the answer of the parents, 11% of the children tended to postpone their daily hygiene/self-care routines and 6% experienced urinary problems. A crucially significant relationship between postponing toilet use and digestive problems while using mobile devices and IA was found ( $p<0.001$ ). Moreover, a significant relationship was found between urinary incontinence while using mobile devices and IA ( $p<0.05$ ).

It was found that low academic success of the child, encountering problems in social relationships due to the internet, a tendency to postpone social activities due to the internet, and encountering problems among family members, school friends, and other people were significantly related to IA ( $p<0.001$ ). Also, it was found that 46% of children were bored, 12% were upset, 11% were upset, 10% were anxious, 5% felt lonely, and 4% behaved aggressively in the absence of mobile devices. This study revealed a significant relationship between deprivation symptoms and IA ( $p<0.001$ ).

22% of the parents indicated that their children had musculoskeletal problems following the use of the internet, which affected their sleep routines ( $p<0.001$ ). The effects of internet use on daily activities, the eye and musculoskeletal systems, and sleep orders are summarized in Table 3.

## DISCUSSION

Our study aims to raise awareness regarding the risks of using the internet and possible health problems among school-age children. There are major deficiencies in the pediatric literature regarding this issue. Studies previously conducted were focused only on limited age groups, such as preschool or adolescent, or on the adult group (university students) over the age of 18. In addition, only one study mentioned problems related to internet addiction. In this context, our study is the most comprehensive in this regard.

When the internet usage habits of the study volunteers were analyzed in terms of IA, it was found that 25.6% of the participating children had problematic use of the internet or internet addiction, as in every one child in four. Similar findings were reported in a similar study of adolescents.<sup>1</sup> When assessing the ages of children regarding their first contact with a mobile device, 16% interacted with a mobile device at age 1. Similar results were obtained for children younger than 7 years old.<sup>7,13</sup> Research has indicated the positive effects of dialog on language skills; however, internet users depend on passive listening or unidirectional interaction through a monitor.<sup>14</sup> Therefore, experts do not recommend interaction with mobile devices until a child is one year old. Similar to the literature, our study indicated that the younger the children interacted with the mobile phone, the higher their risk of IA.<sup>7</sup> It was found that 68% of the participating children had a mobile phone of their own, 78% had Internet access at home, and 50% had a personal social media account. IA was very common among these children. A study indicated that one in every three children has a smartphone, and 24% of those are online constantly.<sup>13</sup> Moreover, another study suggested that the exposure of social media users in adolescence is highly triggered to be depressed by the idealized images of higher-standard possessing young adults; moreover, they develop less self-respect in a period when their self-confidence is still improving and cause negative body perception.<sup>15</sup> Deprivation symptoms enlisted within the diagnostic criteria of IA, were also questioned in the questionnaire. In addition,

Table 3. The effects of internet use on daily activities, the eye and musculoskeletal systems, and sleep orders		
<b>Child's self-perception of his/her body:</b>		
Underweight	36	15%
Normal	162	68%
Overweight	40	17%
<b>Academic success of the child:</b>		
Weak	2	1%
Average	29	12%
Good	99	42%
Very good	108	45%
<b>Social problems the child experienced due to the internet:</b>		
Yes	16	7%
No	222	93%
<b>People that the child had problems with due to the internet:</b>		
Family members (mother, father, brother, sister etc.)	21	9%
School friends	8	3%
Not having problems	1	0%
Other	209	88%
<b>Postponing social activities via the internet:</b>		
Yes	21	9%
No	217	91%
<b>Postponing active sports activities due to the internet:</b>		
Yes	50	21%
No	209	88%
<b>Daily active sports time of the child:</b>		
Less than 1 hour	97	41%
1-2 hours	113	48%
2-3 hours	18	8%
3-4 hours	4	2%
4 hours or more	6	3%
<b>Postponing toilet necessities due to internet access:</b>		
Yes	90	30%
No	207	70%
<b>Digestion problems that the child experienced due to the internet:</b>		
Yes	33	11%
No	264	89%
<b>The type of digestion problem:</b>		
Constipation	13	6%
Gas	4	2%
Fecal incontinence	5	3%
Other	7	3%
<b>Urinary problems caused by mobile devices and internet use:</b>		
Yes	14	6%
No	224	94%
<b>The type of urinary problem:</b>		
Urinary retention	11	5%
Urinary incontinence	4	2%
Urinary tract infection	4	2%
Not having complained	1	0%

Table 3. Continued		
<b>Child's self-perception of his/her body:</b>		
<b>Eye-related complaints based on mobile device and internet use:</b>		
Yes	74	31%
Not having complained	164	69%
<b>Eye-related complaints following internet use:</b>		
Tearing	16	7%
Blushing	37	16%
Burning	20	8%
Pain	17	7%
<b>Eyeglasses:</b>		
Yes	56	24%
No	182	77%
<b>Musculoskeletal problems following internet use:</b>		
Yes	53	22%
No	185	78%
<b>Musculoskeletal problems experienced by the child:</b>		
Headache	30	13%
Neck pain	25	11%
Back pain	21	9%
Shoulder pain	8	3%
Arm pain	4	2%
Wrist pain	11	5%
<b>The feelings of the child when not using a mobile device:</b>		
Unhappiness	27	11%
Loneliness	12	5%
Tension	24	10%
Anxiety	28	12%
Aggression	10	4%
Boredom	110	46%
<b>The effect of internet use on sleep patterns:</b>		
Yes	72	30%
No	166	70%
<b>The child's daily sleeping time:</b>		
Under 6 hours	11	5%
7-8 hours	150	63%
Over 9 hours	77	32%

individuals experiencing problems with family members or other people surrounding them and postponing daily sports activities due to long-duration internet use were affected at high levels, and this infinite loop continues as long as internet use is maintained.

Currently, posts including advertisements can be seen very intensely on YouTube and similar social media platforms. Most advertising companies assist brands with marketing purposes by targeting social media users. The food sector conducts its advertisements and marketing strategies for young adults using social media. In a period when healthy and proper dietary habits are achieved, posts regarding unhealthy junk food and fast food adversely affect children's dietary habits adversely. Among the participants, 81% indicated that they have been exposed to advertisements while using the internet, 11% skip meals, 35% eat



while using the Internet, and 60% consume junk food. There has been a significant relationship between meal skipping, eating while using the internet, consuming junk food, and IA. In a previously conducted study on adolescents in our country, significant relationships were found among IA, eating habits, BMI, and obesity.<sup>1</sup> Our study, on the other hand, did not indicate this relationship between obesity and IA; and this may be because fewer obese patients were found in general pediatric outpatient clinics since obese patients in particular apply directly to endocrine polyclinics.

Among children, 47% had a YouTube account, 67% watched videos, 23% shared content through social media once a month, and 14% shared videos. A crucially significant relation was found between video watching, having a YouTube account, and sharing videos with the IA. A similar study conducted over 9 to 19 years researched internet activity risks and parental behaviors that can cause IA risks.<sup>16</sup> Children in the developmental period are highly affected by comments and likes and think they are accepted by society through these. This directs them to connect to the internet outside their houses and share content during visits, malls, etc. without asking for permission. Our study indicated a significant relation between frequency and increase in sharing and IA. Studies conducted also suggest that shares cause stimulation at the pleasure centers on the brain through the number of likes, especially during adolescence, and lead individuals to develop an addiction through directing the individual to share more, which was likewise the case in our study.<sup>17</sup>

Peer victimization can be identified as intentional harming and mobbing the powerless in terms of physical, verbal or psychological levels. However, peer victimization at schools has surrendered to cyber mobbing.<sup>18</sup> Cyber mobbing is emerging as one of the most dangerous features of our times because bullies can camouflage their identities. Our study indicates that 14% of the participants have a virtual friend, and this situation is significantly related to IA. Although virtually adopted friends provide socialization for children, on the one hand, it can allow individuals to open up for abuse on the other hand. Each parent has been informed regarding the abuse to which they were exposed. The literature requires additional studies in this area. Media literacy lessons should be adapted to the syllabus to teach children what behavior can be comprehended as a crime and which actions to take when encountering a sort of abuse; informative public service announcements should be published on TV and social media to contribute to raising awareness. Experimental studies have indicated that video games decrease children's public behaviors and benevolence, but increase violence and aggressive thoughts.<sup>19</sup> When exposed to violence on TV, a child watches it only; however, on video games, the child participates in the violence. In this context, rather than TV, the internet, media, and video games affect children's physical and mental health more adversely.<sup>19</sup> Moreover, 6.7% of the participants stated exposure to inappropriate content. As with TV, some signings that define the appropriate audience regarding the content of the published material as well as publishing the objectionable content at hours, when most children are expected to be sleeping, can prevent this; if a child-protection program is not set up on a mobile device, this cannot be prevented. As 43% of the participants had set a child-protection program on their mobile devices, 29% of the parents were observed not to have any idea about this. To raise public awareness, training should be provided, media literacy should be added to the syllabus, TV programs should be prepared for parent awareness and educational public service advertisements should be developed.

Studies by experts indicate that environmental stimuli should be reduced and a dark and peaceful environment should be prepared for children to sleep well in high quality. Reading, sleeping friends, and sleeping routines are recommended, but dynamic activities, food, and visual stimuli are not recommended.<sup>4</sup> In studies on sleep physiology, it has been determined that melatonin is a hormone released by the pineal gland that provides circadian rhythm. Through melatonin release, during the sleep cycle, the release of anterior hypophysial hormones, such as prolactin, thyroid-stimulating hormone, sex steroids, and growth hormones, are regulated.<sup>20</sup> Exposure to light causes delayed and decreased melatonin release, thereby affecting anterior hypophysial hormone levels in the blood. This condition has effects not only on cognitive functions such as language development but also on growth and development and causes low academic achievement due to drowsiness during the daytime.<sup>1,20</sup> Similarly, our study suggests that 30% of the parent's sleep patterns of their children are affected by internet use, and a significant relationship was found with IA. The recommendations for digital media and sleep quality are frequently mentioned in the American Academy of Pediatrics protocols developed before or during sleep.<sup>21</sup> Likewise, long exposure to monitors, the flash-blue may cause dry eye and redness; long video-watching periods cause lazy eyes because the individual is affected by exciting graphics.<sup>22,23</sup> 31% of the participants are seen to experience eye-related complaints similar in literature, and a significant relationship is found with IA.

Repetitive game-playing actions enlisted within the internet and game addiction diagnosis criteria harm the time that an individual spends on their affairs and increase the duration of internet use. Therefore, daily hygiene, self-care, toilet use, and sports activities are limited because the child is never satisfied by the time that is spent.<sup>1</sup> It was found that 26% of children postponed their toilet activities due to IA. Changes in bowel habits, the consequence of this issue, cause digestive problems in 8% of children, mostly with obstruction. Similarly, 6% of children are found to be experiencing urinary continence and incontinence problems. A significant relationship was found between IA use and delayed toilet use. Literature has not concentrated on this issue, as only one study has been conducted in our country. Our study is a type of secondary work in these terms, in which the findings of the two works have similarities that support each other.<sup>1</sup>

Looking toward a monitor or touching the keys for a long time are among the mere physical activities while an individual is on the internet or playing video games. Therefore, musculoskeletal problems are likely to occur. Japan and the United States take ergonomic measures for long-duration employees working at desks in front of a computer.<sup>24</sup> Computer applications automatically go to sleep more for 20 seconds every 20 minutes and allow users to relax their eyes; as mouse-pad pillows are used to prevent wrist and back pain. In addition, employees are allowed to benefit from fitness saloons or massage units within their offices.<sup>25</sup> The participating children experienced musculoskeletal problems by 22%, and a significant relationship was found with the IA. Some studies have reported similar findings.<sup>20</sup> The monitor should be placed 30 or 45 centigrade below the child's eye: which would enable protection for spinal health.<sup>11</sup> The monitor can be easily positioned where applicable cover cases are sold for tablets and phones. Ergonomic measures should be taken by parents at home. Additionally, children should participate in physical activity for at least an hour daily to support muscle development as well as regular pauses for long periods of computer use. AAP recommends that computer use for longer than 2 hours may cause risks of obesity and IA.

IA is a severe problem that is gradually increasing among school-age children, and the risks should be acknowledged by the public. Families, teachers, and adolescents should be aware of the positive and negative effects of social media devices. Families and teachers encourage students to share problems they may experience offline and online.<sup>2</sup> When encountering children who have intense media interaction, appropriate measures should be taken while considering possible problems. The results of this study suggest that children who spend a lot of time on the internet are at increased risk of secondary disabilities. Health applicators, teachers, and parents are accountable for taking necessary actions that would jeopardize children's health while providing Internet access.

## CONCLUSION

The IA must be interrogated while evaluating its effects on the physical and mental health of children and adolescents. Primary care physicians, nurses, psychologists, pediatricians, and child and adolescent psychiatrists should provide training for the correct use of the internet and pioneer the dissemination of protective measures. IA diagnostic criteria should be explained children, families, and teachers to increase awareness. Guidelines, which include information on how mobile media equipment is to be used, should be developed accordingly.

## MAIN POINTS

- Our study is the most comprehensive research on internet addiction and its effect on daily habits that focused on a wide age range.
- The risk of internet addiction increases with screen exposure, particularly at a younger age, especially under the age of 1. Our study indicated that the younger the children interacted with the mobile phone, the higher their risk of IA.
- Starting to be exposed to screens at a younger age causes an increase in internet addiction and unhealthy eating behaviors, neglect of daily self-care, sedentary life, and related health problems in later ages.
- There is a need for guides containing information on how families' mobile media devices can be used by children. General practitioners, nurses and psychologists, child health and disease specialists and child and adolescent psychiatrists should provide training on the correct use of the media, inform families and young people and lead media education .
- Physicians should be aware of the impact of media on the physical and mental health of children and adolescents, and their relationship with the media should be questioned during follow-up examinations of children.

## ETHICS

**Ethics Committee Approval:** This study was approved by the University of Health Sciences Türkiye, Ankara Children's Hematology Oncology Training and Research Hospital Clinical Research Ethics Committee (approval number: 2019-078).

**Informed Consent:** It was obtained.

## Authorship Contributions

Surgical and Medical Practices: S.O., Ş.Ş., M.A., E.A.A., M.M.O., H.Y., E.P., Concept: S.O., Ş.Ş., M.A., E.A.A., M.M.O., H.Y., E.P., F.Z.Ö.Ç., S.Ş., Design: S.O., Ş.Ş., M.A., E.A.A., M.M.O., H.Y., E.P., F.Z.Ö.Ç., S.Ş., Data Collection and/or Processing: S.O., Ş.Ş., M.A., E.A.A., M.M.O., S.Ş., Analysis and/or Interpretation: S.O., Ş.Ş., M.A., M.M.O., F.Z.Ö.Ç., Literature Search: S.O., Ş.Ş., E.A.A., H.Y., E.P., F.Z.Ö.Ç., Writing: S.O., Ş.Ş., H.Y., F.Z.Ö.Ç.

## DISCLOSURES

**Conflict of Interest:** No conflict of interest was declared by the authors.

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