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Brief Report

Alarmingly high prevalence of addictive screen use behaviour among under thirteen children: a cross sectional study in Mumbai

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ABSTRACT

Increasing amount of discretionary (non-homework) screen time (DST) has raised significant concerns over the addictive potential of screen-based media and psychiatric dimension children's health. This study was undertaken to find the prevalence of addictive screen use behaviour in children under the age of 13 years, and its association with the type of content consumed. A cross-sectional study was conducted in Mumbai metropolitan region (MMR) in which 154 parents from 4 schools were interviewed using a pre-validated questionnaire. Data was analyzed using SPSS v26.0, chi-square test and unpaired t test were used at significance level of $p<0.05$. 18% of the children were found of have addictive screen use behaviour and it was found to be significantly associated with playing shooting and fighting games ($p<0.05$). Prevalence of addictive screen use behaviour is alarming among under 13 children. Interventions to tackle this concern must be urgently undertaken.

Keywords: Child, Addictive behaviour, Technology addiction, Screen time

INTRODUCTION

For our children, the 'digital natives' who have grown up surrounded by screen-based media screen time is a major part of contemporary life. These days, the use of screens begins in infancy with new research finding that the prevalence of screen viewing in children aged under two years 'is high and appears to increase steadily across age groups.[1] Although the American academy of pediatrics (AAP) recommends that the use of media should not be permitted at all for children under the age 2 years it was found that in India amongst 370 children of 15-18 months of age, 369 (99.7%) children were exposed to screen-based media before 18 months of age, starting from a median age of 10 months.[2,3]

While an increasing amount of discretionary (non-homework) screen time (DST) has raised significant concerns over children's cardio-metabolic outcomes, there is a rapidly emerging psychiatric dimension to this growing public health issue.[4] Many western studies have already derived associations between addictive screen use and abnormal neurological functions.[5] Behavioural addiction like addiction to screen based content can be diagnosed using following criteria: preoccupation, failure to reduce or stop screen activities, continuation despite negative consequences, loss of outside interests, use to escape adverse moods, lying about extent of use, tolerance, withdrawal symptoms.[6] As far as knowledge of investigators is concerned, majority of studies on screen addiction have been done on college-based population and there is dearth in literature pertaining to such addictive behaviour in children in Indian scenario. School age, which is the most vulnerable age to get exposed and addicted to screen based content has been understudied and hence this study undertaken to find prevalence of addictive screen use behaviour in children under age of

13 years, and its association with type of content consumed.

METHODS

A cross-sectional study was conducted between January 2020-February 2021 in 4 schools of Mumbai metropolitan region (MMR) in Maharashtra. Two schools from each from urban and rural regions were selected. Due to the unavailability of literature on the prevalence of screen addiction in children under age of 13 years, a feasibility sample size of approximately 150 children was taken. Data was collected using an online questionnaire which was sent to the class teachers of respective schools, who circulated it amongst the parents of children from class nursery to 7th standard. Data of children who were below the age of 13 and had access to screen-based devices was included whereas those whose parents refused consent were excluded. Data about the screen use behaviour of the children was obtained from the parents.

Study site

The study conducted at St. Paul's convent high school, Dadar, Matushri Kashiben Vrajlal Valia international Vidhyalaya, Borivali, St. Anthony's convent high school, Vasai and New English School, Vasai.

Study tools

The study tool used was a self-developed questionnaire with the aim of assessing screen use among participants considering the criteria of behavioural addiction, viz. preference (Preoccupation and loss of interest in outside activities), behavioural changes (Failure to reduce or stop screen activities, continuation despite negative consequences, use to escape adverse moods and lying about extent of use) and withdrawal. Preference and behavioural changes were judged based upon a set of 6 questions each. The criterion of preference or behavioural change was fulfilled if the parent answered 3 or more questions as 'yes'. Similarly, the criterion of withdrawal was fulfilled when at least 1 out of 2 questions answered as 'yes'. Only a participant who fulfilled all three criteria was declared to have an addictive screen-use behaviour.

Apart from these questions, questions to assess their screen time, type of content consumed, academic performance, and other behavioural changes etc. were also asked. Questionnaire were made available in English, Hindi and Marathi languages. The questionnaire was developed after a thorough review of literature and also by conducting a focused group discussion with parents and experts in the field of study including 3 psychiatrists and 3 pediatricians. After the questionnaire was framed and validated by experts, the content validity ratio (CVR) of each of the items was calculated to be +1.0 (Cut-off: 1.0 for 6 experts) and a Content validity Index (CVI) of+1.0 (Cut-off: 1.0 for 6 experts) was calculated. This finalized questionnaire was tested using a pilot study on target population with sample size of 30 participants. Responses thus obtained were analyzed and a Kuder-Richardson 20 (KR-20) of 0.814 (Cut-off: 0.8) for internal consistency and Cohen's Kappa coefficient of 0.714 (Cut-off: 0.61) for test-retest reliability calculated.

Ethical consideration

The study was conducted in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki declaration of 1964, as revised in 2013. The study was approved by the institutional ethics committee (EC/OA-133/2019) and informed consent of the parents was obtained before they filled the questionnaire.

Statistical analysis

The data was entered in an excel sheet and analyzed using the SPSS software (Version 26.0). The descriptive data was shown in numbers, percentages and Mean ± SD. Chi-square test and unpaired t test were used for finding the associations and odds ratio was calculated. The $p<0.05$ was considered statistically significant.

RESULTS

Responses were obtained from a total of 154 participants. The mean age of the children was 10.17 years. Proportion of males (51.3%) was slightly higher than that of the females (48.1%). Maximum responses were filled by mothers (76.6%) followed by fathers (16.9%) and guardians (6.5%). The 41% were from the urban areas whereas 59% were from rural areas (Table 1).

Table 1: Demographic characteristics (n=154).

Variables		N	Percentage (%)
Age, mean (SD)		10.17 (2.1)	
Gender	Male	79	51.3
	Female	75	48.1
Relation to child	Mother	118	76.6
	Father	26	16.9
	Guardian	10	6.5
Region of residence	Urban	63	41
	Rural	91	59

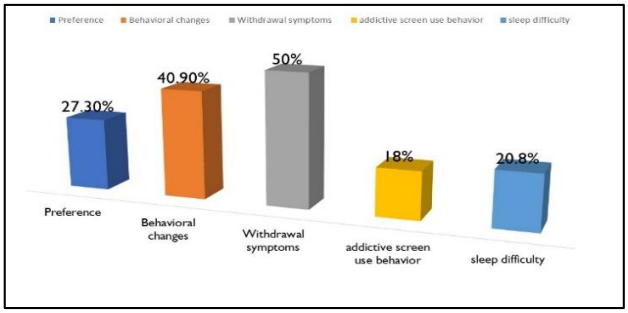

Figure 1: Prevalence of addictive screen use behaviour.

The average discretionary (non-homework) screen time was 2.8 (0.5) hours. whereas the total screen time was 6.2±1.2 hours among the children. There was no significant difference between discretionary screen time among children with and without addictive screen use behaviour [(3.07 hours/day, 2.64 hours/day), p=1.58] preference of using screen over other activities was seen in 27.3% children, Behavioural changes were seen in 40.9% and Withdrawal symptoms reported in staggering 50% of children. 18% of the children fulfilled all 3 criteria and were considered to be having addictive screen use behaviour. 64.3% participants used their phone at bedtime within an hour before sleeping and 20.8% participants had due to late-night screen use (Figure 1).

The 100% of children used screen-based devices to watch Videos, TV shows or Movies, 91% used it for playing games while 87% also used it to access social media. YouTube (88%) followed by cable connection (51%) were the most popular sources of watching Videos, TV shows or Movies, Platform games (51%) like Subway Surf, Temple Run etc were the most popular games whereas WhatsApp (64%) was the most commonly used social media platform. The association analysis of addictive screen use behaviour with type of content consumed, as shown in Table 2, reveals that there is a significant association of playing shooting and fighting games with addictive screen use behaviour.

Table 2: Association of addictive screen use behaviour with types of content consumed.

Variables			Addicts, (n=28)		Non addicts, (n=126)		Total, (n=154)	P value	Odds ratio
			N	%	N	%			
Social media applications	Facebook	Yes	4	26.7	11	73.3	15	0.370	1.742
		No	24	17.3	115	82.7	139		
	WhatsApp	Yes	21	21.0	79	79.0	100	0.217	1.785
		No	7	13.0	47	87.0	54		
	Instagram	Yes	1	5.3	18	94.7	19	0.119	0.222
		No	27	20.0	108	80.0	135		
Gaming applications	Platform games	Yes	14	17.9	64	82.1	78	0.939	0.969
		No	14	18.4	62	81.6	76		
	Shooter games	Yes	11	29.7	26	70.3	37	0.037*	2.489
		No	17	14.5	100	85.5	117		
	Fighting	Yes	7	36.8	12	63.2	19	0.024*	3.167
		No	21	15.6	114	84.4	135		
	Construction and management	Yes	9	30.0	21	70.0	30	0.061	2.368
		No	19	15.3	105	84.7	124		
Video, TV[a] show and Movie watching applications	Netflix	Yes	3	16.7	15	83.3	18	0.859	0.888
		No	25	18.4	111	81.6	136		
	Prime video	Yes	3	12.0	22	88.0	25	0.381	0.567
		No	25	19.4	104	80.6	129		
	YouTube	Yes	26	19.1	110	80.9	136	0.408	1.891
		No	2	11.1	16	88.9	18		
	Dish/cable	Yes	16	20.5	62	79.5	78	0.447	1.376
		No	12	15.8	64	84.2	76		
Video, TV[a] show and movie genres	Cartoon	Yes	23	18.5	101	81.5	124	0.0810	1.139
		No	5	16.7	25	83.3	30		
	Science fiction	Yes	28	18.2	126	81.8	154	0.641	0.817
		No	18	19.4	75	80.6	93		
	Sports	Yes	12	21.4	44	78.6	56	0.430	1.398
		No	16	16.3	82	83.7	98		
	Crime and suspense	Yes	7	30.4	16	69.6	23	0.099	2.292
		No	21	16.0	110	84.0	131		
	Educational	Yes	12	15.2	67	84.8	79	0.323	0.660
		No	16	21.3	59	78.7	75		

*P<0.05 statistically significant, [a]Television.

DISCUSSION

The prevalence of addictive screen use behavior was found to be 18%, which suggests that almost 2 out of every 10 children under the age of 13 years are already showing signs of being addicted to their screen devices. This value is close to the prevalence of 12.4% found out by the another study carried out in the Lebanon by the Hawi et al.[7]

The various behavioural changes observed in children (40.9%) consisted of failure to reduce or stop screen activities, continuation despite negative consequences, use to escape adverse moods and lying about extent of use. The second major criterion observed was preference (27.3%), which meant that children preferred using screen devices over a variety of other activities like spending time with family (26%) and friends (17.5%), playing outdoor sports (27.3%) and studying (37.7%). This is in accordance with previous studies which showed that screen-addicted children were found to have less social support and attachment with family and peers.[8] Although face-to-face interactions may not have been completely replaced, screen devices have become so indispensable that they are now a part of most social interactions. The third criterion studied was withdrawal, and an alarming 50% of participants showed signs of withdrawal in the form of irritability, restlessness and aggression upon stoppage of their use of screen devices, which meant that 5 out of every 10 children, not even teenagers yet, were already the victims of withdrawal.

Addictive screen use behaviour was found to be significantly associated drawn was with certain types of games; specifically with genres like shooter (p=0.037, OR=2.489) and fighting (p=0.024, OR=3.167) games. This is in accordance with international studies which proved that video game players of certain types of games like massively multiplayer online role-playing games (MMORPG) and shooter games meet the criteria of internet gaming disorder more often than other game users, suggesting an association between the both.[9] We also studied the different social media apps used, as well as various genres and apps consumed for watching videos, TV shows and movies. Though some of them showed an odds ratio of >1, none of them reached any significant association with addictive screen use behaviour in children.

The limitation of this study is that it was conducted in a small sample, hence the results may not generalizable to the population. This study will act as a pilot for further large-scale population level studies.

CONCLUSION

The prevalence of addictive screen use behaviour is alarmingly high among the children under the age of 13 years. This behaviour is significantly associated with playing shooter and fighting games. Urgent interventions at family and school level are needed to tackle this ever-growing concern among children

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