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Screen-Based Media Use and Screen Time Assessment among School going Adolescent Girls of North 24 Parganas, West Bengal

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Abstract: *Background:* Screen-based media (SBM) has become a predominant mode of engagement among adolescents with extreme use of it has bad impacts. The study aims to study SBM and its relationship of various socio-demographic factors as well as BMI. *Methods:* This cross-sectional study was conducted among 317 school going adolescent girls from age group 10-16 years from 5 schools of Birati in north 24 parganas, West Bengal. Data collection was carried out using a semi-structured, pre-tested questionnaire administered through face-to-face interviews with adolescents. *Results:* Among the studied adolescent girls, mobile phones were identified as the most frequently used screen-based media. The mean screen time was found to be 2.44 ± 1.20 hours per day. Chi-square test indicated significant associations between screen time and variables such as age, BMI, sleeping hours, availability of a separate room, headache, eye problems, and irritability. Further, Pearson's correlation analysis demonstrated a significant positive relationship between total screen time and age, BMI, access to a personal room, ownership of a mobile phone, and fast-food consumption. In contrast, sleep duration exhibited a significant negative correlation with total screen time, suggesting that increased screen exposure may adversely

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affect sleep behaviour. *Conclusions:* The findings revealed that older adolescents are more likely to engage in prolonged SBM use. BMI is an important factor effecting SBM and self-perception of weight. The study underscores the need for awareness regarding SBM and its potential impact on health and lifestyle patterns.

Keywords: Urban, adolescent, screen time.

Introduction

In recent decades, screen-based media (SBM) has emerged as a dominant form of engagement among adolescents, with technological advancements facilitating constant access to televisions, smartphones, computers, tablets, and gaming consoles. This proliferation of screen-based devices has contributed to a significant shift in adolescents' daily activities, reducing physical activity levels and increasing sedentary behaviour. According to the American Academy of Paediatrics (AAP), screen time for children above two years should be limited to two hours per day (AAP, 2016).

Literatures offer that media provide entertainments which leads to bad impact on adolescents. Studies found association between screen time, food consumption and physical activity. This relationship increases the factors of obesity among adolescents from an early stage. Studies had established a bridge between screen time and health outcomes such as obesity, sleep disturbances, behavioural problems, reduced academic performance, and socio-emotional issues (Anderson & Subrahmanyam, 2017; WHO, 2020).

Entertainment Media Screen Time (EMST) documented demographic factors, such as gender and age. This documentation helps to offers the relationship between demographic factor with screen time. Older adolescents like to get individualized screen media like smartphones for entertainment, but younger adolescents like to share media platforms like televisions with their parents. The study offers that socioeconomic factors have a role, in adolescents with screen media use. Huge amount of media consumption during weekdays, weeknights, and weekends illustrates the complex nature of adolescents' entertainment consumption. This showed the differences between screen-based media use during weekdays and holidays or vacation days. Literatures offer that during COVID; the screen time media was increased because of the online classes. In that time there was several physical and psychological issues among adolescents.

The scenario of other countries which are undergoing electronic affection is very similar with India. According to studies, around 95% of the population in India has availability of television which was major electronic screen-based media among children (Dubey et al., 2018). However, there is need of more study which can offer the use of various SBM and its direct effect on adolescent health in India. The purpose of this study was to assess the occurrence of SBM use of adolescents with screen times. The study aims to get insights into the factors affecting screen time use in urban adolescents.

Materials and Methods

A cross-sectional, school-based fieldwork was adopted to collect data over a three-month period from January to March 2025. The study was conducted in 5 schools of Birati (an urban area) to collect data from the adolescent girls who are in between 10-16 years old. The area, Birati was chosen purposively as it a unique urban area with all amenities of a Metropolitan area i.e, proper connectivity nationally as well as internationally (Railway, Metro railway, Bus stands, International Airport etc. are just 10 mins away from the area), good quality of living, good education (almost schools from all boards are available), middle to high socio-economic status and so on. Based on previous studies indicating a 30% prevalence of adolescents exceeding 2-hour screen time (Khurana et al., 2020), with 5% absolute precision, 95% confidence level, and 10% non- response rate, the required sample size is calculated as 300 adolescents. Schools were selected randomly from Birati, North 24 Parganas, followed by complete enumeration of students from class registers proportionately across grades. However, during the data collection all students were not present and data were collected from those who verbally consented for this study. Finally, total 317 school going adolescent girls had participated in the study. Data collection was carried out using a semi-structured, pre-tested questionnaire administered through face-to-face interviews with adolescents. Collected data includes socio-demographic profile (age, sex, class, religion, parental occupation and education, number of family members, type of family (nuclear/joint), number of siblings, number of separate rooms etc), anthropometric measurements (height, weight and BMI), screen time assessment (self-reported screen time on weekdays and weekends, type of device etc), lifestyle variables (sleep timings, fast food consumption per week, watching TV while eating, self-perception of body weight) and media-related health effects (self-reported physical and mental health symptoms believed to be associated with

prolonged screen exposure). BMI cut-off values based on percentiles were used for the classification of nutritional status (CDC, 2000). Data was entered in MS Excel and analysed using SPSS. Descriptive statistics (mean, SD, percentages) was used to summarize variables. Screen time was categorized based on AAP recommendations (≤2 hours and >2 hours/day). Bivariate analyses were assessed associations between screen time and socio-demographic/health variables. p- value <0.05 will be considered statistically significant.

Results

The table 1 displays the distribution of socio demographic profile of 317 adolescent girls. Among the participants, 49.53% belongs to <13 years age group and 50.47% belongs to ≥13 years age group. In family type majority fall into nuclear sub group (62.460%). Families have less than or equal to 4 members with 64.668%. Majority of the participants have one sibling with 53.627%. Majority of the girl's mother's occupation is housewife (68.454%). However, majority of father's occupation falls under daily labour (29.337%), service (20.504%), & worker (23.343%). Majority of girls did not have separate room accounting 88.013% and also did not have own mobile accounting 76.340%. Out of 317 adolescent girls, majority had 2 hours or more screen time accounting 64.353%.

Table 1: Socio Demographic profile of Adolescent girls

Variables	*Sub group*	*Frequency*	*Percentage*
Age (in years)	<13	157	49.530
	≥13	160	50.470
Family type	nuclear	198	62.460
	extended	119	37.539
No. of family members	≤4	205	64.668
	5-10	104	32.805
	>10	8	2.524
Personal rooms	Yes	38	11.987
	No	279	88.013
No. of siblings	0	120	37.854
	1	170	53.627
	≥2	27	8.517
Screen Time (hours/day)	≤2	204	64.353
	>2	113	35.647

Variables	*Sub group*	*Frequency*	*Percentage*
Mother's occupation	Housewife	217	68.454
	Working	100	31.546
Father's occupation	Businessmen	48	15.142
	Daily labor	93	29.337
	Driver	11	3.470
	Service	65	20.504
	Shopkeeper	14	4.416
	Worker	74	23.343
	Others	12	3.785
Own mobile	Yes	75	23.659
	No	242	76.340
Religion	Hindu	276	87.066
	Muslim	41	12.933

The table 2 represented more than half of the girls, 61.506% use mobile as screen-based media and they usually watch on vacation days. Other 63.636% watch tv on vacation days and 56.25% use computer throughout week.

Table 2: Frequency of screen-based media use

Variables	*Type of screen-based media*		
	TV (n=143) N (%)	*Mobile (n=239) N (%)*	*Computer (n=16) N (%)*
School days	3(2.098)	4(1.674)	2(12.5)
Vacation days	91(63.636)	147(61.506)	5(31.25)
Whole week	49(34.266)	88(36.82)	9(56.25)

The table 3 demonstrates the mean value of TV time which is 0.717 ± 0.116 hours. The mean video game, YouTube, WhatsApp, Instagram and Facebook time are 0.096 ± 0.057 hours, 0.851 ± 0.143 hours, 0.101 ± 0.011 hours, 0.580 ± 0.349 hours and 0.099 ± 0.054 hours respectively. Adolescent girls preferred YouTube as the most popular screen time.

The table 4 described that 55.882% had ≤2 hours screen time from <13 years age group and 61.947% had >2 hours screen time from ≥ 13 years age group. There is significant association between age and screen time of the age group of 10-16 years girls. Majority of underweight and normal BMI girls had > 2 hours screen

Table 3: Descriptive statistic of time spent on various activities using screen- based media

Activities (in hours)	Mean ± SD
TV time	0.717 ± 0.116
Video game time	0.096 ± 0.057
YouTube time	0.851 ± 0.143
WhatsApp time	0.101 ± 0.011
Instagram time	0.580 ± 0.349
FB time	0.099 ± 0.054
Total screen time	2.444 ± 1.204

time, whereas overweight and obese girls seem to have more screen time. The association is confirmed by statistical significance. There is interesting association between sleeping time and screen time, 61.274% had ≤2 hours screen time with 6-8 hours sleeping time. 65.196% belongs to nuclear family with ≤2 hours screen time and 42.478% had >2 hours screen time who are belongs to extended family, with no significant statistical association. In this study population, majority of the girls do not have a separate room, a typical middle class Indian family characteristic. However, girls who have personal rooms tend to have more screen time. There is significant association between separate room and screen time. Similarly, the association between having own mobile and screen time statistically significant. Ultimately, various problems related to screen time e.g., headache, eye problem as well as irritability and screen time is also found to be statistically associated.

Table 4: Association between BMI and screentime

Categories	*Sub Categories*	*≤2 h screen time (n=204) N(%)*	*>2 h screen time (n=113) N(%)*	χ^2	*p value*
Age group (in years)	<13	114(55.882)	43(38.053)	9.247	<0.001
	≥13	90(44.118)	70(61.947)		
BMI	Underweight	20(9.804)	7(6.195)	25.919	<0.001
	Normal	154(75.490)	61(53.982)		
	Overweight	17(8.333)	22(19.469)		
	Obesity	13(6.373)	23(20.354)		

Categories	*Sub Categories*	*≤2 h screen time (n=204) N(%)*	*>2 h screen time (n=113) N(%)*	χ^2	*p value*
Sleeping time (hours/ day)	<6	4(1.961)	11(9.735)	10.244	0.005
	6-8	125(61.274)	68(60.177)		
	>8	75(36.765)	34(30.088)		
Family type	Nuclear	133(65.196)	65(57.522)	1.826	0.177
	Extended	71(34.804)	48(42.478)		
Separate room	Yes	12(5.882)	26(23.008)	20.217	<0.001
	No	192(94.118)	87(76.992)		
Own mobile	Yes	40(19.608)	35(23.009)	5.201	<0.001
	No	164(80.392)	78(76.992)		
Headache	Yes	42(20.588)	57(50.442)	30.178	<0.001
	No	162(79.412)	56(49.558)		
Eye problem	Yes	93(45.588)	69(61.062)	6.968	0.008
	No	111(54.412)	44(38.938)		
Irritability	Yes	59(28.922)	52(46.017)	9.341	0.002
	No	145(71.078)	61(53.983)		

The table described that 72.857% who are belongs to normal BMI category thought themselves as underweight. Similarly, 13.043% who are belongs to underweight category thought themselves as overweight. There is statistically significant association between self-perception weight and BMI of the age group of 10-16 years (χ^2= 80.031) (p value=<0.001).

Table 5: Association between self-perception weight and BMI

BMI categories	*Self-perception N (%)*			χ^2	*p value*
	Under weight (n = 70)	*Right weight (n=178)*	*Over weight (n=69)*		
Underweight	11(15.714)	9(5.056)	7(13.043)	80.031	<0.001
Normal	51(72.857)	134(75.281)	30(43.478)		
Overweight and obesity	8(11.429)	35(19.663)	32(46.377)		

The table 6 described Pearson correlation of variables with total screen time of age group 10-16 years. There is a significant positive correlation between total screen time with age (r=0.313, p <0.001), having separate room (r=0.393, p <0.001), having own mobile (r=0.254, p <0.001) and consumption of fast food (r = 0.147, p = 0.009). However, sleeping time is found to be negatively associated with screen time.

Table 6: Pearson correlation of variables with Total screen time

Factors	*Total screen time*	
	r	*p*
Age (year)	0.313**	<0.001
BMI (kg/m^2)	0.422**	<0.001
Type of family	0.100	0.074
No. of family member	0.030	0.589
No. of siblings	-0.055	0.325
Own mobile	0.254**	0.000
Total sleeping time (hours/day)	-0.170**	0.002
Using screen-based media during eating	0.051	0.370
Having separate room	0.393**	<0.001
Consumption of cold drink (times)	0.096	0.086
Consumption of fast food (times)	0.147**	0.009

Discussion

According to the American Academy of Pediatrics (AAP, 2016), screen time for children above two years should be limited to two hours per day. However, the present study revealed that a large proportion of adolescent girls exceed this recommended limit, raising concerns about their physical, mental, and social well-being. In the current study, among 317 adolescent girls, 64.35% reported two or less hours of screen time daily, while 35.65% reported more than two hours. The mean screen time was 2.44 hours, which is lower than that reported in several other studies. This may be attributed to the younger age group assessed, limited phone ownership, and strong parental supervision, particularly in the pre–board examination period typical of Indian families.

Comparable studies globally have demonstrated high screen exposure among adolescents. For instance, Ye et al. (2018) reported screen time exceeding two hours in 14.7% of boys and 8.9% of girls in China, with a significant rise during weekends. Similarly, Hysing et al. (2015) in Australia found that over two hours of

daily electronic media use was associated with reduced sleep duration of less than five hours. Studies by Frielingsdorf et al. (2025) in Sweden and Dubey et al. (2018) in India reported average adolescent screen times exceeding six hours and more than two hours in 68% of participants, respectively. In India, Prasad and Vangala (2023) found that 13.5% of rural adolescents exceeded two hours, while Ilamparithi & Selvakumar (2017) observed substantial urban–rural differences, urban boys averaging 6.59 hours versus rural boys at 3.28 hours. The comparatively lower screen exposure in the present study may reflect stricter parental control and lower device accessibility among middle-class adolescent girls.

The current study identified a statistically significant association between age and screen time ($p < 0.001$), with older adolescents (older than 13 years) engaging more frequently. This aligns with findings by Nair et al. (2022), who noted increasing screen usage with age and mobile ownership. However, Ye et al. (2018) found no significant age association, suggesting that age-related screen exposure may vary across sociocultural contexts. The present study also revealed a significant association between screen time and having a separate room, consistent with findings by Twenge and Campbell (2018), who linked increased privacy to prolonged digital engagement. Family structure, however, did not show a significant association. While nuclear families reported higher proportions of ≤2 hours screen time, extended family environments did not significantly differ, similar to findings by Khurana et al. (2020), indicating that household composition alone may not determine screen habits.

Mobile phone ownership strongly influenced screen exposure, showing a significant positive correlation ($r = 0.254$, $p < 0.001$). This trend is consistent with Shwetha et al. (2020), who found that 95.6% of adolescents' screen use was via mobile devices. Similarly, Dubey et al. (2018) observed 96.5% television use, while Kalasua et al. (2025) reported 57.54% television usage among 10–15-year-olds. However, in the current study, mobile phone usage (75.39%) surpassed television (45%), reflecting a national transition from shared to personal digital devices.

Prior studies consistently demonstrate that excessive screen exposure adversely affects physical and mental health. Pavan et al. (2023) and Sari et al. (2025) reported that increased screen time is inversely associated with physical activity levels among adolescents. Although this study could not establish such a relationship, it remains a pertinent concern for future investigation. Regarding psychological well-being, previous studies have identified associations between screen time and anxiety,

depression, and stress. Mabaso et al. (2024) and Khalid et al. (2025) observed that approximately one-third of adolescents with high screen use exhibited symptoms of anxiety and depression. Similarly, Mougharbel et al. (2023) found that ≥3 hours of daily screen exposure predicted severe psychological distress. Johnson et al. (2022) further reported that excessive users often experienced restlessness, irritability, and depressive symptoms. Consistent with earlier reports by Doshi et al. (2025), who found high prevalence of visual disturbances (44.1%), headaches (38.1%), and eye dryness (38.9%) among heavy screen users, the current study found similar symptoms, headaches (50.4%), eye problems (61.1%), and irritability (46.0%) among participants with more than two hours of screen time. However, such complaints also appeared among those with shorter screen times, possibly due to confounding factors like noise pollution, emphasizing the multifactorial nature of such symptoms.

Correlation analysis in this study showed significant positive relationships between total screen time and variables such as age ($r = 0.313$, $p < 0.001$), separate room ($r = 0.393$, $p < 0 .001$), own mobile phone ($r = 0.254$, $p < .001$), and fast-food consumption ($r = 0.147$, $p = .009$). Conversely, sleep duration exhibited a negative correlation with screen time, consistent with findings by Hysing et al. (2015) and Lemola et al. (2015), who demonstrated that nighttime screen exposure disrupts sleep patterns through delayed melatonin release. This study found a significant correlation between BMI and screen time. Similar associations have been reported widely. Shuvo & Biswas (2023) found that 49.1% of adolescents using electronic media for more than three hours were overweight or obese. Ganesan et al. (2018) also observed that higher BMI was associated with body image dissatisfaction in 77.6% of adolescent girls. Rey-López et al. (2008) reported a positive correlation between television viewing and overweight status among European adolescents, indicating that sedentary screen habits contribute to excess weight gain. Similarly, Tremblay et al. (2011) and Fang et al. (2019) concluded that higher screen exposure independently predicted increased BMI and obesity risk even after adjusting for diet and physical activity. In a large cross-sectional study, LeBlanc et al. (2015) observed that adolescents engaging in more than two hours of recreational screen time daily were significantly more likely to have overweight or obesity compared to those below this threshold. These findings collectively support the hypothesis that sedentary screen-based behaviours contribute to higher BMI and related metabolic risks.

The present study was limited by its exclusion of older adolescents (17 and18 years), who often gain personal device ownership and may exhibit higher screen exposure. Additionally, the lack of psychological data and environmental controls such as sound pollution may have influenced symptom reporting. However, the findings affirm that screen time among adolescent girls often exceeds recommended limits and is significantly associated with age, device ownership, and lifestyle variables.

Conclusion

The present study provided a comprehensive overview of screen-based media (SBM) use among adolescent girls and its associated factors. The findings revealed a significant relationship between increasing age and higher mean screen time, indicating that older adolescents are more likely to engage in prolonged SBM use. Mobile phone ownership and having a separate room were also strongly associated with increased screen time, suggesting that personal accessibility and privacy contribute to higher digital engagement.

BMI was significantly correlated with screen time and body self-perception, reinforcing the evidence that sedentary digital behaviours can influence weight status and self-image among adolescents. Additionally, a negative association was observed between total screen time and sleep duration, highlighting the detrimental impact of excessive screen use on sleep quality and overall rest. No significant association was found between family type and screen time, although trends indicated that environmental and parental factors may still influence media habits.

The study underscores the importance of early parental monitoring, awareness campaigns, and behavioural interventions to regulate adolescent screen time. Encouraging balanced technology use and promoting active, non-screen recreational activities may help mitigate the adverse consequences of excessive screen exposure among young adolescents.

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