

ORIGINAL RESEARCH ARTICLE

PREVALENCE AND FACTORS ASSOCIATED WITH EXCESSIVE SCREEN TIME AMONG YOUNG CHILDREN OF 5 TO 9 YEARS IN POKHARA METROPOLITAN OF KASKI DISTRICT

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ABSTRACT

Background: Excessive screen time has been increasing among children and adolescents globally. The study aimed to find out the prevalence and associated factors of excessive screen time among young children.

Methods: A cross-sectional study was conducted among children aged 5 to 9 years attending schools in Pokhara metropolitan. Face to face interview was conducted with one of the parents of 352 children. The study was carried out from March to October, 2020. Excessive screen time (ST) was defined as >2 hours screen viewing a day. Chi-square test and binary logistic regression were applied at 5% level of significance.

Results: Of total, 47.4% of children had ST>2 hours a day. Among socio-demographic factors, being a boy (adjusted odds ratio (AOR), 1.65; 95% CI, 1.05-2.57), living in nuclear family (AOR, 0.62; 95% CI, 0.39-0.99) and age of the children (AOR, 1.28; 95% CI, 1.03-1.58) were significantly associated with excessive ST. Having television at home, parental ST, offering screen devices to children had increased likelihood of reporting excessive ST. Odds of reporting of excessive ST was 8.97 times higher among those who had one television at home as compared to those who do not have. Excessive ST was more than three times among those children whose parents offered screen devices to make them eat as well as to have free time for the parents themselves.

Conclusions: Few socio-demographic characteristics, parental ST and parental offering of screen devices were significantly associated with excessive ST. Interventions should target screen device accessibility and ST related behavior of parents.

INTRODUCTION

Screen viewing time is associated with a raised mortality and Cardiovascular disease (CVD) risk despite of physical activity level.¹ Excessive screen time has been increasing among children and adolescents globally.²⁻⁵ Evidence suggested that a higher level of screen time (ST) is associated with unhealthy eating, physical inactivity, obesity, and poor mental health outcomes as well as developmental delay.⁶⁻¹⁰ ST refers that a child/ adolescent spent watching television, playing video games, watching video shows and/or using other apps on a mobile device on a usual school day and weekend day.¹¹ Evidences suggest that socio-demographic characteristics of the family, home media environment, screen devices availability at home and parental screen related behaviors may have role on ST of young children and adolescents.^{2,12,13}

Limited studies have been conducted on ST in Nepal. A study showed that more than two-third children reported >2 hours television viewing per day.¹⁰ In addition, the problem of overweight and obesity are increasing in children and adolescents.^{10,14} The age 5 to 9 years is a very critical age for the

formation of behavior related to physical activity and screen viewing; and the behavior might tract to the adulthood.^{15,16} Therefore, the study aimed to find out the prevalence and associated factors of excessive ST among young children aged 5 to 9 years.

METHODS

A cross sectional study was done to find out the prevalence and its associated factors among children aged 5 to 9 years attending school in Pokhara metropolitan city of Kaski district, Nepal. The study was conducted from March to October, 2020.

Sample size was computed based on a formula recommended for prevalence study.¹⁷ Where value of Z at 95% confidence interval (Z) = 1.96, p = prevalence (p = 0.70), q=1-prevalence=0.30¹⁰, d= precision (d =0.05). The computed sample size was 322. A non-response rate of 10% was added; a total of 352 samples were included in the study.

Multistage cluster sampling techniques was used. At first, 3 wards were randomly chosen from 33 wards in Pokhara

metropolitan. List of the schools with primary classes was prepared in each selected ward. Then, one public and one private school were selected randomly in each ward. Students of grade one to four were selected proportionately from each selected school. Based on the list of students, parents were identified, approached and requested to participate in the study.

Parents of the selected children were visited at their homes and face to face interviews were conducted with them. For the measurement of ST, parents were asked to report the time that their child spent watching television, playing video games, watching video/Television (TV) shows and/or using other apps on a mobile device on a usual school day and week end day. A separate sheet for a usual school day and a usual weekend day was used.^{11,18,19} The average time was derived from summing ST of school days and weekend day. Excessive ST was defined based on the guideline of >2 hours screen viewing as standard.²⁰ We excluded ST of academic purposes from the total ST in the study. Socio-demographic, screen device availability and parental screen behavior related variables were used as shown in table 1.

A semi-structured questionnaire was developed based on the standard guidelines of previous studies.^{11,18,19} The questionnaire was translated into Nepali language and pretested in the similar population.

Statistical package on social science (SPSS) version 20 was applied. Descriptive, bivariate and multivariate analysis was computed. Chi-square test and multiple logistic regression analysis were used at 5% level of significance. All the variables that were significant in the chi-square test were included in the multiple logistic regression analysis except age of the children. Two models were prepared, one of socio-demographic variables, and another of all variables including socio-demographic variables. The model fitness was examined using the Hosmer and Lemeshow goodness of fit test. Both models were fit with the variables entered into the models.

We obtained ethical approval from Nepal Health Research Council (NHRC). Permission was taken from metropolitan and the schools. Written informed consent was taken from each respondent before the interview.

RESULTS

Out of total, 79.5% respondents were mothers of the children; and 41.8% had basic education. Of total, 54.0% of children were boys; 35.2% were at age of 9 years; 31.3% were at grade one. Similarly, 64.1% of children were studying at private schools; 65.3% of children were living in nuclear family; 76% had at least one sibling. Of total, 67.6% had at least one TV at home; 93.2% had smart phone at home; 46.3% had internet connection and 71.6% had cable TV connections at home; 11.6% children had their own personal gadgets. Of total, 49.4% of parents had ST>2 hours a day (Table 1).

Table 1: Socio-demographic characteristics of study population and screen devices availability

Characteristics	Categories	Number (%)
Respondents	Fathers	72 (20.5)
	Mothers	280(79.5)
Education of parents	Illiterate	33 (9.4)
	Basic (up to 8)	147(41.8)
	Secondary (9 to 12)	140(39.8)
	Higher	32 (9.1)
Sex of children	Boys	190(54.0)
	Girls	162(46.0)
Age (in years)	5	22 (6.3)
	6	60 (17.0)
	7	65 (18.5)
	8	81(23.0)
	9	124(35.2)
Grade	One	110(31.3)
	Two	89 (25.3)
	Three	80 (22.7)
	Four	73 (20.7)
School type	Public	127(35.9)
	Private	227(64.1)
Family type	Nuclear	230(65.3)
	Others	122(34.7)
Having sibling	None	85 (24.0)
	One or more	269(76.0)
Number of TVs	0	78 (22.2)
	1	238(67.6)
	2	36 (10.2)
Number of smart phones	0	24 (6.8)
	1	115(32.7)
	2	110(31.3)
	≥3	103(29.3)
Internet at home	Yes	163(46.3)
	No	189(53.7)
TV cable at home	Yes	252(71.6)
	No	100(28.4)
Having child's personal gadget	Yes	41 (11.6)
	No	311(88.4)
Parents ST	≤ 2 hours	178(50.6)
	>2 hours	174(49.4)

Table 2 shows that a total of 47.4% children, 54.2% of boys and 39.5% of girls had ST>2 hours. Mean screen time was 2.63 hours of boys, 2.09 hours of girls and 2.38 of both.

Table 3 shows that sex, type of school, type of family, and education of parents had significant association with ST. However, age of the children and having sibling did not have association with ST.

Table 2: Screen time of young children of 5-9 years

Screen time each day	Boys	Girls	Total
	Number (%)	Number (%)	Number (%)
ST of children			
≤ 2 hours	87 (45.8)	98 (60.5)	185 (52.6)
>2 hours	103 (54.2)	64 (39.5)	167 (47.4)
Mean ST with SD* (in hrs)	190 (2.63 (±1.98))	162(2.09 (±1.76))	352 (2.38 (±1.90))

*SD: standard deviation

Table 3: Association between ST and socio-demographic variables among young children of 5 to 9 years

Variables	Screen time		Chi-square value	p-value
	≤ 2 hours, n (%)	>2 hours, n (%)		
Sex of children				
Male	87 (45.8)	103 (54.2)	7.583	0.006
Female	98 (60.5)	64 (39.5)		
Age (in years)				
5	12 (54.5)	10 (45.5)	0.885	0.927
6	33 (55.0)	27 (45.0)		
7	35 (53.8)	30 (46.2)		
8	44 (54.3)	37 (45.7)		
9	61 (47.7)	63(50.8)		
School type				
Public	80 (63.5)	46 (36.5)	9.412	0.002
Private	105 (46.5)	121 (53.5)		
Family type				
Nuclear	131 (57.0)	99 (43.0)	5.15	0.0213
Others	54 (44.3)	68 (55.7)		
Having sibling				
No	39 (45.9)	46 (54.1)	2.979	0.225
Yes	146 (54.7)	121(45.3)		
Education of parents				
Illiterate	21 (63.6)	12 (36.4)	8.265	0.041
Basic	86 (58.5)	61 (41.5)		
Secondary	66 (47.1)	74 (52.9)		
Higher	12 (37.5)	20 (62.5)		

Table 4 shows that having access to internet, having TV cable, having TV, having smart phone at home, having children’s own personal gadget, offering screen devices to children for different purposes had significant association with ST.

Table 4: Association between children’ ST and screen device availability and parental screen related behaviors

Variables	Screen time		Chi-square value	p-value
	≤ 2 hours, n (%)	>2 hours, n (%)		
Internet at home				
Yes	70 (42.9)	93 (57.1)	11.249	0.001
No	115 (60.8)	74 (39.2)		
TV cable at home				
Yes	99 (39.3)	153 (60.7)	62.655	<0.001
No	86 (86.0)	14 (14.0)		
Number of TV				
None	71 (91.0)	7 (9.0)	61.545	<0.001
One	95 (39.9)	143 (60.1)		
Two	19 (52.8)	17 (47.2)		

Number of smart phone				
None	19 (79.2)	5 (20.8)	12.470	0.002
One to two	68 (59.1)	47 (40.9)		
≥ three	98 (46.0)	115 (54.0)		
Having child's personal gadgets				
Yes	10 (24.4)	31 (75.6)	14.765	<0.001
No	175 (56.3)	136 (44.8)		
Parental offering of screen devices				
To keep child at home				
Never	134 (63.8)	76 (36.2)	26.435	<0.001
Yes*	51 (35.9)	91 (64.1)		
To make child eat				
Never	174 (58.0)	126 (42.0)	24.130	<0.001
Yes *	11 (21.2)	41 (78.8)		
To make child do homework				
Never	180 (54.7)	149 (45.3)	9.373	0.002
Yes*	5 (21.7)	18 (78.3)		
Having free time				
Never	163 (62.0)	100 (38.0)	37.020	<0.001
Yes *	22 (24.7)	67 (75.3)		
Parental screen time				
≤ 2 hours	127 (71.3)	51 (28.7)	50.996	<0.001
>2 hours	58 (33.3)	116 (66.7)		

*Sometimes/most of the time/always

Table 5 shows logistic regression analysis of factors associated with excessive ST. In model one, sex and family type were significant with excessive ST. Boys were 1.65 times more likely to report excessive ST as compared to girls. Excessive ST was 2.00 fold higher among children attending private school in unadjusted model. Children living in nuclear family were 38% less likely to report excess ST.

The model two comprising all variables showed that age of children, number of TVs at home, ST of parents, parental offering of screen devices to make their children eat and to have free time for the parents themselves were significant with ST >2 hours. The odds of reporting of excess ST was 8.9 fold higher among those who had one TV at home as compared to those who do not have TV at home. The likelihood of reporting excessive ST was 3.6 times higher among the children whose parents offered screen devices for making their children to eat food and 3.3 times higher among those whose parents offered screen devices to have free time for the parents themselves.

DISCUSSION

The study revealed that the prevalence of excessive ST per day was 47.4%, and it was 54.2% in boys and 39.5% in girls; it meant that almost half of our children exceeded the recommended limit of ST. As very few studies were found among children of this age group in Nepal, comparison with other studies has been limited. A previous study showed that prevalence of TV viewing >2 hours was about 70%. However, the study population of the study was 8 to 12 years.¹⁰ More than 80% of children exceeded the advised ST in India; it was

36.8% among school-aged children in China.^{3, 20} Another study showed excessive ST of 79.5%.²¹ Most of these evidences show that more than half of children had excessive ST in different countries.^{2,3,10,21} There is variation in the finding in different countries and among age groups of children.

Among socio-demographic variables, sex of the child was significant with ST>2 hours, boys had a 65% higher chance of excessive ST. Similar findings were reported by previous studies.^{2,12} Education of parents was also significant with ST>2 hours. The family type was also significantly associated with excessive ST in model one. Excessive ST was 2.00 fold higher among children attending private school in unadjusted model. School itself might not be a risk factor. In Nepal, the family with higher socioeconomic status preferred to be admitted to private schools. In addition, children living in the nuclear family were 38% less likely to report excess ST as compared to the children living in the joint and extended family. This shows that family structure also play role in ST.

In the study, in bivariate analysis higher number of TV sets, smart phones, presence of TV cable, internet access at home, and child having personal gadgets were significant with ST >2 hours. In the adjusted model, having TV at home was one of the correlates of ST> 2 hours in the study. Parental ST, and parental practices of offering screen devices to make them eat and to have free time for the parents themselves were important correlates of ST>2 hours in the study. The finding is supported by other studies that a strong association was observed between parent and child screen viewing time.²¹ Parent' television time was found a stronger predictor of child television time than media access to child.²² It shows that

Table 5: Logistic regression analysis of the factors associated with ST> 2 hours a day among children of 5 to 9 years

Variables	Crude odds ratios (COR)			Adjusted Odds Ratios (AOR)			
	COR (95% CI)	p-value	Model 1		Model 2	P value	
			AOR (95% CI)	P value	AOR (95% CI)		
Socio-demographic							
Sex of child (ref: female)	Male	1.81 (1.18-2.77)	0.006	1.65 (1.05-2.57)	0.028	1.62 (0.95-2.76)	0.072
Age of child		1.06 (0.90-1.25)	0.442	1.13 (0.95-1.34)	0.160	1.28 (1.03-1.58)	0.021
School type (ref: public)	Private	2.00(1.28-3.13)	0.002	1.40 (0.82-2.38)	0.216	0.80 (0.39-1.63)	0.550
Family type (ref: others)	Nuclear	0.60 (0.38-0.93)	0.024	0.62 (0.39-0.99)	0.048	0.87(0.47-1.61)	0.673
Education of parents (ref: none)	Basic	1.24(0.56-2.712)	0.588	1.17 (0.52-2.64)	0.693	1.17(0.44-3.12)	0.744
	Secondary	1.96(0.89-4.29)	0.092	1.55(0.66-3.66)	0.309	1.090(.38-3.12)	0.861
	Higher education	2.91(1.06-7.98)	0.037	2.15 (0.72-6.43)	0.169	1.52(0.40-5.78)	0.539
Enabling environment							
No. of TV at home (ref: none)	One	15.26 (6.73-34.61)	<0.001			8.97(3.65-22.00)	<0.001
	≥two	9.07 (3.28-25.05)	<0.001			5.30(1.57-17.85)	0.007
TV Cable at home (ref: no)	Yes	9.49 (5.11-17.62)	<0.001			NA*	NA*
No. of smart phone (ref: none)	One to two	3.09 (1.11-8.58)	0.030			1.29(0.39-4.21)	0.667
	≥three	5.51 (1.91-15.94)	0.002			1.33(0.34-5.08)	0.674
Internet at home (ref: no)	Yes	2.06 (1.34-3.16)	0.001			1.08(0.57-2.05)	0.795
Child persona gadget (ref: no)	Yes	3.98(1.89-8.42)	<0.001			2.17(.92-5.132)	0.075
Parental offering of screen devices							
Keeping at home (ref: never)	Yes	3.26 (2.10-5.06)	<0.001			0.911 (0.50-1.63)	0.754
Making them eat (ref: never)	Yes	5.64 (2.81-11.31)	<0.001			3.59(1.55-8.31)	0.003
Making them do homework (ref: never)	Yes	4.90 (1.80-13.32)	0.002			2.11(0.61-7.22)	0.233
Having free time (ref: never)	Yes	5.05 (2.95-8.66)	<0.001			3.29 (1.64-6.61)	0.001
Parents ST						1.004(1.001-1.007)	0.008
Nagelkerke R Square				0.081		0.419	
Hosmer and Lemeshow Test**				0.051		0.755	

*not included in the model due to Multicollinearity, **P value

reducing parents' own screen time can decrease child screen time.^{22,23}

Odds of ST >2 hours was more than 3 times among the children whose parents offered screen devices to their children to make them eat food as compared to those who never did it. The parental practices of keeping the child busy with the device so that they can have their time was also associated with higher probability of ST >2 hours in the study population. Therefore, family environment and screen time of parents and parental practices of offering screen time are important correlates of excess ST among young children. The likelihood of exceeding the daily ST > 2 hours was higher among those whose parents reward good achievement by permitting ST and allow ST to keep them quiet.²³ Similarly, having lunch in front of the screen and an increase of parental ST were associated with the increase of child weekend screen time, and family rules decreased child ST.²⁴ Thus, study has been recommended that policymakers should consider the family environment as it influences children's screen use at home.²⁵ For the ST reduction intervention, role of parents and family involvement is very essential.

About 40% of data was collected after COVID-19 pandemic had started in Nepal; schools were closed and children stayed

at home. This situation might have increased ST. Also, some selected samples were replaced with other children of same schools because the children who were living in rented room had already left the room which might limit the generalizability of findings.

CONCLUSION

Nearly half children in study area exceeded the recommended level of ST. Regarding socio-demographic factors, being boys, living in a nuclear family and age of the children were significantly correlated with ST >2 hours. Regarding environmental factors and parental practices, having TV at home, parental ST, offering of screen devices to children to make them eat and to have free time for the parents themselves were significantly associated with ST >2 hours among children. Involvement of parents to create a supportive environment with reduced accessibility to screen devices at home and decreased parental ST may help to reduce children's ST.

CONFLICT OF INTEREST: None

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