

# Correlation between screen time and psychosomatic symptoms in children during COVID-19 pandemic-related lockdown

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## ABSTRACT

**Background:** This study was planned to estimate the effect of lockdown on psychosomatic problems and sleep of children and their association with screen time during the lockdown. **Methods:** A cross-sectional study was conducted among 1-12-year-old children at a tertiary care hospital in South India. A pre-validated questionnaire with 20 related questions was disseminated through pediatric OPD, telemedicine service, and social media to eligible parents. **Results:** A total of 278 children aged 1-12 years with a mean (SD) age of 6.92 (3.01) years were studied. Most under 5-year-old children had screen time of  $\leq 2$  hours/day, whereas 58.16% of children between 5 and 12 years spent  $> 4$  hours/day ( $P < 0.000$ ). A significant proportion of participants aged 5-12 years had vision problems ( $P = 0.019$ ), whereas under 5-year-old children had significant associated behavioral changes ( $P = 0.016$ ) and sleep problems ( $P = 0.043$ ). **Conclusion:** Behavioral and sleep problems were significantly high and correlated with an increase in screen time among under 5-year-old children. Vision problems were more in 5-12-year-old children.

**Keywords:** Behavioral, children, COVID-19, lockdown, screen time, sleep, somatic

## Introduction

World Health Organization declared COVID-19 as a pandemic on March 11, 2020.<sup>[1]</sup> Schools and daycare centers were closed since March 2020 in India. Schools had started different modes of remote education like online teaching, assignment submission, and exams. Due to relatively more free time, children were also watching online videos and television. Children are affected in numerous ways by the inability to enjoy outdoor games, sedentary lifestyle, unable to socialize with friends or relatives, an

increase in screen time due to online education, and boredom.<sup>[2-5]</sup> COVID-19 pandemic-related lockdown can cause anger issues, sleep, and behavioral problems in children.<sup>[2,6]</sup> It has been seen from the previous study that children exposed to more screen time at 3 and 5 years of age have significantly increased behavioral problems later.<sup>[7]</sup> One study was done in Spain during lockdown reported tantrums in 56.4% of normal children below 7 years of age.<sup>[8]</sup> There is limited knowledge if lockdown has increased the risk of having psychosomatic problems in children and whether increased screen time is contributing to it. This study was planned to fill this lacuna and to know the effect of lockdown on psychosomatic problems including sleep in children and also to assess the association of screen time with these parameters in children.

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## Material and Methods

### Study setting

This cross-sectional study was conducted in the pediatrics department of a tertiary care teaching hospital located in South India after getting formal approval from the institute ethical committee (AIIMS/MG//IEC/2020-21/48).

### Study duration

From September 2020 to January 2021

### Sampling

Conventional sampling was done as per Government of India guidelines for the lockdown period. Study enrolled 318 participants for a period of 5 months of lockdown.

### Data collection

Parents of children living in India aged 1–12 years who were staying indoors due to the lockdown were contacted via multiple methods like physical meetings with parents visiting OPD and through social media. Participants were enrolled after obtaining informed consent. Children who were able to play outdoor games for at least 1 hour/day for 2 days/week during this period were excluded. Children who were already having abnormal neurological profiles like developmental delay, seizure disorder, or psychological problems were also excluded.

### Data analysis

Data analysis was done using Stata software version 14.2 (Stata Corp, College Station, TX, USA). Variables were categorized and presented as frequencies (n) and percentages (%). Pearson Chi-square test/Fisher's exact test was applied to assess the association between lockdown-related activities of participants, psychosomatic problems, and age group (less than 5 years *versus* 5–12 years). The association between behavioral changes, vision, and sleep problems with screen time was also assessed. Statistical significance was set at  $P$  value < 0.05.

### Ethical issues

Institute ethical committee (AIIMS/MG//IEC/2020-21/48).

### Guidelines for reporting

Electronic data collection was done as per the online survey Checklist for Reporting Results of Internet E-Surveys (CHERRIES) guidelines.<sup>[9]</sup> The questionnaire was filled out either on paper or through google form and responses of parents/caretakers were recorded. No identifying information was obtained and patient confidentiality was ensured.

### Study tool

A questionnaire was generated on *Google Forms* comprising 20 questions on screen time, behavioral changes, vision, and sleep problems during the lockdown. The questionnaire was validated

using the Delphi technique wherein it was mailed for review to five experts in the field and was modified as per suggestions received. The modified questionnaire was validated further by pilot testing among 20 non-study participants. The final version of the questionnaire was used to collect information.

## Results

A total of 318 participants were enrolled in the study, out of which 40 were excluded as per exclusion criteria. A total of 278 entries were included for the final analysis. The mean (SD) age of participants was 6.92 (3.01) years and more than half (55.045%) of participants were males.

### Psychosomatic problems

Various psychosomatic problems reported during the lockdown in children are tabulated in Table 1. Children aged 1–12 years had reported various behavioral problems like aggression in 103 (37.05%), tantrums in 76 (27.34%), dullness in 25 (8.99%), and other miscellaneous behavioral problems in 29 (10.43%) children. Aggression was reported by 26 (25.24%) in the age group less than 5 years, whereas it was 77 (74.76%) in age groups 5–12 years. Dullness was noted in 3 (12%) children in the less than 5 years age group, whereas 22 (88%) children in the age group 5–12 years. Tantrums was reported by 29 (38.16%) children in age group less than 5 years and 47 (61.84%) in 5–12 years. Parents/caretakers also reported problems like children indulging in excessive arguments, being disobedient, irritable, hyperactive, addicted to games, and reduced interest/concentration in studies. Among these, 8 (27.59%) children and 21 (72.41%) children were in age groups less than 5 years and 5–12 years, respectively.

### Sleep-related problems

Children who had various sleep problems like sleep talking ( $n = 36$ , 12.94%), sleep terror/nightmare ( $n = 19$ , 6.84%), confusional arousal ( $n = 15$ , 5.4%), and rest ( $n = 5$ , 1.78%) could not specify the type of sleep problems.

### Screen time association with various problems during the lockdown

The association between screen time and behavioral changes, vision, and sleep problems of participants is mentioned in Table 2. Behavioral changes and sleep problems were significantly associated with screen time among less than 5 years aged children. However, behavioral changes and sleep problems among older children and vision problems in both age groups did not differ significantly with the duration of screen time.

## Discussion

Many studies have shown an increase in numerous problems in children, whereas some have also shown a beneficial effect of lockdowns like more family time or reduction in academic stress, bullying at school, etc.<sup>[7,8,10-12]</sup>

**Table 1: Lockdown-related activity of the participants by age group**

Variable	Total n (%)	Age group n (%)		P
		<5 years (Total n=82) n (%)	5-12 years (Total n=196) n (%)	
Duration of staying indoors				
<3 months	28 (10.07)	14 (17.07)	14 (7.14)	0.012
>3 months	250 (89.93)	68 (82.93)	182 (92.86)	
Screen time				
≤2 h	64 (23.02)	41 (50.00)	23 (11.73)	<0.000
>2-≤4 h	82 (29.50)	23 (28.05)	59 (30.10)	
>4 h	132 (47.48)	18 (21.95)	114 (58.16)	
Gets upset/resists when stopped from using media				
Yes	241 (86.69)	76 (92.68)	165 (84.18)	0.057
No	37 (13.31)	6 (7.32)	31 (15.82)	
Vision problems*				
Yes	78 (28.06)	15 (18.29)	63 (32.14)	0.019
No	200 (71.94)	67 (81.71)	133 (67.86)	
Headache				
Yes	93 (33.45)	38 (46.34)	55 (28.06)	0.003
No	185 (66.55)	44 (53.66)	141 (71.94)	
Behavioral changes+				
Yes	152 (54.68)	44 (53.66)	108 (55.10)	0.825
No	126 (45.32)	38 (46.34)	88 (44.90)	
Hours of sleep				
<8 h	28 (10.07)	12 (14.63)	16 (8.16)	0.102
>8 h	250 (89.93)	70 (85.37)	180 (91.84)	
Sleep problems^				
Yes	67 (24.10)	19 (23.17)	48 (24.49)	0.815
No	211 (75.90)	63 (76.83)	148 (75.51)	
Breaks in sleep				
Yes	58 (20.86)	44 (53.66)	14 (7.14)	<0.000
No	220 (79.14)	38 (46.34)	182 (92.86)	
New hobbies developed				
Yes	128 (46.04)	46 (56.10)	82 (41.84)	0.030
No	150 (53.96)	36 (43.90)	114 (58.16)	

+Definition of Behavioral changes: Aggression, tantrums, dullness for at least 5 days a week for >2 weeks. \*Definition of Vision problems: Watery or redness of eyes, or pain in eyes during studying or irritation of eyes for at least 5 days a week for more than 2 weeks. ^Definition of Sleep problems: Problems in nap time initiation, or a child having a break in sleep for more than two times per night or experiencing problems like sleep terror, sleepwalking or sleep talking, or confusional arousal. Any children having these issues for at least 5 days a week for more than 2 weeks

**Table 2: Association between screen time and behavioral changes, vision, and sleep problems of the study participants**

Variable	Screen time							
	<5 years (n=82)			P	5-12 years (n=196)			P
	≤2 h n (%)	>2-≤4 h n (%)	>4 h n (%)		≤2 h n (%)	>2-≤4 h n (%)	>4 h n (%)	
Behavioral changes								
Yes	16 (39.02)	14 (60.87)	14 (77.78)	0.016	11 (47.83)	29 (49.15)	73 (64.04)	0.102
No	25 (60.98)	9 (39.13)	4 (22.22)		12 (52.17)	30 (50.85)	41 (35.96)	
Vision problems								
Yes	6 (14.63)	7 (30.43)	2 (11.11)	0.196	4 (17.39)	17 (28.81)	42 (36.84)	0.153
No	35 (85.37)	16 (69.57)	16 (88.89)		19 (82.61)	42 (71.19)	72 (63.16)	
Sleep problems								
Yes	5 (12.20)	9 (39.13)	5 (27.78)	0.043	3 (13.04)	15 (25.42)	30 (26.32)	0.394
No	36 (87.80)	14 (60.87)	13 (72.22)		20 (86.96)	44 (74.58)	84 (73.68)	

Our study included participants from all over India, whereas other reported studies were restricted to a particular region of India.<sup>[10,12]</sup> Mean age of study participants in our study is lower than other reported studies.<sup>[7,12]</sup> In 45.32% of cases, single child was there in the house, and in 49.64% of cases, there was one more sibling similar to a study from Punjab,

where most families were having one or two children living together in lockdown.<sup>[12]</sup>

### Screen time duration compared to global studies

Total media time increased by 40.5% during the lockdown in adolescent boys and by 33% in adolescent girls in Switzerland.<sup>[13]</sup>

We found significantly high screen-time exposure in children aged 5–12 years which can be due to online classes or the use of media for recreational purposes like watching cartoons, movies, and entertainment videos. Another study on school going children aged 6–15 years found that online education was the cause of increased screen time in 66% of children.<sup>[11]</sup> However, there can be a possibility of parents underestimating or overestimating their child's media use.<sup>[13]</sup>

### Negative impact of lockdown on children

We found that 89.93% of children were having good sleep duration, i.e.  $\geq 8$  hours/day; however, sleep problems were present in 24.10% of 1–12 years children. Younger children were not able to de-stress themselves as effortlessly as older children during lockdown so maybe they were having more sleep disturbances ( $P < 0.00$ ). Vision problems were present in a significant number of children aged 5–12 years ( $P = 0.019$ ) due to sudden changes in the mode of education leading to increased exposure to digital screen. Our study showed more lifestyle problems in less than 5 years of children like somatic complaints, behavioral changes, and sleep disturbances which may be due to organic or attention-seeking behavior of these children while parents got busy with online classes of older siblings or with their work-from-home situation. Most symptoms were self-limiting and none of these children required hospitalization.

There is a significant association between screen time duration and behavioral problems and sleep in children between the age groups less than 5 years, whereas 5–12 years showed no such association. This is an important factor to weigh in while advocating for online studies in pre-school level education, as they were found to have a significant impact on their behavior and sleep due to the amount of screen-time exposure. More anger episodes (30%) were reported previously in children with psychiatric disorders during the lockdown.<sup>[10]</sup> However, our study with normal children also reported aggression (74.76%), tantrums (61.84%), and dullness (88%) in 5–12 years aged children. In children less than 5 years age, we found aggression in 25.24%, tantrums in 38.16%, and dullness in 12% of children. Post lockdown when the pandemic has started waning, we have to had knowledge of these effects in children so that all primary physicians attending them can screen and do preventive steps regarding behavioral issues.

### Positive impact of lockdown on children

Another study found that 42.6% of parents feel that they had more time for their children at home during lockdown compared to the pre-lockdown period as children were confined to the home and a proportion of parents were “working from home.”<sup>[11]</sup> Similarly, we had found some positive impacts of the lockdown that 46.04% of parents reported children had developed some new hobbies during this period. Painting, artwork, gardening, music, dancing, and YouTube video creation were some of new hobbies of kids during lockdown. Similarly, parents were utilizing

lockdown time for many leisure activities like a nature walk or gardening with children as shown by another study.<sup>[11]</sup>

### Limitations

There might be less representation from low socioeconomic groups and those without access to mobile and internet, since the majority of data collection was online via social media. Being a self-reported questionnaire study, an element of recall bias is unavoidable.

### Conclusion

Lockdown has caused significant impact on psychosomatic and sleep behavior in children and also increased screen time. Behavioral and sleep problems were more with younger than older children. Older children 5–12 years of age had significantly more vision problems.

### Institutional Ethical Clearance approval

Obtained.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

### References

1. Zhu H, Wei L, Niu P. The novel coronavirus outbreak in Wuhan, China. *Glob Health Res Policy* 2020;5:6.
2. Maynard T, Waters J. Learning in the outdoor environment: A missed opportunity? *Early Years* 2007;27:255–65.
3. Babu TA, Selvapandiyam J. The psychological effects of COVID-19 pandemic related lockdown in children. *Indian Pediatr* 2020;57:1087.
4. Wang G, Zhang Y, Zhao J, Zhang J, Jiang F. Mitigate the effects of home confinement on children during the COVID-19 outbreak. *Lancet* 2020;395:945–7.
5. Panchal U, Pablo GS, Franco M, Moreno C, Parellada M, Arango C, *et al.* The impact of COVID-19 lockdown on child and adolescent mental health: Systematic review. *Eur Child Adolesc Psychiatry* 2021:1–27. doi: 10.1007/s00787-021-01856-w.
6. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, *et al.* The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *Lancet* 2020;395:912–20.
7. Eysenbach G. Correction: Improving the quality of web surveys: The checklist for reporting results of internet E-Surveys (CHERRIES). *J Med Internet Res* 2012;14:e8. doi: 10.2196/jmir.2042.
8. Patra S, Patro BK, Acharya SP. COVID-19 lockdown and school closure: Boon or bane for child mental health, results of a telephonic parent survey. *Asian J Psychiatr* 2020;54:102395. doi: 10.1016/j.ajp.2020.102395.
9. Tamana SK, Ezeugwu V, Chikuma J, Lefebvre DL, Azad MB, Moraes TJ, *et al.* Screen-time is associated with inattention

- problems in pre-schoolers: Results from the CHLD birth cohort study. PLoS One 2019;14:e0213995. doi: 10.1371/journal.pone.0213995.
10. Ambrožová P, Eisenkolbová P, Junová I, Stašová L. University of Hradec Králové. Parents' view of media use by children during the COVID-19 pandemic (Czech republic) , INTED 2021 Proceedings;3802-09.
  11. Garcia-Adasme SI, Cárdenas-Rebollo JM, Jimenez-Perianes A, Lalinde M, Jimeno S, Ventura PS, *et al.* Pediatric home confinement due to COVID-19: Somatic and anxiety spectrum consequences. J Clin Nurs 2021;30:3238-48.
  12. Sama BK, Kaur P, Thind PS, Verma MK, Kaur M, Singh DD. Implications of COVID-19-induced nationwide lockdown on children's behaviour in Punjab, India. Child Care Health Dev 2021;47:128-35.
  13. Radesky JS, Weeks HM, Ball R, Schaller A, Yeo S, Durnez J, *et al.* Young children's use of smartphones and tablets. Pediatrics 2020;146:e20193518. doi: 10.1542/peds.2019-3518.