

Research Article



A Cross-sectional Study to Evaluate the Correlation of Screen Hours and Sleep Pattern with Behavior among School-going Children Residing in New Delhi

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Abstract: Background: Excessive screen hours and inadequate sleep duration in early life predict a greater likelihood of the later development of psychopathology in childhood and adolescence. Hence, this study was done to evaluate the Correlation between Screen hours and sleep patterns with behavior among school-going children residing in New Delhi. **Methods:** A cross-sectional study was performed from January to March 2022 among 400 students chosen using a simple random sampling procedure in New Delhi. Data was collected through school teachers based on their observations and analyzed using Epi info version 7. To predict the correlation between screen hours and sleep patterns with the behavior of students, a univariate analysis was done. A p-value of 0.05 was taken as statistically significant. **Results:** Present study included 180 (45%) females and 220(55%) male school children from New Delhi. Among them, 243(60.8%) were ≤ 10 years while 157(39.2%) were >10 years old. In the present study, 113(28.2%) students had behavior score 10 as assessed by teacher, 107(26.8%) had 9, 95(23.8%) had 8, 37(9.3%) had 7, 26(6.5%) had 6, 14(3.5%) had 5, 3(0.8%) had 4, 2(0.5%) had 3, 1(0.3%) had 2 and 2(0.5%) had behavior score of 1. The mean behavior score was 8.40±1.578 as assessed by the teacher. In the present study, behavior score was significantly more in students who had duration of watching screen per day <2 hours, duration of watching TV on a typical day <2 hours, duration of using a smartphone on a typical day <2 hours, and average duration of sleep per day on a weekday between 6-8 hours, and who didn't have a habit of watching mobile/TV before sleeping while there was no significant difference between the students on the basis of duration internet surfing, duration of videogames/games on screen per day and duration of onset of sleep after going to bed. **Conclusion:** The present study concluded that the behavior of school children was significantly associated with the duration of screen hours and the average duration of sleep per day. School children should be advised to limit or reduce screen time exposure, especially before bedtime hours, and to have adequate sleep of 6-8 hours to minimize any potential impacts on their behaviors.

Keywords: Correlation, Screen hours, Sleep pattern, Behavior, School Children, New Delhi.

INTRODUCTION

Excessive screen hours and inadequate sleep duration in early life predict a greater likelihood of later development of psychopathology in childhood and adolescence. With the widespread use of portable electronic devices and the normalization of screen media devices in the bedroom, insufficient sleep has become commonplace, affecting 30% of toddlers, preschoolers, school-age children, and most adolescents.^{1,2}

In multiple studies, excessive screen time has been linked to school problems, anger, aggression, frustration, depression, and other emotional problems. Over-stimulation causes kids to have poor focus and depletes their mental energy, which often leads to explosive behavior. Behavioral issues can also arise from less time for human interaction with family and friends and nature, less time engaging in other activities which are more relaxing, like art and crafts, reading and might help cope with frustrations from other issues, and less time for fun, such as at the playground with friends, sleep disruption, which can cause mood disturbance and cognitive issues and lack of physical activity, which can also impact mood.³⁻⁵

In a recent literature review of studies investigating the link between screen media use and sleep, many studies found an association between screen media use and delayed bedtime and/or decreased total sleep time. Increased screen hours negatively influence sleep quality, leading to reduced alertness, increased fatigue, compromised daytime functioning, and impaired mood.¹⁻⁸

Regarding the possible influences of excessive screen time and inadequate sleep duration on the behavior of the students, the data are still insufficient to confirm the hypothesis that this behavior of the students depends on the time spent on screen as well as on sleeping duration. Also, such studies are limited to school children. Thus, the present study was done to evaluate the correlation of screen hours and sleep patterns with behavior among school-going children residing in New Delhi.

OBJECTIVES OF THE STUDY:

To evaluate the Correlation of Screen hours and Sleep patterns with behavior among school-going children residing in New Delhi.

RESEARCH METHODOLOGY:

- ❖ **Research Approach:** Descriptive.
- ❖ **Research Design:** Cross-sectional survey design.
- ❖ **Study Area:** New Delhi.
- ❖ **Study Duration:** Between January to March 2022.
- ❖ **Study Population:** Children aged between 5 to 18 years studying either in government and private schools.
- ❖ **Sample Size:**
Assuming that 50% of school children had adequate knowledge regarding screen hours and sleep duration, 5% absolute error, 95% confidence level, and 5% non-response rate, our minimum sample size was 400.
- ❖ **Inclusive Criteria:** Students who were willing to participate in the study.

- ❖ **Exclusion Criteria:** Students who were not willing to participate in the study.
- ❖ **Study Tool:**
A pre-test semi-structured questionnaire containing questions regarding socio-demography screen hours, sleeping durations, sleeping habits, and behavior was created and utilized in the study after pilot testing.
- ❖ **Validity of Tool:** By the experts in this field.
- ❖ **Data Collection:** Data was collected and recorded by the school teachers.
- ❖ **Data Analysis:**
Data was collected and entered in a Microsoft Excel spreadsheet, cleaned for errors, and analyzed with Epi Info V7 Software with an appropriate statistical test in terms of frequencies, percentage, mean standard deviation, etc. A univariate analysis was done to predict the relationship between the screen hours, sleeping duration, and behavior. A p-value of 0.05 was taken as statistically significant.
- ❖ **Ethical Considerations:** Participants’ confidentiality and anonymity were maintained.

RESULTS:

The present study was developed to evaluate the correlation between screen hours and sleep patterns with behavior among school-going children residing in New Delhi. A total of 400 respondents including 180(45%) females and 220(55%) male school children from New Delhi participated in the study. Among them, 243(60.8%) were ≤ 10 years while 157(39.2%) were >10 years old. (Figure-1)

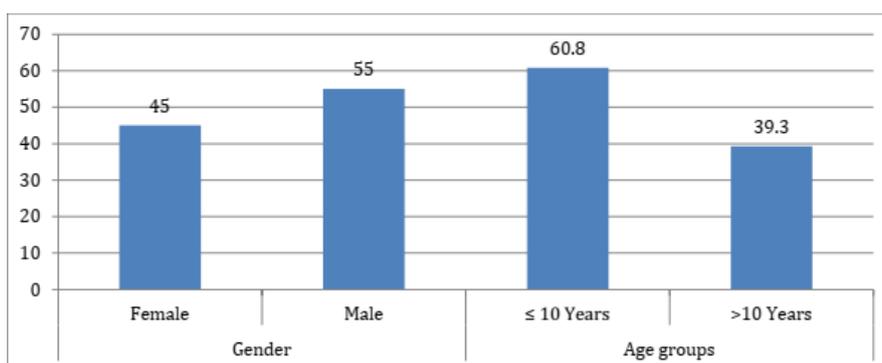


Figure 1: Age and Gender Distribution of study participants

Among the total 317(79.3%) school children had screen hours <2 hours per day while 83(20.7%) had ≥2 hours per day. 355(88.8%) school children watched TV <2 hours per day while 45(11.2%) watched ≥2 hours per day. 349(87.3%) school children using smartphones <2 hours per day while 51(12.7%) use ≥2 hours per day. 344(86.0%) school children had the habit of internet surfing <2 hours per day while 56(14.0%) had ≥2 hours

per day, 363(90.7%) school children play videogames/games on mobile <2 hours per day while 37(11.2%) play ≥2 hours per day. 198(49.5%) school children had adequate sleep hours of 6-8 hours, 174(43.5%) had sleep hours of more than 8 hours and 28(7%) had sleep duration of fewer than 6 hours. 364(91%) school children had onset of sleep within 30 minutes after going to bed while 36(9%) had after 30

min or more than that. 251(62.7%) school children didn't have the habit of watching Mobile/TV before

sleeping while 149(37.3%) had this habit. (Table-1)

Table 1: Pattern of screen hours and sleeping habits among study participants

		Freque ncy	Perce nt
Duration of screen hours per day	<2 hours	317	79.3
	≥2 hours	83	20.7
Duration of watching TV on a typical day	<2 hours	355	88.8
	≥2 hours	45	11.2
Duration of using smartphone on a typical day	<2 hours	349	87.3
	≥2 hours	51	12.7
Duration of internet surfing per day	<2 hours	344	86.0
	≥2 hours	56	14.0
Duration of videogames/games on screen per day	<2 hours	363	90.7
	≥2 hours	37	9.3
The habit of watching Mobile/TV before sleeping	No	251	62.7
	Yes	149	37.3
The average duration of sleep per day on a weekday	< 6 hours	28	7.0
	6-8 hours	198	49.5
	>8 hours	174	43.5
The onset of sleep after going to bed	<30 minutes	364	91.0
	≥ 30 minutes	36	9.0
The habit of watching Mobile/TV before sleeping	No	251	62.7
	yes	149	37.3
Total		400	100

Present study, 113(28.2%) students had behavior score 10 as assessed by teacher, 107(26.8%) had 9, 95(23.8%) had 8, 37(9.3%) had 7, 26(6.5%) had 6, 14(3.5%) had 5, 3(0.8%) had 4, 2(0.5%) had 3,

1(0.3%) had 2 and 2(0.5%) had behavior score of 1. The mean behavior score was 8.40 ±1.578 as assessed by the teacher.

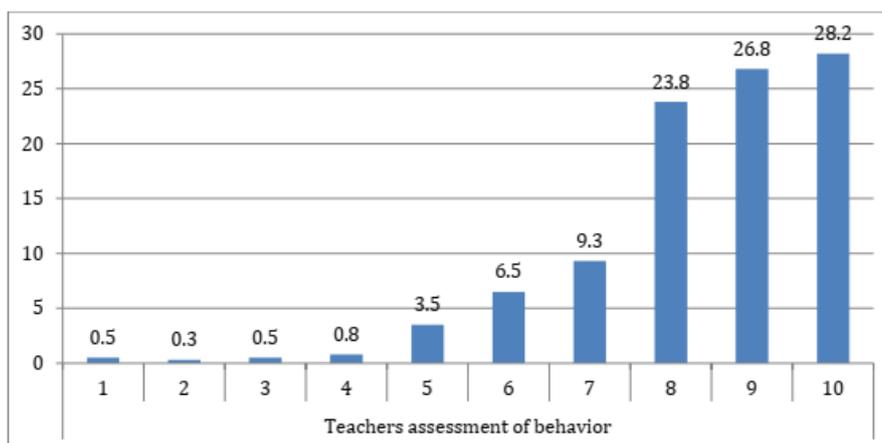


Figure 2: Teacher's assessment of student's Behavior

In the present study, behavior score was significantly more in students who had a duration of watching screen per day was <2 hours, a duration of watching TV on a typical day of <2 hours, duration of using a smartphone on a typical day <2 hours, average duration of sleep per day on a weekday between 6-8

hours, and who didn't have habit of watching mobile/TV before sleeping while there was no significant difference between the students on the basis of duration internet surfing, duration of videogames /games on screen per day and duration of onset of sleep after going to bed.

Table 2: Association of screen hours and sleeping pattern with behaviour of school children

The pattern of screen hours and Sleep	N	Teacher's assessment of student's Behavior score		p-value	
		Mean	Std. Deviation		
Duration of watching screen per day(hours)	<2 hours	317	8.60	1.369	0.00
	≥2 hours	83	7.64	2.040	0
Duration of watching TV on a typical day	<2 hours	355	8.48	1.485	0.00
	≥2 hours	44	7.73	2.095	3
Duration of using smartphone on a typical day	<2 hours	349	8.52	1.391	0.00
	≥2 hours	51	7.55	2.361	0
Duration internet surfing	<2 hours	344	8.45	1.530	0.11
	≥2 hours	56	8.09	1.832	2
Duration of videogames/games on screen per day	<2 hours	363	8.43	1.546	0.19
	≥2 hours	37	8.08	1.862	7
The average duration of sleep per day on a weekday	<6/>8 hours	202	8.36	1.480	0.57
	6-8 hours	198	8.44	1.675	8
The habit of watching Mobile/TV before sleeping	No	251	8.81	1.231	0.00
	Yes	149	7.71	1.843	0
The onset of sleep after going to bed	<30 minutes	364	8.44	1.579	0.13
	≥ 30 minutes	36	8.03	1.540	8

DISCUSSION:

Nowadays, children’s time spent in front of screens – such as televisions, computers, tablets, gaming consoles, and smartphones – continues to increase. Previous studies have examined associations between screen time and a broad array of psychological health indicators (e.g., anxiety, depression, aggression, attention problems) among children, yet results from these works have yielded mixed findings. In a recent systematic review of reviews, moderately strong evidence was found for associations between screen time and depressive symptoms and weak evidence for associations of screen time with problem behaviors, anxiety, hyperactivity, inattention, and poor sleep. Time spent engaging in screen time might replace time spent sleeping. Few studies have tested this proposal. Research has shown that adolescents (11- to 15-year-olds) sleep onset difficulties and sleep duration had a strong relationship with behavioral and psychological symptoms like feeling low, irritability, nervousness, headache, etc.^{9,10}

In the present study, behavior score was significantly more in students who had a duration of watching screen per day was <2 hours, a duration of watching TV on a typical day of <2 hours, duration of using a smartphone on a typical day <2 hours, average duration of sleep per day on a weekday between 6-8 hours, and who didn’t have habit of watching mobile/TV before sleeping while there was no significant difference between the students on the basis of duration internet surfing, duration of videogames/games on screen per day and duration of onset of sleep after going to bed.

In the study by Hale L *et al.*,¹, short sleep duration and nocturnal awakenings in toddlers were associated with the development of behavioral and emotional problems, sleep problems have been found to predict a greater incidence of behavioral and emotional problems emerging by mid-adolescence. The study also identified associations between short sleep duration and emotional problems, peer conflict, and suicidal ideation.

In another study by Guerrero *et al.*,³, time spent on various screens was positively associated with problem behaviors: watching television/movies was associated with a 5.9% increase in rule-breaking behavior, 5% increase in social problems, 4% increase in aggressive behavior and 3.7% increase in thought problems. Greater time spent playing mature-rated video games was associated with greater somatic complaints, aggressive behavior, and reduced sleep duration. Sleep duration mediated the relationship between screen time and problem behaviors, albeit the effect sizes were small. The largest effects were observed between sleep duration and all problem behaviors, with greater sleep duration predicting an 8.8–16.6% decrease in problem behaviors.

These relationships may be bi-directional, as sleep and psychological problems influence one another throughout development, suggesting a resonance phenomenon or a vicious cycle that may be exacerbated by excessive screen media habits.

CONCLUSION:

The present study concluded that the behavior of the school children was significantly associated with the duration of screen hours and average duration of sleep per day. School children should be advised to limit or reduce screen time exposure, especially before bedtime hours, and to have adequate sleep of 6-8 hours to minimize any potential impacts on their behaviors.

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