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RESEARCH PAPER

Effect of Prolonged Screen Time in Children: Developmental and Behavioral Concern

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Abstract

Background: Prolonged screen time (time spent on digital devices) among children has become a global concern due to its detrimental effects on their development and behavior.

Objective: This study investigated the adverse effects of prolonged screen time in children.

Methods: A cross-sectional survey was conducted among 153 parents from Defence Services Command and Staff College, Mirpur Cantonment, Dhaka, Bangladesh; who had at least one child aged 1 to 12 years. Data were collected during August to October 2022 from the parents about their children's screen time, developmental and behavioral issues by using a self-administered questionnaire. Statistical analysis included descriptive methods and the Chi-square test, with a significance threshold of p-value ≤0.05.

Results: The mean age of the participants (parents) was 32.99 ± 3.49 years, majority being women (66%). Female parents and parents who were homemaker or had higher educational background, more likely reported their children to be on excessive screen time. In 56% of cases, no adverse developmental or behavioral issues were observed. Parents identified speech delay (17%), aggressive behavior (13%), poor communication (9%), hyperactivity (7%), screen addiction for feeding (7%), vision problems (4%), inattention to study (4%) and sleep disturbances (3%) as common adverse effects of excess screen time exposure in their children. Aggressive behavior, poor communication, addiction on screens during feeding were found strongly associated with prolonged screen time (≥2 hour per day) use in children. Children of most participants (87%) had access to smartphones, with 52% usage reported for recreational purpose.

Conclusion: The growing prevalence of excessive screen use among children in Bangladesh is associated with various developmental problem (speech delay and poor communication) and behavioral changes (aggressive behavior, hyperactivity, screen addiction for feeding, visual & sleep disturbance, inattention to study). Parents should play the pivotal role in managing screen time to mitigate these negative outcomes.

Keywords: Screen time, children's developmental problem, behavioral changes

Introduction

In today's world, digital devices and media play a central role in everyday life.[1] Children are increasingly exposed to digital media at younger ages and for longer durations, particularly in affluent households with internet-connected devices.[2] While technology has revolutionized learning, communication, and information sharing, excessive or inappropriate digital media use can negatively impact children's overall health.[1]

Screen time refers to the time spent using digital devices such as televisions, computers, tablets, smartphones, and gaming consoles.[3] The World Health Organization (WHO) and the American Academy of Pediatrics (AAP) recommend limiting screen time to no more than one hour per day for children aged 2-4 years, ideally with parental supervision.[4] The AAP discourages screen exposure for children under two, while National Institute of Health and Care Excellence (NICE) advises restricting leisure screen time to under two hours for all children.[5,6] However, these guidelines are frequently ignored. A national survey conducted in 2017 in the United States revealed that 46% of children under two had been exposed to mobile screens.[7] Similar trends are observed in Asia, where screen time among young children is prevalent in high- and middle-income households.[8]

Children, due to their developing cognitive abilities and limited critical thinking skills, are more vulnerable to

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digital media's negative effects.[9] Pediatric experts highlight concerns about its impact on language acquisition, as excessive screen time reduces parent-child interactions crucial for early language development. Research indicates that high screen exposure may delay language skills and impair communication abilities in young children.[3]

Physically, excessive screen time promotes a sedentary lifestyle, increasing risks of obesity, poor muscle development, and musculoskeletal problems such as neck, back, and wrist pain, along with vision-related issues like eye strain.[1,10] In the long run, it may contribute to serious health problems such as hypertension, high cholesterol, and cardiovascular diseases in adulthood.[11] Additionally, children engaged in prolonged screen use often consume unhealthy, sugary foods, increasing the likelihood of dental issues.[12]

Beyond physical and mental development, excessive screen exposure can lead to behavioral challenges. Studies link prolonged screen time to hyperactivity, aggression, reduced attention span, and attention deficit hyperactivity disorder (ADHD).[9] Children who spend more time on screens may struggle with impulse control and emotional regulation. Mental health issues like mood disorders including suicidal thoughts, sleep disturbances, and poor academic performance have also been connected to prolonged screen time in adolescents. [11,13] Thus more than two hours of screen time per day can have significant developmental and behavioral consequences for children.[6]

Bangladesh ranks 9th globally in internet usage, with 75.9% of its population online.[14] Urban children, especially in Dhaka, are increasingly exposed to screens due to changing social dynamics, such as the rise of nuclear families, working parents, digital-based education, and fewer outdoor play opportunities. However, research on screen time and its effects on Bangladeshi children remains limited compared to studies in Western countries.

Parental awareness and perceptions play a crucial role in managing children's screen exposure. As the primary influencers in their children's lives, parents must recognize the risks associated with excessive screen time and take proactive measures to mitigate its negative effects. This study aims to explore Bangladeshi parents' views on effect of excessive screen use on children's development and behavior. Understanding their awareness and concerns will help identify potential risks and guide effective interventions to promote balanced and healthy screen habits for children.

Materials and Methods

This cross-sectional observational study was conducted at the Defence Services Command and Staff College, Mirpur Cantonment, Dhaka, Bangladesh from August to October 2022. The study selected 153 parents (father/mother) having at least one child aged 1-12 years, by purposive & convenient sampling. Data from the eldest child within this age range was considered in cases of multiple children.

The participants were explained about the study's objectives, confidentiality measures, their rights, and their potential risks/benefits. Written informed consent was obtained, and participation was voluntary. The Institutional Review Board of Combined Military Hospital, Dhaka approved the study, ensuring confidentiality and anonymity. Parents who declined participation or provided incomplete surveys were excluded from study. Parents having no children with screen exposure and children with known developmental disorders like Down Syndrome, neurological disturbances, or congenital vision/hearing impairments were also excluded.

Respondents were interviewed using a structured hard-copy questionnaire in english, ensuring alignment with their academic backgrounds and english proficiency. The questionnaire had two sections. In first part, sociodemographic data addressing information on age, gender, education, income, occupation, family structure, and number of children were collected. Screen time assessment was in the second part which evaluated children's and parents' screen time, device availability, purpose of device use and related adverse effects on children.

Parents reported their child's daily screen usage in hours. The screen time duration of children was divided into less than two hours per day and equal to or more than two hours per day. The exposure of children to different digital devices (desktops, laptops, mobile phones, tablets) were recorded. Parents specified whether screen time of their kids was primarily for academic (e.g., studying, school lectures) purpose or recreational (e.g., social media, entertainment) purposes or both. The developmental and behavioral effects of screen time exposure were assessed through structured questionnaire on speech delay,

poor communication, hyperactivity, aggressive behavior, vision problems, sleep disturbances etc.

Statistical analysis was conducted using IBM SPSS version 26.0. Subjects were categorized into two groups based on the duration of children's screen time (less than 2 hour and more than or equal to 2 hours). Sociodemographic data, developmental & behavioral effects were analyzed between two groups. Descriptive statistics were used to report categorical variables as percentages and frequencies, while quantitative data were presented as means and standard deviations. The chi-square test was used to assess differences between categorical variables and p-value ≤0.05 considered statistically significant.

Results

A total of 153 parents completed the survey where mean age of the parents was 32.99 (± 3.49) years with majority being female (66%). Table I presents the comparison of sociodemographic characteristics between participants with their children having screen exposure 2 hours or more, and less than 2 hours per day. No significant association of screen time duration of children was observed with parental age, monthly family income, number of children, family structure and parental screen time. However, female parents, homemaker parents, parents with higher education found to have significant association (P=0.000) with their children having screen time duration two hour or more (table-I).

Table I: Socio-demographic characteristics of the study (N=153)

Variables	Screen time in children (≥2 hours/day) n (%)	Screen time in children (<2 hours/day) n (%)	P-value
Age of the parents (in years)			0.222
20-30 years	09 (5.9%)	04 (2.7%)	
30-40 years	69 (45.1%)	66 (43.1%)	
>40 years	04 (2.6%)	01 (0.7%)	
Mean ± SD 32.99 ± 3.49			
Gender of the parents			0.000*
Male	05 (3.3%)	47 (30.8%)	
Female	77 (50.3%)	24 (15.7%)	
Educational level of the parents			0.000*
Under graduate	02 (1.3%)	01 (0.7%)	
Graduation completed	22 (14.4%)	45 (29.5%)	
Post graduate	58 (37.9%)	25 (16.4%)	
Occupation of the parents			0.000*
Govt. Employee	09 (5.9%)	07 (4.6%)	
Non-Govt. Employee	10 (6.5%)	01 (0.7%)	
Health professionals	10 (6.5%)	38 (24.9%)	
Homemaker	53 (34.6%)	25 (16.4%)	
Monthly family income			0.265
>50,000 per month	68 (44.4%)	62 (40.5%)	
<50,000 per month	14 (9.2%)	09 (5.9%)	
Number of kids in family			0.393
1 kid	47 (30.7%)	34 (22.2%)	
2 kids	32 (20.9%)	33 (21.6%)	
3 kids	02 (1.3%)	04 (2.6%)	
4 kids	01 (0.7%)	00 (0%)	
Family structure			0.612
Nuclear family	68 (44.4%)	61 (39.8%)	
Joint family	14 (9.2%)	10 (6.6%)	
Screen time of Parents			0.072
<2 hours/day	32 (21%)	18 (11.8%)	
≥2 hours/day	50 (34.6%)	53 (21.6%)	
No idea	02 (1.3%)	01 (0.7%)	

The kids of the respondents were prone to use smartphones (87%), TV/smart TV (58%), tablet (37%), laptop (18%), desktop computer (8%) and gaming console (5%). Ninety six out of 153 parents (63%) expressed that their children used more than one device (figure 1). About half of the parents (52%) reported that their children used devices for recreation purpose followed by academic purpose in 33% cases. 23 parents (15%) reported both recreational and academic use of devices by their children (figure 2).

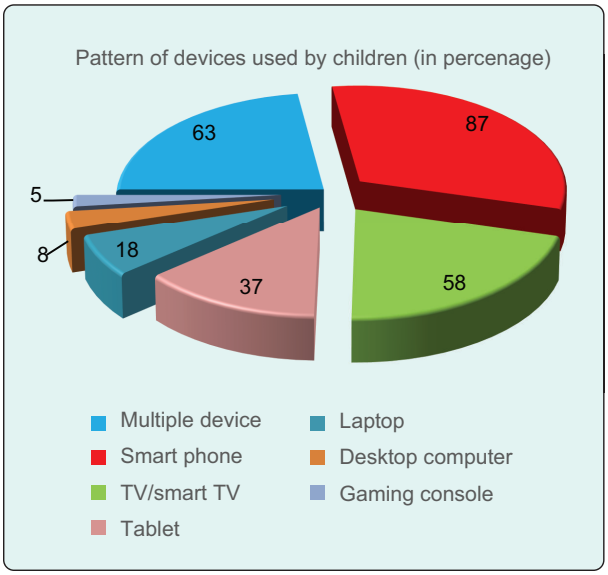

Figure 1: Pattern of device usage by children (parents' view):

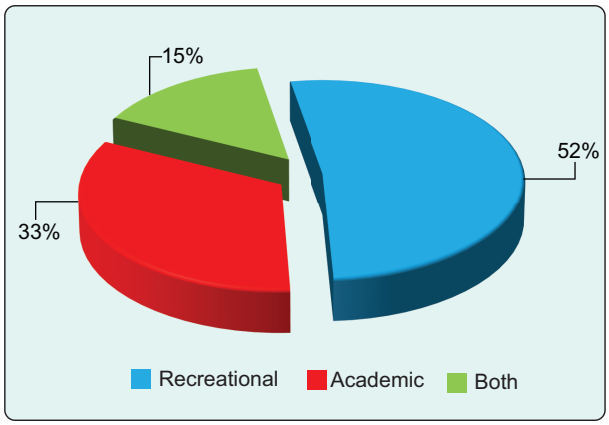

Figure 2: Purpose of device usage by children (parents' view)

Total 86 (56%) parents expressed that there were no developmental or behavioral problems in their children. Under developmental adversities; children had speech delay in 17% cases and poor communication in 9% cases. Behavioral problems were found as anxiety or aggressive behavior (13%), hyperactivity (7%), screen addiction for feeding (7%), vision problem (4%), inattention to study (4%) and sleep problem (3%) (table II).

While exploring the relation of screen time duration with adverse effects on children, we observed significant relationship ($P<0.05$) of total screen time durations two hour or more per day with anxiety/ aggressive behavior, poor communication and screen addiction for feeding (Table III).

Table II: Effects of screen exposure in children according to parents' view (N=153)

Effects of screen exposure	No of cases (n=153)	Percentage (100%)
No developmental/behavioral problem	86	56
	Developmental	
Speech delay	26	17
Poor communication with others (social skill development)	14	9
	Behavioral	
Anxiety/Aggressive behavior	20	13
Hyperactivity	11	7
Screen addiction for feeding	10	7
Vision problem	6	4
Inattention to study	6	4
Sleep disturbance	5	3
Total	102	67

**Some participants expressed about multiple problems in a single child (multiple response table)

Table III: Relation of screen time duration of children with adverse effects on development and behavior

Developmental/behavioral problems in children	Screen time duration in children		Total	P-value
	<2 hours/day	≥2 hours/day		
No problem	37 (23%)	49 (33%)	86 (56%)	0.342
Speech delay	08 (5%)	18 (12%)	26 (17%)	0.079
Anxiety/Aggressive behavior	05 (3%)	15 (10%)	20 (13%)	0.006*
Poor communication	02 (1%)	12 (8%)	14 (9%)	0.002*
Hyperactivity	03 (2%)	08 (5%)	11 (7%)	0.187
Screen addiction for feeding	01 (1%)	09 (6%)	10 (7%)	0.017*
Vision problem	02 (1%)	04 (3%)	6 (4%)	0.512
Inattention to study	02 (1%)	04 (3%)	6 (4%)	0.512
Sleep disturbance	02 (1%)	03 (2%)	5 (3%)	0.770

*The chi-square test was used to assess differences between categorical variables, with a p-value of d"0.05 considered statistically significant (multiple response table).

Discussion

Digital devices have become an integral part of daily life, making children today digital natives. However, many countries fail to follow screen time guidelines set by the American Academy of Pediatrics (AAP). In the U.S., 87% of children exceed these recommendations, a trend seen globally.[15] In Bangladesh, while most parents are unaware of AAP guidelines, they are concerned about excessive screen exposure's impact on their children's developmental and behavioral problems.[16] In the light of limited evidence, this study aimed to assess parental perceptions of excessive screen time in the Bangladeshi context.

The study analyzed sociodemographic factors influencing children's screen time. The average age of parents was 32.99 ± 3.49 years, with 66% being mothers. A significant proportion of children spent over two hours on screens daily, particularly those of homemaker mothers and parents with postgraduate education. This is likely due to their greater involvement in monitoring their children's activities and aligned with findings from a similar study in the Philippines.[17] No significant correlation was found between parents' screen time and their children's (p-value 0.072), though research suggests parental screen habits influence children.[18,19] Most participants came from affluent nuclear families, with half having only one child, but these factors did not strongly affect screen duration like a Chinese study.[2]

Smartphones were the most common digital devices used by children (87%), followed by smart TV (58%), tablet (37%), laptop (18%), and others. Multiple devices were used in 63% cases. Device accessibility and multiple-device usage patterns were similar to studies in other countries.[17] About 52% of children used devices for recreational purpose followed by academic usage of screen (33%). Recreational use significantly contributed to increased screen time, consistent with global trends.[20]

Excessive screen time has known negative effects on physical, social, and emotional development. It may delay motor, and communication skills, disrupt interactions with caregivers, and contribute to obesity, sleep disorders, and mental health issues.[21,22] In this study, 17% of children had speech delay, and 9% experienced poor communication. Behavioral concerns included aggression and anxiety (13%), hyperactivity (7%), screen addiction for feeding (7%), vision problems (4%), inattention to study (4%), and sleep disturbances (3%). These effects were also discovered by other international authors. [22,23] While some studies link prolonged screen exposure to ADHD symptoms and decreased academic performance, no significant correlation was found in this study between screen time and speech delay, hyperactivity or inattention to study alike a study of Malaysia.[19] Nevertheless, prolonged screen time in children (≥2 hours in a day) was strongly associated with anxiety/aggressive behavior in children, poor communication, and screen addiction for feeding which are consistent with different international studies.[17,22]

Despite concerns, screen time also has benefits, including improved fine motor skills, cognitive development, and access to educational resources,

the fact which is acknowledged by many parents.[16] While prolonged exposure was linked to speech delay and autism spectrum disorder (ASD)-like symptoms in some studies, this study found significant association of children's screen exposure with some developmental and behavioral effects other than speech delay.[24] This study explores Bangladeshi parents' views on screen time of their children, finding a few developmental and behavioral links. Future research should include diverse groups and objective data to assess long-term developmental impacts.

There are few limitations of the study. Screen time was based on parental recall rather than objective measurements. Additionally, only parents' responses were considered, which may introduce bias. Clinical assessments of developmental and behavioral disorders could enhance accuracy. The study focused on urban, socioeconomically advantaged children, while children from middle-income backgrounds may have a higher risk of increased screen time. Expanding the sample to include diverse socioeconomic and educational backgrounds would improve generalizability. Furthermore, the cross-sectional design limits the ability to determine causality between screen exposure and its effects. These findings highlight the need for awareness and future research on the physiological and psychosocial impacts of excessive screen time.

Despite these limitations, the study has notable strengths. A good number of representative samples including educated parents provided insights into real parental concerns. The study also considered wide range of digital media and measured the pattern of exposure of children to specific media which strengthens its comprehensive approach.

Conclusion

This study concludes that prolonged screen time had negative effects on children, which includes speech delay, poor communication, aggressive behavior, hyperactivity, screen addiction for feeding, vision problem, inattention to study and sleep disturbance. Children exposed to screen time for two hours or more per day showed a strong tendency toward aggressive behavior, poor communication, and screen addiction for feeding.

Recommendation

Future research in Bangladesh should include diverse populations including different socioeconomic background and educational levels. Further studies should also focus on children with clinically diagnosed effects of prolonged screen exposure with a larger sample size.

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