

PARENTAL AWARENESS OF CHILDREN'S GADGET EXPOSURE AND ITS IMPACT ON THEIR BEHAVIOUR AND DEVELOPMENT

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Abstract

Background: The significant dependence of children on screen media has sparked considerable public health concerns owing to its potential to adversely affect their motor, language, and socio-emotional development. This study explored the level of knowledge among parents and the consequence of prolonged screen exposure in the child's behaviour. **Methods:** A cross-sectional study was conducted over a year in Saveetha medical college, Thandalam, involving 75 participants both inpatient and from the outpatient clinic. Data on demographic variables, screen usage, behaviour, and developmental issues were collected through self-reported questionnaires and analysed using SPSS. **Results:** The majority of children were in the 4–6 years age group (48%), with mobile phones being the most used device (65.3%). Parental supervision was reported by 37.3%, and recreational content was the most watched (49.3%). Behavioural issues, such as temper tantrums (24%) and developmental issues such as delay in eye contact (17.3%), were noted predominantly. No significant correlations were found between screen time and demographic/behavioural outcomes. A significant difference ($p = 0.032$) was reported for the type of content watched, including recreational content (56.7%) among exposure, followed by educational content (40%), and social media (3.3%). **Conclusion:** While the age and content type had some influence on the perceived usefulness of screen time, factors such as gender, socioeconomic status, and parental education did not significantly affect the outcomes. This study highlights how various factors interact in understanding the impact of screen exposure on child development, stressing tailored interventions, and parental screen awareness. The usefulness of screen exposure based on content type highlights the importance of considering the content when evaluating the impact of screen time on children.

Keywords: Mobile Phones, Developmental And Behavioural Delay, Parenting Style, Screen Exposure Time, Digital Learning, Children.

INTRODUCTION

Screen time refers to the duration an individual spends using electronic devices with screens, such as televisions, computers, tablets, game consoles, and smartphones.¹ The last two decades have witnessed a surge in mobile phones and computers, intensifying our dependence on these devices in our daily routines.² Notably, children are among the most ardent users of technology.³ Establishing healthy habits, such as regular physical exercise and adequate sleep, is recognised as a crucial factor linked to improved health and psychosocial well-being in children and adolescents.⁴⁻⁶ Previous research has highlighted connections between screen time and reduced physical activity, adverse effects on mental health, and shorter sleep periods.⁷ The

use of devices such as TVs, laptops, smartphones, and tablets can detrimentally impact children's health by promoting illness and diminishing physical activity levels.

Excessive technology use in children is correlated with an increased risk of obesity, type 2 diabetes, and various medical and psychological issues.^{8,9} Notably, in prekindergarten children, extended exposure to screen-based media is associated with decreased microstructural integrity in brain white matter tracts that support language and literacy skill development.¹⁰ Furthermore, studies have indicated that prolonged screen time is linked to heightened behavioural problems in children.¹¹ An article from 2019 underscored the pivotal role of the home environment in fostering physical inactivity and escalating screen time, which is closely associated with childhood overweight and obesity. Parents, although concerned, often lack confidence in effectively managing their children's screen time and related behaviours.¹²

Parents' concerns regarding the risks associated with their children's screen media usage prompted them to establish rules to limit their screen time. Studies by Schary et al. and Valcke et al. have highlighted that an authoritative parenting style, characterised by warmth and control, is commonly adopted.^{13,14} In a study conducted in Singapore by Goh et al., it was noted that children typically seek parental permission before using tablet devices and screen-based device usage is often permitted only after completing homework.¹⁵ However, as children grow older and gain more independence in device usage and decision-making, parents find it increasingly challenging to regulate their screen time, leading to conflicts, as stated by Jago et al.¹⁶ This disagreement between parents and older children regarding screen time restrictions, as noted by Erickson et al. and Nikken et al., can be perceived as an addictive behaviour by parents, further contributing to conflicts.^{17,18}

Beyens et al. observed that children subjected to high levels of restrictive mediation regarding screen usage tend to have more conflicts with their parents than those with fewer restrictions.¹⁹ Matthes et al. found that excessive parental screen usage strongly predicted a lack of control over children's screen time, resulting in inconsistent rules, emotional reactions, and conflicts. Some parents also express a sense of reduced ability to guide their children as they grow older and engage with increasingly captivating screen media content, while others feel that they lack understanding of these technologies themselves.²⁰ However, there is limited data available on the perception of Indian parents concerning the excessive use of modern devices among children.

This cross-sectional study aimed to identify and compare the parameters useful for screening devices among children and assess the outcomes of each parameter. This is one of the first studies conducted in the Indian population to assess the knowledge among parents and overall risk and outcomes of using mobile and other devices.

MATERIALS AND METHODS

This cross-sectional study was conducted for 1 year (January 2023 to January 2024) after obtaining ethical approval from the ethics committee of the tertiary care centre. The targeted population consisted of parents and children aged 1–10 years who attended Saveetha medical college and hospital for treatment/consultation. All enrolled parents provided consent and assent to their children after a brief explanation of the study. Data were collected using a self-report questionnaire which was evaluated by the authors.

Data Collection:

- **Participants:** A cross sectional involving 75 participants from the Indian population, including children aged 1–10 years and their parents.
- **Data Source:** Data on age group, sex, socioeconomic status (SES), education level of children and parents, type of device used, parental supervision, content watched, behaviour noticed with screen exposure, developmental problems, and the perceived usefulness of screen time were collected.
- **Data Collection Methods:** Surveys and questionnaires were administered to parents to gather information on the aforementioned parameters. Additionally, the screen time and actual screen time were measured and recorded for analysis. Behavioural assessment was done through administration child behavioural checklist to the parents.

Data Assessment:

- **Demographic Parameters:** The demographic parameters included age group, sex, SES, education level of children and parents, type of device used, and parental supervision.
- **Behavioural and Developmental Parameters:** Parameters such as content watched, behaviour noticed with screen exposure, developmental problems, and perceived usefulness of screen time were assessed.
- **Screen Time Parameters:** Screen time and actual screen time were assessed to understand the duration of device usage among children and their impact.

Statistical Analysis:

Statistical analyses were performed using SPSS version 22.0.

- **Descriptive Statistics:** Descriptive statistics, such as mean, standard deviation, number of patients, and percentage, were calculated for demographic parameters, behavioural and developmental parameters, and screen time parameters.
- **Inferential Statistics:** Inferential statistics, including t-tests and analysis of variance (ANOVA), were conducted to compare means between different groups based on age group, gender, SES, education level, type of device used, parental supervision, content watched, behaviour noticed with screen exposure, developmental problems, and perceived usefulness of screen time.
- **Correlation Analysis:** Correlation analysis was performed to examine the relationships between screen time variables and behavioural/developmental outcomes.

RESULTS

A total of 75 children were assessed, of whom 22 were aged 1–3 years (29.3%), 36 were aged 4–6 years (48%), and 17 were aged 7–10 years (22.7%). There were 36 males (48%) and 39 females (52%). Socioeconomic status (SE status) was divided into upper, middle, and lower categories, with nine participants (12%) in the upper category and 33 participants (44%) in the middle and lower categories. Regarding education, eight children (10.7%) had no formal education, while 26 children (54.6%) were attending preschool and 41 children (54.6%) attended primary school.

Table 1: Demographic characteristics of patients

		Number of Patients (n=75)	Percentage (%)
Age group (years)	1 to 3	22	29.3
	4 to 6	36	48.0
	7 to 10	17	22.7
Gender	Male	36	48.0
	Female	39	52.0
S E status	Upper	9	12.0
	Middle	33	44.0
	Lower	33	44.0
Education	Nil	8	10.6
	Pre school	26	34.6
	Primary School	41	54.6
Parent education	Uneducated	22	29.3
	Primary school	18	24.0
	Higher sec school	19	25.3
	Undergraduate	10	13.3
	Postgraduate	6	8.0
Type of device	Mobile phone	49	65.3
	Digital tab	11	14.7
	Television	10	13.3
	Laptop	5	6.7
Parental supervision	No	47	62.7
	Yes	28	37.3
Content watched	Recreational	37	49.3
	Educational	25	33.3
	Social media	13	17.3

Among the parents, 29.3% were uneducated, 24% had completed upto primary school education, 25.3% had higher secondary school education, and 13.3% were undergraduates and 8% were postgraduates. The children predominantly used mobile phones (65.3%), digital tabs (14.7%), televisions (13.3%), and laptops (6.7%). Parental supervision was reported as no (62.7%) and yes (37.3%), while the content watched included recreational (49.3%), educational (33.3%), and social media (17.3%) [Table 1]. In terms of behaviour noticed with screen exposure, 38.7% exhibited normal behaviour, 13.3% were aggressive or destructive, 8% experienced insomnia, 4% had sibling rivalry, 8% had breath-holding spells, 24% had temper tantrums, and 4% had Increased sedentary attitude. Regarding developmental problems, 66.7% had no issues, 10.7% had a speech delay, 17.3% had a delay in eye contact, and 5.3% had Delay in fine motor development[Table 2].

Table 2: Behavioural patterns in children

		Number of Patients	Percentage
Behaviour noticed with screen exposure	Normal behaviour	29	38.7
	Temper tantrums	18	24.0
	Aggressive/Destructive	10	13.3
	Insomnia	6	8.0
	Breath-holding spells	6	8.0
	Sibling rivalry	3	4.0
	Increased sedentary attitude	3	4.0
Developmental problems	Nil	50	66.7
	Delay in eye contact	13	17.3
	Delay in speech	8	10.7
	Delay in Fine motor	4	5.3
Exposure proven to be useful for the child	Nil	45	60.0
	Primary School	30	40.0

Association and correlation of parameters with screen time

An insignificant difference was reported between gender, parental supervision, exposure to screen proven to be useful, age groups, SES, type of device, content watched, behavioural problems, and developmental problems [Tables 3, 4, and 5].

Table 3: Association of gender, parental supervision, use exposure, and age group with screen time

Gender		Mean	Std. Deviation	P - Value
Screen time	Male	71.25	41.41	0.368
	Female	80.77	49.46	
Parental supervision		Mean	Std. Deviation	P - Value
Screen time	No	75	45.75	0.772
	Yes	78.21	46.43	
Exposure proven to be useful for the child		Mean	Std. Deviation	P - Value
Screen time	No	76.67	47.35	0.913
	Yes	75.5	43.95	
Age group		Mean	Std. Deviation	P - Value
Screen time	1 to 3 years	77.73	37.22	0.12
	4 to 6 years	66.67	45.98	
	7 to 10 years	94.41	51.63	
	Total	76.2	45.72	

Table 4: Association of SES, type of device, and content watched with screen exposure

SES		Mean	Std. Deviation	P - Value
Screen time	Upper	70	38.97	0.86
	Middle	79.09	48.21	
	Lower	75	45.93	
	Total	76.2	45.72	
Actual screen time	Upper	2.89	1.9	0.69
	Middle	3.27	1.75	
	Lower	3.45	1.75	
	Total	3.31	1.76	
Type of device		Mean	Std. Deviation	P - Value
Screen time	Mobile phone	78.67	48.46	0.702
	Digital tab	79.09	47.95	
	Television	72	33.76	
	Laptop	54	37.65	
	Total	76.2	45.72	
Actual screen time	Mobile phone	3.49	1.84	0.171
	Digital tab	2.73	1.56	
	Television	3.7	1.64	
	Laptop	2	0.71	
	Total	3.31	1.76	
Content watched		Mean	Std. Deviation	P - Value
Screen time	Recreational	78.24	44.32	0.92
	Educational	75	51.6	
	Social media	72.69	40.55	
	Total	76.2	45.72	
Actual screen time	Recreational	3.14	1.84	0.52
	Educational	3.6	1.44	
	Social media	3.23	2.09	
	Total	3.31	1.76	

Table 5: Association of behavioural noticed and developmental problems with screen exposure

Behaviour noticed with screen exposure		Mean	Std. Deviation	P - Value
Screen time	Normal behaviour	78.62	49.69	0.835
	Aggressive/destructive	84	60.5	
	Insomnia	55	32.4	
	Sibling rivalry	80	34.64	
	Breath-holding spells	85	39.87	
	Temper tantrums	75.83	42.57	
	Increased sedentary attitude	50	8.66	
	Total	76.2	45.72	
Actual screen time	Normal behaviour	3.48	1.64	0.748
	Aggressive/Destructive	3.4	2.17	
	Insomnia	3.17	1.6	
	Sibling rivalry	2.67	1.15	
	Breath-holding spells	2.67	2.16	
	Temper tantrums	3.56	1.89	
	Increased sedentary attitude	2	0	
	Total	3.31	1.76	
Developmental problems		Mean	Std. Deviation	P – Value
Screen time	Nil	78.9	45.84	0.736
	Delay in speech	82.5	51.96	
	Delay in eye contact	64.62	46.39	
	Delay in fine motor	67.5	37.75	
	Total	76.2	45.72	
Actual screen time	Nil	3.34	1.8	0.766
	Delay in speech	3.13	1.55	
	Delay in eye contact	3.54	1.94	
	Delay in fine motor	2.5	1	
	Total	3.31	1.76	

Factors affecting the outcome of screen exposure

Age group analysis revealed no significant differences ($p = 0.578$).

Table 6: Comparison of demographic data and other factors with outcome

		Exposure proven to be useful for the child		P value
		No	Yes	
Age Group	1 to 3 years	13 (28.9%)	9 (30%)	0.578
	4 to 6 years	20 (44.4%)	16 (53.3%)	
	7 to 10 years	12 (26.7%)	5 (16.7%)	
Gender	Male	20 (44.4%)	16 (53.3%)	0.45
	Female	25 (55.6%)	14 (46.7%)	
S E status	Upper	5 (11.1%)	4 (13.3%)	0.744
	Middle	19 (42.2%)	14 (46.7%)	
	Lower	21 (46.7%)	12 (40%)	
Parent education	Uneducated	22 (48.9%)	10 (33.3%)	0.561
	Primary school	9 (20%)	9 (30%)	
	High sec school	11 (24.4%)	8 (26.7%)	
	Undergraduate and Postgraduate	3 (6.7%)	3 (10%)	
Type of device	Mobile phone	31 (68.9%)	18 (60%)	0.194

	Digital tab	8 (17.8%)	3 (10%)	
	Television	5 (11.1%)	5 (16.7%)	
	Laptop	1 (2.2%)	4 (13.3%)	
Parental supervision	No	28 (62.2%)	19 (63.3%)	0.922
	Yes	17 (37.8%)	11 (36.7%)	
Content watched	Recreational	20 (44.4%)	17 (56.7%)	0.032
	Educational	13 (28.9%)	12 (40%)	
	Social media	12 (26.7%)	1 (3.3%)	
Behaviour noticed with screen exposure	Normal behaviour	19 (42.2%)	10 (33.3%)	0.56
	Aggressive/Destructive	5 (11.1%)	5 (16.7%)	
	Insomnia	2 (4.4%)	4 (13.3%)	
	Sibling rivalry	2 (4.4%)	1 (3.3%)	
	Breath-holding spells	4 (8.9%)	2 (6.7%)	
	Temper tantrums	10 (22.2%)	8 (26.7%)	
	Increased sedentary attitude	3 (6.7%)	0	
Developmental problems	Nil	32 (71.1%)	18 (60%)	0.556
	Delay in speech	4 (8.9%)	4 (13.3%)	
	Delay in eye contact	6 (13.3%)	7 (23.3%)	
	Delay in fine motor	3 (6.7%)	1 (3.3%)	

Gender analysis indicated a non-significant difference ($p = 0.45$) in exposure, which proved to be useful for children.

SES analysis showed no significant difference ($p = 0.744$) in exposure, which proved to be useful for children across the upper, middle, and lower categories.

The analysis based on parental education level showed a non-significant difference ($p = 0.561$) in exposure, which proved to be useful for children.

No significant difference was found in the analysis based on the type of device regarding exposure considered beneficial for children. Phones had the highest count at 31 (68.9%), followed by digital tabs at eight (17.8%), televisions at five (11.1%), and laptops at one (2.2%), totalling 45 responses. Among the proven exposures, mobile phones also had the highest count at 18 (60%), followed by laptops at four (13.3%), televisions at five (16.7%), and digital tabs at three (10%), with a total of 30 responses. There was no significant difference between parental supervision and exposure ($p = 0.922$).

Analysis of the observed content showed a significant difference ($p = 0.032$) in exposure, which proved to be useful for children. Among those whose exposure was proven to be useful, 56.7% engaged in recreational content, 40% in educational content, and only 3.3% in social media. This contrasts with the percentages of 44.4% for recreational, 28.9% for educational, and 26.7% for social media, among those where exposure was not proven to be useful.

Examination of behavioural responses associated with screen exposure indicated a lack of statistically significant disparity ($p = 0.56$) concerning the efficacy of exposure for children. Among instances where exposure was deemed beneficial, the rates were 33.3% for normal behaviour, 16.7% for aggressive/destructive behaviour, 13.3% for insomnia, 3.3% for sibling rivalry, 6.7% for breath-holding spells, 26.7% for temper tantrums, and 0% for Increased sedentary attitude. Conversely, in instances where exposure was not deemed beneficial, the rates were 42.2% for normal behaviour, 11.1% for aggressive/destructive behaviour, 4.4% for insomnia, 4.4% for sibling rivalry, 8.9% for breath-holding spells, 22.2% for temper tantrums, and 6.7% for Increased sedentary attitude.

The analysis of developmental problems in children exposed to screens revealed a non-significant difference ($p = 0.556$). Within the group where exposure was proven useful, the percentages were 60% for no developmental problems, 13.3% for delayed speech, 23.3% for delayed eye contact, and 3.3% for Delay in fine motor development. Conversely, in the group in which exposure was not proven useful, the percentages were 71.1% for no developmental problems, 8.9% for delayed speech, 13.3% for delayed eye contact, and 6.7% for Delay in fine motor development [Table 6].

DISCUSSION

Our demographic analysis revealed that a significant proportion of children in the study fell within the 4–6-year-old age group, with 36 children accounting for 48% of the sample. This age group showed the highest percentage of exposure deemed beneficial, with 16 children (53.3%) reporting useful exposure out of 36 in this age range, indicating a potential correlation between age and the perceived usefulness of screen time ($p = 0.578$).

A cross-sectional study conducted by Alkalash et al. reported that more than half of children between three and six years old possess personal electronic devices, a trend that raises concerns about potential addiction issues due to their constant availability. This concern was bolstered by statistically significant findings regarding screen time duration, with 40% of older children spending one to two hours daily on their devices compared to 28% of younger children under three years of age.²¹ In addition, Ghorbani et al., during the COVID-19 pandemic revealed that electronic device usage among children has increased since the pandemic, with 56.6% of those aged three and above increasing their screen time post-pandemic. This surge likely stems from the unique circumstances during COVID-19, such as social distancing measures and the emergence of new online platforms across various educational and professional domains.²² These factors have contributed to making screen exposure a ubiquitous daily activity across all age groups, including children, as evidenced by several studies.^{18,22,23}

Of the 39 female participants, 14 (46.7%) reported beneficial exposure, while 16 (53.3%) out of 36 male participants reported the same ($p = 0.45$). Similarly, socioeconomic status (SES) and parental education levels did not significantly impact the perceived usefulness of screen time. Alkalash et al. reported that the age of children and their screen time habits revealed some interesting patterns. Children aged less than three years, and those aged 3–6 years had a significantly longer screen time.²¹ However, we did not observe a significant difference in these parameters.

Regarding parental education, uneducated parents reported 10 out of 32 (31.3%) beneficial exposures, primary school-educated parents reported 11 out of 18 (61.1%), high school-educated parents reported 8 out of 19 (42.1%), and undergraduate and postgraduate parents reported 3 out of 6 (50%) beneficial exposures ($p = 0.561$). As reported by Vereecken et al. higher education has been associated with better understanding and awareness of child development and parenting practices.²⁴ Alkalash et al. reported that this could be a contributing factor to the relatively good level of knowledge regarding screen time regulation (76.4%, $n = 344$) observed among the parents in this study.²¹

The analysis of the observed content showed a significant difference in exposure deemed beneficial based on the type of content. Recreational content had the highest percentage (56.7%) of exposure deemed useful, followed by educational content (40%) and social media (3.3%). This suggests that recreational and educational content may be more beneficial than social media content in terms of screen time. A study conducted by Nathan et al. reported that children's content consisted primarily of video games, cartoons, and songs. These findings support previous research, indicating that entertainment-related content is popular among young children.²⁵ In a study conducted by Sauce et al., it was emphasized that parents must be aware of the content their children are exposed to, as inappropriate or violent content can hurt their children's behaviour and emotional well-being.²⁶

The type of content can affect various elements, such as the conduct of adult caregivers during screen time, the suitability of content for the child's age, and the degree of interaction facilitated by the screen.²⁷ Introducing more screen time during early childhood adversely affects language development. Conversely, commencing screen time later in childhood may offer certain advantages.²⁸ In addition, the attributes of videos, their content, and the practice of co-viewing contribute to shaping language development. Nevertheless, other studies have highlighted detrimental effects on speech, language abilities, motor skills, and social development.^{22,25}

Limitations

- **Sample Size and Demographics:** The study included a specific population from India, limiting the generalisability of the findings to other cultural or geographical contexts. Additionally, the sample size may not be representative of the entire population of children aged 1–10 years old.
- **Self-Reported Data:** The collected data relied on self-reported information from parents, which may be subject to recall bias or social desirability bias, potentially influencing the accuracy of responses.
- **Parental Factors:** The study did not extensively explore parental attitudes, beliefs, or practices related to screen time, which can play a significant role in children's screen use behaviours and outcomes.
- **Short-Term Observation:** The study's duration was limited to one year, providing a snapshot of screen time and its effect on children over a short duration, follow up will be needed to look for the long term effects of prolonged screen time on the child's overall development.

CONCLUSION

This study on parental knowledge and the impact of screen time on children's behaviour highlighted significant findings, emphasising the importance of tailored interventions and parental awareness. Notably, while no significant differences were found in the usefulness of exposure based on demographic factors, there was a significant association between the type of content watched and beneficial exposure, with recreational and educational content showing higher percentages of beneficial exposure than social media. These results underscore the need for targeted strategies to mitigate the potential adverse effects of screen exposure on children's well-being.

Financial or other competing interest

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Conflict of interest

No conflict of interest

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