

## Original Research Article

# Digital media use among children under five: an insight into socio-demographic factors and immediate behavioural outcomes

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### ABSTRACT

**Background:** With advancement and increasingly accessibility of digital technology, digital devices have become integral part in every household. Sociodemographic factors influence digital media use, yet data from tertiary care settings in India remain limited. This study provides important insights into how various sociodemographic factors influence children's screen time and its association with behavioral problems.

**Methods:** An observational study was conducted among under five children attending a tertiary care hospital. Parents were interviewed using a structured questionnaire about sociodemographic characteristics, availability & usage of digital devices and behavioral issues observed. Data were analyzed using SPSS.

**Results:** The study included 384 children aged below five years. The mean age was 29.4 months, with male predominance (57%). The median number of family members was 5, 80% of households had two or more digital devices. The mean screen-time was 72.3 minutes per day and 49.2% of children had excessive screen time while only 32.4% consumed educational content. 58.7% of parents had not set time limits for screen usage. Younger age, higher socioeconomic class, lower paternal education, early initiation of screen exposure, greater access to devices, were all significantly associated with excessive screen-time. 14.8% of all participants exhibited behavioral changes associated with screen use.

**Conclusions:** Excessive screen time is highly prevalent among under five children. It is strongly influenced by sociodemographic factors and is linked to behavioral problems. A balanced approach to screen time in early childhood can reduce negative outcomes.

**Keywords:** Behavioural changes, Digital media, Screen time, Sociodemographic factors, Under five children

### INTRODUCTION

The advancement in technology and increasing digital media use has changed the childhood experiences significantly. As technology is becoming inevitable part of our daily lives, young children are getting exposed to various forms of digital media, including television, smartphones and tablets. It can not only affect their lifestyle and development but can impact their behaviour adversely. As per the literature, while digital media offer educational benefits, excessive screen time can result in adverse developmental outcomes, including impaired language skills, reduced attention spans and behavioural

issues.<sup>1,2</sup> The American academy of paediatrics recommends zero screen time in children <2 years and between 2 to 5 years one hour per day for specific purposes like educational games or teaching aid for a limited period (not longer than 30 minutes per session and not more than two sessions per day, under supervision - a shared media use), rather than for entertainment, emphasizing the importance of parental involvement during media consumption. However, studies reveal that many children exceed this guideline significantly. This excessive screen time is often linked to various sociodemographic factors, including parental education level, family structure and socioeconomic status.<sup>2-5</sup> Understanding the association

between these sociodemographic factors and screen time is essential for developing effective interventions. Parents have a vital role in modelling healthy media habits. Also, the content consumed during screen time can lead to varied outcomes; high-quality educational content can foster learning, while inappropriate or excessive exposure can result in negative outcomes.<sup>3</sup> This observational study helps to understand the association between these sociodemographic factors and excessive screen time in under five children. The findings will not only add on to the existing knowledge about this topic but may provide practical insights for parents and healthcare professionals working towards optimizing children's digital experiences, thus improving outcomes.

## METHODS

This study is a cross sectional observational study which was carried out on 384 parents of children (age less than 5 years), attending paediatric OPD and stable patients admitted in paediatric ward of HBTMC and Dr R N Cooper Hospital (Mumbai), a tertiary care hospital during from February 2023 to May 2024.

The study was conducted with the aim of studying the association of sociodemographic factors with use of digital media in under five children. The study was approved by the institutional scientific committee and ethics committee. Written informed consent was taken from all the parents participating in the study. OPD patients and all admitted stable IPD patients of paediatric ward of age less than 5 years during study period, were included in study. Parents who did not give consent and parents of sick ICU children were excluded from the study. Preliminary information of parents and children along with socio-demographic profile of the family and digital media usage were assessed using a predesigned questionnaire. The Questionnaire was formulated based on the study objectives and after review of literature. The content validation was done with a panel of experts. Parents were explained in the language they understood and given adequate time to answer questionnaire. Excessive screen time was recorded for those exceeding the American Academy of Paediatrics recommendations i.e., zero screen time in children <2 years and one hour per day for children aged 2 to 5 years.<sup>5</sup>

Data collected was entered in Microsoft Excel. Data is represented in frequencies and percentages. Mean and standard deviation of quantitative variables are shown. Appropriate statistical tests are applied using SPSS. The categorical variables are analysed by Chi-square test. Pearson's correlation coefficient is calculated between two continuous variables. Linear regression is done to predict screening of child based on study variables.

## RESULTS

The study includes 384 participants of age less than 5 years. Among the 384 children, the largest proportion

belonged to the 4–5 years age group (106, 27.6%), followed by 2–3 years (76, 19.8%), 3–4 years (69, 18.0%), 1–2 years (68, 17.7%) and less than 1 year (65, 16.9%). The mean age was 29.4±15.7 months (range: 6–59 months). Males constituted 57% (219) and females 43% (165). Most participants were residents of Mumbai (95.1%), with smaller proportions from Thane/ Palghar (3.9%) and other regions (1.0%).

Family size most commonly comprised four (33.9%) or five (21.6%) members. The median number of family members was 5 (IQR: 4–6, range: 2–28). Three mothers and three fathers were expired and two fathers were divorced, with those children residing with their mothers. The median number of family members is 5 with an interquartile range of 4 to 6. The range is minimum of 2 to maximum of 28 members. The mothers of three participants had expired. The fathers of three participants had expired, two were divorced and the children stayed with the mother.

Regarding parental education, most mothers and fathers had primary or middle school education (mothers: 38.0% primary, 26.0% middle; fathers: 33.1% primary, 31.3% middle). Graduates constituted 7.3% of mothers and 8.6% of fathers, while illiteracy was observed in 8.9% and 4.4%, respectively. Occupationally, 93.2% of mothers were unemployed. Fathers were predominantly skilled workers/shop or market sales workers (65.4%), followed by plant and machine operators (21.4%) and craft-related workers (5.7%).

Socioeconomic status based on the Modified Kuppuswami Scale showed that most families belonged to the upper middle class (74.2%), followed by lower middle (21.1%), upper (2.9%) and upper lower (1.8%), with none in the lower class. The mean family income was Rs.19,185.7±19,941.7. Only 0.3% (1 household) reported having no digital device. A majority (84.6%) of respondents have access to at least one digital device. The mean age of starting the usage of digital screen devices is 16.4 months with a standard deviation of 9 months. The youngest age of starting usage is 3 months and the oldest is 48 months in those who have been exposed to screens.

The mean screen-time per day among screen users (n=327) is 72.3 minutes with a standard deviation of 62.4 minutes. The median screen time is 60 minutes. The minimum screen-time is 10 min and the maximum is 300 minutes. It includes only 327 participants who had exposure to screens. The majority of children across all age groups had screen time of ≤1 hour per day (67.9%). However, as age increased, the proportion of children with higher screen time also increased. The mean usage of screen by the parents is 44.4 minutes with standard deviation of 99.6 minutes. The median usage is 0 minutes. Range of usage is 0-660 minutes per day. The excessive screen-time among the participants was seen in 189 (49.2%) (n=384). \*The participants less than 1 year who had any screen exposure and those above 1 year with screen-time more

than 60 min in a day were considered as having excess screen-time. Among the total 384 children, 49.2% (n=189) were reported to have excessive screen-time, while 50.8% (n=195) did not. A higher proportion of children aged 1-2 years (82.4%) were exposed to excessive screen-time. Among infants (<1 year), excessive screen-time was observed in 50.8% of cases.

Younger children had significantly higher screen time (p=0.002). More females (54.5%) had excessive screen time than males, but the difference was not significant (p=0.07). Socioeconomic status showed a significant association (p=0.043), with the highest screen time in the upper class (63.6%). No significant associations were found with residence, family size, mother’s education or parental occupation. However, lower paternal education was significantly linked to excessive screen time (p=0.027). Mother’s employment status was not a significant factor (p=0.348).

Excessive screen time was significantly associated with early exposure to digital devices and greater accessibility (p<0.0005). Children with excessive screen time started using screens earlier (12 vs. 18 months). Access to more devices increased excessive screen use, with the highest prevalence (100%) among those with access to three devices. However, the number of devices at home showed no significant association (p=0.109). Parental screen-related work duration was not significantly linked to excessive screen time (p=0.132).

A linear regression analysis was conducted to predict the screen-time of a child based on the study factors. Based on the statistically significant variables found in the above bivariate tests, variables were selected after checking for multicollinearity using scatter plots and calculation of pearson’s correlation coefficient. Also, the factors which were found to be more relevant were preferentially

included in the regression analysis. The following predictor variables were included age of the child. Age at which the child started using screens. Screen-time of parents

**Dependent variable**

Screen-time of child. The results of the analysis are as follows. The linear regression equation is screen-time of child in minutes=29.3+0.13(Screen-time of parent) – 1.39 (Age of child in months of starting usage) + 1.91 (Child’s present age in months). The screen time among participants who had behavioural changes was significantly higher (mean-137.9 minutes, SD-71.5 minutes) (p<0.0005).

Among those with any screen time exposure (n=327), 5.8% (n=19) exhibited aggression, while none of the participants without screen time exposure (n=57) exhibited aggression. This association was statistically significant (p=0.044, Fisher’s Exact test). 9% (n=17) of participants with excessive screen time (n=189) exhibited aggression, compared to only 1% (n=2) of those without excessive screen time (n=195). This difference was highly significant (p < 0.0005, Chi-square test).

Among those who reported any screen-time exposure (n=327), 6 participants (1.8%) experienced disturbed sleep, while none of the participants without screen-time exposure (n=57) reported disturbed sleep. This difference was not statistically significant (p=0.598). 6 participants (3.2%) in the excessive screen-time group (n=189) reported disturbed sleep, whereas none of the participants in the non-excessive screen-time group (n=195) experienced disturbed sleep. This association was statistically significant (p=0.014), indicating a potential link between excessive screen-time and disturbed sleep.

**Table 1: Number of digital devices available in the house of the participants.**

Digital devices in house	Frequency	%
<b>No device</b>	1	0.3
1	77	20.1
2	219	57
More than 2	87	22.7
<b>Total</b>	<b>384</b>	<b>100.0</b>
<b>Number of digital devices with access</b>		
None	59	15.4
1	231	60.2
2	86	22.4
3	5	1.3
4	3	0.8
<b>Total</b>	<b>384</b>	<b>100.0</b>
<b>Age-group when screens introduced</b>		
Less than 1 year age	88	26.9
1 to 2 years	137	41.9
2 to 3 years	76	23.2
3 to 4 years	23	7.0
More than or equal to 4 years	3	0.9
<b>Total</b>	<b>327</b>	<b>100.0</b>

**Table 2: Screen-time usage per day of the participants.**

Screen -time	Frequency	%
Less than or equal to 1 hour	222	67.9
1 to 2 hours	69	21.1
More than 2 hours	36	11
<b>Total</b>	<b>327</b>	<b>100.0</b>

**Table 3: Age-wise distribution of screen-time and prevalence of excessive screen-time among the study participants.**

Age group (in years)	Screen-time		
	≤1 hour	1-2 hours	>2 hours
<1	33 (100)	0 (0)	0 (0)
1-2	51 (91.1)	4 (7.1)	1 (1.8)
2-3	39 (58.2)	16 (23.9)	12 (17.9)
3-4	43 (62.3)	19 (27.5)	7 (10.1)
4-5	56 (54.9)	30 (29.4)	16 (15.7)
<b>Total</b>	<b>222 (67.9)</b>	<b>69 (21.1)</b>	<b>36 (11)</b>
	Excessive screen-time		Total
	Yes	No	
<1	33 (50.8)	32 (49.2)	65 (100)
1-2	56 (82.4)	12 (17.6)	68 (100)
2-3	28 (36.8)	48 (63.2)	76 (100)
3-4	26 (37.7)	43 (62.3)	69 (100)
4-5	46 (43.4)	60 (56.6)	106 (100)
<b>Total</b>	<b>189 (49.2)</b>	<b>195 (50.8)</b>	<b>384 (100)</b>

**Table 4: Association of sociodemographic factors with excessive screen time (n=384).**

Sociodemographic factors	Excessive Screen-time		P value
	Yes	No	
<b>Age (in months) (mean (standard deviation))</b>	26.9 (16.1)	31.8 (15)	0.002*
<b>Sex</b>			
Male	99 (45.2)	120 (54.8)	0.07
Female	90 (54.5)	75 (45.5)	
<b>Socioeconomic status</b>			
Upper (I)	7 (63.6)	4 (36.4)	0.043*
Upper Middle (II)	142 (49.8)	143 (50.2)	
Lower Middle (III)	40 (49.4)	41 (50.6)	
Upper Lower (IV)	0 (0)	7 (100)	
<b>Residence</b>			
Mumbai	180 (49.3)	185 (50.7)	0.397^
Thane, Palghar district	7 (46.7)	8 (53.3)	
Rest of Maharashtra	2 (100)	0 (0)	
Rest of India	0 (0)	2 (100)	
Number of family members (mean (standard deviation))	5 (2.5)	5 (2.3)	0.486
Mother’s educational level (median (Interquartile range))	3 (2–4)	3 (2–4)	0.816@
Father’s educational level (median (Interquartile range))	3 (2–4)	3 (2–4)	0.027*@
Mother’s occupation level (median (Interquartile range))	1 (1–1)	1 (1–1)	0.425@
Father’s occupation level (median (Interquartile range))	6 (4–6)	6 (4–6)	0.280@
<b>Mother working</b>			
Yes	15 (57.7)	11 (42.3)	0.348
No	171 (48.2)	184 (51.8)	
<b>Total</b>	<b>189 (49.2)</b>	<b>195 (50.8)</b>	-

\* - p<0.0005, significant at 0.05 level, Chi-square test used for categorical variables, unpaired t test for continuous variables. ^Fisher’s Exact test used. @Mann-Whitney U test used.

**Table 5: Association of digital screen availability, number of digital devices, content of the screen-time with excessive screen time (n=384).**

Screen availability	Excessive Screen-time		P value
	Yes	No	
<b>Number of digital devices available at home</b>			
No device	0 (0)	1 (100)	0.109 <sup>^</sup>
1	33 (42.9)	44 (57.1)	
2	105 (47.9)	114 (52.1)	
More than 2	51 (58.6)	36 (41.4)	
<b>Number of digital devices with access</b>			
None	0 (0)	57 (100)	<0.0005* <sup>^</sup>
1	132 (56.7)	101 (43.3)	
2	50 (58.1)	36 (41.9)	
3	5 (100)	0 (0)	
4	2 (66.7)	1 (33.3)	
<b>Age at which digital screen device usage started (in months) (mean (standard deviation))</b>	12 (8–18)	18 (12–24)	<0.0005*
<b>Time of parental work or activity requiring screen usage (in minutes) (mean (standard deviation))</b>	15 (0-60)	0 (0 – 30)	0.132
<b>Total</b>	189 (49.2)	195 (50.8)	-
<b>Description of screen -time</b>			
<b>Type of content watched</b>	<b>Frequency</b>	<b>%</b>	
Known	293	89.6	
Not known	34	10.4	
<b>Educational content watched</b>			
Yes	106	32.4	
No	221	67.6	
<b>Framed cut-off time</b>			
Yes	135	41.3	
No	192	58.7	
<b>Total</b>	327	100.0	

p<0.0005, significant at 0.05 level, Chi-square test used for categorical variables, unpaired t test for continuous variables. <sup>^</sup>Fisher’s Exact test used.

**Table 6: Results of linear regression analysis.**

Model	r	r square	Adjusted r square	Std. error of the estimate		
1	0.426	0.181	0.173	56.704		
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	229627.183	3	76542.394	23.805	<0.0005*
	Residual	1038552.634	323	3215.333		
	Total	1268179.817	326			

\*Significant at 0.05 level.

**Table 7: Results of linear regression analysis.**

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.*	95.0% confidence interval for B		
	B	Std. Error	Beta			Lower Bound	Upper Bound	
1	(Constant)	29.245	7.565		3.866	<0.0005	14.362	44.127
	Screen-time of parent	0.130	0.038	0.175	3.448	0.001	0.056	0.204
	Age of starting usage	-1.393	0.449	-0.204	-3.102	0.002	-2.276	-0.509
	Present age (in months)	1.911	0.271	0.464	7.039	<0.0005	1.377	2.445

\*Significant at 0.05 level.

**Table 8: Behaviour changes among the participants in those exposed to screen time and those who are not (n=384).**

Screen-time	Behavioural changes		Total	P value
	Present	Absent		
<b>Any screen-time present</b>				
Yes	57 (17.4)	270 (82.6)	327 (100)	0.001*
No	0 (0)	57 (100)	57 (100)	
<b>Excessive screen-time present</b>				
Yes	47 (24.9)	142 (75.1)	189 (100)	< 0.0005*
No	10 (5.1)	185 (94.9)	195 (100)	
Total	57 (14.8)	327 (85.2)	384 (100)	-
<b>Screen-time Excessive crying</b>				
<b>Any screen-time present</b>				
Yes	42 (12.8)	285 (87.2)	327 (100)	0.004*
No	0 (0)	57 (100)	57 (100)	
<b>Excessive screen-time present</b>				
Yes	34 (18)	155 (82)	189 (100)	< 0.0005*
No	8 (4.1)	187 (95.9)	195 (100)	
Total	42 (10.9)	342 (89.1)	384 (100)	-
<b>Screen-time Aggression</b>				
<b>Any screen-time present</b>				
Yes	19 (5.8)	308 (94.2)	327 (100)	0.044*^
No	0 (0)	57 (100)	57 (100)	
<b>Excessive screen-time present</b>				
Yes	17 (9)	172 (91)	189 (100)	< 0.0005*
No	2 (1)	193 (99)	195 (100)	
Total	19 (4.9)	365 (95.1)	384 (100)	-
<b>Screen-time Disturbed sleep</b>				
<b>Any screen-time present</b>				
Yes	6 (1.8)	321 (98.2)	327 (100)	0.598
No	0 (0)	57 (100)	57 (100)	
<b>Excessive screen-time present</b>				
Yes	6 (3.2)	183 (96.8)	189 (100)	0.014*
No	0 (0)	195 (100)	195 (100)	
Total	6 (1.6)	378 (98.4)	384 (100)	-

\*p<0.05, significant at 0.05 level, Chi-square test used. The screen time among participants who had behavioural changes was significantly higher (mean-137.9 minutes, SD - 71.5 minutes). (p<0.0005).

**DISCUSSION**

With advancing technology and increasingly accessibility of digital media, the family socio demographic dynamics and child raising strategies are changing. Thus there is a need for further research to better understand their implications on child development and wellbeing. The current study provides important insights into how various sociodemographic factors influence children's screen time and its association with digital media usage in under 5 children and reported behavioural problems. In the study average age of the children was 29.4 months, which is crucial because young children are more vulnerable to the effects of screen exposure. Karia et al in Western Uttar Pradesh found 92.5% of children had access to digital devices and screen time increased as children got older.<sup>6</sup> In our study there were more boys (57%) than girls, which matches Karia et al's findings where boys were 191 (53.8%).<sup>6</sup> A study by Babusabgari et al comprised nearly equal numbers of male (49.3%) and female (50.7%) under-

five children.<sup>3</sup> Most participants in this study were from Mumbai (95.1%), showing urban children are more exposed to digital devices. This aligns with research by Raje and Mohite et al, where 92.5% of children in urban areas had access to digital screens.<sup>7</sup> In contrast, studies by Arantes and Morais et al suggest that children in rural areas have different media habits, often influenced by their parents' education and financial status.<sup>8</sup> The typical family size in this study was five members. While this could provide a supportive environment, the loss of a parent due to divorce or death might create instability, affecting how children use digital media. Over half (53.3%) were only children, with no siblings and Most families (56%) followed a nuclear family structure. Research by Paulus et al suggests that children with siblings tend to spend less time on screens, possibly because they share devices and engage in more social activities.<sup>9</sup> In the study the education level of parents also played a role in children's media use. In this study, 38% of mothers and 33% of fathers had only primary education. This lower level of education may

make it harder for parents to monitor their children's screen time effectively. Sandborg et al, showed that parents with higher education levels are more engaged in managing their children's digital habits. Single parents, especially those who have lost a spouse, may rely more on digital media for entertainment and education due to time constraints.<sup>10</sup> Research by Karia . et al, supports this, as children from nuclear families had higher screen exposure.<sup>6</sup> However, Darni & Perdana et al, emphasize that strong parental involvement and digital literacy can help reduce the risks of excessive media use.<sup>11</sup>

In our study a significant difference in employment between mothers and fathers. About 93.2% of mothers were unemployed, while 65.4% of fathers worked in skilled jobs, reflecting traditional gender roles. In contrast to this the study by Babusabgari et al 46.7% of mothers were homemakers, while 30.7% were engaged in labor work.<sup>3</sup> Laws et al found that unemployed mothers may have less awareness of digital parenting strategies, affecting management of their children's screen time.<sup>12</sup>

In our study, average family income was Rs.19,185.7, with some families earning much more or much less. Income can influence children's digital media habits, as shown in research by Darni & Perdana et al which links parental occupation and financial status to children's media use.<sup>11</sup> However, Yaman et al found that digital parenting awareness is not always tied to income, suggesting that cultural factors also play a role.<sup>13</sup> In this study most households own at least two digital devices, showing a high level of digital access. A study by Briggs et al, explains that households have different ways of using technology, with some members sharing devices while others may have limited access due to restrictions or family rules.<sup>14</sup> Research by Bano et al shows that factors like income, education and employment influence whether families can afford digital devices.<sup>15</sup> Similarly, Pei's research suggests that while digital access can improve a family's financial situation, it can also increase economic inequality, highlighting the ongoing "digital divide."<sup>16</sup>

In our study children spent an average of 72.3 minutes per day on screens, with a median of 60 minutes. This means that many children exceed the recommended screen time limits. 21.1% spent more than an hour on screens, showing a trend toward higher usage. A similar study by Raje & Mohite found that over 60% of children exceed recommended screen time limits, with factors like family structure and income playing an important role.<sup>7</sup> The COVID-19 pandemic has further increased screen time as children relied more on digital devices for learning and entertainment. While excessive screen time is a concern, it's also important to recognize that digital media can have benefits if used wisely. In this study, 49.2% of children had excessive screen time. The highest screen use was seen in children aged 1-2 years, with 82.4% exceeding the recommended limits, a statistically significant finding ( $p=0.002$ ). Infants under one year and children aged 4-5 years had lower screen time. Children with excessive

screen exposure started using screens earlier, at around 12 months, compared to 18 months for others. The study also found that children who had access to three or more digital devices had a 100% chance of excessive screen time, showing a strong link between device availability and usage. However, unlike a study by AC & Kardalkar in Karnataka, did not find a significant link between the number of devices at home and screen time ( $p=0.109$ ).<sup>17</sup> This suggests that more number of devices will not always result in excessive screen time.

A study by Karia et al in Western Uttar Pradesh showed 62.5% of children exceeded two hours of daily screen time, with smartphones being the most common device. Higher screen use was seen in nuclear families and urban areas.<sup>6</sup> Another study by Oliveira & Pereira emphasized that too much screen time can negatively affect children's motor and cognitive skills, with even one hour potentially having harmful effects.<sup>18</sup> Although slightly more girls (54.5%) had excessive screen time, this difference was not statistically significant ( $p=0.07$ ). A study by Paulus FW et al, found no significant differences in screen time between boys and girls, highlighting that this trend may not apply to all populations.<sup>9</sup> This finding differs from a study by Buchkova et al and Karia et al , which found gender differences in screen usage.<sup>6,19</sup> However, socioeconomic status did play a role, with children from upper-class families having the highest screen time (63.6%,  $p=0.043$ ). Interestingly, a mother's employment status did not significantly affect children's screen time ( $p=0.348$ ), suggesting that working mothers do not necessarily lead to higher screen exposure for their children.

In the study 89.6% of parents were aware of the content their children watched, showing that most parents pay attention to their child's media consumption. However, only 32.4% of children watched educational content. Similarly, a study by AC & Kardalkar found that only 33.33% of children followed the World Health Organization's (WHO) screen time recommendations.<sup>14</sup> Additionally children aged 2-4 years had the highest screen time (76.27%), suggesting that this age group is more likely to engage with non-educational content. and 58.7% of parents did not set limits on screen time, which is concerning. This finding is similar to the study by Shakya et al which found that excessive screen time was linked to a lack of parental control.<sup>20</sup> On the other hand, a study by Karia et al, found that more parents followed screen time recommendations, showing that parenting styles vary across different regions.<sup>6</sup>

One possible reason for these trends is socioeconomic status. Families with fewer resources or entertainment options may use screens as a way to keep children entertained or for babysitting. Also, with more digital devices and content available, some parents struggle to set limits and may not be able to discipline theirs and child's screen time. In the study children who spent time on screens were more likely to show behavioural changes, among all children with screen time, 17.4% had

behavioural issues and this number rose to 24.9% for those with excessive screen time. In the study by Ilamparithi et al rural boys were more likely to experience emotional issues when their screen use surpassed two hours, while urban boys were more likely to experience conduct issues, hyperactivity/inattention, peer issues and pro-social issues. Rural females had behaviour issues, while urban girls had hyperactive and peer issues.<sup>21</sup> A study by Priya et al found that there was a significant correlation between screen time and behavioural issues and delayed language development along with increased visual issues.<sup>22</sup>

This study shows a strong link between screen time and excessive crying. 12.8% of those with any screen time exposure reported it. This number increased to 18% among those with excessive screen exposure. A study by Rajalakshmi et al found that too much screen time can lead to behavioural problems, including delayed language development and learning difficulties, leading to increased crying and emotional distress. Additionally, 57.1% of children in the study did not engage in outdoor play on weekdays. Lack of physical activity and social interaction, combined with excessive screen time, may contribute to emotional and behavioural issues in young children.<sup>23</sup>

This study shows a strong connection between screen time and aggressive behaviour. The rate of aggression was even higher (9%) in children with excessive screen time, compared to just 1% in those with lower screen use ( $p < 0.0005$ ). A study by Karia et al also found that excessive screen time contributed to behavioural issues, particularly in urban children.<sup>6</sup> On the other hand, Raje & Mohite observed that children with more educated parents had higher screen time, suggesting that parental involvement might influence how screen time affects behaviour.<sup>7</sup>

This study shows that excessive screen use negatively impacted sleep in children under five ( $p = 0.014$ ), likely due to factors such as the type of content, timing of use and level of interaction with the device. These findings are consistent with study by Jesmine et al from Bangladesh.<sup>24</sup> Another study by AC & Kardalkar in India suggested that family structure and the number of devices in a home can indirectly affect sleep patterns.<sup>14</sup> However, findings from Hale et al, suggest that moderate screen use does not always impact sleep, highlighting differences in study methods, sample sizes and cultural habits.<sup>25</sup>

The hospital-based sample may not represent the general population, limiting the generalizability of the findings. Cross-sectional design prevents determination of causal relationships between sociodemographic factors and digital media use. Parental self-reporting may introduce recall and social desirability bias in estimating children's screen time. Language development and potential developmental delays were not assessed in the study and children were not referred for further evaluation due to limitation in time.

## CONCLUSION

The study findings suggests that factors like family structure, socioeconomic background and access to multiple devices play important a role in screen exposure and digital media usage by younger children. Greater access to digital devices, younger age, lower paternal education and earlier initiation of screen use were significantly associated with higher screen-time. Excessive screen time is linked to behavioural problems, including aggression, excessive crying and sleep disturbances. The rise of digital media in children's lives especially during the COVID-19 pandemic has also contributed to these trends. However, not all screen time is harmful. Encouraging a balance between screen time, physical activity, quality content and parental supervision can help reduce the negative impact on child development. This highlights the importance of finding a balanced approach to screen time in early childhood fostering healthy overall development.

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