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A Longitudinal Study of Children's Digital Play Addiction Tendencies and Parental Guidance Strategies

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Abstract
The current study aims to identify changing trends in digital play addiction tendencies among young children and parental guidance strategies before, during, and after the COVID-19 pandemic. In light of the bioecological model of development, it was hypothesized that the pandemic would have a significant impact on the addiction to digital play among young children. The participants of this longitudinal trend study were 1552 parents with children from 4 to 6 years of age who attended public preschools or kindergartens in Denizli, Turkey—data was collected through the Digital Play Addiction Tendency and Digital Play Parental Mediation Scale. The results revealed that children's digital play addiction increased during the pandemic and declined post-pandemic. Moreover, both significant changes and stability were observed in parental digital play guidance strategies. Specifically, parental control over their children's digital activities has decreased over time. Results are discussed in relation to the literature, with implications explored for future research and parents.

Keywords Digital play · Addiction · Parental guidance · Early childhood · Pandemic

Introduction

Technological devices have become an important part of life worldwide, and it is known that more than two-thirds of the world's population uses the internet and mobile phones (Digital Report, 2022). This remarkable expansion of digital technology has profoundly impacted people's lives, particularly young children (Bergen et al., 2016; Louv, 2020; Plowman, 2016). A significant number of children grow up in societies where they have extensive access to a wide range of digital tools that are an integral part of their daily routines. In households, schools, and social settings, the use of digital devices such as smartphones, tablets, and computers has increased rapidly, and young children use these devices primarily for play and entertainment (Arnott & Yelland, 2020; Güneş, 2022; Işıkoğlu, 2019; Rideout & Robb, 2020). Recent research has reported an increase in the access to and use of digital technology by 0–8 year-olds (Isikoglu Erdogan et al., 2019; Ofcom, 2023) and average daily screen time reached 2.4 h per day (Radesky et al., 2020; Rideout & Robb, 2020). Furthermore, during the pandemic, screen time increased for children ages 3–17 in 12 countries (Bergmann et al., 2022). Similar studies in Turkey reported that young children spend more than 3 h per day in front of screens (Konca, 2022; Şimşek et al., 2023), which is above the recommended daily limit of less than an hour for children between the ages of two and four (AAP, 2016; WHO, 2019; Yesilay, 2023).

Young children often refer to their screen time as play. This has led to the emergence of the concept of digital play in the literature. Digital play, broadly defined as children using digital devices in playful ways (Scott et al., 2023), is further characterized by Edwards (2019) as a form of children's meaning-making within digital contexts. As a result of its wide-ranging nature, defining digital play is a complex task. In recent years, researchers have attempted to distinguish between digital games, (e.g., Minecraft and Pokémon Go), and digital play, which is the primary activity of children that entails (1) an imaginary situation, (2) rules and roles, and (3) play activities (Veresov & Vereska, 2022). Through this definition, the developmental value of any digital game can be determined by how children engage with it as a form of digital play. According to the current study, digital play refers explicitly to the use of technological tools such as tablets and smartphones for entertainment and play.

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In this context, digital play involves interacting with digital content, applications, or games on these devices. There are positive and negative outcomes associated with digital play's effects on young children's development and learning. Some studies have shown that educational games can support children's learning (Hurwitz & Schmitt, 2020; Radesky & Christakis, 2016; Zimmermann et al., 2017) and promote problem-solving and collaboration skills (Danby et al., 2018; Kucirkova et al., 2014). On the other hand, prolonged screen time associated with language development issues, obesity, and depressive symptoms in young children (Hossain et al., 2021; Ribner et al., 2021; Stiglic & Viner, 2019).

There is evidence that excessive and uncontrolled use of digital games could result in young children developing addiction tendencies (Budak & Işıkoğlu, 2023; Ebbeck et al., 2016; Rosendo-Rios et al., 2022). In recent years, digital game addiction has been recognized as a non-substance addiction and is defined as "excessive, uncontrolled, and irregular use that interferes with daily tasks and can cause social and emotional problems" (Domoff et al., 2020; Lemmens et al., 2009). According to some researchers, such addictions are more prevalent among children since adults are usually able to control behaviors that may become addictive. Still, children do not yet possess the necessary self-regulatory mechanisms to control their behavior (Vazsonyi & Huang, 2010). A recent study has found that both preschool children and young adults are more susceptible to developing addictive behavior related to smartphone usage compared to other age groups (Csibi et al., 2021). The concept of digital game addiction has not yet been standardized in the literature (Schulz van Endert, 2021). However, this study uses the term "digital play addiction tendency" as a substitute for "digital game addiction concept". In order to regulate the amount of time that young children spend playing digital games, it is important that parents supervise their children (Alter, 2018). Research investigating addiction tendencies in young children has identified multiple interrelated factors linked to problematic media use (Dormoff et al., 2020). These factors include parental attitudes (Akaroğlu, 2022), parental mediation (Budak & Işıkoğlu, 2023), and the quality of the mother-child relationship, parental screen addiction (Li et al., 2022), all of which can contribute to the development of such tendencies. (Emiroğlu-İlvan & Ceylan, 2023).

It is known that parents play an important role in preventing addiction by mediating their children's access to digital devices (Espinosa et al., 2006). Parents, who are considered as regulators of environmental opportunities for children (Chaudron et al., 2018), purchase digital devices such as tablets and phones for their children, allow them to use their own devices, facilitate their use of digital games, and impose restrictions on duration and content (Budak & Işıkoğlu, 2023; Chaudron et al., 2018; Şimşek et al., 2023; Zehir et al., 2019). Parents' strategies to manage their children's relationship with technology are defined as parental guidance strategies (Clark, 2011; Livingstone & Helsper, 2008). The primary purpose of parents using these strategies is to reduce the adverse effects of media and enable their children to use digital tools consciously and appropriately (Beyens et al., 2019). Research on parental mediation has identified several distinct types of mediation, including active, restrictive, and technical mediation (Livingstone et al., 2015; Milosevic et al., 2022; Nikken & Schols, 2015). Active mediation involves engaging in behaviors such as discussing media content and activities with the child, sitting nearby, and actively sharing in the child's experiences. Restrictive mediation involves setting rules that limit the amount of time children spend online and directly controlling their choices of content and activities. Technical mediation involves using technological tools to filter, restrict, and monitor children's digital activities (Livingstone, 2015; Nikken & Jansz, 2006). Although parents may employ a combination of mediation strategies, research has shown that active mediation is associated with positive outcomes for young children, including enhanced social and cognitive skills and reduced problem behaviors (Benedetto & Ingrassia, 2021).

Despite recommendations in the literature for parents to employ active mediation strategies, reports indicate that parents often face challenges in actively mediating their children's digital device usage, particularly in terms of duration and content, and may occasionally permit their children to use digital devices alone (Ateş & Durmuşoğlu Saltalı, 2019; Keya et al., 2020; OfCom, 2023). The independent usage of digital devices by children without parental supervision or parents directing their children towards playing digital games to keep them occupied can lead to the development of digital play addiction in children (Budak &Işıkoğlu, 2023).

Present Study

The bioecological model of development provides a theoretical framework to comprehend the influence of the Covid-19 pandemic and parental guidance strategies on the addiction tendencies of young children towards digital play. Bronfenbrenner (1995) states that a child's development is an interconnected system of relationships influenced by multiple levels of the surrounding environment, from the immediate settings of the family and school to the broader cultural values, laws, and customs. The first layer of the theory, known as the microsystem, highlights the crucial role played by family, peers, school, and neighborhood in a child's development. Recently, Johnson and Puplampu (2008) proposed the concept of the ecological techno-subsystem in the microsystem, drawing attention to the effects of interactions with digital tools on social interaction, cognitive development, and mental health. The increasing interaction of young

children with digital tools on a daily basis brings developmental risks, especially excessive use, and addiction. The impact of the pandemic can also be mentioned in the chronosystem, which is part of the multilevel system that affects all layers. Exposure of children in a period of rapid growth and development to the effects of the pandemic is likely to significantly impact their overall development. In addition, the family, the most important partner of the microsystem, needs to adapt to changing conditions according to the Family Processes and Content (FPC) model and should possess skills related to these conditions (Samania, 2011). With these skills, it is predicted that families can provide effective coping strategies for crisis management. Based on this perspective, we hypothesize that the digital play parental mediation that parents choose to implement during a crisis such as the pandemic will impact young children's tendency toward digital play addiction.

The COVID-19 pandemic led to the implementation of social isolation measures in Turkey starting from March 2020. After lifting restrictions in 2022, children and families have resumed their daily routines. Studies conducted during this period have revealed that young children used digital devices for at least 1 h more per day compared to the period before the pandemic (Bergman et al., 2022; Güzen, 2021; Şimşek et al., 2023). Other research findings indicated an increase in digital game addiction tendencies among primary school children (Dağ et al., 2021) and preschoolers (Güzen, 2021) during the COVID-19 pandemic period. The changes in children's environments and lives during the pandemic, such as increased time spent at home and limited outdoor play, have affected children's digital game addiction tendencies and parental guidance strategies. Several studies have been carried out to investigate the duration and content of children's digital play both before and during the pandemic (Bergman et al., 2022). However, a gap in research exists in terms of a comparative analysis of children's digital play addiction tendencies and parental guidance strategies across the pre-pandemic, pandemic, and post-pandemic periods, which could reveal trends in this area.

The purpose of this research was to identify changing trends in digital play addiction tendencies among young children and parental guidance strategies before, during, and after the COVID-19 pandemic. In light of this main problem, two hypotheses were tested: (1) Does the tendency towards digital play addiction among children differ significantly across three time points (pre-during-post)? (2) Do parents' guiding strategies differ significantly across three time points (pre-during-post) Through these questions, we aim to gain a comprehensive understanding of both children's and parents' behaviors concerning digital play across the three specific time frames: before, during, and after the pandemic. This approach allows us to compare changes that occurred in children's digital play addiction tendencies and parental guidance strategies during these distinct phases. It provides us with the opportunity to discern whether the pandemic caused trends, either by fostering change or maintaining stability in these aspects. This study has made a substantial contribution to the existing literature by comparing the addiction to digital play and parental guidance processes during three distinct periods. Furthermore, it is expected that this study will provide empirical evidence regarding the increase in addiction to games among young children, which has been a serious concern in the field.

Method

A longitudinal trend study was designed to investigate changes in children's tendencies toward digital play addiction and the strategies used by parents to guide their children. Trend studies, also known as replicative surveys, are a subtype of longitudinal analysis, alongside cohort and panel studies (Büyüköztürk et al., 2014; Cohen et al., 2018). A trend study examines changes in trends over time, and it does not require the participation of the same people in the survey more than once (Sheppard, 2020). The primary goal of a trend study is to examine how specific attitudes, behaviors, or other variables change over time within a particular population.

Participants

Participant parents were recruited during three different periods. To be eligible for the study, potential participants had to meet two criteria: (1) they had to have a child between the ages of 4 and 6 years old, and (2) their child had to attend a preschool or kindergarten in the Denizli public school district. After signing the necessary consents, parents completed three questionnaires pertaining to digital play addiction, parental guidance strategies, and media demographic information and habits. The participants recruited during the pre-pandemic study were chosen from Denizli because the data was collected through face-to-face paper-pencil forms. Although we used criterion sampling to recruit participants, it was convenient for us to recruit parents where the researchers lived. During and after the pandemic, we had the opportunity to use random recruitment techniques for online data collection. However, we did not purposely choose this to minimize differences among participants across the three different time frames. This type of recruitment may result in some population members (lack of internet access, or digital devices) being inadequately represented in our sample.

Pre-pandemic data were collected in April-May 2019 by disseminating paper-based measurement scales to public early childhood schools in the Denizli region. The forms were completed by willing parents, who returned them to

the respective schools. During-pandemic data was collected during the period from October to November 2020, when distance education was active, and lockdown restrictions were in place. Initially, the measurement instruments were converted into an electronic format, and the hyperlinks associated with them were distributed to public early childhood schools in Denizli. Parents were provided with the hyperlinks by these schools and volunteered to participate in this study by completing the online questionnaire. Post-pandemic data were collected online in October–November 2022, after the lifting of social isolation restrictions, which included the reopening of schools, removal of wearing masks, and dismissal of lockdown rules. The same methodology as that utilized during the pandemic study was followed for data collection. Information about participants were presented in Table 1.

Table 1 shows that 1552 parents participated in this research at three different time points. More than half of the parents hold a university degree, and less than half of them (656) came from middle-income homes. Among the participating children, 834 were boys, and 718 were girls.

Measures

Digital Play Addiction Tendency Scale (DPAT)

The DPAT, developed by Budak and Işıkoğlu (2022), is an assessment tool designed to measure tendencies toward addiction to digital play during early childhood. There are 20 items scored on a five-point scale representing 5: Always, 4: Often, 3: Sometimes, 2: Rarely, and 1: Never. The DPAT showed good psychometric properties (Budak & Işıkoğlu, 2022). Exploratory and confirmatory factor analyses were conducted for construct validity. The incremental fit indices ($\chi 2/sd = 3.402$; RMSEA = 0.075 [0.00–0.05]; SRMR = 0.52; CFI = 0.92) provided strong evidence for the factorial validity of the scale. The internal consistency coefficient was found 0.93. The scale has four factors named withdrawal, conflict, constant play, and displacement. The scale yields scores ranging from 20 to 100, with higher scores indicating greater tendencies towards digital play addiction. The scores are categorized as follows: 20–35 as minimum addiction tendency, 36–51 as low, 52–67 as moderate, 68–83 as high, and 84–100 as very high.

Digital Play Parental Mediation Scale (DPPM)

The DPPM is a valid and credible tool designed to measure how parents mediate their children's digital play (Budak & Işıkoğlu, 2022). It comprises 23 items rated on a five-point Likert scale (ranging from 1 = strongly disagree to 5 = strongly agree). The scale consists of four subscales assessing different parental mediation strategies. These subscales are (1) active mediation, which includes being present while the child plays digital games, discussing game

Table 1 The participant parents' and their children's demographic information

	Pre pandemic I 2019 April–May		During pandemic II 2020 Oct–Nov		Post pandemic III 2022 Oct–Nov		
	N	%	N	%	N	%	Total N
Parent							
Mother	351	80.3	446	90.2	570	92.1	1367
Father	76	17.4	49	9.8	49	7.9	174
Education level							
Below BA	215	50.4	250	50.4	323	52.2	788
Above BA	212	49.6	246	49.6	296	47.8	754
Income							
Low	151	43.8	219	44.2	351	59.2	721
Mid	86	24.9	147	29.6	132	22.3	365
High	108	31.3	117	23.6	110	18.5	335
Child							
Girl	208	47.6	216	43.5	294	47.5	718
Boy	229	52.4	280	56.5	325	52.5	834
Child age							
4 year old	153	35.0	197	39.7	254	41.0	604
5 year old	207	47.4	229	46.2	293	47.3	729
6 year old	77	17.6	70	14.1	72	11.6	219
Total	437		496		619		1552

*The deficiencies in totals are due to the participants' parents leaving those questions blank

Table 2 Descriptive statists about study variables

	Time	M	SD	Skewness	Kurtosis	Range
Digital play addiction tendency (DPAT)						
	Pre	39.93	14. 49	0.626	−0.299	20–84
	During	49.46	16.94	0.414	−0.712	21–97
	Post	47.13	17.18	0.580	−0.199	20–99
Digital play parental mediation scale (DPPM)						
Active	Pre	4.13	0.77	-1,427	0.862	1–5
	During	4.19	0.65	-1.168	1.056	1–5
	Post	4.18	0.75	-1.437	1.223	1–5
Technical	Pre	3.42	1.11	−0.343	−0.606	1–5
	During	2.76	0.59	−0.151	0.548	1–5
	Post	2.74	0.64	−0.212	0.299	1–5
Encouraging	Pre	1.93	0.66	0.699	0.229	1–5
	During	2.26	0.43	0.425	1.017	1–5
	Post	2.17	0.58	0.427	0.227	1–5
Permissive	Pre	1.86	0.70	0.695	0.141	1–5
	During	2.49	0.66	0.097	0.093	1–5
	Post	2.44	0.67	0.106	0.008	1–5

content, and providing explanations and instructions; (2) technical restrictions, which involve setting limitations on time and content; (3) encouraging, which refers to suggesting digital play as a way to calm the child down or keep them occupied; and (4) permissive, which allows children to play alone and choose digital games freely. The Parental Digital Play Mediation Strategies scale and its subscales demonstrate good internal reliability, with Cronbach's alpha coefficients ranging from 0.92 to 0.74. Additionally, confirmatory factor analysis was conducted to verify the factorial validity of the scale. The incremental fit indices ($\chi 2 = 2.409$; RMSEA = 0.058 [0.05–0.08]; SRMR = 0.059; CFI = 0.90) provide strong evidence for the factorial validity of the scale.

Demographic Information

The study gathered socio-demographic data, including age, gender, education level, income, and average daily screen time. Parents reported the daily amount of time their children spent watching television, using tablets, and smartphones, which was then used to calculate their total daily screen time.

Data Analysis

Two phases of statistical analysis were conducted: (1) children's digital play addiction tendency scores and (2) parents' guidance scores from the three periods before, during, and after the pandemic were calculated and tested for normality (Table 2). Generally, a distribution is considered approximately normal if its skewness or kurtosis (excess) lies between − 1.5 and + 1.5 (Tabachnick & Fidell, 2013). In the current study, kurtosis and skewness values ranged from 0.97 to − 1.437, indicating considerable normality. To compare scores between pre-pandemic, during-pandemic, and post-pandemic periods, a variance analysis was conducted.

Results

To determine children's digital play addiction tendencies and parental mediation strategies, descriptive statistics were computed, including means, standard deviations, skewness, kurtosis, and range of study variable scores. These statistics are presented in Table 2.

Table 2 shows that the mean DPAT scores were $\bar{x}$= 39.93 before the pandemic, $\bar{x}$= 49.46 during the pandemic, and $\bar{x}$ = 47.13 after the pandemic, indicating a low level of addiction. The parents had the highest mean scores of $\bar{x}$ = 4.19 on active mediation during the pandemic and the lowest mean score of $\bar{x}$ = 1.86 on permissive strategies during the pre-pandemic period.

Findings About Digital Play Addiction Tendency Scale (DPAT)

To identify differences in the study variables related to DPAT scores before, during, and after the pandemic, a sequence of univariate ANOVAs was conducted. In terms of DPAT scores, ANOVA revealed statistically significant effects of time (F (2, 1548) = 42.31, $p < .000$). The post-hoc analyses of Tukey showed a significant difference in children's digital play addiction tendencies before, during, and after the pandemic. In other words, the mean score during

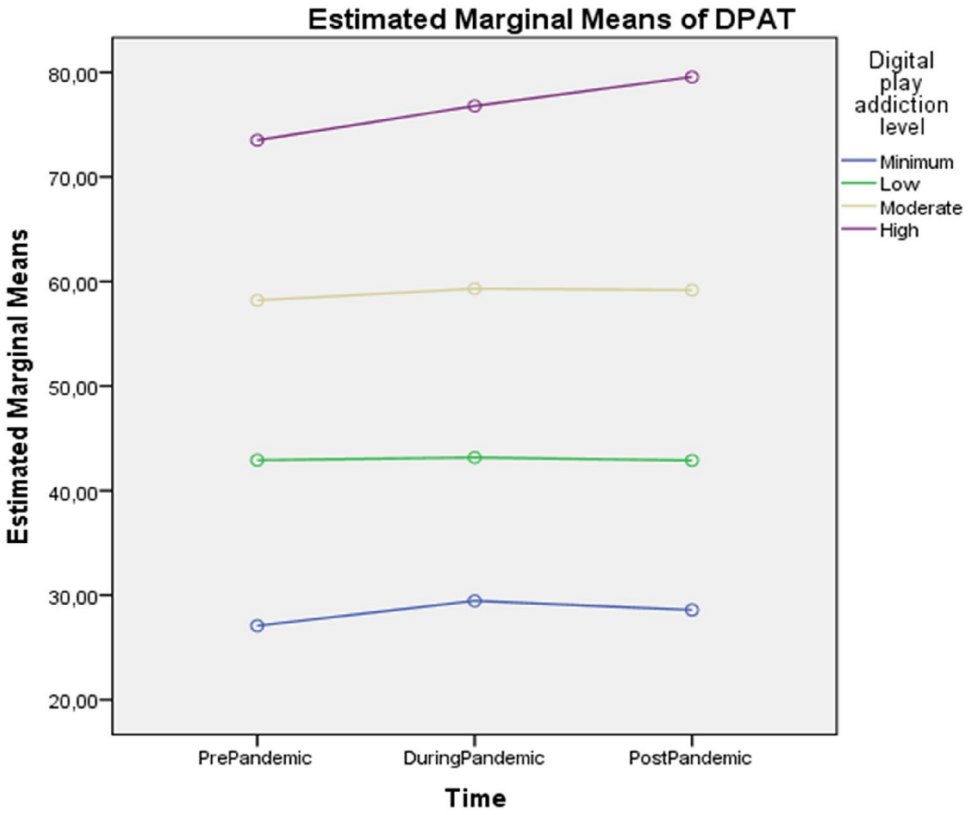

Fig. 1 The effects time and addiction categories on digital play addiction tendency scores of a means plot

the pandemic was significantly higher than the scores before and after the pandemic. Moreover, the scores of children prior to the pandemic were significantly lower than those scores during and post-pandemic. In summary, the DPAT scores of children increased significantly during the pandemic and then decreased significantly afterward.

To analyze the trends in children's DPAT scores across five categories (minimum, low, moderate, high, and very high), ANOVA test was initially planned. However, the pre-pandemic data had one observation on the very high category, and it did not meet the assumptions required for this analysis. As a result, the very high and high categories have been combined into one category, and 3 × 4 factorial ANOVA was conducted to compare the effects of time (pre/during/post) and addiction categories (minimum, low, moderate, high) on addiction scores. A factorial ANOVA revealed that there was a statistically significant interaction between the effects of time and addiction categories (F(11, 1551) = 1474.68, $p = .000$). The main effect for time yielded an F ratio of F(2, 1551) = 14,47, $p < .00$, indicating a significant difference between Pre pandemic ($\bar{x}$=50.42, SD = 4.63), during pandemic ($\bar{x}$=52.17, SD = 4.10) and post-pandemic ($\bar{x}$=52.55, SD = 4.50). The main effect for addiction categories yielded an F ratio of F(3, 1551) = 4315.82, $p > .000$, indicating that the significant difference between minimum ($\bar{x}$ = 28.37, SD = 4.76), low ($\bar{x}$ = 42.98, SD = 4.55), moderate ($\bar{x}$= 58.89, SD = 4.84), and high ($\bar{x}$ = 76.62 SD = 7.08), The interaction effect was significant, (F(6, 1551) = 5.049, $p < .000$). The means plot reported in Fig. 1.

As seen in Fig. 1, the mean of minimum digital play addiction tendency scores was pre-pandemic ($\bar{x}$ = 27.07), during-pandemic ($\bar{x}$ = 29.45), and post-pandemic ($\bar{x}$ = 28.58). These scores indicated that even children with minimal addiction tendencies raised their scores during the pandemic and were significantly lowered post-pandemic. Despite this, their scores were still higher than before the pandemic. The mean of high play addiction tendency scores was pre-pandemic ($\bar{x}$=73.51), during-pandemic ($\bar{x}$ = 76.78), and post-pandemic ($\bar{x}$ = 79.56). At all three time points examined, there was a significant increase in these mean values.

Findings About Digital Play Parental Mediation Scale (DPPM)

A series of univariate ANOVA tests were conducted to explore the time differences among the Parental Digital Play Guidance Strategies (DPPM). The one-way ANOVA analysis indicated that except for *active mediation*, the other three scales indicated significant differences. The means, standard deviations, and F statistics can be seen in Table 3.

Post-hoc analyses of one-way ANOVA (Tukey) indicated a significant difference among pre, during and

Table 3 Comparisons of parental guidance strategies across time

	Pre pandemic		During		Post pandemic			
	$\bar{x}$	*ss*	$\bar{x}$	*ss*	$\bar{x}$	*ss*	*F*	*p*
Active	4.13	0.77	4.19	0.65	4.18	0.75	0.818	0.441
Permissive	1.86	0.70	2.49	0.66	2.44	0.67	122.574	0.000
Encouraging	1.93	0.66	2.26	0.43	2.17	0.58	41.787	0.000
Technical	3.42	1.11	2.76	0.59	2.74	0.64	114.511	0.000

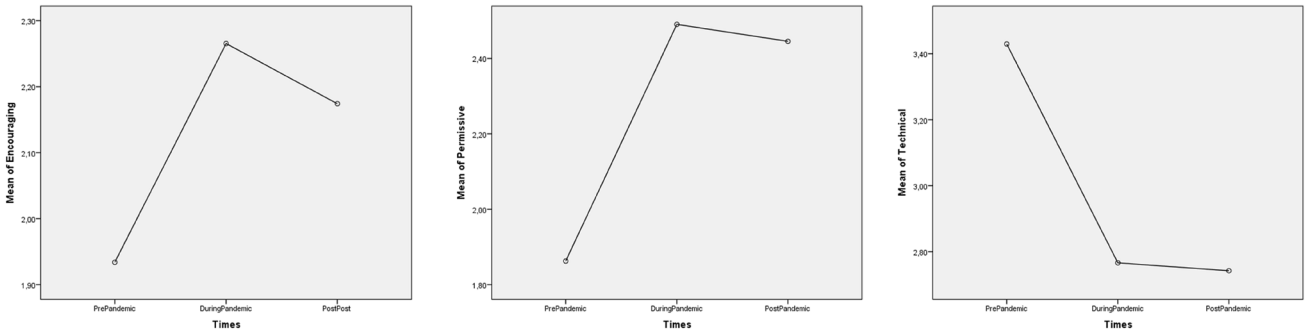

Fig. 2 Mean plots of the DPPM's subscales

post-pandemic scores on parents' DPPM scores. The average permissive scores of parents during the pandemic were significantly higher than their scores pre and post pandemic. Similarly, the encouraging scores during the pandemic were significantly higher than the pre and post-pandemic scores. In other words, parents during and after the pandemic allowed their children to engage in digital play more than they had before the pandemic. On the other hand, the technical restriction scores pre-pandemic were significantly higher than during and post-pandemic scores. These results indicated that parents decreased their implementation of technical restrictions, such as setting screen time and content limits, during and after the pandemic. The ANOVA mean plots can be seen in Fig. 2.

Figure 2, showed that while parents' encouraging and permissive scores increased during the pandemic, they decreased after the pandemic. However, contrary to these subscales, a decrease was observed in the parents' technical restriction scores. At all three time points examined, the mean values of technical restriction subscale decreased significantly. This suggests that parents' technical restrictions significantly decreased during and post-pandemic.

Discussion

The present longitudinal trend study aimed to explore the digital play addiction tendencies among young children, along with the shifting patterns of parental guidance strategies before, during, and after the COVID-19 pandemic. For the first research hypothesis, the results indicated that children's digital play addiction increased during the pandemic and declined post-pandemic, but did not return to previous levels. Specifically, the study found that the pandemic led to a rise in young children's addiction to digital play. These findings are consistent with previous studies that have indicated a rise in digital play addiction among young children, which is increasingly becoming a serious concern for both children and their families (Guzen, 2022; Radesky et al., 2023). In accordance with bioecological theory and the chronosystem (Bronfenbrenner, 1995), it appears likely that the impact of the pandemic on children will persist for a long period of time. Interestingly, this study's findings also showed that children exhibiting high levels of digital play addictive tendencies did not experience a decline in those behaviors. In fact, compared to children with lower levels of addictive tendencies, these tendencies increased after the onset of the pandemic. However, additional research is required to investigate other related factors that could contribute to the elevated prevalence of addiction in these children. Taken together, these findings suggest that the pandemic may have affected young children's tendencies toward addiction to digital play. The increased usage of digital devices and reduced social interaction during the pandemic may have contributed to the development of addictive tendencies in young children towards digital play (Simşek et al., 2023).

In relation to the second research hypothesis, the current study examined trends in parental guidance strategies during

pre and post-pandemic periods, revealing significant changes and stability in parental mediation toward children's play activities. In this study, it was encouraging to find that parents' active guidance strategies remained consistent across the three time periods examined. Parents are aware of the importance of active mediation, which involves actively engaging with their children during digital play, discussing content, and providing guidance and instruction. Several other studies have also emphasized the importance of parents using active mediation strategies during their children's digital playtime (Cao et al., 2022; Jago et al., 2016; Nevski & Siibak, 2016). This approach is effective in promoting responsible and healthy digital media use in children, as well as enhancing parent-child communication and relationships (Clark, 2011).

On the other hand, the pandemic increased permissive and encouraging strategies employed by parents, which subsequently decreased after the pandemic but did not return to pre-pandemic levels. These strategies involve parents being more lenient and allowing their children to engage in digital activities without active mediation or supervision. Due to the pandemic's limitations, parents could not engage their children in out-of-home activities, forcing them to seek alternative methods to keep their children engaged and entertained. As a result, parents became more inclined to permit their children to participate in activities they may not have previously allowed (Fitzpatrick et al., 2022). Previous research findings have suggested that parents tend to engage in the co-use of traditional media, such as books and television, more often than touchscreen devices (Connell et al., 2015). It is reasonable to conclude that parents accompany their children less in digital games and encourage them to play with digital devices.

The findings regarding technical restrictions revealed a decrease in parents' ability to enforce limits on the amount of time their children spend playing digital games and the type of content they consume during and after the pandemic. As a result, it appears that parental control over their children's digital activities has decreased, contrary to previous research. Several studies revealed that parents from various child-rearing cultures preferred implementing restrictive rules, such as screen time limits and website access restrictions, to prevent potential risks (Chang et al., 2019; Kirwil, 2009; Nikken & Schols, 2015). A possible explanation for this decline may be that the pandemic caused significant changes in family dynamics and daily routines, causing parents to prioritize other responsibilities over monitoring their children's digital activities. Additionally, distance education and social distancing measures might have made it more challenging for parents to monitor and enforce digital boundaries. It is also possible that some parents had difficulty balancing their work and childcare responsibilities, leaving them with less time and energy to control their children's digital behavior. The study's results revealed different patterns of change in parental guidance across various dimensions, contrary to our second hypothesis. It is particularly noteworthy that a continuous decrease was observed in parental guidance in technical limitations, while no significant changes were noted in active strategies. This finding suggests that parents tend to reduce their guidance regarding technical restrictions, meaning they are setting fewer limitations on time and content of their children's digital play. These results also lead us to think that the fewer technical restrictions parents impose, the more children are exposed to digital games for longer durations and various contents. Moreover, the reasons for the continuation of reduced technical limitations for parents after the pandemic should also be examined.

Conclusion and Implications

During the COVID-19 pandemic, digital play has remained a significant aspect of young children's lives, and their play habits, as well as the strategies used by parents to guide them, and the strategies used by parents to guide them, have changed. Overall, our research results emphasized that digital play addiction has become a significant concern among young children. The results of this study have revealed that even after the lifting of pandemic-related social distancing rules, children's digital play addiction tendencies have not disappeared. Therefore, young children and their parents must become aware of digital play addiction. The pandemic has highlighted the importance of peer and play environments as alternative ways to prevent game addiction in the absence of social opportunities. Therefore, it is recommended that young children be provided with hands-on play materials, safe parks, classrooms, libraries, and opportunities to socialize with their peers. This might help prevent digital game addiction. Acquiring self-regulation skills, which are defined as the ability to control one's behavior, will also be important in preventing play addiction for young children. At this point, it is important for parents and educators to employ mediation strategies effectively engage with their children during play, foster positive interactions, establish consistent and fair rules regarding the content and duration of digital games, and teach children self-regulation skills related to screen time. Additionally, educators can play a crucial role by integrating digital literacy and responsible technology use into the curriculum, promoting a balanced approach to screen time in the classroom, and collaborating with parents to ensure a coordinated effort in guiding children's digital experiences. Together, parents and educators can help children develop healthy digital habits and maximize the educational benefits of technology.

This study strengthens previous research on the evolving patterns of addiction to digital play among young

children and effective parental guidance approaches. This work provides new information suggesting that returning to the 'old normal' before the pandemic was not the case for children's digital play addiction or parental mediation. This suggests that young children engage more with digital play post-pandemic, and parents seem to feel comfortable with their children's digital play habits. On the other hand, the research lags behind in exploring the developmental effects of digital play. Empirical studies are needed to understand the long-term developmental effects of exposure to digital play and parental guidance, especially in technology-driven societies where there are more opportunities to access digital games and devices, which was not the case in Turkey. To further explore children's play addiction, future studies could investigate longitudinal trends. Moreover, additional research is needed to develop parental programs that can assist in moderating children's interactions not only with digital play but also with emerging technologies such as AI. There is a great need to learn more from empirical research about the reported practices and the naturalistic observations of parental mediation related to the children's relationship with digital devices.

The study reported has some limitations that need to be acknowledged. One of these limitations is related to the sampling methods. Due to the challenges posed by the pandemic, it was difficult to reach out to the families in the initial sample. Consequently, three different samples from the same region and early childhood schools were included in the study. Additionally, gathering data from different parents at three different times could have influenced the results, including sociocultural differences unrelated to time. The other limitation is the measurement tools used, which were not suitable for older children. As a result, only children between the ages of 4 and 6 were included in the study. To gain a better understanding of the duration of addiction tendencies, future studies could explore this phenomenon in older children.

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Data Availability The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Conflict of interest The authors report there are no conflict of interests to declare.

Ethical Approval The reported study was approved by the Social Sciences Research Ethical Review Board of the Pamukkale University, Denizli TURKEY.

Informed Consent Informed consent was obtained from all participant parents included in the study.

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