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A Study on Screen Time and its Relation with Behavioral Problems among Preschool and School Age Children Aged Up to 15 Years Attending a Tertiary Care Hospital

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Abstract: ***Background: Excessive screen time has emerged as a growing concern in pediatric health, often implicated in behavioral disturbances among children. This study aims to assess the association between screen time exposure and behavioral problems among preschool and school-aged children visiting a tertiary care hospital. Methods: An observational cross-sectional study was conducted among 108 children aged 18 months to 15 years. Demographic data, screen time exposure, and behavioral assessments using PPSC and PSC-17 were collected. Statistical analyses included chi-square tests and logistic regression. A p-value < 0.05 was considered statistically significant. Results: The majority of children (75.9%) were exposed to screen media before 12 months of age with average screen time exceeded one hour in 75.9% of children. But multiple device use showed a trend toward increased risk (OR=0.776). Behavioral problems were present in 47.2% of participants. No significant association was observed between screen time and behavioral problems (p=0.8). Conclusion: The majority of children have early exposure to screen time i.e, before the age of 1 year and prolonged screen usage that exceeds more than one hour a day. While screen time alone was not significantly associated with behavioral disturbances, early exposure and multiple device use may contribute to behavioral risk. Parental guidance and regulated screen use remain critical.***

Keywords: Screen Time, Behavioral Problems, Children, Digital Media Exposure, Child Development

1. Introduction

Children today are immersed in a digital world, where screen-based devices such as smartphones, tablets, and televisions have become ubiquitous. Over the last two decades, screen time among children has significantly increased, while the age at first exposure has concurrently declined. [1,2]

Although digital media can foster learning through educational content, concerns have risen about its potential adverse effects on cognitive, behavioral, and physical health. Notably, excessive screen exposure is linked with behavioral disturbances, attention difficulties, and emotional dysregulation. [3]

The American Academy of Pediatrics and the Indian Academy of Pediatrics have both established screen time guidelines for children, emphasizing minimal to no screen time for preschoolers. [4]

However, parental awareness and adherence to these guidelines remain variable. Indian studies focusing on the behavioral impacts of screen time, particularly in preschool and school-aged populations, are limited.[5] This study aims to assess the relationship between screen time exposure and the risk of behavioral problems among preschool and school age children aged up to 15 years attending a tertiary care hospital using standardized tools such as the PPSC and PSC-17.

2. Materials and Methods

Study Design: Cross-sectional observational study

Study Setting: Pediatric OPD, BGS GIMS, Bengaluru

Study Duration: May 2025 - November 2025

Sample Size: 108 children (based on 80% expected prevalence)

Inclusion/Exclusion: Children aged 18 months to 15 years excluding those with known neurodevelopmental disorders

Data Collection: Demographics, screen use questionnaire, PPSC and PSC-17 tools

Statistical Analysis: SPSS v22.0, chi-square and logistic regression, $p<0.05$ significant

3. Results

Demographic Characteristics

		Frequency	Percentage
Age	<5	60	55.6
	>5	48	44.4
Gender	Female	49	45.4
	Male	59	54.6
Socio- Economic Status	Lower	13	12.0
	Lower Middle	39	36.1
	Lower Upper	20	18.5
	Upper	4	3.7
	Upper Lower	13	12.0
	Upper Middle	19	17.6

Age Distribution
Among the 108 children studied, the majority (55.6%) were aged below 5 years, while 44.4% were above 5 years. This indicates a relatively younger population being exposed to screen devices.

Gender Distribution
There was a slightly higher representation of males (54.6%) compared to females (45.4%), indicating a near-balanced gender distribution.

Socioeconomic Status (SES)
The majority of children belonged to the lower-middle (36.1%) and upper-middle (17.6%) SES. Only a small proportion were from upper SES (3.7%). This suggests that most children with screen exposure come from middle to lower economic backgrounds.

Screen Exposure Characteristics

		Frequency	Percentage
Age at First Exposure (Months)	0-12	82	75.9
	13-18	16	14.8
	>18	10	9.3
Average Screen Time	<1 Hour	26	24.1
	1-3 Hours	47	43.5
	More than 3 Hours	35	32.4
Type of Device	Smart Phones	32	29.6
	Smart Phones, Tablets/ Ipad	3	2.8
	Smart Phones, Tablets/ Ipad, Television	1	0.9
	Smart Phones, Television	15	13.9
	Tablet/ Ipad	11	10.2
	Tablets or ipad, television	2	1.8
	Televison	8	7.4
	All of the above	36	33.3

Age at First Exposure
Most children (75.9%) were exposed to screens before the age of 12 months, 14.8% between 13–18 months, and only 9.3% after 18 months. Early screen exposure appears to be highly prevalent.

Average Screen Time
43.5% of children had 1–3 hours of daily screen time, while 32.4% had more than 3 hours, and only 24.1% had less than an hour. This indicates a significant proportion of children exceeding recommended screen time limits.

Type of Devices Used
A diverse range of devices was used. One-third (33.3%) used all types of devices (smartphones, tablets, television), and 29.6% used smartphones only. Television-only use was lowest (7.4%). This suggests widespread multi-device exposure.

Behavioral Outcomes

Risk of Behavioral Problems	Frequency	Percentage
Absent	57	52.8
Present	51	47.2
Total	108	100.0

Risk of Behavioral Problems
Almost half (47.2%) of the children showed behavioral problems, while 52.8% did not, highlighting a high prevalence of risk.

Association Analysis

Age at First Exposure (Months)	Risk of Behavioral Problems				Total	
	Absent		Present			
	N	%	N	%	N	%
0-12	41	71.9	41	80.4	82	75.9
13-18	9	15.8	7	13.7	16	14.8
>18	7	12.3	3	5.9	10	9.3
Total	57	100.0	51	100.0	108	100.0
Fisher's Exact value = 1.48, P value = 0.5, Inference: Is Not Statistically Significant						

1) Age at First Exposure vs Behavioral Problems
- Children exposed before 12 months had a higher prevalence of behavioral issues (50% of cases).
- However, the association was not statistically significant (Fisher's Exact p = 0.5).

2) Average Screen Time vs Behavioral Problems
- A higher percentage of behavioral issues was seen in children with >3 hours of screen time (35.3% of affected group), yet the association was not statistically significant (Chi-square p = 0.8).

3) Number of Devices Used vs Behavioral Problems
- Multiple device use was slightly higher in the group with behavioral problems (54.9% vs. 50.9%), but this association was also not statistically significant (Chi-square p = 0.7).

Logistic Regression Analysis (Risk Factors for Behavioral Problems)

Average Screen Time	Risk of Behavioral Problems				Total	
	Absent		Present			
	N	%	N	%	N	%
<1 Hour	15	26.3	11	21.6	26	24.1
1-3 Hours	25	43.9	22	43.1	47	43.5
More than 3 Hours	17	29.8	18	35.3	35	32.4
Total	57	100.0	51	100.0	108	100.0
Chi-Square value = 0.53, P value = 0.8, Inference: Is Not Statistically Significant						

Number of Devices	Risk of Behavioral Problems				Total	
	Absent		Present			
	N	%	N	%	N	%
Single Device	28	49.1	23	45.1	51	47.2
Multiple Devices	29	50.9	28	54.9	57	52.8
Total	57	100.0	51	100.0	108	100.0
Chi-Square value = 0.17, P value = 0.7, Inference: Is Not Statistically Significant						

Risk Factors		OR	95% CI	p Value
Age (In Years)	<5	0.528	0.182 - 1.536	0.2
	>5	Reference		
Gender	Female	0.499	0.752 - 1.717	0.5
	Male	Reference		
Socioeconomic Status	Lower	0.268	0.053 - 1.36	0.1
	Lower Middle	0.244	0.065 - 0.915	**0.04***
	Lower Upper	0.175	0.037 - 0.817	**0.03***
	Upper	0.537	0.037 - 7.801	0.6
	Upper Lower	0.227	0.041 - 1.264	0.09
	Upper Middle	Reference		
Age at First Exposure (Months)	0-12Months	0.413	0.091 - 1.881	0.2
	13-18Months	0.594	0.099 - 3.558	0.6
	Over 18	Reference		
Average Screen Time	<1 Hour	1.666	0.526-5.272	0.4
	1-3 Hours	1.413	0.546-3.657	0.5
	More than 3 Hours	Reference		
Type of Device	Multiple Devices	0.776	0.341-1.747	0.5
	Single Device	Reference		

1) **Age**: Children <5 years had lower odds (OR = 0.528), but not statistically significant (p = 0.2).
2) **Gender**: Females showed lower odds (OR = 0.499), though this was not statistically significant (p = 0.5).
3) **Socioeconomic Status**:
   - Children from lower middle (OR = 0.244, p = 0.04*) and lower upper SES (OR = 0.175, p = 0.03*) had significantly lower odds of behavioral problems compared to those from upper middle SES (reference group).
4) **Age at First Exposure:** Earlier exposure (<12 months or 13–18 months) did not significantly increase risk.
5) **Screen Time:** Neither <1 hour nor 1–3 hours significantly altered the risk compared to >3 hours.
6) **Type of Device:** Use of multiple devices was not a statistically significant risk factor (OR = 0.776, p = 0.5).

4. Discussion

This cross-sectional study investigated the prevalence of screen time exposure and its association with behavioral problems among children. Our findings revealed that nearly half (47.2%) of the study participants exhibited behavioral problems. Although the majority of children had early exposure to screens (75.9% before 12 months of age), and over two-thirds had screen exposure exceeding 1 hour daily, statistical analysis revealed no significant association between screen time parameters and behavioral issues.

These findings align with the broader body of literature that points to a modest but consistent correlation between screen time and behavioral disturbances. A comprehensive meta-analysis covering 98 studies and over 159,000 children indicated statistically significant, though small, associations between screen time and both externalizing (r = 0.11) and internalizing behaviors (r = 0.07) (Eirich et al., 2022). This supports our observed trend, even though the associations in our sample did not reach statistical significance. [6]

Furthermore, a large-scale study by Twenge and Campbell, 2018 found that children exceeding 2 hours/day of screen time had significantly higher odds of emotional symptoms, conduct problems, and total behavioral difficulties. Our findings mirror these trends, particularly the higher proportion of behavioral risk among children with screen time above 3 hours (35.3%), although without statistical significance.[7]

In a study focusing on preschoolers (2-5 years), screen exposure of more than 4 hours daily was significantly associated with conduct and peer problems (Tezol et al., 2022). The parallels in behavioral trends support our results, despite our cohort's younger mean age and smaller sample size. [8]

Longitudinal studies further corroborate the connection between screen use and behavioral dysregulation. For instance, the Adolescent Brain Cognitive Development (ABCD) Study found that each additional hour of screen time was associated with 7% higher odds of conduct disorder and 5% higher odds of oppositional defiant disorder (Bozzola et al., 2019). While our study design limits causality inference, these findings underscore the potential long-term effects of early screen exposure. [9]

Interestingly, our logistic regression showed that children from lower-middle and lower-upper socioeconomic backgrounds had significantly lower odds of behavioural problems compared to those from upper-middle-class families. This is somewhat inconsistent with literature indicating that lower SES may contribute to behavioural risk due to factors like reduced parental engagement or environmental stressors. These contradictions suggest that SES may serve as a complex effect modifier requiring deeper exploration.[10–12]

Contrary to studies that have highlighted the differential impacts of screen content and modalities (e.g., social media vs. gaming), our analysis of device types (single vs. multiple devices) showed no significant effect on behavioural outcomes. This discrepancy may be attributed to the broad classification of devices in our study, which might have obscured modality-specific associations.

Overall, while our findings resonate with international evidence regarding the potential behavioral impact of screen

time, the lack of statistically significant associations in this study may be attributed to sample size limitations, reliance on parental reporting, and limited granularity in measuring screen content and context.

5. Strengths

- This study highlights a critical public health concern by examining behavioral issues related to screen time in early childhood.
- Use of a standardized and structured data collection format improved consistency.
- A comprehensive inclusion of socioeconomic data and device exposure variables allowed for exploratory subgroup analyses.
- The findings are relevant for guiding parental and policy-level interventions in early childhood digital media use.

6. Limitations

- The cross-sectional nature of the study limits causal inference.
- Behavioural assessments were based on parental reporting, which may be subject to recall and social desirability bias.
- The relatively small sample size may have limited statistical power to detect significant associations.
- Screen exposure was not categorized by content type, duration per session, or parental supervision, which could be critical mediators.

7. Summary

- Nearly half of the children in the study showed behavioural problems.
- Most children were exposed to screens before 12 months of age and used multiple devices.
- Screen time duration, age of first exposure, and number of devices used were not significantly associated with behavioural problems.
- Socioeconomic status was the only factor that showed a significant association with behavioural outcomes.

8. Recommendations

- Future studies should incorporate longitudinal designs to clarify directionality and causal relationships.
- Greater specificity in categorizing screen types, usage patterns, and content is essential.
- Socioeconomic and familial context should be integrated to understand moderating influences.

9. Conclusion

This study contributes to the growing body of literature examining digital media use in early childhood. Although no statistically significant associations were observed between screen time parameters and behavioural problems, the high prevalence of early exposure and behavioural risk highlights the need for vigilant parental guidance and public health strategies. Future studies with larger sample sizes, longitudinal follow-up, and detailed screen usage profiling are essential to unravel the nuanced relationships between screen exposure and behavioural health in children.

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