

A Study of digital addiction in Children during COVID-19 (Pandemic) conditions

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Abstract

Background: Advances in technology in the modern world, including improvements in digital technology and increasing access to them, have led to the public spending a lot of time with digital screens. Therefore, screen addiction in children presents a global challenge. In this paper, we aimed to investigate parents' attitudes in this regard, mainly whether the behavior of parents and family members caused children's screen addiction. In particular, we studied children's dependence on digital screens during the pandemic.

The research was conducted by sharing a questionnaire on an online platform. The investigation began on 5/6/2022 and ended on 12/6/2022. A total of 142 minors were interviewed. The questionnaire consisted of two parts. The first part was general questions, and the second was from the test by Kimberly Young, a professor of psychology, adapted for children. It determines the attitude, from lack of interest in the Internet to dependence on it. Based on the study, we have thought that it will be helpful to enrich specific preventive measures to confound digital addictions in children.

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Keywords: Pandemic; Screen addiction; Psychological disorders.

Introduction

The term "addiction" definition is generally not precise and somewhat judgmental. It does not only refer to dependence on substances but also involves an inability to stop partaking in activities such as gambling, gaming, eating, or working. (1). Advances in technology in the modern world, including improvements in digital technology and increasing access to them, have led to the public spending a lot of time with digital screens. (2) In addition to the above, the declaration of the pandemic in 2019 was accompanied by many new laws and restrictions that led to a peak in the population's attachment to digital devices. The situation was especially complicated by the transition of the educational process to the online mode and the restriction of social distancing. According to studies, the unlimited use of time with digital devices contributes to the disease's development, confirmed by the results before and after the pandemic. (3,4) Furthermore, according to other authors, spending a long time in front of the screen negatively affects the normal course of sleep in children and their nervous-mental, physical, and emotional state. (5,6)

According to a study by Kim and co-authors, If the mother is a screen addict, she contributes to the premature exposure of the child to the screen. (7) It is noted that according to a study conducted in Turkey, adults and children with psychiatric symptoms have a longer screen time

than healthy children. (8) Screen addiction in children, when it reaches a critical limit, can change the mechanism of gene expression. This further causes neuro-functional and synaptic changes, the earlier this occurs, the more it affects the child's later behavior. (9) When a child is screen-addicted, his daily "portion" increases because he receives dopamine. They think they cannot be happy without it. (10)

It should be noted that many teenagers and children become victims of suicide games every day. The Blue Whale was one of the first to claim the lives of thousands of children, indicating the problem's scale. (11) According to the latest studies, suicide among children and adolescents is becoming more and more dangerous. In the third week of 2020, an investigation began in the United States of America on how much suicide attempts and incidents would increase during the pandemic. (12)

Each example above emphasizes the global challenges of screen addiction in children. Although there is no evidence of similar research conducted in Georgia, it will be an announcement in our region. In this paper, we aimed to investigate parents' attitudes in this regard, mainly whether the behavior of parents and family members caused children's screen addiction.

Material and Methods

The research was conducted by sharing a questionnaire on an online platform. The investigation began on 5/6/2022 and ended on 12/6/2022. A total of 142 minors were interviewed. The questionnaire consisted of two parts. The first part was general questions, and the second was from the test by Kimberly Young, a professor of psychology, adapted for children. It determines the attitude, from lack of interest in the Internet to dependence on it. The questionnaire was based on a scale

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of 1 point to 5 points, consisting of 20 questions. Possible answers were: never (1 point), rarely (2 points), sometimes (3 points), regularly (4 points), and always (5 points). The maximum score of the mentioned test is 100, where 20-49 gradation controls the duration of time spent on the Internet. 50-79 is an internet user for an excessive amount of time. 80-100 are completely addicted to digital devices and cannot imagine life without them. (13) 51.3% live in cities, and 48.7% live in rural areas. We received the following data according to age categories: <10 years - 11%, 10-15 years - 46.8%, 15-18 years 42.2%. In addition to the questionnaire mentioned, we studied some clinical cases also.

Results and discussion

Myopia is one of those diseases that can be caused by screen addiction. Risk factors are less physical activity and prolonged exposure to blue light from digital screens. Widespread cases of astigmatism are observed in developed countries with high levels of education and urbanization. (14) Our research revealed that 23 of the 142 respondents were found to be visually impaired, 17 of them live in the city, and 4 in the village. Most of them are between 15-18 years of age, spend more than 4 hours in front of the screen, and the sleep interval is 6-8 hours or less than 6 hours (figure 1).

Obesity is a metabolic syndrome caused by the development of a large amount of adipose tissue in the body. The main reasons are overeating and less physical activity. This is a risk factor for diabetes and cardiovascular diseases. It can also lead to low self-esteem, depression and mental disorders. (15,16) Of the 142 respondents, 63 children confirmed that they gained weight after the pandemic. It turned out that 37 of them live in the city, and 26 live in the countryside. In addition, most children are under the age of 10-15 and the average sleep duration is 6-8 hours. Regarding sports activities, it was revealed that about 60% of 63 children do not go to sports circles and most of them spend more than 3 hours in front of digital screens (figure 2).

As we mentioned above, one of the actual problems developed due to screen addiction is a psychological disorder, namely depression.(17) During technology addiction, dopamine, serotonin and cortisol are released in the body. The happiness hormones are released when a child uses a digital screen, dopamine and serotonin. When a teenager does not use a digital device, a stress hormone known as cortisol is released. With long-term use, the number of dopamine transporters decreases so the release and subsequent transport of dopamine are inhibited resulting in euphoria in children. It is because of this mechanism that depression is formed in the past. (18) Randomized control trials conducted in the United States of America in 2012 revealed a psychological correlation with depression developed under the influence of digital devices. Suicide rates were found to have increased significantly.(19) In 2013, "Internet gaming disorder" was included in the American Psychiatric Association's mental and behavioral disorders classification. (20) Notably, video games and digital expo-

sure proved to be somewhat predisposed to the development of the autism spectrum.(21) This has a negative impact on young children. They tend to face withdrawal and have difficulty communicating with family members and society. That is also a significant reason; they often start talking later than their peers.(22)

The results of the study showed that 142 randomly interviewed children had the following grading indicators according to the Kimberly Young test: 20-49 points - 52% (in 74 children), 50-79 points - 44% (63 children), 80-100 points - 3% (5 children) (Table 1).

Parents' active use of digital screens significantly encourages children to carry out similar behavioral activities, which is confirmed by studies conducted in different countries and cities (Malaysia, Hong Kong, etc). (23,24) Regarding our results, it was found that the parents of 102 of the 142 children interviewed were active and moderately active users of digital devices. As mentioned above, according to the curling test, 68 children could not control the duration of exposure to the screen; from them, parents of 52 children are also active users of digital screens, which is about 76%. The latter proves how much influence parents' behavior has on children (Table 2).

We also searched for several clinical cases. Case 1: Patient- A 4-year-old boy. He entered the clinic with the following complaint: pain in the joints of both thumbs. According to anamnestic data, the patient was consulted by various specialists, an orthopedic-traumatologist, and a pediatrician, but the final diagnosis could not be established. Radiologic and ultrasonographic studies and general blood analysis were conducted, but pathological changes were not confirmed anywhere. With a full research of the anamnesis and based on the existing instrumental-laboratory studies, the diagnosis of digital addiction of the patient was made, which resulted from the active movement of the thumbs on the mobile phone. The parents admitted that the child spent at least 6 hours on the phone daily and said they could not control this situation.

Case 2: Patient - A 15-year-old girl. She applied to the clinic with the following complaints: pain in the heart, headache, and high blood pressure. Weight - 82 kg, height - 158 cm, BMI - 32.8 kg/m², pulse 90. Blood pressure - 140/90 mm/Hg. Laboratory studies: glucose - 5.4 mmol/l, HbA1c - 6.4%. Instrumental studies: echocardiography - no changes are noted, ECG - no changes are noted. As a result of being overweight, the patient developed crisis moments due to the periodically disturbed metabolism. According to anamnestic data, it is clear that during the pandemic, the patient did not go to sports circles, did not perform physical activities, and spent a lot of time sitting at the computer. As a result, the patient changed her mood and became lonely. Her Parents expressed that they are trying to get her back to an active lifestyle but to no avail. Although the initial diagnosis was obesity, prediabetes was also established due to examinations.

According to the American Academy of Pediatrics (2020), kids between 2 and 6 years old should only use screens for one hour or less. Having easy access to digital games can make kids spend more time on screens, have

fewer chances to talk to friends in person, and play games by themselves more. (25)

During self-isolation, the lack of controlled time spending on social media exacerbates anxiety, apathy, depressed mood, and a sense of isolation from social reality. One particular study also proves that young people spend almost all day online due to the obsessive pattern of social media involvement and/or procrastination, which often provokes withdrawal syndrome upon the attempt to distract from them. (26)

The mental well-being of adolescents was adversely affected by the physical distancing measures implemented during the Covid-19 pandemic. To cope with the challenges of social distancing, adolescents worldwide increased their use of digital devices. Research findings indicated that, while most studies found a link between poor mental health and both social media usage ($r = 0.171$, $p = 0.011$) and media addiction ($r = 0.434$, $p = 0.024$), a meta-analysis of the data revealed a consistent positive relationship between time spent on social media and negative mental health outcomes ($k = 11$, $r = 0.171$, 95% CI (0.050–0.286), $p = 0.011$, $I^2 = 96\%$). Consequently, adolescents faced an elevated risk of encountering mental health issues as a result of increased exposure to screen time and social media during the pandemic. (27)

The results from the correlational analysis and mediating analysis demonstrated that nomophobia (NMP) exhibited a positive correlation with smartphone addiction (SA), ($b = 0.541$, $t = 16.512$, $p < 0.001$ (0.4768 / 0.6057)). Additionally, the study's findings revealed a significant positive relationship between NMP and the usage of social media tools (SMTU), ($b = 0.231$, $t = 4.597$, $p < 0.001$ (0.1323 / 0.3298)). Furthermore, a noteworthy positive association was identified between SMTU and SA, ($b = 0.070$, $t = 2.199$, $p < 0.05$ (0.0074 / 0.1)). In conclusion, the study has yielded valuable insights into the dynamics of nomophobia and smartphone addiction among secondary school students during the COVID-19 home confinement period. The analyses conducted have lent support to the hypotheses, revealing a positive correlation between nomophobia (NMP) and smartphone addiction (SA), as well as a significant

relationship between NMP and the usage of social media tools (SMTU). Furthermore, the findings have underscored the noteworthy association between SMTU and SA. Collectively, these results highlight the intricate interplay of these factors, shedding light on the parallel mediating role of digital gaming and social media tools usage in the context of adolescent smartphone addiction during extended periods of home confinement. (28)

Urgent actions by policymakers are required to encourage healthy screen habits and foster the mental well-being of children and adolescents amidst the pandemic. These measures may encompass a return to in-person learning, reducing the time spent on online education, and motivating youngsters to limit screen time. Equally vital is ensuring that children have access to enhanced mental health and social support services. Additionally, providing teachers and therapists with training on addressing problematic media usage can aid children in overcoming the isolation and stress brought about by the pandemic. (29)

Conclusion

This research delves into a significant issue – screen addiction in children, shedding light on its prevalence, contributing factors, and potential consequences. The study's findings concerning the prevalence of screen addiction in children are concerning and highlights the serious consequences. It also underscores the significant role of parents, the potential health risks associated and the need for preventive measures to safeguard the well-being of children in the digital age. Based on the study, we have thought that it will be helpful to enrich specific preventive measures to confound digital addictions in children.

Abbreviation

1. **COVID-19**- Coronavirus disease 2019
2. **BMI**- Body mass index
3. **HbA1c**- Glycated haemoglobin A1c
4. **ECG**-Electrocardiogram

Figure 1. Children whose eyesight has deteriorated since the pandemic.

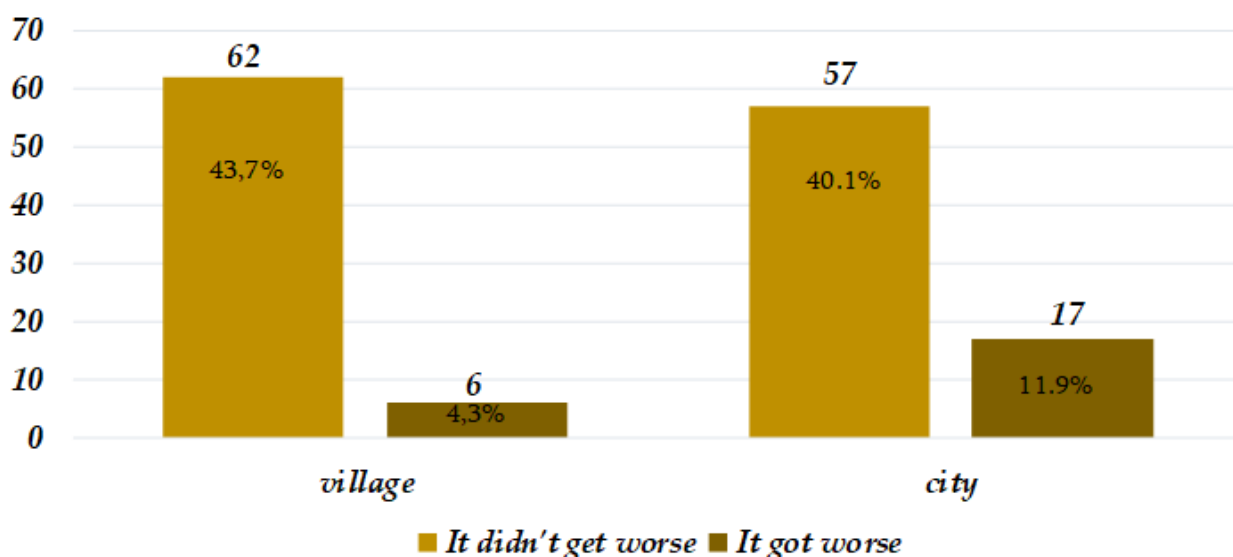


Figure 2. Children who gained weight after the pandemic

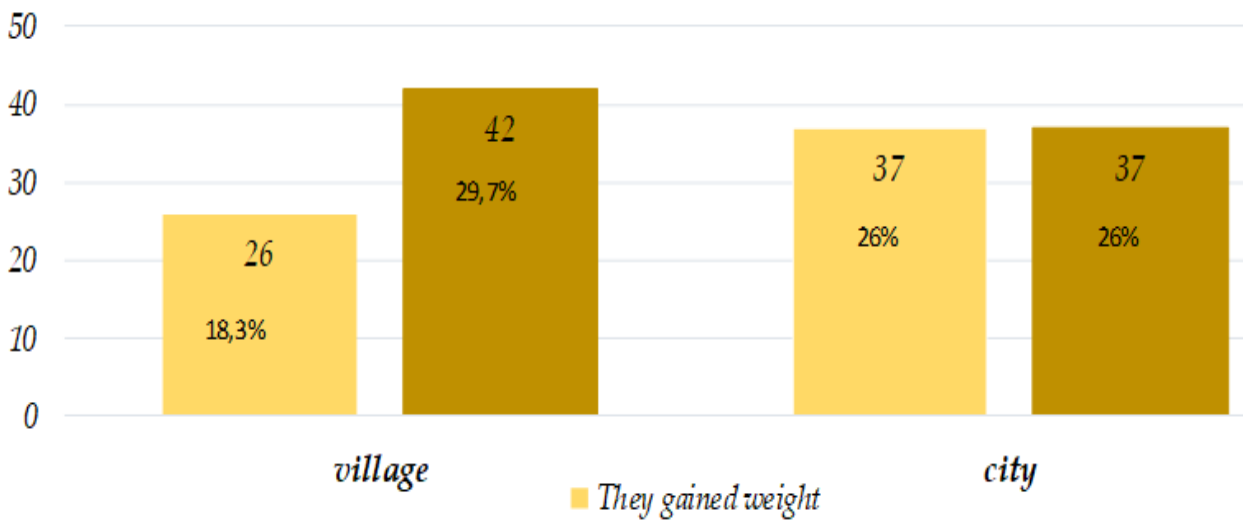


Table 1. Kimberly Young Test Results.

Graduation	Number	% rate
20-49	74	≈ 52
50-79	63	≈ 44
80-100	5	≈ 4

Table 2. Influence of parents' behaviour on children

	Number of children (% rate)
Children of parents actively using the Internet	19 (≈ 27 ≈ 27 %)
On average, children of actively using parents	33 (≈ 48 ≈ 48 %)
Bowl	52 (≈ 75 ≈ 75 %)

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