

SCREEN ADDICTION AS A PREDICTOR OF AGGRESSIVE TENDENCIES IN CHILDREN AGED 60-72 MONTHS

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Abstract

Behaviour during early childhood, when the foundations of personality are laid, is crucial for adapting to social life and school. Children who exhibit negative behaviour, particularly in schools—the first institution encountered after the family—struggle to adapt to school to the school environment, form friendships, and gain peer acceptance, thereby facing significant social challenges. In recent years, it has been thought suggested that the increase in the amount of time children spend in front of screens has increased behavioural problems in children has led to more behavioural problems. It is very important crucial to prevent children from acquiring negative behaviours during this period. The aim of the study is to determine the effect of whether screen addiction as a predictor of predicts aggression tendencies aggressive tendencies in children aged 60-72 months. The study involved 155 children attending pre-school education preschool and their parents. Data were collected using the Information Form, the Aggression Orientation Scale for Children Aged 36-72 Months, and the Problematic Media Use Scale-Screen Addiction Scale for Children, Parent Form. The data were analysed using the Kruskal–Wallis H and Mann–Whitney U tests, and correlation and regression analyses. A statistically significant and positive relationship was found between screen addiction and aggressive tendencies in children aged 60-72 months. Recommendations were made to parents and teachers.

Keywords: Addiction, Aggression orientation, Child, Screen addiction

INTRODUCTION

The increasing use of digital technologies at increasingly younger ages has a decisive impact on children's developmental processes. Increased screen exposure, particularly during the pre-school years, stands out as a significant environmental factor that can limit children's social interactions, play-based learning experiences, and emotional regulation skills (Twenge & Campbell, 2019). In this context, screen use should be considered not merely a matter of time spent a multidimensional risk area affecting children's behavioural and emotional development.

Recent studies have shown that intensive and uncontrolled screen use during early childhood can negatively affect children's peer relationships and social adaptation processes; this has been linked to attention problems, behavioural difficulties and aggressive tendencies (Domoff et al., 2020). In particular, screen addiction impairs social learning processes by reducing children's opportunities for play and face-to-face interaction, and it can also adversely affect the development of emotion-regulation and self-control skills. This increases the likelihood of children responding more impulsively and aggressively to stress and disappointment (Coyne, Rogers, Nelson, & Barr, 2022). Recent studies have shown that screen time predicts aggressive tendencies not only in terms of quantity but also in terms of content (Martins, Wang, Beullens, & Valkenburg, 2021).

Aggression can be defined as the intention to harm another person, manifested through psychological or physical harm (Veiga, O'Connor, Neto, & Rieffe, 2022). Aggression is divided into two categories: physical aggression and relational aggression. Physical aggression is defined as the threat of physical harm by hitting, kicking, hurting, or injuring using physical force, while relational aggression is defined as the threat of withdrawal from the relationship or termination of the relationship (e.g., you can't play with me, you can't come to my party) with the intention of harming another individual (Ostrov, Kamper-DeMarco, Blakely-McClure, Perry & Mutignani, 2019). Aggression observed during the preschool period is often regarded as a sign of growth and not taken seriously by adults. From a developmental perspective, aggression, which can emerge from the early years of life, increases significantly up to the age of three and then shows a gradual decline from three to five years of age (Dearing, Zachrisson, & Naerde, 2015; Ersan, 2020).

Often, Children who exhibit aggressive behaviour struggle to adapt to preschools and are rejected by their peers. Although the form and purpose of behaviours associated with aggression vary, they possess consistent characteristics from pre-school to adulthood (Hay, Meldrum, Widdowson, & Piquero 2017; Suh & Kang, 2020). Studies show that factors such as the temperament, gender, emotion regulation skills of preschool children, and the psychological state of parents have a decisive effect on aggression (Brown, Craig, & Halberstadt, 2015; Han, Cho, & Kim 2014). There are also studies that indicate aggression is a behavioural problem (Evans, Frazer, Blossom, & Fite 2019; Huitsing & Monks, 2018; Zulauf, Sokolovsky, Grabell, & Olson, 2018). Aggressive behaviours in preschool children significantly affect their social adjustment, academic performance (including failure), and likelihood of involvement in crime in later years. Therefore, it is necessary to identify and explain the factors that cause aggression in early life.

Most studies examining the relationship between screen addiction and children's aggressive tendencies have focused on primary school-aged children (Coyne et al., 2022; Martins et al., 2021). However, the 60–72-month period is a critical developmental stage during which children's social adjustment, self-regulation, and behavioural patterns are intensively shaped as they transition from preschool to primary school (Lauricella, Russo, Robb & Wartella, 2022). During this period, children develop their social skills through play-based learning while also striving to adapt to increasing environmental expectations.

Current research based on social learning theory indicates that exposure to aggressive behaviour displayed on screen strengthens aggressive thought patterns in children, leading to an increase in anger responses and attributions of hostile intent. Conversely, it has been reported that tendencies to develop empathy and exhibit prosocial behaviour weaken during this process (Swing & Anderson, 2010; Keikha, Qorbani, Tabae, Djalalinia & Kelishadi, 2020). Experimental and longitudinal studies also support these findings, revealing that increased screen time is significantly associated with physical and verbal aggression, defiant behaviour, and the frequency of general behavioural problems (Radesky et al., 2015; Santos et al., 2023). When evaluated by content type, violent television programmes, cartoons, and digital games are among the main factors that increase aggressive tendencies. Content in which violence is left unpunished, rewarded,

or presented as an entertaining narrative element increases desensitisation to violence among children and paves the way for the normalisation of aggressive behaviour. Interactive digital games, in particular, can have a stronger impact on learning and reinforcing aggressive behaviour, as they allow aggressive scenarios to be actively experienced rather than passively observed (Gentile et al., 2011; Swider-Cios, Vermeij & Sitskoorn, 2023).

Therefore, this research reveals the effect of screen addiction on aggression during this critical period, presenting findings that are more specific and developmentally focused than previous studies. Screen addiction is conceptualized not only in terms of screen time, but also as an addiction model that predicts children's propensity for aggression. While previous studies have mostly focused on the amount of screen use (Domoff et al., 2020; Twenge & Campbell, 2019), this research examines the relationship between screen addiction levels in children and aggression.

Limiting screen time to age- and developmentally-appropriate content and a usage period determined by parental control has been shown to contribute to children's cognitive and language development while also increasing their knowledge of concepts (Karani, Sher & Mophosho, 2022; Massaroni, Delle Donne, Marra, Arcangeli, & Chieffo, 2023). Controlled screen use supports children's productivity, emotionally soothes them, supports second language acquisition, ensures the development of their native languages, and increases their motivation, contributing to their ability to actively use technology, according to positive results obtained from research (Şimşek & Işıkoğlu, 2021; Yücelyiğit & Aral, 2020). It has been determined that uncontrolled and unlimited screen use by children causes negative effects such as digital addiction, difficulty falling asleep and staying asleep, obesity, cyberbullying, antisocial behaviour, laziness, and commercial risks (Muslu & Gökçay, 2019). Spending excessive, uncontrolled time using technological products negatively affects preschool children, who are in a developmentally crucial period. Some of these negative effects include an inability to control emotions, anger, and aggression. Preschool children, who are in a particularly sensitive period for personality development, were identified as the target group in this study. It was predicted that screen addiction among children aged 60-72 months could affect their tendencies towards aggression. The study sought answers to the following sub-questions:

1. Are children's age, gender, duration of preschool education, and daily media usage time significantly associated with problematic media usage (screen addiction) and tendencies towards aggression?
2. Is there a significant relationship between children's problematic media use and their aggressive tendencies?
3. To what extent does children's problematic media use affect their aggressive tendencies?

MATERIAL AND METHOD

Research Design and Population

This study was designed as correlational research. In this study, the sample comprised children aged 60–72 months who attended official nursery schools affiliated with the Ministry of National Education in a province in eastern Turkey during the 2023–2024 academic year. The study used non-probability purposive sampling. This method enabled data collection from children and parents who were available and voluntarily participated during the study period.

The inclusion criteria for the study were defined as follows: the child was between 60 and 72 months of age and attended a public preschool; the parent voluntarily participated in the study and completed the measurement tools in full. Children with developmental diagnoses, chronic illnesses, or special educational needs were excluded from the sample.

The sample size was calculated according to the formulas proposed by Özdamar (2003). Considering that the population size was 679 children, the minimum sample size was determined to be 133 with a 95% confidence level and a 5% sampling error. To account for potential data loss, the sample size was increased, and data were collected from 155 children and their parents. This number was considered sufficient for statistical analyses.

In our study, children's levels of screen addiction were measured; however, content-based variables such as the type of screen content children were exposed to, its level of violence, whether it was educational or entertainment-oriented,

and whether its use was passive or interactive were not evaluated. This situation limits the ability to draw detailed conclusions about which types of content or programmes are most strongly associated with aggressive tendencies.

Furthermore, data were collected via parental reports, which may introduce biases such as differences in parents' perceptions and social desirability bias. That the study was conducted in a single province is another factor limiting the generalisability of the findings.

Some formulas used to determine the sample size are as follows(Özdamar, 2003, pp. 116-118):

N: Population size, n: Sample size

P: Observation rate of X in the population, Q(1-P):Non-observation rate of X

Z α : Values of 1.96, 2.58, and 3.28 for $\alpha = 0.05, 0.01, 0.001$

d= Sample error

σ = Population standard deviation

t α ,sd = Critical values of the t-distribution with sd degrees of freedom (sd = n-1). The critical values t α ,sd can be taken equal to the Z α values when sd = n-1 $\rightarrow 5000$.

When the population variance is known and only Type I error is considered, the sample size is calculated using the following formulae.

$$n = \frac{679 \cdot (2.58)^2 \cdot 0.05}{(679-1) \cdot (0.05)^2} = \frac{225.9848}{1.695} = 133.32$$

In this case, the sample for the study was calculated to be at least 133 children(aged 60-72 months)(Özdamar, 2003).

Data Collection Tools

Descriptive Information Form

The form includes questions about age, gender, duration of pre-school education, and daily media usage time. Findings related to the demographic variables of the study are presented in

Table 1. Distribution of Participants According to Demographic Variables

Variable	Group	Number (n)	Percentage (%)
Gender	Girl	79	51.0
	Boy	76	49.0
Age	5 Age	89	57.4
	6 Age	66	42.6
The period during which he/she received pre-school education	0-6 month	32	20.6
	1 year	43	27.7
	2 year	53	34.2
	3 years and more	27	17.4

The child's daily media usage time	less than 30 minutes	32	20.6
	1-3 hours	117	75.5
	between 4 and 5 hours	6	3.9
Total		155	100.0

Table 1 shows that 51% of the children included in the study were girls and 49% were boys. 57.4% were 5 years old and 42.6% were 6 years old. 20.6% had received 0-6 months of pre-school education, 27.7% 1 year, 34.2% 2 years, and 17.4% 3 years or more. 20.6% had received 0-6 months of pre-school education, 27.7% had received 1 year, 34.2% had received 2 years, and 17.4% had received 3 years or more. were 1 year old, 34.2% were 2 years old, 17.4% were 3 years old and older, and had received preschool education for 3 years or more; 20.6% of participants used media for less than 30 minutes per day, 75.5% for 1-3 hours per day, and 3.9% for 4-5 hours per day.

Aggression Orientation Scale(ATS)for Children Aged 36-72 Months

The scale was developed by Kaynak, Kan, & Kurtulmuş (2016) to determine the aggression tendencies of children in the 36-72 month age group. The 27-item scale has 4 subscales. The scale's subscales are as follows: 'Physical Aggression Towards Others' consists of 8 items. This type of aggression involves intentionally inflicting physical harm on others. The 'Relational Aggression Towards Others' sub-dimension consists of 7 items. This sub-dimension refers to aggression that involves intentionally harming others to exclude them. The 'Self-Directed Aggression' sub-dimension consists of 5 items. This sub-dimension is a type of aggression in which a person deliberately harms themselves. The 'Object-Directed Aggression' sub-dimension consists of 7 items. This sub-dimension is aggression, in which a person deliberately damages an object in a moment of anger. The Cronbach's alpha value for the entire scale is .957; the Cronbach's alpha values for the subscales are .946 for the 'Physical Aggression Towards Others' subscale, .945 for the 'Relational Aggression Towards Others' subscale, and .853, and .920 for the 'Object-Directed Aggression' sub-dimension (Kaynak et al., 2016). In this study, the values for the sub-dimensions were 0.92, 0.96, 0.85, and 0.93, respectively. Each item on the 7-point Likert scale, presented as '1=never does - 7=always/constantly does', was designed to represent a specific behavioural pattern. This scale aims to determine the targets of aggression in children aged 36-72 months. The scores for each sub-dimension are calculated separately. A high score on a subscale is interpreted to indicate adoption of the behaviour pattern represented by that dimension. In our study, Cronbach's alpha was 0.90.

Problem Media Use Scale - Screen Addiction Scale for Children Parent Form(PMUS)(4-11 years)

The scale was developed by Domoff and colleagues in 2017 and adapted into Turkish by Furuncu (2019) in 2019. The Problematic Media Use Scale was developed to identify problematic media use in children under the age of 12.

The short form of the scale consists of 9 items, while the long form consists of 27 items. The items on the 5-point Likert scale, which does not include reverse-scored items, are scored from 1(never)to 5(always).The total score on the scale is calculated as the average of all item scores. High scores on the scale indicate problematic media use. The scale, completed by parents based on their child's behaviour, assesses screen addiction in children from a parental perspective, specifically problematic use of visual media devices such as tablets, televisions, smartphones, and computers. Cronbach's alpha was .97 for PMUS and .92 for PMUS-SF. In this study, the Cronbach's alpha of the scale was calculated as 0.91. According to the research results, the short form of the scale, consisting of 9 items, is a valid and reliable measure for detecting screen addiction in children aged 4-11 (Furuncu & Öztürk, 2020).

The long-form scale score is obtained by summing the scores from all items and dividing by 27; in the short-form, it is obtained by dividing by 9. The higher a child's score on the scale, the greater the problematic use.

Data Collection and Analysis

Following permission obtained from the Provincial Directorate of National Education, visits were made to the schools where the research was conducted. The purpose and methods of the research were explained to the parents to

have them complete the scales; informed consent was obtained, and the data collection tools were completed in full. Prior to the application, the importance of the research and its contribution to education were explained to the parents. The application was conducted face-to-face and took 20–30 minutes.

Statistical analyses were conducted using SPSS 25.0 software. Prior to the main analyses, the distributional properties of the continuous variables were examined. Normality was assessed using skewness and kurtosis coefficients and other distributional characteristics. The results indicated that the data did not satisfy the assumption of normality required for parametric statistical tests. In addition, the relatively small sample size and the ordinal nature of the scale scores supported the use of non-parametric statistical methods.

Accordingly, non-parametric tests were preferred for the analysis. The Mann–Whitney U test was used for comparisons between two independent groups, while the Kruskal–Wallis H test was employed for comparisons involving more than two independent groups. These tests are recommended when normality assumptions are violated or when data are measured at an ordinal level, as they do not require normally distributed data and are robust against distributional deviations (Field, 2024). Furthermore, correlation and regression analyses were conducted to examine the relationships between screen addiction and aggressive tendencies.

Limitations of the Study

The statements made by the participants in the study were deemed accurate. Limitations included the study's limited focus on a single province and the sample size. When evaluating the findings of this study, certain methodological limitations must be taken into account. Although the study measured the screen addiction levels and aggressive tendencies of children aged 60–72 months, it did not provide a detailed assessment of the type and nature of the screen content to which the children were exposed. Contextual variables such as the level of violence in the content, whether the content was educational or entertainment-oriented, and whether the usage pattern involved passive viewing or interactive participation were not addressed in this study. This limits the ability to draw clear conclusions about which types of content or programmes are most likely to increase aggressive tendencies.

On the other hand, the cross-sectional design of the study does not allow for causal interpretations of the relationships between variables. While the findings reveal significant relationships between screen addiction and aggressive tendencies, the direction of causality cannot be determined within the scope of this research. Furthermore, data based on parental reports may introduce biases such as differences in parental perception and social desirability bias. Future studies that use longitudinal or experimental designs, employ measurement tools that characterize screen content in greater detail, and include teacher observations or direct behavioural measurements, in addition to parental reports, will contribute to a more comprehensive and explanatory understanding of the relationship between screen addiction and aggressive tendencies. Furthermore, the data collection tools were completed by parents, which may introduce bias because parents may subjectively evaluate their children's behaviour and respond in socially desirable ways. This situation is considered a methodological limitation that must be taken into account when interpreting the findings.

Ethical Aspects of the Research

The Inonu University Social and Human Sciences Scientific Research and Publication Ethics Board deemed this research ethically appropriate by decision number 41, dated 04.05.2023. Necessary research permits were obtained from the National Education Directorate to conduct research in educational institutions.

RESULT AND DISCUSSION

Table 2. PMUS and ATS Total Score Averages

Scales	N	Min-Max	Mean $\pm$ Stand. dev.
Problem Media Use Scale (PMUS)	155	1-4.22	1.81 $\pm$ 0.71
Aggression Orientation General Scale (ATS)	155	1-2.41	1.20 $\pm$ 0.27

Source of Variance	Sum of Squares	Sd	Mean Squares ₁	F	P	Significant difference
Intergroup	91.386	3	30.462	2.395	.069	-
Intragroup	2862.159	225	12.721			
Total	2953.546	228				

Table 2 presents the mean total scores on children's problematic media use and aggression tendency scales. The mean scores for children's problematic media use were found to be 1.81 ± 0.71 , while the mean scores for aggression tendency were 1.20 ± 0.27 . The children participating in the study had problematic media use and aggression tendency scores that were below average.

Table 3. Comparison of Children's Descriptive Characteristics with Their Average Scores on the Problematic Media Use and Aggression Tendency Scales

Group	Sub-variable	N	%	PMUS	PATO	RATO	SDA	AAO-I	ATS
Gender	Girl	79	51	72.45	77.11	83.02	80.59	71.89	76.63
	Boy	76	49	83.77	78.93	72.78	75.3	84.35	79.43
	Test Value			U=2563.500 z=-1.574 p=.11	U=2931.500 z=-.268 p=.789	U=2605.500 z=-1.629 p=.103	U=2797.000 z=-1.319 p=.187	U=2519.500 z=-1.882 p=.060	U=2893.500 z=-.394 p=.693
Yaş	5 Age	89	57.4	85.69	88.28	83.51	81.21	79.47	87.32
	6 Age	66	42.6	67.64	64.14	70.57	73.67	76.02	65.43
	Test Value			U=2253 z=-2.482 p=.013*	U=2022.5 z=-3.514 p=.000*	U=2446.5 z=-2.037 p=.042*	U=2651 z=-1.861 p=0.063	U=2806.5 z=-0.515 p=0.607	U=2107.5 z=-3.049 p=.002*
Duration of pre-school education	0-6 month	32	20.6	96.69	98.47	91.8	88.36	86.72	102.17
	1 year	43	27.7	74.9	71.72	79.38	80.02	73.48	67.09
	2 year	53	34.2	71.93	77.02	68.96	71.74	73.41	73.8
	3 years and more	27	17.4	72.7	65.67	77.19	74.8	83.89	74.96
	Test Value			U=7.133 z=3 p=0.068	U=10.778 z=3 p=.013*	U=6.879 z=3 p=0.076	U=9.573 z=3 p=.023*	U=3.164 z=3 p=0.367	U=12.799 z=3 p=.005*
Child's daily media usage time	less than 30 minutes	32	20.6	62.39	78.44	90.7	81.52	71.5	79.44
	1-3 hours	117	75.5	80.74	76.95	74.89	77.5	78	76.44
	4-5 hours	6	3.9	107.75	96.08	70.83	69	112.75	100.67
	Test Value			U=6.979 z=2 p=.031*	U=1.173 z=2 p=0.556	U=4.316 z=2 p=0.116	U=1.461 z=2 p=0.482	U=5.068 z=2 p=0.079	U=1.757 z=2 p=0.415
Total		155	100						

*Problematic Media Use Scale(PMUS).Aggression Tendency Scale(ATS).Physical aggression towards Others”(PATO). Relational aggression towards Others(RATO).Self-directed aggression(SDA).Aggression against objects/items”(AAO-I)

Table 3 presents a comparison of scales and their subscales based on selected descriptive characteristics. No significant differences by gender were found for the scale and its subscales ($p > .05$). A significant difference was observed between the children's age and the total score for problematic media use (peer dependency). the sub-dimension score for 'physical aggression towards others', the sub-dimension score for 'relational aggression towards others', and the total score for aggression tendency ($p < .05$). A significant difference was found between the duration of preschool education and the subscale scores for 'physical aggression towards others' and 'aggression towards oneself', and the total aggression tendency score ($p < .05$). A significant difference was found between the child's daily media use time and problematic media use (screen addiction) ($p < .05$).

Table 4. Correlation Table for Scales and Sub-Dimensions

Scale and Sub-Dimensions	Problem Media Use Scale	Physical aggression towards others	Relational aggression towards others	Self-directed aggression	Aggression towards objects/property	Aggression Orientation Scale
Problem Media Use Scale	1.000	.225**	.286**	.292**	.227**	.315**
Physical aggression towards others		1.000	.450**	.380**	.491**	.867**
Relational aggression towards others			1.000	.369**	.344**	.659**
Self-directed aggression				1.000	.242**	.415**
Aggression towards objects/property					1.000	.717**
Aggression Orientation Scale						1.000

Table 4 presents the correlations between the scale and its sub-dimensions. According to the findings, there is a statistically significant and positive relationship between the participants' total scores on the Problematic Media Use Scale and the Aggression Orientation Scale and the sub-dimension scores for 'physical aggression towards others,' 'relational aggression towards others,' 'aggression towards oneself,' and 'aggression towards objects.' ($r = 0.315$; $p < 0.01$).

Multiple linear regression was performed to determine whether problematic media use (screen addiction) affected participants' aggressive tendencies.

Table 5. Regression Analysis Explaining the Effect of Problematic Media Use (Screen Addiction) on Aggression Tendencies

Variable	B	Beta	T	Sig.	VIF	R	R ²	Adapted R ²	F
Fixed	1.008		17.862	.000					
Problem Media Use Scale	.107	.286	3.698	.000	1.000	.286 ^a	.082	.076	.000 ^b

Table 5 indicates that problematic media use (screen addiction) among children significantly predicts aggressive tendencies [(R= .286; R²= .082; Adjusted R²= .076) F (1.153)= 13.672; $p \leq .01$]. In the regression analysis, where participants' problematic media use was considered the independent variable and their aggressive tendencies the dependent variable, participants' problematic media use explained 8.2% of the variation in aggressive tendencies (R² = .082). In other words, changes in participants' problematic media use were seen to affect their aggressive tendencies. Looking at the t-values of the regression analysis, it is understood that children's Problematic Media Use [t= 3.698; $p = .000$ ($p < .01$)] significantly predicts their aggression tendencies in a positive direction. In other words, a 100-unit increase in participants' problematic media use increases their aggressive tendencies by 10.7%.

CONCLUSION

This study, conducted to determine the effect of problematic media use (screen addiction) on aggressive tendencies in children aged 60-72 months, found a statistically significant and positive relationship between screen addiction and aggressive tendencies among participants. In the studies by İnanlı and Metindoğan (2023), it was observed that as the media usage time of preschool children increased, their aggressive behaviour also increased. Çınar Karasu and Ayhan's (2024) studies found that as the time spent in front of screens increased among preschool children, their tendencies towards 'physical aggression towards others,' 'relational aggression towards others,' 'self-directed aggression,' 'aggression towards objects/property,' and general aggression increased. Kahn and colleagues (2021) also identified a link between screen time and behavioural problems. Similarly, Tezol and colleagues (2022) stated in their study conducted on a Turkish sample that excessive screen time increases the risk of behavioural disorders in preschool children. Yılmaz, Demirli Çaylan, and Karacan (2015) investigated the effectiveness of an intervention programme aimed at reducing screen time in preschool children. At the end of their study, they reported that parents reported less screen time and less aggressive behaviour in their children. The study found a significant difference between the child's daily media usage time and problematic media usage (screen addiction). McArthur, Tough and Madigan (2022) observed in their study conducted in Canada that behavioural problems increased in children who used screens for 2-3 hours per day compared to children with less than 1 hour of screen exposure per day. Although technological devices are accessible to every child, the duration of media use by children, especially in the preschool period, is under parental control.

No significant difference was found between the gender variable and children's problematic media use. Our findings are consistent with the results of many studies (Arslan 2023; Manav, 2024; Bodur, 2022). A review of the literature on similar studies reveals varying results. One study found that 3-4-year-old girls spent more time watching television than boys (Vandewater, Bickham & Lee, 2007). Another study reported that 4-6-year-old boys spent more time in front of screens than girls (Koyuncuoğlu & Akaroğlu, 2022). Similarly, some studies found that boys scored higher than girls, and significant differences were observed between screen addiction and gender (Dilci, Arslan & Ersoy, 2019; Öztürk Eyimaya, Uğur, Sezer & Tezel, 2020).

It has been observed that children's tendency towards aggression does not differ according to gender. Similarly, Köksal (2016)'s study, in which the sample group consisted of children, concluded that the child's gender is not a variable that affects their tendency towards aggression. Similarly, in a study examining aggression tendencies and self-regulation skills in preschool children aged 48-72 months, it was observed that children's aggression tendencies did not differ according to the gender variable (Suna Şaka, 2022). Contrary to our findings, there are also studies that determine that boys' aggressive tendencies are higher than girls' (Özata, 2021; Gölge, 2022; Yırtıcı, 2019).

The study determined that the age variable affects problematic media use in children. It was observed that the total score for problematic media use (peer dependency), the sub-dimension score for 'physical aggression towards others,' the sub-dimension score for 'relational aggression towards others,' and the total score for aggression tendency were higher in 5-year-old children than in 6-year-old children. Contrary to our findings, studies in the literature have determined that 6-year-old children exhibit higher problematic media use behaviour than 5-year-old children (Arslan, 2023). However, some studies have found no significant differences between problematic media use and the age variable (Çakır, Kocagöz & Karakuş, 2021; Taş & Güneş, 2019; Ünsal, 2019).

It has been observed that aggressive tendencies differ significantly according to age. Children in the 5-year-old group were found to have higher aggressive tendencies than children in the 6-year-old group. This result is consistent with the findings of a study examining the effect of aggressive tendencies on the play interactions of children aged 48-72 months (Üzel, 2020). Contrary to our findings, a study examining the relationship between pre-school children's aggressive tendencies and their toy preferences found that children's aggressive tendencies did not differ according to age (Aydın, 2022).

It has been determined that the duration of children's participation in pre-school education has an effect on problematic media use. Children who attended pre-school education for three years or longer were found to have less problematic media use compared to children who received less pre-school education. Similarly, children who do not attend school were found to spend more time using tablets, televisions, and phones than children who attend school (Özkılıç Kabul, 2019). The digital addiction level scores of students who do not receive pre-school education are higher than those of students who do receive pre-school education (Çelik. E. & Çelik. O. T., 2023). Contrary to these studies, there are studies that show no significant difference when the level of problematic media use is evaluated according to the variable of receiving preschool education. In one study, no statistically significant difference was found between the duration of preschool education and digital screen exposure in children aged 5-6 years (Topal Camcı, 2022). In a study examining problematic media use and play behaviour, it was also stated that children's problematic media use did not show a significant difference according to the duration of their preschool education (Manav, 2024).

It has been determined that aggressive tendencies differ significantly according to the variable of preschool education duration. It was observed that children who received preschool education for 0-6 months had higher aggression tendencies than children who received preschool education for longer periods. A significant difference was observed between the subscale scores for 'physical aggression towards others,' 'aggression towards oneself,' and the total aggression tendency score. Contrary to our findings, Yıldızbaşı and Sak (2020)'s study on preschool children found that the duration of preschool education did not affect children's aggression tendencies (Yıldızbaşı and Sak, 2020).

A significant and positive relationship has been observed between problematic media use and aggressive tendencies. As children's problematic media use increases, so does their tendency towards aggression. A study conducted by Çankaya indicated a positive correlation between children playing war and fighting games on the computer and aggression (Çankaya, 2014). It was found that children who spent 4-5 hours per day using media had more problematic media use than children who spent less time using media. Similar to our findings, it has been stated that children with daily screen usage of 8 hours or more have higher average scores for 'physical aggression towards others,' 'aggression towards oneself,' 'aggression towards objects/property,' and total aggression tendency scale scores compared to children with shorter daily screen usage (Radesky, Silverstein, Zuckerman & Christakis, 2014). It was determined that as children's daily screen usage time increased, their 'physical aggression towards others,' 'relational aggression towards others,' 'aggression towards oneself,' 'aggression towards objects/property,' and general aggression tendencies also increased. Our findings are consistent with the results of a study examining screen exposure and aggression tendencies in preschool children (Çınar Karasu, 2024).

The relatively low level of explanatory power obtained in the regression analysis ($R^2 = .082$) should be regarded as a natural reflection of the multidimensional and multifactorial nature of aggressive behaviour in early childhood rather than a methodological weakness of the study. Within the framework of developmental psychopathology and ecological systems theory, it is emphasised that aggression is shaped by the simultaneous influence of individual characteristics (temperament, impulsivity, emotion regulation skills), familial variables (parental attitudes, parental mental health,

family interactions), social context (peer relationships, school environment) and environmental stimuli (Bronfenbrenner & Morris, 2007; Brown et al., 2015; Huitsing & Monks, 2018; Veiga et al., 2022).

In this context, the fact that screen addiction accounts for approximately 8% of the total variance in aggression should not be interpreted as meaning that the variable has a negligible effect. On the contrary, this finding indicates that screen addiction should be considered an independent and specific risk factor for aggressive tendencies in early childhood. Considering that children's self-regulation and emotion regulation skills are not yet fully developed, especially in the pre-school period, it is expected that an environmental variable such as screen addiction will have a limited but meaningful effect (Lauricella et al., 2022; Santos et al., 2023).

The primary aim of the regression model in this study is not to present a comprehensive structure explaining aggressive behaviour in all its aspects, but rather to test the predictive role of screen addiction on aggressive tendencies in children aged 60–72 months. In this respect, the findings reveal that screen addiction is a variable that should not be overlooked in early childhood and provide an important theoretical and empirical basis for future multivariate and longitudinal studies. Future studies are expected to increase the explained variance by including variables such as parenting styles, emotion regulation skills, temperament traits, and the nature of screen content in the model (Coyne et al., 2022; Lauricella et al., 2022).

Therefore, it is not expected that aggression in early childhood can be explained to a high degree by a single variable; studies addressing social and behavioural outcomes indicate that low or moderate levels of explanatory power are considered acceptable in the literature (Ferguson & Konijn, 2015; Evans et al., 2019; Coyne et al., 2022). Indeed, previous studies examining the relationship between screen use and problem behaviours have also reported that the explanatory levels of regression models are limited, but the relationships are statistically and theoretically meaningful (Domoff et al., 2020; Martins et al., 2021; Radesky et al., 2015).

The study found that changes in participants' problematic media use affected their aggression tendencies. Gentile, Coyne, and Walsh's (2011) studies predicted that an increase in violent media would lead to higher verbal aggression, higher relational aggression, higher physical aggression, and less social behaviour in school-aged children. Daly and Perez's (2009) studies stated that violent programme content was significantly related to general and physical aggression. This study, conducted to determine the effect of problematic media use (screen addiction) on aggression tendencies in children aged 60–72 months, yielded the following results:

- A statistically significant and positive relationship was found between screen addiction and aggression tendencies in children ($p < .05$).
- It was observed that changes in screen addiction in children affected their aggressive tendencies.

In light of these results;

It is recommended that teachers and parents be informed about media, that psychological support be provided to children for the psychological disadvantages caused by screen addiction, and that media literacy be made concrete and offered to young children in pre-school educational institutions. It is recommended that parents accompany their children during media use rather than leaving them alone, in order to protect them from potential dangers. Parents should be aware of their children's screen time and ensure that it is controlled.

Ethics Committee Approval

This study was approved by the Inonu University Social and Human Sciences Scientific Research and Publication Ethics Board with decision number 41, dated 04.05.2023.

Peer-review

Externally peer-reviewed.

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