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Preschool children's digital media usage and self-regulation skill

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ABSTRACT This study aimed to examine self-regulation skill of 4-6-year-old children regarding digital media usage. The data were collected through the questionnaire, which includes self-regulation skills of 4-6-year-old Children (Mother Form), and the demographic information section was filled by 911 volunteer mothers who live in Turkey. Children's digital media usage was examined in terms of the amount of time spent with digital media tools, the types of digital media tools used, and which content was preferred. Analysis of the results clearly showed that the more time children spent using digital media the more likely they were to have lower level of self-regulation. In addition, children who did not use smartphones exhibited higher levels of self-regulation than those who did. Moreover, preferring horror or violent content was associated with the low level of children's self-regulation. On the other hand, children's preference for educational and foreign language content on digital media appeared to be related to a high score in self-regulation. The study results show a relationship between digital media usage and self-regulation skill. The study suggests that children's amount of spent time with digital media tools might be limited, the content might be controlled, and types of digital media tools might be carefully chosen. Parents have an important role here. They should be aware that improper digital media usage is harmful to children's self-regulation skill.

Keywords: *Preschool, Self-regulation, Technology usage.*

Okul öncesi dönemi çocuklarının dijital medya kullanımları ve öz-düzenleme becerisi

ÖZ Bu çalışma 4-6 yaş arasındaki çocukların öz-düzenleme becerisini dijital medya kullanımları açısından incelemeyi amaçlamaktadır. Bu çalışmanın verileri Türkiye'de yaşayan 911 annenin gönüllü olarak doldurduğu 4-6 Yaş Çocuklarına Yönelik Öz-Düzenleme Becerileri (Anne Formu) ve demografik bilgiler bölümünü içeren anket aracılığı ile toplanmıştır. Çocukların dijital medya kullanımları dijital medya kullanılarak geçirilen süre, kullanılan dijital medya aracı ve tercih edilen içerikler açısından araştırılmıştır. Bütün veriler çevrimiçi form aracılığı ile toplanmıştır. Çalışmanın sonuçları açıkça göstermektedir ki dijital medya ile geçirilen süre arttıkça çocukların öz-düzenleme puanları azalmaktadır. Ayrıca akıllı telefon kullanmayan çocukların kullanan çocuklara göre daha yüksek öz-düzenleme puanına sahip olduğu çalışma sonucunda ortaya konulmuştur. Diğer taraftan eğitim içerikleri ve yabancı dil içeriklerini tercih eden çocukların öz-düzenleme beceri puanları daha yüksektir. Fakat şiddet ve korku unsuru içeren içerikleri tercih eden çocukların öz-düzenleme puanlarının daha düşük olduğu bulunmuştur. Çalışmanın sonuçlarına dayanarak dijital medya kullanımı ile öz-düzenleme becerileri arasında ilişki bulunmuştur. Bu sebeple çocukların dijital medya kullanım saatleri kısıtlanmalı, çocukların tercih ettiği içerikler kontrol edilmeli ve kullanılan dijital araç türlerine dikkat edilmelidir. Bu noktada ebeveynlerin katkısı çok önemlidir. Ebeveynler uygun olmayan dijital medya kullanımlarının çocukların öz-düzenleme becerilerine olumsuz yönde etkisi olacağının farkında olmalıdırlar.

Anahtar Sözcükler: *Okul öncesi, Öz-düzenleme, Teknoloji kullanımı.*

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INTRODUCTION

Self-Regulation

Self-regulation is explained as a process by which an individual systematically controls and canalizes their feelings, thoughts, and actions to reach their goals (Zimmerman, 1986). Self-regulation enables us to control ourselves and to do what is necessary, regardless of our desires (Bodrova & Leong, 2008). Thus, self-regulated individuals are capable of controlling or orienting their emotions, actions, thoughts, and attention to reach self-set goals. Self-regulation is multifaced (McClelland et al., 2010; Schunk & Zimmerman, 1997); social-emotional and cognitive self-regulation (Bodrova & Leong, 2006). Lack of social-emotional self-regulation is related to aggression, emotional explosion, and lack of social skills (Saarni et al., 1998 as cited in Bodrova & Leong, 2006). Therefore, social-emotional self-regulation is related to obeying social rules (Bodrova & Leong, 2006). While cognitive self-regulation (also called executive functioning) (Fuhs et al., 2013) is necessary for problem-solving and related abilities (Bodrova & Leong, 2006). Cognitive self-regulation includes working memory, cognitive or attentional flexibility, and inhibitory control elements (Blair, 2016). According to Diamond (2013), cognitive flexibility enables one to make adaptations to changing demands or priorities, accepting being wrong, and taking advantage of immediate and unexpected opportunities. Inhibitory control involves controlling attention, behavior, emotion, and/or thoughts despite an internal predisposition for doing something more appropriate or what is needed. McClelland and Cameron (2011) explain that working memory function is related to saving information in the mind and manipulating that information. Both social-emotional and cognitive self-regulation is required for academic success and school readiness for young children (Eisenberg et al., 2010; Howard et al., 2021; Ursache et al., 2011; Willis & Dinehart, 2013).

Self-regulation development begins during the early years of development as well as increases more rapidly during this period (McClelland & Cameron, 2011). Young children's capacity to control their emotions, behaviors, and cognition is one of the signs of their self-regulation development (Holochwost, 2021). Improving self-regulation during children's early years can positively impact children's development because children who have advanced self-regulation skills are good at delaying gratification and controlling their immediate drive, compliance, social competence, empathy, moral development, and alteration (Eisenberg et al., 2004). Moreover, self-regulation allows children to deal with important information, following instructions, continue tasks, and process necessary information (Savina, 2021). Their self-regulation is fundamental for being successful in academic life and learning (Blair & Raver, 2015) because self-regulation is referred to as the ability to think, stop, and take purposeful action (McClelland & Tominey, 2015). Therefore, self-regulation skills in young children predict long and short-term consequences such as school readiness, ability to cope with stress, attending school, having high self-worth, less substance use, and/or criminal activity (McClelland et al., 2013; Mischel et al., 2011).

Better self-regulatory capacity is associated with a more effective teacher and peer environment within the early childhood education setting (Williams & Berthelsen, 2017). Importantly, the development of self-regulation depends on individual and environmental factors that are linked with either the home, school, and community environment or the preschooler's peers (Dias & Cadime, 2017). As mentioned in the ecological model, child development is affected by micro, meso, exo, and macrosystems (Brofenbrenner, 1989). Home (e.g., parenting), non-parental care settings (e.g., Preschool, kindergarten), and peer group are the factors that are under microsystem, impact children's self-regulation (McCabe et al., 2004). Moreover, neighborhood and culture, which are components of the macrosystem, influence children's self-regulation (McCabe et al., 2004). In the modern age, technology could also be evaluated as a factor of self-regulation. Technology is questioned because of causing micro and repeated distraction on self-regulation (Orhan et al., 2021). A study demonstrated that media multitasking negatively impacts memory and attention performance (Uncapher & Wagner, 2018).

Additionally, technology leads to deficient self-regulation when people use it to mitigate their negative feelings or to have fun. Shortly, they try to satisfy certain psychological needs with technology (LaRose et al., 2003; Uzun & Kilis, 2019). For this reason, the environmental factors which children are directly influenced by can be analyzed in terms of improving their self-regulation.

Digital Media Tools Usage in Early Years

Self-regulation is impacted by heritage, early experiences, and adult functioning (Dias & Cadime, 2017; Fonagy & Target, 2002). For this reason, children's environmental conditions and their daily routine can be analyzed to describe the effects of environmental variables on self-regulation. It is well known that children are starting very early in life to use digital media tools such as tablets, mobile phones, electronic toys, and/or television (O'Mara & Laidlaw, 2011; Steeves, 2014). Furthermore, it has been found that young children spend between less than one hour to more than four hours per day on digital media tools (Radesky et al., 2020; Zhao et al., 2018). While children are using digital media, they most often do different activities such as watching videos or playing games. Rideout (2017) reports that children in the United States use mobile devices for approximately 48 minutes per day and spend most of their time watching videos or playing mobile games. The use of media devices can have detrimental effects on children, for instance, in a meta-analysis study by Radesky (2018) they found a moderate correlation between media use and attention span problems. It is argued in another study that social skills are negatively affected by computers, mobile devices, and video games (Paulus et al., 2021; Wartella et al.,2013). In addition, Reid et al. (2016) suggest that children's behavior is negatively affected by the digital media tools they encounter such as television, computer, mobile devices, and video games. Another study shows that excessive digital media usage also has a detrimental impact on children's academic performance (Adelantado-Renau et al., 2019).

Digital media studies are still developing and while positive effects are suggested by some groups, on the contrary, other groups highlight the negative effects. For instance, a longitudinal study revealed that lower media exposure at two years is associated with high level self-regulation at four years (Cliff et al., 2018). Additionally, the same study shows that high self-regulation at four years is associated with lower media exposure at four years. Although, media exposure at four years old is not associated with self-regulation at six years old (Cliff et al., 2018). Apart from the amount of time spent time or the impact of excessive media exposure, the effect of content on self-regulation is not widely discussed. It is further found that children are attracted to fantastic, (Huber et al., 2018, Taggart et al., 2019), violent (Reid Chassiakos et al., 2016; Taggart et al., 2019), horror (Antunes, 2017; Lester, 2016), educational (Huber et al., 2018, Taggart et al., 2019), and foreign language (Kim & Smith, 2015) content. These types of content have different impacts on children's executive functions, for example, children who play educational apps are more likely to delay gratification than children who watch a cartoon and the educational app also has a positive effect on working memory (Huber et al., 2018). It is found in another study that fantasy related content in videos impairs inhibitory control, while fantasy related interactive content does not (Li et al., 2018). Similarly, decrease in children's executive functioning is observed immediately after viewing animated cartoons (Li, 2014). In addition, digital media in some places is being replaced by activities that encourage children to explore their environment, interact with friends, and play in unstructured ways. Such initiatives will help to limit children's use of digital media tools and improve their self-regulation and social skills (Radesky et al., 2014a).

Young children excessively use digital media in today's world. These media have both negative and positive impacts on their development. Literature states that digital media usage also impacts children's self-regulation (Cliff et al., 2018; Nathanson et al., 2014; Radesky et al., 2014b), which rapidly develops in the early years (McClelland & Cameron, 2011). Self-regulation is highly predictive for social, cognitive, and academic outcomes in adulthood (Zelazo et al., 2016; McClelland et al., 2013). Therefore, the subject has been investigated in the early childhood period. The current study aims to investigate 4-6 years old children's self-regulation according to digital media habit as Cliff et al. (2018) suggested that media use context and content is needed investigation. Teachers and parents are a vital source of information about children's self-regulation development. For this reason, the researcher in this current

study thought that mothers, as close witnesses to their child's development, spend the most amount of time with their children, and as a result, are best at answering questions regarding their children's progress during the preschool period. Also, previous studies on self-regulation have not dealt with preschool children's digital media use habits in terms of content and types of digital media tools. The study is important because, as a result, the study examines the differences of 4-6 years old children's self-regulation skill regarding spending time with digital media tools, types of digital media tools, and preferred digital content. Thus, the researchers in the present study attempted to answer the following questions:

• Does self-regulation differ among children spending different amounts of time on digital media tools?
• Does self-regulation differ among children using different types of digital media tools?
• Does self-regulation differ among children according to different content preferences of digital media tools?

METHOD

The aim of this study was to examine the 4-6 years old children's self-regulation regarding amount of time spent, types of digital media tools and content. It was determined that the most suitable method for use in this current study was the quantitative research method. Importantly, survey research is used to describe large community's features (Fraenkel et al., 2012), and the subject of the study is defined and described in their own conditions (Karasar, 2006). Thus, survey research was chosen for use in this study.

Participants

The participants of the current study were 911 mothers of 4-6-year-old children living in Turkey. The sample size was decided based on the previous studies in Turkey. The study that used the same form included 212 mothers in Denizli with .90 power (Özdemir & Budak, 2019). Additionally, sample size matrix could be helpful for a researcher to decide sample size number (Das et al., 2016). Based on the table, the 746-sample size gives 0.2 effect size and .90 power with 0.5 error. Therefore, the researchers included more than 746 mothers in the study. The mean age of the mothers was 33.62 years. The children are 49.2% boy and 50.8% girl. The children's ages were 48-54 months (44.9%), 60-66 months (18.9%), 54-60 months (18.2%), and 66-72 months (18%). A majority of the children (73%) were participating in early childhood education in preschool or kindergarten. Regarding digital media, children accessed it via television (70.2%), smartphone (56.8%), tablet (27.5%), and personal computer (4.9%). The convenience sampling method was used for participant selection, and an internet-based questionnaire was used in an effort to access mothers throughout Turkey.

Data Collection

The researcher first obtained the necessary permission from the Ethical Board of their university. Subsequently, the measure used in the current study, the self-regulation skills of 4-6-Year-Old Children (Mother Form) as well as the demographic information form was posted online. In addition, all participants indicated their agreement to voluntarily take part in the study. The duration of the data gathering process lasted approximately two months. The data collection process was started on 02 May of 2019, and it was finished on 01 July of 2019.

Measurement

Self-regulation skills of 4-6-year-old children (mother form)

The self-regulation skills of 4-6-Year-Old Children (Mother Form) measures 4-6-year-old children's self-regulation skill according to their mother's view. Erol and Ivrendi (2018) developed this form which includes 20 items assessing the self-regulation skill of 4-6-year-old children in terms of working memory, attention, inhibitory control-emotion, and inhibitory control-behavior. According to Erol and Ivrendi, the highest score is 210 and the lowest score is 20 which get from the whole scale (2018). The results can be evaluated based on the whole test score or sub-scale. In the current study, the results were evaluated regarding whole test score. Content and face validity were both obtained through expert opinion. For criterion-related validity evidence, scores from the whole instrument were correlated with the scores obtained from the Child Behavior Rating Scale (Bronson et al., 1990). The resulting validity coefficient was found to be .84. As measures of internal consistency, the Cronbach alpha value for the scale is calculated at .90. Additionally, the factors of the scale were found that working memory is α =.82; attention is α =.89; inhibitory control-emotion is α =.77 and inhibitory control-behavior is .75 (Erol & Ivrendi, 2018). The resulting validity was calculated .84 and test-retest reliability coefficients were calculated .77. Based on the results, the instrument was found to be a valid and reliable scale for the measurement of 4-6-year-old children's self-regulation skills according to their mother's point of view (Erol & Ivrendi, 2018). The Cronbach alpha value for the current study was calculated at .85 for the whole scale; attention was .78; working memory was .66; inhibitory control-emotion was .78 and inhibitory control-behavior was .71.

Demographic information form

A demographic information form was used to obtain data regarding the children's daily media usage habits (i.e., amount of time spent on and with digital media tools, type of digital media tools used, and content preferences of digital media tools). In addition, information regarding the children's age, gender, and frequency of media use was obtained. The mothers were also asked whether their children attended preschool.

Data Analysis

The collected data were analyzed using the SPSS 22 statistical software program. Prior to the data analyses, a total of 944 questionnaires were returned to the researcher and checked for incomplete or irrelevant responses and eliminated from the data set if these discrepancies were found. Accordingly, data analyses were carried out using data collected from 911 participants. For the first research question, one-way analysis of variance (ANOVA) was conducted. The remaining research questions were addressed through separate independent sample t-tests. To control for type I error, the alpha level set at .05 was divided by the number of independent t-tests conducted. Prior to each analysis, underlying assumptions of normality and homogeneity of variance were checked. For the normality assumption, skewness and kurtosis values were inspected. For homogeneity of variance, Levene's test of equality of variances were examined and after removing potential outliers; it was determined that all the assumptions were satisfied. As a measure of effect size, r^2 was calculated. According to Gravetter et al. (2014), r^2 values between 0.01 and .09 indicate small effect, r^2 values between 0.09 and .25 indicate medium effect, and r^2 values greater than 0.25 indicate large effect.

RESULTS

Amount of Time Spent with Digital Media Tools and Self-Regulation

A one-way between groups ANOVA was run to address the first research question exploring whether

self-regulation differs among children spending different amounts of time with digital media tools. Participants were divided into five groups according to the amount of time spent with digital media tools (Group 1: 0-1 hour; Group 2: 1-3 hours; Group 3: 3-5 hours; Group 4: 5-7 hours and Group 5: 7 hours and above). In addition, the researchers wished to examine the level of 'more than four hours' as well, therefore, the groups were divided in the given form. As presented in Table 1, it was indicated in the results that there was a statistically significant difference among the groups with respect to total self-regulation scores at the .05 significance level, F (5, 910) = 13.1, p = .00 with a small effect size (η^2 = .08). Post-hoc comparisons using the Tukey HSD test revealed that the total self-regulation score for Group 1 (M = 83.28, SD = 7.7) was significantly greater than that of Group 2 (M = 81.10, SD = 8.4), Group 3 (M = 78.16, SD = 10.1), Group 4 (M = 78.46, SD = 9.5), and Group 5 (M = 70.22, SD = 10.1). Also, the total self-regulation score for Group 2 was found to be significantly greater than Group 3 and Group 5. Moreover, according to the results, Group 3 and Group 4 (M = 78.46, SD = 9.5) were found to be better in terms of total self-regulation scores compared to Group 5 (M = 70.22, SD = 10.1). Overall, the results suggested that as the amount of time spent with digital media tools increased, the level of children's self-regulation tended to decrease. In fact, Group 5 which spent 7 hours or more with digital media tools obtained a significantly lower total self-regulating score, compared to other groups, while Group 1 which spent 0-1 hour, obtained the highest score.

Table 1.
ANOVA Results for Amount of Time Spent with Digital Media Tools and Self-regulation Skill

	Sum of Squares	*df*	*Mean Square*	*F*	*Sig.*
Between Groups	3752.10	4	938.02	13.1	.000
Within Groups	64917.2	906	71.65		
Total	68669.3	910			

*Note. *p < .05.*

Type of Digital Media Tools and Self-Regulation

To address the second research question, examining whether self-regulation differs among children using different types of digital media tools, four separate independent t-tests were conducted. Alpha level was set by dividing the alpha level of .05 by four. Accordingly, the significance values were compared against the adjusted alpha level of .0125. As the types of digital media tools used, the television, tablet, personal computer, and smartphone were included in the analyses. When the impact of watching television on children's self-regulation was investigated, it was found that there was no statistically significant difference between children spending time engaged with the television (M = 81.30, SD = 8.68) and not spending time engaged with the television, with respect to self-regulation (M = 81.57, SD = 8.71); t (909) = -.426, p = .670 (see Table 2).

Table 2.
Comparison of Type of Digital Media and Self-Regulation

Type of Digital Media Tool	Spending Time	*n*	*M*	*SD*	*t*	*p*
Television	Yes	649	81.30	8.68	-.426	.670
	No	262	81.57	8.71		
Tablet	Yes	246	81.87	8.27	1.03	.304
	No	665	81.20	8.83		
Personal Computer	Yes	42	79.81	9.53	-1.2	.230
	No	869	81.46	8.64		
Smartphone	Yes	517	80.30	8.98	-4.83	.000
	No	393	82.82	8.07		

*Note. *p < .05.*

As shown in Table 2, another independent sample t-test was conducted to examine whether spending time with a tablet makes a difference in students' self-regulation. This also showed that there was no statistically significant difference between children spending time with a Tablet (M = 81.87, SD = 8.27) and not spending time with a Tablet (M = 81.20, SD = 8.83); t (909) = 1.03, p = .304 (see Table 2).

Consistent with the previous results related to the impact of television and tablet use, the result concerning whether spending time with personal computers makes a difference in children's self-regulation, also produced an insignificant result. In other words, it was found that there was no statistically significant difference between children spending time with a Personal Computer (M = 79.81, SD = 9.53) and not spending time with a Personal Computer (M = 81.46, SD = 8.64); t (909) = -1.2, p = .230 (see Table 2).

On the other hand, according to the study results, children spending time with a Smartphone (M = 80.30, SD = 8.98) appeared to have a statistically lower total self-regulation score compared to children who did not spend time with a Smartphone (M = 82.82, SD = 8.07); t (909) = -4.83, p = .000 (see Table 2). The magnitude of the differences in the means was also small (r^2 = .02)

Preferred Content of Digital Media Tools

To address the third research question, it was examined whether self-regulation differs among children who prefer different types of content when using digital media tools. Six separate independent t-tests were conducted. Alpha level was set as .008 by dividing the alpha level of .05 by six.

Table 3.
T-test Comparison of Preferred Content and Self-Regulation Skill

Type of Content	Preferred content	*n*	*M*	*SD*	*t*	*p*
Fantastic Content	Yes	294	81.08	8.47	-.723	.470
	No	617	81.53	8.79		
Violent Content	Yes	65	78.21	10.21	-3.1	.002
	No	846	81.63	8.52		
Horror Content	Yes	27	76.44	8.99	-3.01	.003
	No	884	81.53	8.64		
Daily-Life Content	Yes	424	81.17	8.85	-.707	.480
	No	487	81.57	8.55		
Educational Content	Yes	493	82.51	8.28	4.3	.000
	No	418	80.05	8.97		
Foreign-Language Content	Yes	230	82.36	8.71	1.99	.047
	No	681	81.05	8.66		

Note. $*p < .05$.

Thus, with respect to their level of self-regulation, it was shown in the results that there was no statistically significant difference between children who preferred to watch fantastic content, daily-life content, and foreign language content and those who did not (see Table 3). On the other hand, a statistically significant difference was found between children who preferred to watch violent content (M = 78.21, SD = 10.21) and those who did not (M = 81.63, SD = 8.52) in concern to their self-regulation; t (909) = -3.1, p =. 002. Also, the magnitude of difference as measured by eta-squared was small (r^2 = .01).

In addition, the difference between children who preferred to watch horror content (M = 76.44, SD = 8.99) and those who did not (M = 81.53, SD = 8.64) was found to be statistically significant, t (909) = -3.01 , p = .003, with a small effect size (r^2 = .01).

It was also revealed through the results that there was a statistically significant difference between children who preferred to watch educational content (M = 82.51, SD = 8.28) and those who did not (M = 80.05, SD = 8.97); t (909) = 4.3, p = .000, with a small effect size (r^2 = .02).

DISCUSSION

The main purpose of this research was to examine the effect of 4-6-year-old children's digital media usage habits on their self-regulation. To accomplish our specified aim, three research questions were identified. The following is devoted to the discussion of findings related to the examination of the proposed questions.

Amount of Time Spent on Digital Media Tools and Self-Regulation Skill

The first research question was used to explore whether self-regulation differs among children according to the different amounts of time they spend on digital media tools. Thus, it was determined that as the time spent with digital media tools increases, children's total self-regulation scores were likely to decrease. This result agreed with the related literature which demonstrated that screen time has a negative correlation with language and executive functions of children younger two years of age (Barr et al., 2010; Zimmerman & Christakis, 2005). In support of these findings, another study reveals that infants and toddlers exhibit more self-regulation difficulties than their peers who interact with media for fewer hours each day (Radesky et al., 2014b). Parallel with our results, it is shown in related literature that an excessive amount of watching television and videos has a significant influence on causing behavioral disturbances in children less than two years of age (Lissak, 2018; Mistry et al., 2007). Also, frequent screen time increases children's social isolation and decreases their opportunities for social contact, which ultimately might hamper their social development (Hosokawa & Katsura, 2018). The increasing time spending with digital media is associated with having low social self-regulation skill since children usually prefer digital games instead of traditional games (Canaslan-Akyar & Sevimli-Celik, 2022) anymore. In addition, Palmer (2015) states that spending a large amount of time with a computer from an early age causes later difficulties in the areas of concentration, organization, attention, language skills, imagination, and creativity. Accordingly, the long-term use of digital media can harm children's self-regulation skill, because as highlighted by the studies mentioned above, increasing the hours of digital media use negatively impacts attention, working memory, inhibitory control and problem solving (Lillard & Jennifer, 2011). These skills comprise self-regulation so spending time with digital media is critical especially in early childhood period. In short, it was suggested in the current study, which was consistent with the findings of related literature, that the amount of time spent with digital media did affect children's self-regulation.

Type of Digital Media Tools and Self-Regulation

The aim of the second research question was to explain whether self-regulation differs among children according to the type of digital media tools. For example, televisions, tablets, personal computers, and smartphones were chosen as digital media tools in this study. According to the responses of the surveyed mothers', television was the most popular type of digital media tool among their children, followed by smartphones. Furthermore, several children used tablets and personal computers as digital media tools in their daily lives.

It was shown in this study that there was no statistically significant difference in self-regulation between watching television and not watching television. Importantly, this finding was consistent with the findings from Blankson et al. (2015) and Ferguson (2011) that watching television does not appear to have a long-lasting significant effect on children's executive functions. The reason for this finding may be that watching television could be more controlled by adults because of the size of the screen. Blankson et al. (2015) also suggest that the home environment and parental scaffolding do impact the viewing of television on children's executive function. Therefore, the controlled watching of television might impact children's self-regulation less. Research also reveals that active parent mediation (parent-child conversation about digital media) is an effective way of reducing the negative effects of digital media on children (Austin et al., 2009; Coyne et al., 2017).

On the other hand, it is shown in the findings of the current study that the use of smartphones did make

a difference to children's level of self-regulation: more specifically, children who used a smartphone were observed by their mothers to have lower levels of self-regulation. Furthermore, in this current study, it was suggested that although the use of a tablet did not impact children's self-regulation, smartphone use did negatively impact the self-regulation skill of 4-6-year-old children. This result is explained by Gold (2015), who states that the small screens on smartphones limit navigation by toddlers. Furthermore, Hosokawa and Katsura, (2018) report that frequent use of mobile devices (i.e., smartphones or tablet computers) without educational content can be related to behavioral problems in early childhood. To summarize, the screen size of a digital media device can negatively affect children's self-regulation, thus, adult guidance should be present and interaction with these types of media tools should be limited.

Preferred Content of Digital Media and Self-Regulation Skill

The aim of the third research question was to explain whether self-regulation differs among children according to preferred content of digital media on children's self-regulation. Based on previous studies, attempts were made in the present study to establish whether the type of content viewed on digital media tools impacted children's self-regulation. For example, Huber et al. (2018) state that not only screen time but also interactivity, and content are important agents especially in the early years of development. In addition, Courage and Howe (2010) state that developmentally appropriate media content contributes to children's development of social-emotional skills such as friendliness, sharing, and acceptance of diversity as well as their cognitive development such as literacy and numeracy skills. However, media content should be assessed in terms of whether it is developmentally appropriate for children (Lieberman et al., 2009a) as it can lead to children behaving aggressively and showing anti-social behavior through role-modeling, rewarding, and/or teaching (Lauricella et al., 2017; Lieberman et al., 2009b).

In this current study preferred content of digital media was classified as fantastic, violent, horror, daily-life, educational, and foreign-language content. According to the mothers' responses, most children preferred to spend time using educational content followed by daily-life content. Fantastic, foreign language, violent, and horror content were also selected by some children as well. The children who preferred violent and horror content were found to have lower levels of self-regulation than children who did not have these preferences. Also, it is suggested in the relevant literature that violent digital media content is associated with poor self-regulation (Coyne et al., 2018). In addition, Swing and Anderson (2014) report that exposure to violence in the media and attention problems are interrelated. Consistent with current findings, a related study also shows that increased watching of aggressive television content causes a decline in self-regulatory behaviors, although some prosocial behaviors increase (Lillard et al., 2015). Indeed, violent television programming is found to have an adverse effect on children's level of aggression (Anderson et al., 2015). Actually, according to Denissen et al. (2018), aggression can arise from a failure in self-regulation. Furthermore, self-regulation is crucial for understanding violent behavior (Anderson et al., 2015) because aggressive acts can be a predictor of low self-regulation (Robson et al., 2020). Although aggressive behavior can be derived from low self-regulation, aggression and low self-regulation can also be affected by violent experiences (Fitzpatrick et al., 2016). It is claimed that exposure to violent television content might be related to problems such as increasing aggression and poor self-regulation. Thus, violent and horror content media is likely to have adverse effects on children's self-regulation.

In contrast, we found that children who preferred to watch educational content had higher levels of self-regulation. This is seen in previous studies, for instance, Lillard, et al. (2015) state that educational programs have positive effects on executive function performance, and in another more recent study it is reported that educational applications have a positive impact on working memory (Huber et al., 2018). Elsewhere it is shown that although overall television use was related to lower executive function, only educational cartoons are positively associated with executive function (Lillard et al., 2015). Moreover, Lillard et al. (2015) add that interactive applications have a more positive impact on immediate executive function than observational videos. McNeill et al. (2019) state that less than 30 minutes of educational and interactive digital media each day may not be harmful to children's development. In an earlier study,

Huber, et al. (2016) find that tablet-based educational play improves children's executive function, problem-solving, and planning ability. In addition, according to Valkenburg and Piotrowski (2017) educational media content improves young children's academic and social-emotional development.

Another category investigated in this current study was fantastic content. According to the study results, the effect of such content on preschool children's self-regulation was not statistically significant. However, in the related literature, fantastic, physically impossible events are seen as a reason for low executive function and fantastic events are also suggested to have negative effects on inhibitory control in children (Lillard et al., 2015). On the other hand, Li et al. (2018) show that touch screen fantastic content tends to decrease the negative effect of fantastic content on inhibitory control. Long and Li (2020) revealed that listening to fantastic stories from audiobooks for around 10 minutes disrupted children's inhibitory control. However, there was no negative impact when children viewed the same video content. Because children can easily understand this is fantastic content when they visualize it (Long & Li, 2020), as touch screen fantastic content has a less harmful impact on inhibitory control. Interactive and multisensory digital media could reduce the harmful impact of content on self-regulation. Furthermore, language and daily life content were not statistically significant. Considering the result of the current study, the preferred content of digital media impacts children's self-regulation. Among the preferred digital media categories, only educational content could be associated with a high level of self-regulation. Other categories might be kept away from children, or they do not leave alone while spending time with those contents.

IMPLICATIONS

Overall, children's self-regulation shows differences according to digital media habits reported in this study. The difference is sometimes in favor of self-regulation but sometimes against it. For example, the amount of time spent using digital media and the nature of the preferred digital media content seemed to determine its associated with preschoolers' self-regulation. To use digital media tools for enhancing children's self-regulation, a balance of duration, tool, and content are crucial. It may be advisable to make educational content and educational practices attractive for children. According to Green Crescent, children should not meet with digital media before three years old (2017). They spend thirty minutes between 3-6 years old and forty-five minutes in early childhood period (Green Crescent, 2017). The current study results also revealed when children's spending time with digital media increases, their self-regulation score decreases. Therefore, children's spending time with digital media could be arranged based on their age, and children must not exceed their duration with digital media. On the one hand, children should receive the advantages of digital media. Importantly, parents can assert some control of their children while they are spending time with digital media, therefore, a big screen could be chosen. In other words, parents reverse digital technology's negative impact on children's self-regulation development by setting some rules.

Limitations and Suggestions for Future Studies

Although the current study has shed light on the children's self-regulation regarding digital media habits, it was subject to some limitations which should be noted for future consideration. First of all, the study was conducted with mothers of children between the ages of 4 to 6-years-old, thus, in future studies a specific age could be chosen. In this way, developmental differences in self-regulation could be eliminated. Secondly, in this study, no comparison was made between the types of digital media tools, and/or media content. Instead, each of these categories was examined on a yes or no basis through separate independent sample t-tests because each media tools and preferred digital media content have multiple responses. Thus, the impact of each type of activity on self-regulation, for example, children's self-regulation levels were compared according to each category (i.e., tablet, smart-phone, personal computer or television) separately. However, in future studies, each category can be compared with another to determine which ones most contribute to children's self-regulation and self-regulation sub-

scales also could be analyzed in the study. The current study reveals and discusses the total self-regulation and digital media habits, but future studies could present more detailed analyses via focusing on sub-scales. Additionally, the sample could be chosen from only attending preschool or not attending preschool for future studies. Finally, all of the participants and data were obtained via the application of an online quantitative survey which excluded those without access to the internet or who were not familiar with this type of form. Furthermore, some participants may have also wanted to qualify their responses in various ways, yet that would have required a different sampling method.

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TÜRKÇE GENİŞLETİLMİŞ ÖZET

Okul öncesi dönemi gelişim açısından çok kritik bir dönemdir. Çünkü bu dönemde geliştirilen beceriler ileriki dönemlerde elde edilecek beceriler için zemin hazırlar. Ayrıca bu dönemde geliştirilemeyen bazı beceriler de ilerleyen dönemlerde başka sorunlara sebep olabilir. Okul öncesi döneminde kazanılan önemli becerilerden birisi de öz-düzenleme becerisidir. Öz-düzenleme akademik başarı ve sosyal ilişki geliştirme alanlarında önem arz eder.

Öz-düzenleme becerisi çocukların okul başarısı, okula devam etme oranı, okula hazır bulunuşlukları, stresle başa çıkma ve kendilerini değerli hissetmeleri üzerinde etkilidir. Öz-düzenleme konusunda başarılı olan çocuklar haz almayı erteleme, içten gelen istekleri kontrol etme, empati duygusu, ahlak gelişimi gibi konularda da başarılıdırlar. Çünkü kendi davranışlarının olası sonuçlarını tahmin edebilirler. Yani öz-düzenleme becerisi çocukların ders süresi boyunca kendilerini kontrol ederek dersi dinleme ve sorumluluklarını yerine getirebilmek için önemli bir beceridir. Öz-düzenleme becerisi okula devam etme ve akademik başarı için bu yönüyle ilişkilidir.

Öz-düzenleme becerileri çocukların etkileşim halinde bulundukları aile, çevre, arkadaş ve öğretmen gibi dış etkenlerden etkilenmektedir. Bu sebeple erken çocukluk döneminde öz-düzenleme becerileri üzerinde etkili olan çevresel faktörlerin incelenmesi önemlidir. Bu çevresel faktörler başta aile, çocuğun bakımını üstlenen kişi, yaşadığı mahalle sonrasında okul, arkadaşları ve öğretmenidir.

Günümüzün hızla gelişen ve değişen teknolojisi karşısında bireyler teknolojik aletlerle çok erken yaşlarda tanışmaktadırlar. Dijital medya araçlarının kullanım yaşı gittikçe azalmaktadır. Bu durumun çocukların gelişimlerinin üzerinde hem olumlu hem de olumsuz etkilerinin bulunduğu savunulmakta ve hala tartışılmaktadır. Dijital medya araçlarının çocukların yürütücü işlev becerileri üzerinde de etkilerinin olduğu yönünde çalışmalar literatürde mevcuttur. Bazı çalışmalar bu araçların çocukların yürütücü işlev becerileri üzerinde olumsuz etkileri olduğunu savunurken bazı çalışmalar herhangi bir etkisi olmadığını savunmaktadır.

Öz-düzenleme becerisinin çocukların akademik ve sosyal alandaki etkisi göz önünde bulundurulduğunda erken yaşlarda bu becerilerin geliştirilmesi büyük önem arz etmektedir. Günümüz koşulları göz önüne alındığında çocukların dijital medya araçları ile geçirdiği uzun saatlerin onların öz-düzenleme becerisine olumlu ya da olumsuz etkilerinin incelenmesi gerekmektedir. Bu sebepler göz önüne alındığında ilgili çalışma aşağıda yer alan araştırma sorularını cevaplandırmaya çalışmaktadır;

- Çocukların öz-düzenleme becerisi dijital medya kullanım sürelerine göre değişkenlik göstermekte midir?
- Çocukların öz-düzenleme becerisi çocukların kullandığı dijital medya aracı türüne göre değişkenlik göstermekte midir?
- Çocukların öz-düzenleme becerisi tercih edilen dijital medya içeriğine göre farklılık göstermekte midir?

İlgili çalışma nicel araştırma desenlerinden tarama modeli kullanılarak yürütülmüştür. Çünkü tarama modeli büyük kitlelerin hali hazırda var olan durumlarını ortaya çıkarma amacı taşımaktadır. Bu çalışmada 4-6 yaş grubu çocukların öz-düzenleme puan ortalamasının dijital medya araçlarını kullanma süresine, kullanılan dijital medya araçlarının türüne ve tercih edilen dijital medya içeriğine göre farklılaşıp farklılaşmadığının ortaya çıkarılması amaçlanmıştır. Çalışmada veri toplamak amacıyla "4-6 yaş öz-düzenleme becerileri (anne formu)" kullanılmıştır. Anneler çocukları ile daha çok vakit geçirdikleri için onların günlük rutinleri hakkında en doğru bilgiyi vereceklerdir. Bu yüzden veriler annelerden toplanmıştır. Çalışmaya 4-6 yaşında çocuğu olan anneler katılmıştır. Anketler katılımcılara çevrimiçi olarak ulaştırılmıştır. Kullanılan ölçeğin Cronbach alfa değeri 0,90 ve test geçerlik güvenirlik katsayısı 0,77 olarak hesaplanmıştır.

Toplanan veriler SPSS 22 paketi kullanılarak analiz edilmiştir. Birinci araştırma sorusu için ANOVA testi diğer araştırma soruları için ise t-testi kullanılarak veriler analiz edilmiştir. Çalışmanın sonuçlarına bakıldığında 4-6 yaş arasındaki çocukların dijital medya kullanımı ile öz-düzenleme becerisi arasında anlamlı fark bulunmuştur F (5, 910) = 13,1, p = 0,00. Yani çocukların medya ile geçirdikleri süre arttıkça öz-düzenleme beceri puan ortalamaları azalmaktadır. Çocukların kullandıkları medya araçlarının öz-düzenleme becerisi ile ilişkisine bakıldığında ise t-test sonucu akıllı telefon kullanan çocuklar ile kullanmayan çocuklar arasında kullanmayan çocukların öz-düzenleme becerisi lehine bir sonuç çıkmıştır. Çocukların tercih ettikleri içerik ve öz-düzenleme becerisi arasındaki ilişki incelendiğinde t-test sonucuna göre şiddet, korku ve eğitsel içeriklerin öz-düzenleme becerisi arasında anlamlı bir farklılık bulunmuştur. Bu farklılık korku ve şiddet içeriklerinin öz-düzenleme becerisi puan ortalaması ile olumsuz, eğitsel içeriklerin ise öz-düzenleme becerisi puan ortalaması ile olumlu yönde etkisinin olduğu sonucunu ortaya koymuştur.

Bu sonuçlara göre 4-6 yaş grubu çocukların öz-düzenleme becerisi için dijital medya araçları ile geçirdikleri süre önemlidir. Bu süre arttıkça çocukların öz-düzenleme puan ortalamasında bir azalma meydana gelmektedir. Bunun sebebi dijital medya araçlarının çocukların dikkat, yoğunlaşma ve yürütücü işlev becerilerine olumsuz yönde etki etmesinden kaynaklanabilir.

Çocukların kullandıkları medya araçları da öz-düzenleme becerisine etki ettiği düşünülmüş ve incelenmiştir. Sonuçlara göre televizyon, tablet, bilgisayar ve akıllı telefondan sadece akıllı telefon kullanımı çocukların öz-düzenleme becerisi puan ortalamasına etki ettiği bulunmuştur. Bu durumun sebebi ekran büyüklüğü ile alakalı olabilir. Çünkü diğer dijital medya araçlarında yapı iskelesi kullanılabilir ya da çocukların tercih ettikleri içeriklere müdahale edilebilir. Ancak akıllı telefonlar diğer araçlara göre daha küçük ekrana sahip oldukları için çocuklar bu cihazları bireysel kullanmaya daha yatkındır. Yetişkin ile birlikte kullanılmayan, yapı iskelesine çok fazla izin vermeyen bu araçta çocukların dijital içerikleri uygunsuz olarak kullanma ihtimalleri artış gösterebilir.

Çalışmanın bir diğer sonucu ise çocukların şiddet ve korku içeriklerini tercih etmeleri öz-düzenleme becerisine olumsuz etki ettiğini söylemektedir. Öte yandan eğitsel içerikli uygulamalar çocukların öz-düzenleme becerisi üzerinde olumlu etkiye sahiptir. Çocuklar uygunsuz içerikler tercih ettiğinde ve yanlarında bu içerikleri engelleyecek ya da tartışacak bir yetişkin olmadığında olumsuz olarak etkilenebilirler. Oysa çocuklar gelişimlerine uygun olarak hazırlanmış, eğitici içeriklere sahip içerikler ile vakit geçirdiklerinde öz-düzenleme becerisi de olumlu olarak etkilenmektedir.

Çalışmanın sonuçları göz önünde bulundurulduğunda çocukların etrafını saran dijital medya araçlarının uygun bir şekilde kullanılması çocukların öz-düzenleme becerisi üzerinde olumlu yönde etkiye sahiptir. Yani çocukların gelişim seviyelerine uygun eğitsel içerikler tercih etmeleri, dijital medya araçları ile geçirilecek sürenin gelişimlerine uygun olarak belirlenmesi ve çocukların geniş ekranlı dijital medya araçlarını tercih etmesi öz-düzenleme becerisi puan ortalaması üzerinde olumlu yönde katkıda bulunacaktır.