



Digital game addiction of preschool children in the Covid-19 pandemic: social emotional development and parental guidance

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Abstract

The Covid 19 pandemic has caused children to spend more time at home and an increase in their digital addiction tendencies. Children's digital game addictions were affected by parents' strategies and negatively affected their social and emotional development. The study was carried out in order to determine the digital game addiction tendency levels of children and the strategies applied by the parents, and to examine the correlation between the results obtained and the social-emotional development of the children. The study was designed as a cross-sectional study. 142 children attending pre-school education for 60–72 months were included in the study. Personal Information Form, Digital Game Addiction Tendency Scale, Digital Game Parental Mediation Scale and Ages & Stages Questionnaires: Social-Emotional were used. As a result, the increase in digital game addiction in children has negatively affected social and emotional development. The level of digital game addiction tendency is associated with parents' digital game manipulation strategies. Active parental guidance strategy prevented children's digital game addiction tendency, while digital oriented guidance and free parental strategies increased addiction tendency.

Keywords Digital game addiction · Parental guidance · Social emotional development · Preschool children

Introduction

The coronavirus (COVID-19) pandemic emerged in China in December 2019. As of 12 March 2020, the World Health Organization declared that COVID-19 is a pandemic (World Health Organization, 2020). With the emergence of the first case in Turkey as of March 11, 2020, schools were closed and education was provided by distance education. In addition, face-to-face interaction became limited due to measures

such as social distance and curfew. Thus, children's screen time increased (Golberstein et al., 2020; Ornell et al., 2020). The increase in screen time caused children to spend more time with digital games (Susilowati et al., 2021).

Digital technologies have become part of our daily lives. Thus, children are introduced to digital games from early childhood. (Fang et al., 2021). Today, with the increase in social and economic opportunities, digital game addiction is one of the leading causes of depression, anxiety and dissatisfaction (Seo & Lim, 2010; Twenge & Campbell, 2009). Digital games are more interesting than non-digital games because they contain sounds and visual effects. For this reason, children may become addicted if they play digital games excessively (Lee & Morgan, 2018). Digital game addiction is considered a compulsive-impulsive spectrum disorder and includes both online and offline use (DSM-V). Digital players, who have become addicted, have weak self-control, play games for long periods of time, forget the responsibilities they have to fulfill during the day, and often do not quit the game even to eat. When digital games are interrupted or not played, they show irritable and aggressive behavior (Brack et al., 2013; Center for Internet Addiction Recovery, 2017).

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According to the American Academic of Pediatrics (2020), children between the ages of 2 and 6 should have a standard screen time of no longer than one hour. Easy access to digital games causes an increase in the time spent in front of the screen, a decrease in the opportunities for face-to-face communication with peers, and an increase in stand-alone games (Rosen et al., 2014). Children who spend a lot of time with digital games have problems such as sedentary behavior, screen addiction, increasing obesity, metabolic problems, poor sleep and visual impairment (UNICEF, 2017). Therefore, digital games endanger the health of children. For this reason, digital games are an important danger to health because they prepare the environment for chronic metabolic diseases. The occurrence of chronic diseases causes lifelong treatment need and morbidity.

During the COVID-19 pandemic, parents and experts were worried, as preschool children playing digital games for long periods of time may cause addiction (Nevski & Siibak, 2016). Children whose parents are inconsistent, authoritative, unsupportive, and do not have a loving family environment spend time in the fantasy world of digital games to fill their emotional gaps, feel safe in this world and weave a cocoon for themselves (NIA, 2012; Park 2001; Young & Rodgers, 1988). In addition, today, parents work more due to difficult living conditions and may recommend digital games to their children themselves. Thus, children become addicted to digital games with parental consent (Keya et al., 2020). Digital games played excessively and without guidance cause children to be unable to control their desire to play, and to disrupt their emotions, thoughts, behaviors and daily life (Mustafaoğlu & Yasacı, 2018). For this reason, if children who spend time on digital platforms are not supervised by their parents, the risk of abuse of virtual environments will increase (Young, 2009). In the studies, demoralizing family relationships (Loton, 2014) and permissive (Anandari, 2016) parenting attitude are among the factors that increase digital game addiction. The behaviors of parents that increase digital game addiction caused children to spend a lot of time with digital games during the Covid-19, children has been problems in their social emotional development such as aggression, problem behavior, communication breakdowns (Hastings et al., 2009; Yalçın-Irmak ve Erdoğan, 2016; Aji 2020; Rahayu, 2021).

Social and emotional development of preschool children develops through social relations (Trawick-Swith, 2017). In the COVID-19 pandemic, children's spending their time at home has reduced their interaction with their peers. (Luo et al., 2022). Despite this, the fact that children spent their time at home with digital games also limits their interaction with their parents (Cao et al., 2021). Excessive use of technology negatively affects children's social development (Caplan, 2002). The child whose social and emotional development

is weakened has a lack of communication and concentration difficulties. This weakening affects not only their social and emotional development but also all developmental areas. Technological addictions mostly affect skills such as empathy, persistence, patience, attitude towards uncertainty, social adaptation skills, reaction to stressful situations, accepting and adapting to innovation and change, and communication within the scope of social emotional development (Stavrou, 2018). Online group games have a positive effect on children's social skills (Yannier, 2015), but this effect is not as strong as face-to-face interaction. Exposure to screens in early childhood has a negative impact on their social and emotional development in the following years (Hinkley et al., 2017). For these reasons, the social and emotional development of children has been adversely affected during COVID-19.

Parents have a great role in minimizing the negative effects of digital games on children and in their conscious use of digital games. Due to the developmental characteristics of preschool children, they need to be supported and guided by an adult. It is the parents' duty to provide this support and guidance (Senemoğlu, 2011). In order for their children's digital game behaviors not to turn into addiction and negatively affect their social and emotional development, parents should observe their children's digital game processes and behaviors and guide their children. In addition, parents should be role models in using technological tools (Goodwin, 2018).

The digital game addictions of children, who spend a lot of time with technological tools, especially digital games, in the Covid-19 pandemic, parents' guidance strategies for digital games, and their social-emotional development should be evaluated. Studies have investigated the screen time of preschool children (Susilowati et al., 2021), screen time and parent role (Nwankwo et al., 2019), screen time and its negative effects (Anders et al., 2021; Marfua, 2021; Qutoshi, et al., 2018), digital games (Norman et al., 2016), smartphone time (Sadri, 2018), digital media usage (Kaya et al., 2022), developmental suitability of digital games (Crescenzi-Lanna, 2022), digital game playing and parental attitudes (Kanak & Özyazıcı, 2018; Keya et al., 2017; Papadakis, 2019), social media use and parenting strategies (Kostyrka-Allchorne, 2017). The common aspect of these studies is that technology and digital game play can cause addiction without positive guidance by parents. However, no study has been found that examines children's digital game addictions, digital game guidance strategies and social emotional development together. In this study, the determination of children's digital game addiction tendency levels and the strategies applied by the parents, the correlation between the results obtained and the social-emotional development of the children were examined.

Method

Research design

The study was designed as a cross-sectional study. The cross-sectional studies are applied at one time point, provided a ‘snapshot’ of the outcome and associated factors. Cross-sectional studies are conducted to investigate the associations between risk factors and outcome of interest (Levin, 2006).

Study group

142 children attending pre-school education for 60–72 months were included in the study. The study group was determined by snowball sampling method. First, ten parents were contacted and they were asked to report the parents they know who have children aged 60–72 months who attend pre-school education. The reported parents were contacted again and the working group was increased. The children who included in the study, 56.3% ($n=80$) were boys and 43.7% ($n=62$) were girls. 25.4% of children had their own tablet or phone. 57.0% ($n=81$) of the participants used digital games or internet for one hour or less, 29.6% ($n=42$) use one to two hours and more than two hours.

Data collection tools

Personal Information Form, Digital Game Addiction Tendency Scale, Digital Game Parental Mediation Scale and Ages & Stages Questionnaires: Social-Emotional were used.

Personal information form The form developed by the researchers consists of questions about children’s gender, age, duration of playing digital games, having their own tablet or phone.

Digital gaming addiction tendency scale The scale was developed to evaluate the level of digital game addiction tendencies of preschool children (Budak & Işıkoğlu, 2022). The scale consists of 20 items and has a 5-point likert type. The lowest score that can be obtained from the scale is “20” and the highest score is “100”. As the total score obtained from the scale increases, children’s addiction tendencies towards digital games increase. Addiction levels were classified as follows: Between 20 and 35 points; addiction tendency at least, between 36 and 51 points; low addiction tendency, between 52 and 67 points; addiction tendency is medium, between 68 and 83 points; addiction tendency is high, between 83 and 100 points; addiction tendency is very high. Disengagement from Life (children’s disconnection

in their social lives during the process of playing digital games), Conflict (their reactive behaviors when digital games are blocked), Continuous Playing (spending a long time with digital games in their daily lives), and Reflecting on Life (digital games affect children’s lives). The total reliability coefficient of the scale was determined as 0.93.

Digital game parental mediation scale The scale was created in order to determine what kind of parental guidance strategy the parents had in the digital game playing processes of their children (Budak & Işıkoğlu, 2022). The scale consists of 21 items and is in a 5-point Likert type. The Digital Game Parental Mediation Scale consists of 4 sub-dimensions: Active Parental Guidance Strategies (following the interaction process with digital game and applying necessary instructions), Digitally Oriented Parental Guidance Strategies (directing children to digital game), Free Parental Guidance Strategies (not applying any strategy), and Technical Parental Guidance Strategies (controlling the digital game process through technical programs). Reliability coefficients of the sub-dimensions of the scale were calculated as 0.79, 0.76, 0.57 and 0.61, respectively.

Ages & stages questionnaires: social-emotional The scale is a tool filled in by parents to assess the social-emotional competencies and problems of infants and children aged 3 to 72 months. The scale was developed by Squires, Bricker and Twombly (2003), and adapted into Turkish by Küçüker, Kapçı, and Uslu (2015). The scale has eight different age forms to evaluate children between 3 and 72 months. These are the 6th, 12th, 18th, 24th, 30th, 48th and 60th month forms, respectively. The Cronbach Alpha values of the forms ranged from 0.67 to 0.91, and the mean value for all forms was 0.82. In this study, the 60th month form of the scale was used. The 60th month form also covers children up to 72 months.

Data collection

Ethics committee approval was obtained for data collection. First of all, five parents with 60–72 months old children who volunteered to participate in the study were determined. After these parents were asked to fill in the forms, they were asked to suggest the parents they know who have children in the same age group. Newly determined parents were asked to fill in the forms from those who volunteered to participate in the study, and parents with children in the same age group were asked to suggest. This process continued until a sufficient number of parents were reached. Data were collected from parents who volunteered to participate in the study and

Table 1 Comparison of children's digital game addiction level with social emotional development and parenting strategies

Digital game addiction tendency		social emotional development	Active Parental Guidance Strategies	Digitally Oriented Parental Guidance Strategies	Free Parental Guidance Strategies	Technical Parental Guidance Strategies
Addiction tendency	n(%)	Median (Min-Max)	Median (Min-Max)	Median (Min-Max)	Median (Min-Max)	Median (Min-Max)
Least	40(28.3)	52.5(15–100)	36.0(8–40)	7.0(6–17)	5.0(4–13)	11.5(3–15)
Low	54(38.0)	50.0(15–100)	36.0(18–40)	11.5(6–22)	7.0(4–14)	11.0(3–15)
Medium	32(22.5)	65.0(20–130)	32.0(23–40)	16.0(10–24)	8.0(4–16)	10.0(3–15)
High	11(7.7)	75.0(60–170)	29.0(17–39)	18.0(7–19)	11.0(5–14)	10.0(5–13)
Very high	5(3.5)	70.0(45–175)	30.0(24–37)	18.0(12–24)	15.0(4–15)	11.0(9–15)
X²		17.773	15.024	69.996	35.625	3.133
p		0.001	0.005	< 0.001	< 0.001	0.536

had children aged 60–72 months. Data collection tools were filled by the mothers of the children with Google Forms.

Analysis of data

Descriptive statistics were used in the analysis of the data obtained from the Personal Information Form, Digital Game Addiction Tendency Scale, Digital Game Parental Mediation Scale, Ages & Stages Questionnaires: Social-Emotional, and Personal Information Form. Categorical data were expressed as percentage and frequency, and continuous data as median, minimum, and maximum. When the distribution characteristics of continuous data were evaluated with the Kolmogorov–Smirnov test, the continuous data did not show normal distribution characteristics ($p < 0.05$). Kruskal Wallis H Test was applied to compare non-normally distributed continuous with three or more groups. When a statistically significant difference was found in Kruskal Wallis H test results, Bonferroni corrected Mann-Whitney U Test was used for multiple comparisons. After bonferroni correction, the significant p value was found by dividing the α value by the number of comparisons. Spearman's Rank Correlation Coefficient Tests were used to evaluate the correlation between continuous data. Statistical significance level was accepted as $p < 0.05$. The statistical analysis were carried out using Statistical Package for the Social Sciences (SPSS) 26.0 for Windows software (IBM Corp. in Armonk, NY.).

Results

When children's digital game addiction tendencies were classified as at least, little, moderate, high and very high, their social and emotional development scores decreased as their addiction tendency went from the least, to the high and to the very high. This finding was statistically significant ($X^2 = 17.733$, $p = 0.001$). As a result of the pairwise test, the difference between the social-emotional development

scores of those with high addiction tendency and least or low addiction tendency were statistically significant.

Active parental guidance strategy scores decreased with increasing digital game addiction tendency. This finding was statistically significant ($X^2 = 15.024$, $p = 0.005$). As a result of the pairwise test, active parental guidance strategy scores were statistically different between those with low addiction tendency and those with medium or high levels of addiction.

Digitally Oriented Parental Guidance Strategies scores increased with the increase in digital game addiction tendency. This result was statistically significant ($X^2 = 69.996$, $p < 0.001$). As a result of the Pairwise test, there was a statistically significant difference between the Digitally Oriented Parental Guidance Strategies scores of those with low digital game addiction tendency and low, medium, high and very high addiction tendency. In addition, there is a statistically significant difference between Digitally Oriented Parental Guidance Strategies scores of those with low digital game addiction tendency and those with high or very high digital game addiction tendency.

Free Parental Guidance Strategies scores increased as digital game addiction tendency to increase. This finding is statistically significant ($X^2 = 35.625$, $p < 0.001$). As a result of the Pairwise test, it was seen that there was a statistically significant difference between the Free Parental Guidance Strategies scores of those with a least digital game addiction tendency and those with low, medium, high and very high levels of digital game addiction tendency.

There was no statistically significant difference in technical parental strategy scores according to digital game addiction tendency ($X^2 = 3.133$, $p = 0.536$).

Active Parental Guidance Strategies ($r = -0.201$, $p = 0.017$), Digitally Oriented Parental Guidance Strategies ($r = 0.637$, $p < 0.001$), Free Parental Guidance Strategies ($r = 0.461$, $p < 0.001$), and social-emotional development of children ($r = 0.262$, $p = 0.002$) were correlated with the

Table 2 The relationship between children's digital game addictions and parental guidance strategies and social emotional development

Digital game addiction tendency		Active Parental Guidance Strategies	Digitally Oriented Parental Guidance Strategies	Free Parental Guidance Strategies	Technical Parental Guidance Strategies	Social Emotional Development
Disengagement from Life	r	-0.201	0.637	0.461	-0.097	0.262
	p	0.017	< 0.001	< 0.001	0.253	0.002
Conflict	r	-0.171	0.614	0.420	-0.034	0.301
	p	0.042	< 0.001	< 0.001	0.690	< 0.001
Continuous Playing	r	-0.283	0.648	0.515	-0.112	0.275
	p	0.001	< 0.001	< 0.001	0.183	0.001
Reflecting on Life	r	-0.102	0.585	0.475	-0.018	0.204
	p	0.227	< 0.001	< 0.001	0.830	0.015
total	r	-0.235	0.719	0.527	-0.087	0.292
	p	0.005	< 0.001	< 0.001	0.302	< 0.001

Disengagement from Life sub-dimension of the digital game addiction tendency scale.

Active Parental Guidance Strategies ($r=-0.171$, $p=0.042$), Digitally Oriented Parental Guidance Strategies ($r=0.614$, $p<0.001$), Free Parental Guidance Strategies ($r=0.420$, $p<0.001$) and social-emotional development of children ($r=0.301$, $p<0.001$) were correlated with the conflict of sub-dimension of the digital game addiction tendency scale.

Active Parental Guidance Strategies ($r=-0.283$, $p=0.001$), Digitally Oriented Parental Guidance Strategies ($r=0.648$, $p<0.001$) and Free Parental Guidance Strategies ($r=0.515$, $p<0.001$) were correlated with the Continuous Playing sub-dimension of the digital game addiction tendency scale.

Digitally Oriented Parental Guidance Strategies ($r=0.585$, $p<0.001$), Free Parental Guidance Strategies ($r=0.475$, $p<0.001$) and social-emotional development of children ($r=0.204$, $p=0.015$) were correlated with Reflecting on Life sub-dimension of the digital game addiction tendency scale.

Active Parental Guidance Strategies ($r=-0.235$, $p=0.005$), Digitally Oriented Parental Guidance Strategies ($r=0.719$, $p<0.001$), Free Parental Guidance Strategies ($r=0.527$, $p<0.001$) and social emotional development of children ($r=0.292$, $p<0.001$) were correlated with Total score from the Digital Gaming Addiction Tendency Scale.

Discussion

The study was carried out in order to determine the digital game addiction tendency levels of children and the strategies applied by the parents, and to examine the correlation between the results obtained and the social-emotional development of the children.

Digital game addiction in children has negative effects on their development (Kuss & Griffiths, 2012). Since children spend more time alone while playing digital games, it

is thought that their social and emotional development is negatively affected. In the study, a relationship was found between children's digital game addiction and their social emotional development. According to this result, as the digital game addiction of children increases, their social and emotional development decreases. Studies have shown that children with digital game addiction have a high tendency to aggression (Lee & Morgan, 2018; Jeong et al., 2017). Because the aggressive content in digital games activates the defense mechanism in the left brain lobe of children and causes children to react as if they have encountered the digital game in real life (Weber et al., 2006). Since children addicted to digital games are left alone in front of the screen too much, their social skills and self-esteem can be negatively affected (Caplan, 2003; You et al., 2017), their social competencies decrease (Lemmens et al., 2011) and their social relations weaken (Hawkey et al., 2009). In some studies, it has been observed that digital game addiction increases the frequency of impulse control, depression and anxiety, anxiety disorder and social isolation (Stockdale & Coyne, 2018), decreases interpersonal trust and social self-efficacy (Blinka & Mikuska, 2014).

Digital game addiction causes children to break away from their social lives (detachment from life) during the process of playing digital games, to show reactive behavior when they prevent digital games (conflict), to spend a long time with digital games in their daily lives (continuous playing), and to affect children's lives (reflection on life). A study which conducted with people who spend time playing online Facebook games, is stated that there is a relationship between the time spent playing Facebook games and the variables of perceived stress, life satisfaction, behavioral distancing, and coping with distraction (O'Toole, 2014). Choosing digital games by disconnecting from life is a useful action for those who want to get away from their private life for a while (Cheng & McCarthy, 2013; Sonnentag et al., 2008). However, this process will negatively affect the

social lives of individuals when addiction occurs (O'Toole, 2014). In DSM V, conflict behavior is observed in online gaming disorder (DSM V, 2013). Studies have shown that there is a positive relationship between technology (Turel et al., 2011) and smartphone (Kuem et al., 2021) addiction and conflict. Conflict over digital game addiction shows that individuals have a negative impact on their social lives. The communication of addicted individuals is affected and weakened (Turel et al., 2011). When addiction is observed at an early age, it can be said that the social-emotional development of children whose social-emotional development mainly develops through communication with their environment (Bandura, 2001) will be negatively affected from early childhood. As a result, conflict is a factor that is thought to be effective on children's social-emotional development, as it is associated with the negative behavioral consequences of excessive consumption of an object and affects the adaptation of individuals to society. Continuous playing is among the behaviors seen in digital game addiction. Continuous playing behavior refers to spending a lot of time with digital games and negatively affects the general development and health of children (Mylona, 2020; Rumpf, 2018). Self-esteem, anger, social anxiety, aggression, and psychological-behavioral problems are seen in children who spend time on the Internet all the time (Bisen et al., 2020; Obeid et al., 2019). It is thought that there is a relationship between continuous playing and social-emotional development since children who spend time with digital games cannot find the opportunity to open up to the environment. In addition, internet addiction negatively affects children's quality of life (Tabak & Zawadzka, 2017). Dependent children constantly live in a misleading and unreal world, after a while they begin to reflect the virtual life in their lives. Thus, their interpersonal relationships, development and functionality are affected (Young, 2007). When these researches and the results obtained from the current study are evaluated, it is seen that digital game addiction negatively affects the social and emotional development of children. During the covid 19 pandemic period, children who spend a long time in front of the screen and cannot go out to the street, has increased their tendency to play digital games. At the same time, the social-emotional development of children who could not interact with their peers face-to-face was negatively affected, and the increase in screen time added to this increased the tendency to digital game addiction.

Parents should guide and supervise their children's digital games (Clark, 2011). This parental guidance is effective in preventing digital game addiction. In the current study, digital parenting strategies are active parental, digitally oriented, free parental and technical parental. Active parental strategy prevented digital game addiction, while digitally oriented and free parental strategies increased addiction.

Technical parental strategies are not associated with addiction. Parental guidance strategies play a preventive role in children's digital game addiction (Benrazavi & Teimouri, 2014). Active parenting strategy encourages children to be more critical while using the internet and playing games, and improves the relationship with their parents (Hidaayah, 2022). In Budak's (2020) study, active parental strategy does not have a addiction tendency in children, and digitally oriented and free parental strategies increased children's addiction tendency. Studies have shown that the active parenting strategy is effective in reducing the unwanted effects of the digital world such as addiction (Buijzen et al., 2008; Buijzen & Valkenburg, 2005). In another study examining the strategies parents use during children's use of digital technology, parents supported positive digital content, discouraged and restricted negative digital content (Piotrowski, 2017).

Restrictive parenting strategies are insufficient to create long-term attitudes, affecting only momentary behaviors (Li et al., 2019). Parental guidance strategies are effective in reducing the risks that will occur in children (Kirwil, 2009). Parental guidance strategies are effective in children's use of the internet and digital tools (Livingstone & Helsper, 2008; Livingstone et al., 2017). Mediation of children's digital activities by parents who implement digital parenting strategy is effective on children's online behavior (Nichols & Selim, 2022). Parental guidance strategies are effective in reducing the addiction of children who spend time with digital games at home during the Covid-19 process. Active parental guidance strategy is effective in preventing children's digital game addictions. Digitally oriented and free parental strategies increase the time children spend in digital games and therefore increase the level of addiction.

Conclusion

As a result of the study, it was determined that social emotional development was negatively affected as digital game addiction increased in children. Digital game addiction level is associated with parents' digital game guidance strategies. Active parenting guidance strategy prevents children's digital game addiction, while digital and free parenting strategies increase addiction. Changes in digital technology have made digital games a part of our lives. Considering that it is not possible to keep children away from digital games, it is a fact that the best strategy to minimize their harm is to be guided by the parents of the children. For this reason, parents should be informed about this issue and the most appropriate guidance strategies should be applied.

When the impact of digital technology, which has a great place in every aspect of children's lives, on children's development is determined from an early age and interventions are

planned, children will use digital technology consciously in the future. In addition, these results will allow the planning of various experimental studies in future research. With the spread of such studies, parents will also become aware of digital addiction and they will be able to guide their children more consciously with an active parenting strategy.

Data availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval The study was carried out following the guidelines by the Declaration of Helsinki and the Spanish Society of Psychology. Ethical approval for the study was provided by the research ethics committee of the second author's institution.

Consent to participate Authorization was obtained from each parents and informed consent was acquired from the participants' parents or legal guardians.

Consent for publication Not applicable.

Conflicts of interest The authors declare that they have no conflict of interest.

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