



## A CROSS SECTIONAL STUDY TO EXAMINE THE ASSOCIATION BETWEEN TOTAL SCREEN TIME AND BMI IN CHILDREN AGED 10-15 YEARS

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### ABSTRACT

**Introduction:** Recent studies from WHO suggest that there is around 16% of childhood obesity around the globe and India accounts for 11.15% of it. The causes are multifactorial but screentime plays a significant role in it. Our aim with this study was to find out the correlation between screen time and BMI in adolescent children aged 10-15 yrs. **Material and Method:** A cross-sectional observational study was conducted at Pacific Medical College and Hospital, Udaipur in association with a private school on 1021 students. The period of study was from 01/03/2021 to 28/02/2022. **RESULT:** The study was conducted on 451 (44%) females and 570 (56%) males. The maximum frequency of students watching screens was 1 to 4 hours on average. The BMI is positively correlated with screen time. The p-value (0.001) is statistically significant. The coefficient is 0.7 and is highly significant as well as positive between Screen Time and BMI. **Conclusion:** Screen usage is a significant risk factor for adolescent obesity. Our findings add to the body of literature by demonstrating that increased screen time from ages 10 to 15 was linked to increases in BMI at the higher tail of the distribution of BMI.

**KEYWORDS :** Screen time, BMI, obesity, Physical activity

### INTRODUCTION

Nowadays, as a result of the advancement of contemporary technology, children began using various electronic devices at a very young age. The life of a person can be negatively impacted by excessive screen time, particularly the life of a child. Blum-Ross and Livingstone (2017)<sup>1</sup> include "behaviour, content, contact, and commercial" as the general concerns associated with excessive and inappropriate screen use.

American Academy of Pediatrics (2016) recommends that children should spend no more than an hour per day in front of an electronic screen. Screen time refers to the amount of time spent and the diverse activities performed online using digital devices (DataReportal, 2020).

With the COVID-19 epidemic came limitations, guidelines, and directives to stay at home. As a result, people stayed indoors, playgrounds were deserted, and there was little activity on the streets. The pandemic's restrictions on social engagement made the excessive use of digital devices for socializing worse (Pandey and Pal, 2020).<sup>3</sup> Recent data from the WHO revealed that the presence of childhood obesity worldwide is 16.5 per cent and in India, it accounts for 12.4 per cent in boys and 9.9 per cent in girls. The causes of childhood obesity are multifactorial. The body mass index (BMI) for age is the criterion used most widely in epidemiological studies to assess excess weight in children and adolescents.

The purpose of our study was to determine the relationship between daily recreational screen time and excess weight and obesity using three different standards for children aged 10-15 years.

### MATERIAL AND METHODS

This cross-sectional and prospective study was carried out at Pacific Medical College and Hospital, Udaipur, Rajasthan. The proposed study was conducted from 01.03.2021 to 28.02.2022 On 1021 youngsters in total of age group 10 -15 years. We went to the neighbourhood public school to talk to kids. Every participating child's parent's consent will be obtained. The study was conducted after taking approval from the Pacific Medical College ethical committee.

#### Inclusion Criteria

Children whose parents give consent.

#### Exclusion Criteria

- Any adolescent with a known medical condition, such as

hypothyroidism, diabetes mellitus, physical handicap, intellectual disability, developmental delay, behaviour issues, visual or hearing impairment, chronic sickness, or acute illness, was excluded from the study.

- Teenagers whose parents refuse to give consent

The children's demographic information was gathered. The students were asked to self-report their daily physical activity and screen time habits. The amount of screen time spent on an average school day and the average holiday was compiled, and the average amount of screen time over a week was converted into an average amount of screen time per day.

#### Anthropometric Measurement

The height of the children was measured by a stadiometer and the weight by a digital weighing scale. The BMI was calculated using the formula [Weight(kg)/Height(m<sup>2</sup>)]. Weight by digital weighing machine will be collected.

### RESULT

In our study, 1021 children were selected. The frequency of students 10 years of age was 33, with 11 years 176, with 12 years 326, 13 years, 306 and with 14 years 180 students. The mean age was 12.41 years. Out of these children 451(44%) were female and 570(56%) were male. The observation was that 247 students were watching Tv/playing games online for less than 1 hour 505 children were watching screen for 1-2 hours, and 2-4 hours by 221 individuals, and more than 4 hours were by 48 children.

**Table 1: Showing Distribution Of Students According To Spending Time In Front Of Screen In A Day**

S.No.	Screen time per day	Number of students	Percentage (%)
1.	< 1 hour	247	24
2.	1-2 hour	505	49
3.	2-4 hours	221	22
4.	>4 hours	48	5

The BMI and screen time had a positive relationship. It was found in our study that the p-value (0.001) is significant which establishes the fact that excessive screen time can lead to obesity.

**Table 2: Correlation Of BMI With Screen Time**

S. No.	BMI kg/m <sup>2</sup>	Mean BMI	Mean Screen time per day	Corelation Coefficient	p-value

1.	Severely under weight <14 kg/m <sup>2</sup> (N=102)	13.87 ± 5.65	2.30 ± 5.65	0.791	<0.0001
2.	Under weight 15- 18.4 kg/m <sup>2</sup> (N=297)	16.89 ± 6.65	3.22 ± 6.08		<0.0001
3.	Normal 18.5-24.9 kg/m <sup>2</sup> (N=317)	22.09 ± 8.15	3.80 ± 4.66		<0.0001
4.	Obese Class I 25-29.9 kg/m <sup>2</sup> (N=100)	27.66 ± 6.05	4.24 ± 5.80		<0.0001
5.	Obese class II 35-39.9 kg/m <sup>2</sup> (N=116)	37.43 ± 7.44	5.30 ± 4.35		<0.0001
6.	Obese class III >40 kg/m <sup>2</sup> (N=89)	57.56 ± 8.23	7.30 ± 2.34		<0.0001

**DISCUSSION**

Our study group comprised 1021 adolescents between 11-14 years of age. Our study group had more female students. The mean age of the students was 12.41 ± 1.06 years. The distribution of students based on sex was 451 (44%) females and 570 (56%) males. The study by Kumar SS et al 2020 reported males(53.2%) than females (46.8%) which is similar to our study(2). A study conducted by M. G. Matias et al, 2017 reported girls (59%) more than boys (41%) which was different from our study.

The mean ± SD of Height was 158.23 ± 11.80 cm, mean weight was 50.45 ± 14.91 kg and BMI was 19.68 ± 4.20. The maximum number of children taking screen time was 1-2 hours daily. The minimum frequency of students watching screens was > 4 hours. The students doing the least physical activity per day were 247 (24%). The maximum number of students were who use to do physical activity for 1-2 hours daily. According to IAP, screen time should be limited to 1-2 hours daily. A positive relation between screen time and overweight and obesity was found in the study conducted among 18784 adolescents in Mexico. Low physical activity levels and watching television for more than 2 h/day were found to be important determinants of overweight and obesity among adolescents in a study by Nawab t et al 2014(4). Carlson S A et al in a study among American youth noted that odds that children would exceed recommended screen time limits (<120 minutes per day) decreased as physical activity in the previous week increased. The most current evidence for this comes from O'Brien et al. (2018)(7), who discovered that boys were more likely than girls to spend time on screens during adolescence. The current study discovered that boys reported using computers more frequently than girls, which is consistent with the results of a significant international survey (Cheema, 2015)(8), albeit among 15-year-old students. According to a major (n = 284,717) survey conducted in 43 countries (including ROI), boys used entertainment software on computers more often than girls. Our study reveals that boys engage more in regular physical exercise than girls. Boys seem to be more aggressive than girls, which could be the cause of this. The study done on adolescents reported a median screen time of 4.79 hours per day, which is more than twice the American Academy of Paediatrics suggested daily limit for this age group (2 hours) but is comparable to the

screen-time habits of a national sample of adolescents (Rideout & Robb, 2019). (9)

A lower increased level of moderate and vigorous physical activity was associated with lower BMI and less TV watching and increased TV was associated with an increased BMI in the youth risk behaviour survey among US youth.

The prevalence of overweight and obesity among urban school children in the age group of 13-17 years study at Chennai by Sunder JS et al was 14.3 % and 4.7 % respectively. (13) The prevalence of overweight and obesity was found to be 18.7 % and 5.8 % among adolescents aged 10-19 years in a study in South India. These studies are consistent with our study.

**CONCLUSION**

Screen usage is a significant risk factor for adolescent obesity. Our findings add to the body of literature by demonstrating that increased screen time from ages 10 to 15 years was linked to increases in BMI at the higher tail of the distribution of BMI. Studies show that media consumption on screens is a correlate and a risk factor, but they do not establish that it is a cause.

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