



LEVEL OF SCREEN EXPOSURE AMONG CHILDREN ATTENDING PRESCHOOL EDUCATION AND CARE

NIVO IZLOŽENOSTI EKRANIMA DJECE POLAZNIKA PREDŠKOLSKOG ODGOJAJ I OBRAZOVANJA

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ABSTRACT

Children of preschool age are exposed to digital media/screens to varying degrees. While some authors highlight the positive effects of screen exposure, others emphasize the negative impacts, particularly on early childhood growth and development. The aim of this study was to survey parents (N = 89) of preschool-aged children attending preschool education and care regarding their children's level of screen exposure. In addition to the primary aim, secondary objectives were set to examine the relationship between parents' age and the level of screen exposure, the relationship between parents' education and the level of screen exposure, and the relationship between the total number of screens in the household and the level of screen exposure. The "Seven in Seven Screen Exposure Questionnaire" was used to assess the level of screen exposure. The analysis of the results showed that the level of screen exposure among preschool-aged children attending preschool education and care falls into the category of low exposure. No statistically significant correlation was found between parents' age, parents' education, and the level of screen exposure among preschool-aged children. However, a statistically significant correlation was identified between the total number of TVs and cellphones in the household and the level of screen exposure.

Keywords: screen time, preschool-aged children, level of screen exposure among children attending preschool education and care

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SAŽETAK

Djeca predškolske dobi su u većoj ili manjoj mjeri izložena digitalnim medijima/ ekranima. Dok pojedini autori navode pozitivne efekte gledanja ekrana, drugi ipak ističu negativne efekte naročito po rani rast i razvoj djece. Cilj ovog istraživanja je bio ispitati roditelje (N=89) djece predškolske dobi koja su polaznici predškolskog odgoja i obrazovanja o nivou izloženosti ekranima. Pored glavnog cilja postavljeni su i parcijalni ciljevi kojima su se nastojalo ispitati povezanost dobi roditelja i nivoa izloženosti ekranima, ispitati povezanost obrazovanja roditelja i nivoa izloženosti ekranima te ispitati povezanost ukupnog broja ekrana u domaćinstvu i nivoa izloženosti ekranima. Za ispitivanje nivoa izloženosti ekranima korišten je upitnik „Sedam u sedam upitnik o izloženosti ekranu“ koji je preveden i prilagođen bosanskom jeziku. Analizom rezultata, nivo izloženosti ekranima djece predškolske dobi koji pohađaju predškolski odgoj i obrazovanje je u kategoriji niskog nivoa izloženosti. Statistički značajna povezanost nije ostvarena između dobi roditelja, obrazovanja roditelja i nivoa izloženosti ekranima djece predškolske dobi. Statistički značajna povezanost ostvarena je između ukupnog broja TV i mobitela u domaćinstvu i nivoa izloženosti ekranima.

Ključne riječi: vrijeme pred ekranom, djeca predškolske dobi, nivo izloženosti ekranima polaznika predškolskog odgoja i obrazovanja

INTRODUCTION

In the 21st century, technical devices (televisions, computers, cellphones) have become accessible in every household. Screen time, including watching television and playing video games, has become an integral part of the daily lives of young children and adolescents (Pate, Mitchell, Byun & Dowda, 2011, as cited in Rogović, 2020).

Children today are exposed to media at a very early age, leading to the notion that childhood has become media-oriented. However, the impact of media on a child depends on the behavior of adults. Therefore, the activity or passivity of adults who regulate children's exposure to media is crucial (Radeljak, 2016, as cited in Pašica & Turza-Bogdan, 2020).

In their study, Pons, Bennasar-Veny, and Yanez (2020) examined the relationship between parents' education levels and children's screen-related leisure time, considering household factors that mediate the relationship between parents' education and screen time. The results showed that maternal education is a key factor influencing children's screen-related leisure time. Parents, especially mothers, exert a strong influence in the home environment, and the level of maternal education can affect certain environmental factors (for example, a TV in the child's bedroom) and habits (for example, background TV). Children whose parents have no more than a secondary education tend to spend, on average, 1.5 hours more per day in front of screens compared to children of college-educated parents (Rideout & Robb, 2020, as cited in Wiltshire, Troller Renfree, Giebler & Noble, 2021).

Watching television reduces the time spent playing, alters the environment and content of play, and introduces new toys as a result of the influence of television content (Blanuša Trošelj, 2014, as cited in Lukić, 2023).

The impact of digital media on children depends on the content they consume, their psychophysical domain and developmental stage, as well as many other factors that can amplify or mitigate the positive and negative effects of media content on children (Kuterovac Jagodić, Štulhofer & Lebedina Manzoni, 2016, as cited in Sušić, 2021).

Although modern technologies have generated great interest and enthusiasm among the general public and can be beneficial for children and youth, experts increasingly emphasize their harmful effects on child development if not used in moderation and in accordance with the child's age (Cordes & Miller, 2000; Ernest et al., 2014, as cited in Roje Đapić, Buljan Flander & Selak Bagarić, 2020).

Research Aims and Hypotheses

It is impossible to resist technological advancements. Digital media are present in all aspects of children's lives, even from the earliest age. The primary aim of this research is to examine the level of screen exposure among preschool-aged children attending preschool education and care. Alongside the primary aim, the following secondary objectives were defined: to examine the relationship between parents' age and the level of screen exposure, to examine the relationship between parents' educational level and the level of screen exposure, and to examine the relationship between the total number of screens in the household and the level of screen exposure among preschool-aged children. In line with the objectives, the following hypotheses were formulated:

H1: The level of screen exposure among preschool-aged children falls into the category of higher screen exposure.

H2: There is a statistically significant correlation between parents' age and the level of screen exposure among preschool-aged children.

H3: There is a statistically significant correlation between parents' educational level and the level of screen exposure among preschool-aged children.

H4: There is a statistically significant correlation between the total number of screens in the household and the level of screen exposure among preschool-aged children.

Research Methodology

Research Sample

The research included 89 parents of preschool-aged children attending two preschool institutions in the Municipality of Maglaj, aged between 12 months and 5 years and 3 months, with an average age of 41.8 months. The questionnaires were completed by the parents, whose average age was 35.2 years.

Analyzing the educational level of the mothers, 37 participants (41.6%) had completed secondary education, 42 participants (47.2%) had higher education or a university degree, and 10 participants (11.2%) held a master's degree. Regarding the fathers' educational level, 54 participants (60.7%) had completed secondary education, 34 participants (38.2%) had higher education or a university degree, and only 1 participant (1.1%) held a master's degree. Before conducting the research, the preschool institution directors were informed about the aim of the study and the methodology, emphasizing that the research was voluntary and

anonymous, without collecting personal or anamnesis data on the children and parents. Parents were provided with questionnaires, which they returned to the researcher upon completion.

Measuring Instruments

For the purpose of the study, the "Seven in Seven Screen Exposure Questionnaire" (Yalcin et al., 2021) was translated and adapted to the Bosnian language. The questionnaire items were designed based on the recommendations of the American Academy of Pediatrics (AAP) for children's media use. The questionnaire consists of seven questions: three questions in the category "Screen Exposure Rules," two questions in the category "Screen Exposure During Daily Routines," and two questions in the category "Conditions of Screen Exposure."

Screen time during the day refers to the daily average use of screens (TV and other devices such as smartphones, computers, tablets, and so forth). Daily screen time is assessed separately for weekdays and weekends. The average daily screen time is calculated as follows $[(TV \text{ workdays} + \text{"Other screens" workdays}) \times 5 + (TV \text{ weekends} + \text{"Other screens" weekends}) \times 2] / 7$, and scored as the total average screen time in the following manner: 0 points: <1 hour; 1 point: 1–2 hours; 2 points: >2 hours. Screen viewing with parents is represented by the frequency of shared viewing and is scored as follows: 0 points: always; 1 point: sometimes; 2 points: rarely. The setting of screen time limits is evaluated by the question: "Do you set limits on screen viewing? If so, does your child adhere to these limits?" The scoring depends on the presence of limits and the child's adherence: 0 points: limits are set by the parent(s) and the child adheres to them; 1 point: the parent does not set any limits on screen viewing; 2 points: the parent(s) set limits, but the child does not adhere to them. Screen viewing during meals and screen viewing at least one hour before bedtime are assessed based on whether these behaviors occur and scored as follows: 0 points: no; 1 point: yes. The question regarding the age at which screen viewing began is scored as follows: 0 points: ≥ 24 months; 1 point: 18–23 months; 2 points: 12–17 months; 3 points: <12 months. The question about the type of screen content is open-ended. If the response includes only age-appropriate educational content and excludes low-quality content, it is scored as 0 points. If the response includes fast-paced programs, apps with violent content, or content for older children and adults, it is assessed based on the amount of inappropriate content: 1 point: one type of inappropriate content; 2 points: ≥ 2 various types of inappropriate content. For clarity, the last question was adapted to allow parents to select pre-determined answers, that is, the types of content their child watches. The total scores are classified into two categories: lower screen exposure (<7) and higher screen exposure (≥ 7). Additionally, the question about the total number of screen devices (TV, computer, tablet, cellphone) in the household was included.

Statistical Data Processing

The data were analyzed using the statistical software SPSS 20.0. Basic statistical parameters were calculated for each variable: arithmetic mean, standard deviation, minimum and maximum scores, and frequency. The Pearson correlation coefficient was used to assess the relationships between variables. A statistically significant difference was considered at $p < 0.05$.

RESULTS

Analyzing the responses of parents ($N=89$) in Table 1, the average time children spend watching television on weekdays is between 1 to 2 hours ($M=1.46$), while the time spent on other screens during weekdays is also between 1 to 2 hours ($M=1.07$). The average time spent watching television during weekends is between 1 to 2 hours ($M=1.54$), and the time spent on other screens during weekends is similarly between 1 to 2 hours ($M=1.16$).

Of the total 89 parents, 27% stated that they always watch screens with their child, 69.7% reported that they sometimes watch screens with their child, while 3.4% indicated that they rarely or never watch screens together with their child.

In response to the question, "Do you set screen time limits?" 83 parents (93.3%) reported that they set limits, and their child adheres to them. Meanwhile, 2.2% of parents stated that they do not set any limits, and 4.5% of parents reported setting limits that their child does not follow.

When asked, "Does your child use screen devices during meals?" 25.8% of parents responded positively, while 74.2% responded negatively.

In response to the question, "Does your child use screen devices at least one hour before bedtime?" 40.4% of parents answered positively, while 59.6% answered negatively.

According to the parents' responses in this study, 55 children, or 61.8%, started watching screens before their first birthday, while 33 children (37.1%) started watching screens at the age of 1 year, and only 1 child (1.1%) started watching screens at the age of 2 years.

To the question, "What type of programs and screen content is your child exposed to?" 81 parents (91%) responded that their child is exposed to age-appropriate and exclusively educational content, 5 parents (5.6%) indicated exposure to inappropriate content (for example, video games, various apps), and 3 parents (3.4%) stated that their child is exposed to various types of inappropriate content (for example, games, apps, social media).

Table 1. Basic statistical indicators and frequency of the questionnaire results

Variables	%	M	SD	MIN	MAX
<u>Watching TV on weekdays</u>					
<1 hr	4 (4.5)	1.46	0.58	0	2
1-2 hrs	40 (44.9)				
>2 hrs	45 (50.6)				
<u>Watching other screens on weekdays</u>					
<1 hr	16 (18.0)	1.0	0.65	0	2
1-2 hrs	51 (57.3)				
>2 hrs	22 (24.7)				
<u>Watching TV on weekends</u>					
<1 hr	5 (5.6)	1.54	0.60	0	2
1-2 hrs	31 (34.8)				
>2 hrs.	53 (59.6)				
<u>Watching other screens on weekends</u>					
<1 hr	15 (16.9)	1.16	0.68	0	2
1-2 hrs	45 (50.6)				
>2 hrs	29 (32.6)				
<u>Watching screens together</u>					
-Always	24 (27.0)	1.76	0.50	1	3
-Sometimes	62 (69.7)				
-Never	3 (3.4)				
<u>Setting limits</u>					
-Yes, I set limits	83 (93.3)	1.11	0.43	1	3
-No, I don't set limits	2 (2.2)				
-Yes, but my child doesn't respect them	4 (4.5)				
<u>Watching screens during meals</u>					
-Yes	23 (25.8)	1.74	0.44	1	2
-No	66 (74.2)				
<u>Watching screens one hour before bedtime</u>					
-Yes	36 (40.4)	1.60	0.49	1	2
-No	53 (59.6)				
<u>Start of watching screens</u>					
-Before age 1	55 (61.8)	1.39	0.51	1	3
-Between ages of 1 and 2	33 (37.1)				
-After age 2	1 (1.1)				
<u>Type of program watched by child</u>					
-educational, age appropriate	81 (91.1)	1.1	0.42	1	3
-inappropriate content	5 (5.6)				
-various types of inappropriate content	3 (3.4)				

Table 2 presents the level of screen exposure for preschool-aged children. According to the parents' responses and the overall results of the questionnaire, 80 children (89.9%) have a low level of screen exposure, while only 9 children (10.1%) have a high level of screen exposure. Based on the obtained results, the first hypothesis is not accepted.

Table 2. Basic statistical indicators and frequency of screen exposure levels in preschool-aged children

(N=89)	%	M	SD	MIN	MAX
Low level of screen exposure	80 (89.9)	1.01	0.30	1	2
High level of screen exposure	9 (10.1)				

Based on the results in Table 3, we can conclude that cellphones are the most prevalent in the households of the respondents (M=2.29), while tablets are the least common (M=0.26).

Table 3. Basic statistical indicators and frequency of total number of screens in household in preschool-aged children

(N= 89)	%	M	SD	MIN	MAX
<u>Total number of TVs in household</u>					
- no TV	-				
-1 TV	43 (48.3)				
-2 TVs	42 (47.2)	1.56	0.58	1	3
-3 TVs	4 (4.5)				
-more than 3 TVs					
<u>Total number of computers in household</u>					
-no computers	58 (65.2)				
-1 computer	27 (30.3)	0.39	0.57	0	2
-2 computers	4 (4.5)				
-3 computers	-				
-more than 3 computers	-				
<u>Total number of tablets in household</u>					
-no tablets	68 (76.4)				
-1 tablet	19 (21.3)	0.26	0.48	0	2
-2 tablets	2 (2.2)				
-3 tablets	-				
-more than 3	-				
<u>Total number of cellphones</u>					
-no cellphones	-				
-1 cellphone	1 (1.1)				
-2 cellphones	65 (73.0)	2.29	0.56	1	4
-3 cellphones	19 (21.3)				
-more than 3 cellphones	4 (4.5)				

Table 4 shows the correlation between variables describing the parents' age and the level of screen exposure. The anamnestic variables describing the parents' age and the level of screen exposure did not show a statistically significant correlation. Based on the obtained results, the second hypothesis is not accepted.

Table 4. Correlation between the variables of parental age and the level of screen exposure in preschool-aged children

Variable		Age of mother	Age of father	Level of screen exposure
Age of mother	r	1		
	Psig			
	N	89		
Age of father	r	.670**	1	
	Psig.	.000		
	N	89	89	
Level of screen exposure	r	.038	-.008	1
	Psig.	.722	.943	
	N	89	89	89

Table 5 shows the correlation between variables describing the parents' educational level and the level of screen exposure. The anamnestic variables, including the fathers' and mothers' educational levels and the level of screen exposure, did not show a statistically significant correlation. Based on the obtained results, the third hypothesis is not accepted.

Table 5. Correlation between the variables of parental educational level and the level of screen exposure

		Educational level of mother	Educational level of father	Level of screen exposure
Educational level of mother	r	1		
	PSig			
	N	89		
Educational level of father	r	.395**	1	
	PSig	.000		
	N	89	89	
Level of screen exposure	r	-.015	.099	1
	PSig	.887	.357	
	N	89	89	89

Table 6 shows the correlation between variables describing the total number of screens in the household and the level of screen exposure for preschool-aged children. A statistically significant correlation was found between the variable describing the level of screen exposure and the total number of TVs in the household. A positive correlation was observed between the variables describing the total number of screens in the household. Additionally, the level of screen exposure and the total number of cellphones showed a statistically significant

correlation (positive correlation). Based on the above, the fourth hypothesis is partially accepted.

Table 6. Correlation between the variables of the total number of screens in the household and the level of screen exposure among preschool children

Variable		Total number of TVs in household	Total number of computers in household	Total number of tablets in household	Total number of cellphones in household	Level of screen exposure
Total number of TVs in household	r	1				
	PSig					
	N	89				
Total number of computers in household	r	0.113	1			
	PSig	0.292				
	N	89	89			
Total number of tablets in household	r	0.043	0.562**	1		
	PSig	0.689	0.000			
	N	89	89	89		
Total number of cellphones in household	r	0.151	.0270*	0.052	1	
	PSig	0.159	0.011	0.626		
	N	89	89	89	89	
Level of screen exposure	r	0.254*	0.095	0.052	0.222*	1
	PSig	0.017	0.376	0.631	0.036	
	N	89	89	89	89	89

DISCUSSION

The issue of screen time during preschool years has become a widely discussed topic in recent years. It is important to consider the results of existing research regarding rules for screen exposure, exposure during daily routines, and conditions of screen exposure, as well as the presence of screens in households and the influence of socio-economic factors on screen usage.

A Finnish study found that children aged 3 to 6 years spent an average of 111 minutes per day in front of screens (Maatta et al., 2017, according to Mustonen, Torppa, & Stolt, 2022). In a study conducted in Croatia, children aged 2 to 5 years spent an average of 2 to 3 hours per day in front of screens, while children aged 6 to 7 years spent 3 to 3.6 hours per day (Đapić, Flander & Bagarić, 2020, according to Rogović, 2020). The Spanish Association of Primary Healthcare Pediatricians recommends limiting screen time to less than 2 hours per day, regardless of age (Gentile et al., 2012, according to Pons et al., 2020).

In her study, Sušić (2021) notes that 53% of parents talked to their children about the content they watch on TV, while 38% of respondents said they did so occasionally, and 5% said they never discussed screen content with their children. Pašica & Turza Bogdan (2020) found that 70% of parents reported watching TV with their children either mostly or frequently.

According to a report by UNICEF and the Regulatory Communications Agency, TV and DVD viewing rules are most common for children aged 0-10 years, with over 90% of parents setting such rules (Hasanagić, Papović & Kovačević, 2020).

The American Academy of Child and Adolescent Psychiatry (AACAP, 2024) recommends banning all devices during meals and removing screen devices from children's rooms 30 to 60 minutes before bedtime. Roje Đapić et al. (2020) report that nine out of ten parents stated their children sometimes spend time in front of screens within an hour before bedtime (89.8%), and 40.6% said they do so often or always. Regarding screen usage during meals, one in three children occasionally uses screens (59.5%), while one in ten does so often or always (10.1%).

Sušić (2021) found that most children began using digital devices such as smartphones, computers, or tablets between the ages of one and three years. The American Academy of Pediatrics (2001) recommended that children under 2 years old should not be exposed to television (Blankson et al., 2015). The World Health Organization (WHO) also advises against screen time for children under two years old (Stiglic & Viner, 2019, according to Rocha et al., 2021). The results of this study contradict the recommendations of both the American Academy of Pediatrics and the World Health Organization.

Taylor et al. (2018) in their study found that parents reported their children watched children's programs (N=102) on TV, with a few also watching adult programs (N=3), and some watching both types of programs (N=2). However, Barr et al. (2010, according to Taylor et al., 2018) found that younger children were exposed to a higher proportion of TV programs intended for older audiences. Sušić (2021) concludes that the use of digital media for watching cartoons and other entertainment videos dominates, while educational content is rarely used or not at all, unless integrated into content children follow.

Shakya et al. (2023), using the "Seven in Seven Screen Exposure Questionnaire" (Yalcin et al., 2021), found that 69.6% of children aged 2 to 5 years had a high level of screen exposure. Yalcin et al. (2021), in a sample of 1,245 preschool-aged children, found that 22.5% had a high level of screen exposure, while 77.5% had a low level.

According to a report by UNICEF and the Regulatory Communications Agency, children in Bosnia and Herzegovina, from birth to 18 years, live in a complex information-communication environment and are surrounded by numerous devices. Data from parents show that nearly all children live in households with smartphones (93%), most with computers (desktop or laptop) (76%), and with Smart TVs (73%) (Hasanagić et al., 2020).

Cárdenas-Fuentes et al. (2021) in a cohort study, where the mother's level of education was one of the indicators of the child's socio-economic status, concluded that children of mothers with higher education levels spent significantly less time in front of screens compared to children of mothers with lower education levels. Socio-economic status influences screen use in children in various ways. Screen use is higher in children from families with lower socio-economic status than in those with higher status (Cameron et al., 2015, according to Männikkö et al., 2020). The educational level of parents plays an important role in shaping the social and physical characteristics of the home environment (Glymour et al., 2014, according to Männikkö et al., 2020). The mother's educational level is positively correlated with the supervision of children's screen behavior (Mantziki et al., 2015, according to Männikkö et al., 2020).

CONCLUSION

Children of preschool age attending preschool education programs exhibit a low level of screen exposure. Statistically significant correlations were not found between variables describing the parents' age, educational level, and the level of screen exposure in preschool children. However, a statistically significant correlation was found between the variables describing the total number of screens (total number of TVs and cellphones in the household) and the level of screen exposure in preschool children.

The results obtained align relatively well with previous research; however, a concerning finding is that more than half of the surveyed parents reported that their children started watching screens before the age of one, which does not align with the recommendations of pediatric associations or organizations worldwide. The importance of this research lies in ensuring that screen use/digital media is utilized in a quality and educational manner, and that it is employed in accordance with regulations to avoid potential negative effects that could disrupt a child's development (especially language, cognitive, and socio-emotional development). Exposure to screens at an early age should be prevented, and the focus should be on educational and advisory workshops/lectures on this topic. Considering that the sample consisted of parents of preschool children, and that these children spend a significant portion of the day outside the home, it can be concluded that preschool children are not at risk of excessive exposure to digital media/screens. Therefore, children attending preschool education programs are surrounded by a stimulating environment and activities that allow for quality time, while the risk of negative impact from digital media/screens is reduced.

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