



A CROSS-SECTIONAL ANALYTICAL STUDY ON THE EFFECT OF ELECTRONIC MEDIA ON THE ADOLESCENT POPULATION

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ABSTRACT

Background: Mass media is integral to adolescents' lives, providing information and entertainment but posing health and behavioral risks. Excessive electronic media use may impair sleep, concentration, academic performance, physical activity and weight status. Owing to limited evidence from India, this study examines media use patterns and their impact on adolescent health and development. **Aim:** to evaluate the extent of electronic media exposure among adolescents and its effects on obesity, sleep, concentration, academic performance and extracurricular activities. **Method:** After approval from the Institutional Ethics and Scientific Committees, this cross-sectional study included 520 adolescents aged 10–19 years. Informed consent was obtained from all participants. Data were collected using a structured questionnaire and anthropometric measurements. Weight and height were measured using a balanced beam scale and stadiometer and BMI was calculated for all subjects. **Result:** Among 520 adolescents (mean age 13.07 years), excessive media use (> 2 hours/day), more common in males, significantly affected sleep timing and scholastic performance. Most had normal BMI, owned mobile phones, accessed the internet and reported adverse effects on sleep, concentration and academics. **Conclusion:** This study of 520 adolescents showed that electronic media use exceeding two hours daily significantly affected sleep, concentration, scholastic performance, obesity and extracurricular activities, with greater exposure and adverse effects among males, highlighting the need for balanced and positive media use to promote healthy adolescent development.

KEYWORDS : Adolescent population, overweight, obesity, Concentration, Scholastic performance.

INTRODUCTION

One of the most significant changes in the social environment of the 21st century has been the saturation of daily life with mass media. Electronic media, while offering convenience and information, has also created a "virtual bad street" that exposes children and adolescents to potentially harmful content within their own homes.¹ Media has become the backbone of the modern entertainment industry and a powerful means of sharing information, ideas and opinions worldwide, with television, radio, newspapers and the internet enabling instant access to national and international affairs.

Media plays a vital role in shaping public opinion and is often referred to as the third pillar of democracy after the government and the people. It promotes transparency in governance by allowing citizens to express grievances through social media platforms, enabling authorities to take corrective action. Television, cinema and print media also contribute to projecting cultural values and traditions, while offering entertainment that helps individuals feel rejuvenated. In developing countries, media plays a key role in highlighting social evils such as poverty and child labor, shaping public awareness and government response. However, young people are highly impressionable and often accept media content uncritically, leading to unhealthy habits, addiction, biased thinking and social unrest. Thus, media acts as a double-edged sword, capable of promoting social good when used responsibly, but harming the social fabric if misused.

Rapid technological advancement has improved quality of life but excessive media use has caused stress and distraction among adolescents; this study explores patterns of electronic media usage in this population.²

India, with the world's second-largest telecommunication network, has witnessed near-universal mobile phone

ownership among youth, particularly males aged 24 years and below. Research indicates that excessive media exposure reduces time spent on healthy activities such as physical exercise, outdoor play and family interaction and may negatively influence health-related behaviors, especially among children unable to distinguish fantasy from reality.¹

This study Aim's to evaluate the extent of electronic media exposure among adolescents and its effects on obesity, sleep, concentration, academic performance and extracurricular activities.

MATERIALS AND METHODS

Study Site: The present study was conducted among patients and adolescents attending the OPD and IPD at Dr. Babasaheb Ambedkar Memorial Central Railway Hospital, Byculla, Mumbai.

Study Population: Adolescents aged 10–19 years of both sexes constituted the study population.

Study Design: A cross-sectional analytical study design was adopted.

Sample Size And Sampling Technique: Assuming a 50% prevalence of impact of electronic media use among adolescents, the sample size was calculated using the formula $n = Z^2(pq)/d^2$ at 95% confidence interval and 10% precision. The calculated sample size was 471, which was increased to 520 after adjusting for a 10% non-response rate. Participants were selected using a simple random sampling technique.

Study Period: The study was conducted from August 2017 to May 2019.

Inclusion Criteria: 10 to 19 years old boys and girls attending

at OPD and IPD of Dr. Babasaheb Ambedkar Memorial Central Railway Hospital, Byculla, Mumbai, Maharashtra-400027, India.

Exclusion Criteria: Adolescents who have intellectual disability, learning disability, visual impairment and neuropsychiatric disorders.

Methodology: Ethical approval was obtained from the Institutional Ethics and Scientific Committees. Informed consent was taken and information sheets were provided to all participants. Data were collected using a structured questionnaire. Anthropometric measurements were recorded using a balanced beam scale and a portable or wall-mounted stadiometer.

Anthropometric Measurements: Weight was measured using a balanced beam scale placed on a hard, level surface or a wooden platform. The scale was calibrated with sliding weights set at zero. Participants stood centrally with weight evenly distributed until balance was achieved. Height was measured using a stadiometer fixed vertically against a hard, flat wall with the base at floor level.

Statistical Analysis: Data were expressed as mean ($\pm$ SD), frequencies, and percentages. Chi-square or Fisher's exact test was used for categorical variables, and Pearson's correlation for quantitative data. A p-value <0.05 was considered significant. Analysis was performed using Microsoft Excel 2013, GraphPad Instat 3.06, and SPSS version 21.

RESULTS AND OBSERVATIONS

In the present study, most participants were male (60%), Hindu (81.34%) and had electronic gadgets in bedrooms. Mean sleep duration was 7.97 hours. Media exposure exceeding two hours daily was significantly associated with obesity and reduced extracurricular activities, while effects on concentration and overweight showed no consistent gender-based statistical significance.

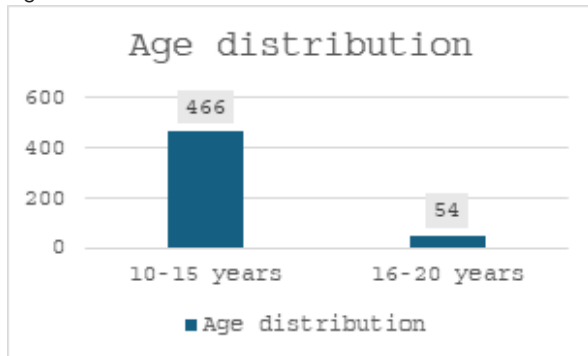


Figure 1: Distribution of study subjects according to their Age.

Demographic characteristics of 520 adolescents aged 10-19 years in this study was determined. The mean age of the study subjects was 13.07 years. Majority of the study subjects belonged to 10-15 years of age group (89.61%)

Table 1: Distribution Of Study Subjects According To Their Body Mass Index

Body Mass Index	Number of subjects	Percentage
NORMAL	379	72.88%
OVERWEIGHT	96	18.46%
OBESE	45	8.65%
Total	520	100%

it was observed that majority of subjects were having normal BMI (72.88%), followed by 18.46% who were overweight and 8.65% were obese.

Table 2: Distribution of Study Subjects According to Mobile Phone Availability, Internet Access, Parental Supervision, Source of Media Introduction, and Internet Sites Visited.

Variable	Category	Number of Subjects	Percentage (%)
Mobile Phone Ownership	Yes	293	56.34
	No	227	43.65
Internet Access	Yes	380	73.07
	No	140	26.92
Watching/Playing Limits	Yes	301	57.88
	No	219	42.11
Parental Supervision at Home	Yes	385	74.03
	No	135	25.96
Introduced to Media By	Parents	323	21.73
	Friends	113	62.11
	Siblings	38	7.3
	Others	46	8.84
Internet Sites Visited	Entertainment	236	45.38
	Study related	209	40.19
	News related	20	3.84
	Others	55	10.57

In the present study, 56.34% of adolescents owned mobile phones and 73.07% had internet access. Screen-time limits and parental supervision were reported in 57.88% and 74.03%, respectively. Friends most commonly introduced social media (62.11%). Entertainment sites were most frequently visited (45.38%), followed by study-related sites (40.19%).

Table 3: Effect Of Media Use On Sleep, Concentration, And Scholastic Performance Among Study Subjects.

Variable	Response	Number of Subjects	Percentage (%)
Media Use Affects Sleep	Yes	187	35.96
	No	333	64.03
Media Use Affects Concentration	Yes	249	47.88
	No	271	52.11
Media Use Affects Scholastic Performance	Yes	208	40
	No	312	60

Effects of electronic media on various aspects of daily life of school going students was observed. Grossly 35.96% study subjects responded that use of social media affects their sleep pattern. 47.88% study subjects responded that use of social media affects their concentration in studies. 40% study subjects responded that use of social media affects their scholastic performance.

Table 4: Comparison Between Total Media Exposure And Gender.

Total Media exposure per day	Males	Females	Total
<2 hours	50	55	105
>2 hours	262	153	415
Total	312	208	520
Significance	Chi-square value: 8.40, p-value: 0.003		

In the present study, total media exposure among study subjects of both genders was compared. It was observed that males had statistically significant more media exposure (exposure more than 2 hours per day) as compared to female study subjects (Chi-square value: 8.40, p-value: 0.003).

Table 5: Comparison Between Total Media Exposure And Prevalence Of Overweight Subjects

Total Media exposure per day	Overweight subjects		Total
	YES	NO	
<2 hours	19	69	88
>2 hours	86	346	432
Total	105	415	520
Significance	Chi-square value: 0.045, p-value: 0.83		

total media exposure among study subjects with their body mass indices was compared, it was observed that in case of total media exposure more than 2 hours per day, the finding was **not** found to be statistically significant (Chi-square value: 0.045, p-value: 0.83)

Table 6: Comparison Between Total Media Exposure And Frequency Of Subjects With Sleep Timing Affected

Total Media exposure per day	Sleep timing affected		Total
	YES	NO	
<2 hours	24	81	105
>2 hours	163	252	415
Total	187	333	520
Significance	Chi-square value: 9.11, p-value: 0.002		

total media exposure among study subjects was compared with sleep timing affected, it was observed that the sleep time was significantly affected among the study subjects with total media exposure greater than 2 hours per day (Chi-square value: 9.11, p-value: 0.002).

Table 7: Comparison Between Total Media Exposure And Frequency Of Subjects With Scholastic Performance Affected.

Total Media exposure per day	Scholastic performance affected		Total
	YES	NO	
<2 hours	29	76	105
>2 hours	179	236	415
Total	208	312	520
Significance	Chi-square value: 7.76, p-value: 0.0053		

total media exposure among study subjects compared with scholastic performance affected, it was observed that the scholastic performance was significantly affected among the study subjects with total media exposure greater than 2 hours per day (Chi-square value: 7.76, p-value: 0.0053).

DISCUSSION

Use of electronic media affects sleep patterns, duration, concentration, and overall development. Several studies from Western countries, including Thailand,³ the Netherlands,⁴ Canada,⁵ and Saudi Arabia and Norway,⁶ have demonstrated these effects. However, such evidence is limited in developing countries like India; hence, the present study was conducted to assess the impact of electronic media exposure on adolescents.

Demographic characteristics of total 520 study subjects in this study was determined. The mean age of the study subjects was 13.07 years. Majority of the study subjects belonged to 10-15 years of age group (89.61%).

Majority of study subjects were having normal BMI (72.88%), followed by 18.46% study subjects were overweight and 8.65% study subjects were obese.

Majority of the study subjects owned mobile phones (56.34%) and had internet access (73.07%). Television (31.15%), mobile phones (20.57%), and multiple gadgets (16.92%) were commonly present in bedrooms. Parental supervision was reported in 74.03%, while friends most frequently introduced social media (62.11%). Entertainment sites were most commonly visited (45.38%), followed by study-related sites (40.19%), with minimal use for news content (3.84%).

Most study subjects slept 5–10 hours daily (93.65%), with a mean duration of 7.97 hours. Electronic media use affected sleep patterns in 35.96% of students, concentration in 47.88%, and scholastic performance in 40% of the study population.

It was observed that total media exposure exceeding two hours per day was significantly associated with obesity among study subjects ($p = 0.043$). On gender-wise analysis,

males showed a significantly higher prevalence of obesity in the more than two hours exposure category compared to females ($p = 0.027$).

A longitudinal study from New Zealand reported that nearly 17% of overweight prevalence at 26 years of age was attributable to watching television for more than two hours per weekday during childhood and adolescence.⁷

In the present study, when total media exposure among study subjects compared with sleep timing affected, it was observed that the sleep time was significantly affected among the study subjects with total media exposure greater than 2 hours per day (p -value: 0.002). However, we could not get any significant relation when findings compared between either gender (p -value: 1.32).

In the present study, media exposure exceeding two hours per day significantly affected concentration ($p = 0.05$) and scholastic performance ($p = 0.0053$). However, gender-wise analysis showed no significant differences in concentration ($p = 0.206$) or academic performance ($p = 0.218$).

CONCLUSION

This cross-sectional study of 520 adolescents found that electronic media exposure exceeding two hours daily significantly affected sleep, concentration, scholastic performance, obesity, and extracurricular activities, with greater exposure among males. The findings highlight the negative impact of excessive media use on adolescent development and emphasize the need to promote balanced and positive use of electronic media for healthy academic and lifestyle outcomes.

REFERENCES

1. Ray M, Jat KR. Effect of Electronic Media on Children, Indian Paediatrics 2010; 47: 561-568.
2. Krithika M, Vasantha S. The Mobile Phone Usage Among Teens and Young Adults Impact of Invading Technology. IJIRSET 2013; 2(12): 7259-7265.
3. Vijakkhana N, Wilaisakditipakorn T, Ruadeekhajorn K, Pruksananonda C, Chonchaiya W. Evening media exposure reduces night-time sleep. *Acta Paediatr.* 2015;104(3):306-312
4. Sijsma A, Koller M, Sauer PJ, Corpeleijn E. Television, sleep, outdoor play and BMI in young children: the GECKO Drenthe cohort. *Eur J Pediatr.* 2015;174(5):631-639
5. Chaput JP, Leduc G, Boyer C, et al. Electronic screens in children's bedrooms and adiposity, physical activity and sleep: do the number and type of electronic devices matter? *Can J Public Health.* 2014;105(4):e273-e279
6. Al-Hazzaa HM, Al-Sobayel HI, Abahussain NA, Qahwaji DM, Alahmadi MA, Musaiger AO. Association of dietary habits with levels of physical activity and screen time among adolescents living in Saudi Arabia. *J Hum Nutr Diet.* 2014;27(suppl 2):204-213
7. Hancox RJ, Poulton R. Watching television is associated with childhood obesity: but is it clinically important? *Int J Obes.* 2006;30(1): 171-5.