

Relationship Between Screen Time and Behavioral Problems in Primary School Students

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Abstract

INTRODUCTION

Rampant use of electronic based devices like television, mobile phones, gaming consoles, computers, etc. disregarding the beneficial effects of physical activity, social interaction, sleep and academic performance result in deficit of psychological well-being of children. The aim of our study was about screen use in Nepalese children and the relationship of screen time with behavioral problems in primary school students. In this study we collected important information based on our objectives on primary school students in our context and to avail the information to clinicians, parents, guardians, educators, policy makers and all those involved.

Methodology

This study was done in Budhanilkantha municipality of Kathmandu district, Nepal. One community school and one private school were randomly selected from a list of schools. Data was collected from all primary school students of these schools with the help of questionnaires filled by parents. Screen time and different socio demographic factors that might affect screen time was assessed with the help of questionnaires filled by parents. Behavioral problems were assessed using parent-filled Strength and Difficulties Questionnaire. Statistical analysis was done using SPSS version 24 for windows.

Result

Our study sample contained 314 primary school students. 52.5% of them were from private school and 47.5% from community school. The mean daily screen time was 1.96 hours, and more than one-fourth of the students had daily screen time of more than two hours per day. Higher number of televisions in the house, presence of computer in the house, more frequent screen use while having meals, higher frequency of screen use with parents, having father with university degree were the factors having statistically significant association with higher screen time of children.

Students with daily screen time of more than two hours per day had higher internalizing problem score (8.93 ± 3.453), higher externalizing problem score (9.28 ± 3.885) and total problem score (18.21 ± 6.253) compared to those with screen time of two hours or less (6.97 ± 3.285 , 6.10 ± 3.398 , 13.07 ± 5.402 respectively). The difference between the groups were statistically significant on all three scales on Mann Whitney U-test ($p < 0.001$, $p < 0.001$, $p < 0.001$ for internalizing, externalizing and total problem score respectively).

Conclusion

The higher screen time in children was significantly associated with higher behavioral problems. Our study findings re-emphasized the need to follow the guidelines and recommendations set by international regulatory bodies as well as develop guidelines on our own on limiting screen time in children for betterment of psychological wellbeing of children.

KEYWORDS

Screen time, Behaviour problem, Children, Primary School, Nepal

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INTRODUCTION

Electronic devices have been an integral part of lives of children today. Screen-based activities in the forms of watching television and other videos, playing games over gaming consoles and computer devices, and using mobile devices like smart phones and tablet computers occupy a significant amount of time of average children today. These screen-based activities have replaced peer interaction, physical activities, and interaction with family members, study time, sleep as well as other activities. Electronic devices have also been entering Nepalese homes in recent times. According to 2011 census, 36 percent of Nepalese

households had television sets while 7 percent of Nepalese households had a computer. In Nepal, mobile penetration has risen from 21 percent in 2009 to 60 percent in 2012 and 113 percent in 2017. Similarly, internet penetration has risen from 21 percent in 2012 to 43 percent in 2015 and 57 percent in 2017.^{1,2}

Concerns have been raised over the harmful effects on high screen time in children of all ages, and scientific researches have been conducted, mostly in last two decades which have shown significant harmful effects of high screen time on physical as well as mental health of children.^{2,3}

Children are exposed to electronic screen-based activities from a very early age compared to a few decades earlier. Today's children also have increased access to a greater number of electronic devices; more advanced, interactive and addictive devices and screen-based activities as compared to children of a few decades ago. High screen use has been considered a major problem affecting health, well being as well as development of young children. The purpose of our study was to explore about screen use in Nepalese children and the relationship of screen time with behavioral problems in primary school students in Nepalese context.

MATERIALS AND METHODS

A school based cross-sectional study was done within a period of one year from November 2018 to October 2019. Ethical approval was obtained from Institute review committee (IRC), Institute of Medicine (IOM). Written permission from local authority (Budhanilkantha Municipality) was obtained. Informed consent was taken from the parents. Confidentiality of the participants was maintained. Probability sampling method was used after listing all the private and community schools in the community. We selected two schools of Budhanilkantha municipality, one private school and one community school, each were selected by simple random sampling technique. All primary school students of the selected schools from grade one to five who met the inclusion criteria were included in the study. A total of 314 students were selected as participants of the study.

Structured questionnaire was used to collect data relating to different socio demographic factors and screen use. The questionnaire contained 23 questions that were filled by the parents. It included questions on child related factors (age, gender, grade, birth order, outdoor play), family related factors (family size, number of children, parent/s living together), electronic device related factors (presence and number of electronic devices, television, computer in the house), screen time of children (weekdays and holidays), screen use related factors (frequency of screen use with parents, while having meals), parents related factors (education and occupation of parents, parents' screen time). Strength and Difficulties Questionnaire (SDQ) is a brief behavioral screening questionnaire for children. It was developed by English child psychiatrist Robert N. Goodman in 1997. It assesses 25 different items on five subscales (emotional symptoms, conduct problems, hyperactivity, peer relationship problems, and pro-social behavior). Different versions according to rater (self-rating, parent-

rating and teacher-rating) and age group are available. It is available in more than 80 languages. Validated versions in these languages are available by the developer. It is free to use for non-commercial purpose. SDQ has strong internal consistency, moderate test-retest reliability, good concurrent validity, and discriminant validity.⁴⁻¹⁰

Statistical analysis was done using Statistical Package for the Social Sciences (SPSS) Version 24. Relationship of different factors (child related, parents related, family related, screen related) with screen time was analyzed. Relationship of screen time with behavioral problems (SDQ subscale scores and total scores) were analyzed.

RESULTS

In our study the total sample size was 314 students from both community (47.5%) and private school(52.5%) . Regarding gender, almost half (46.5%) were male and53.5% of the samples were female with mean age of 9.16 years.

Table 1. Descriptive statistics for socio-demographic variables.

	Minimum	Maximum	Mean	Std. Deviation
Screen Time (hours/day)				
Weekdays	0	6	1.96	1.18
Holidays	0	8	3.61	1.41
Problem Scores Among Different Categories				
Emotional Problem Score	0	10	4.17	2.181
Conduct Problem Score	0	9	3.09	2.028
Hyperactivity Score	0	10	3.84	2.203
Peer Problem Score	0	9	3.32	1.973
Prosocial score	1	10	7.12	2.034
Internalizing Problem Score	1	18	7.48	3.434
Externalizing Problem Score	0	16	6.93	3.792
Total Problem Score	2	31	14.41	6.063

Students' screen time ranged from zero to six hours on weekdays and zero to eight hours on holidays. Similarly, individual problem scores in different categories is shown in Table 1.

Table 2: Four Factor Categorization of Five Different Scale Scores of Students

	Close to Average	Slightly raised	High	Very high
Emotional Problem	38.9%	18.2%	29.3%	13.7%
Conduct Problem	45.9%	16.6%	23.9%	13.7%
Hyperactivity Problem	76.8%	16.2%	5.7%	1.3%
Peer Problem	38.9%	16.9%	15.3%	29.0%
Total problem	45.2%	18.8%	16.9%	19.1%
	Close to average	Slightly lowered	Low	Very low

Close to average prosocial behavior was observed in 46.8%, and very low prosocial behavior was observed in 26.4% (Table 2).

Table 3: SDQ scores and type of school and screen time

Type of School	Internalizing Problem Score Mean (SD)	Externalizing Problem Score Mean (SD)	Total Problem Score Mean (SD)
CommunitySchool	7.73 (3.138)	6.89 (3.833)	14.62 (5.596)
Private School	7.25 (3.675)	6.97 (3.767)	14.22 (6.467)
Combined (All Students)	7.48 (3.434)	6.93 (3.792)	14.41 (3.792)
p-value	>0.05	>0.05	>0.05
Screen Time (Weekdays)			
Upto 2 hours	6.97(3.285)	6.10 (3.398)	13.07 (5.402)
More than 2 hours	8.93 (3.453)	9.28 (3.885)	18.21 (6.253)
p-value	<0.01	<0.01	<0.01

Table 3 showed that mean externalizing problem score was higher in private school students (6.97±3.767) compared to community school students 6.89 ± 3.833) while mean internalizing problem score and total problem score was higher in community school students (7.73±3.138 and 14.62±5.596 respectively) compared to private school students (7.25±3.675 and 14.22±6.467). Like wise, students with daily screen time of more than two hours per day had significantly higher internalizing problem score (8.93± 3.453), higher externalizing problem score (9.28 ±3.885) and total problem score (18.21±6.253) compared to those with screen time of two hours or less (6.97±3.285, 6.10±3.398, 13.07±5.402 respectively) with p-value less than 0.01 in all.

Table 4. Correlation between Screen time on Weekday and Holidays with SDQ Scores

	Internalizing Problem Score	Externalizing Problem Score	Total Problem Score
ST Weekday Screen time	.296**	.416**	.428**
p-value	.000	.000	.000
ST Holiday screen time	.148***	.222**	.223**

Table 4 revealed that there was a significant positive correlation between screen time on weekdays with internalizing, externalizing and total problem score (p-value <0.05). Similarly, there was a significant low degree of positive correlation between screen time on holidays with internalizing, externalizing and total problem score (p-value <0.05).

DISCUSSION

In our study, the screen time of male and females were almost similar. Our findings are similar to the finding from Chassiakos YR, et al, 2016.¹¹ Studies on children from Canada and Portugal also had similar findings.^{1,12} Many other

previous studies have also not found significant difference in screen time across the two genders, although some studies have found difference in pattern on screen use, with boys spending more time on gaming and using computers compared to girls.¹²

The mean screen time on weekdays and holidays was 1.96±1.177 and 3.61±1.413 hours respectively. The median screen time per day was two and four hours, on weekdays and holidays respectively. The average daily screen time in our study was similar to that of neighboring countries India (1.8 hours/day) and China (1.9 hours/day).¹⁸ The average daily screen time in our study was slightly lower than that of recent studies on American (2.78±1.95 hours/day), Canadian (2.8±1.8 hours/day), British (15.1 hours/week, IQR=8.5-26.0) and European (2.8±2.0 hours/day) children of similar age group.¹³⁻¹⁶ More than one fourth of the students (26.11%) had a screen time of more than two hours per day. It was lesser than that of children from India and China.¹⁸ It was almost half the prevalence seen in children of similar age in Lebanon.¹⁷ This may be due to parental guidance, less number of digital gadgets in house and parental behavior of using the gadgets.²⁰

Our study showed a statistically significant linear relationship between daily average screen time of children, both on weekdays and holidays, and behavioral problems across all three scales of Strength and Difficulties Questionnaire (SDQ). Our study also showed statistically significant higher behavioral problems in children with daily average screen time of more than two hours on weekdays compared to those with lower screen time. Our findings are similar to the findings of similar studies done in different parts of the world which have shown high screen time to be associated with higher behavioral problems and poor psychological wellbeing in children of the same age group as ours.¹⁹⁻²⁶ The screen based technology is rapidly changing day by day and youth are engaging with various methods of screen. According to several researcher it is mandatory for more studies on this issue. Screen time was always associated with poor physical and mental health status of children. Therefore, children should not engage in arbitrary screen time during school closures and should be supported in their daily routines.²⁶

Considering the limitation of this study as this is a cross-sectional study and various psychosocial factors of primary care-giver and children in future study these aspects should also be considered and hence raise the further scope of this type of study.

CONCLUSION

Our study concluded that higher screen time in children was significantly associated with higher behavioral problems. Our study findings reemphasize the need to follow the guidelines and recommendations set by international regulatory bodies as well as develop guidelines on our own on limiting screen time in children for betterment of psychological wellbeing of children. Considering the limitation of this study as this is a cross-sectional study and

various psychosocial factors of primary care-giver and children in future study these aspects should also be considered and hence raise the further scope of this type of study.

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CONFLICT OF INTEREST

We declare that we do not have any conflicts of interest with respect to research to the research authorship , and publication of this research.

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