Screen-time and Associated Factors among MBBS Students of a Government Medical College of Northeast India: A Cross-sectional Study

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Abstract:

Introduction: Individuals now-a-days spend considerable time for viewing at LCD or LED screens of electronic gadgets. Such prolonged viewing may affect their health adversely. **Objective:** To estimate the proportion of high screen-time among MBBS students of a Government Medical College of Northeast India and to determine its association with their self-reported health problems and socio-demographic factors. **Method:** A cross-sectional study was conducted during August and September 2024, using a self-administered and validated questionnaire in a calculated sample of 254 MBBS students of a Government Medical College, chosen by stratified random sampling. High screen-time was defined as spending more than 2 hours per day by a person for viewing an active LCD or LED screen. Chi-square test was used to test the significance of difference between two or more proportions and logistic regression analysis was also used. **Results:** Proportion of high screen-time was found to be 96.1% (244). Among all, 96.4% of the male, 96.7% of the urban, 98.3% of the hosteller, 97.5% of the students from nuclear families and all of the third year MBBS students had high screen-time. Except the type of family, proportion of high screen-time did not differ significantly across different groups of students. Logistic regression analysis has identified 'studying online' (AOR: 1.984, 95% CI: 1.565–2.342) and 'studying in 3rd year' [AOR: 1.756, 95% CI: 1.014–1.671) as the significant determinants of screen-time ($p<0.05$). No significant association was detected between screen-time and self-reported health problems of the respondents. **Conclusion:** Majority of the MBBS students have high screen-time but it had no significant association with their self-reported health problems. Studying online' and 'studying in 3rd year' were found to be significant determinants of high screen-time.

Keywords: Health problem, MBBS students, Screen-time

Introduction:

Various electronic gadgets with either LCD or LED screen are extensively used these days. Screen-time is the amount of time spent by a user for viewing LCD or LED screen of devices like: smartphone, computer, television, video game console or tablet etc.[1] Such devices have become indispensable in the day-to-day activities of life and are used extensively by almost all the youngsters.[2] It was observed that apart from sleeping, children and adolescents used to spend maximum time with screen-based media and it was on an average seven and half hour per day.[3] Utility of a smartphone is not only limited to making and receiving phone calls on the go but also used for various other

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purposes like photography, internet access and internet-based task, using social media, controlling various smart home appliances, medical gadgets, transport vehicles, security system, DTP works, banking, listening music, watching movies, playing games and so on. Computers and tablets are used in all the establishments like offices, banks, transport, educational institutes, factories and also at personal level for routine works.

There is a saying that science is a blessing as well as a curse too and it holds true for these smart devices also. Excessive use of such gadgets with a display screen is not devoid of adverse health effects. Apart from causing intractable addiction, it may cause visual problems, cervical spondylosis, obesity, leg vein thrombosis, psychosomatic disorders and other health problems.[4-7] It is not possible to stop the use of such devices but their misuse or excessive use may be controlled. Prevalence of cervical spondylosis is increasing among young people and majority of them are attributable to excessive smartphone use.[8] Research has established positive associations between excessive use of smartphone and cervical disc degeneration.[5]

Higher chances of developing psychological problems like bipolar disorder, depression, anxiety, somatization, dependent personality disorder, and compulsive personality disorder etc. were found to be associated with excessive use of smartphone by the young people.[9] Indian Academy of Paediatrics recommends that children below the age of 2 years should not be exposed to any type of screen with the exception of occasional video call with relatives. Screen time for children between the age of 2 and 5 years should not exceed 1 hour and the lesser, the better.[10] The American Academy of Paediatrics in 2016 also recommended limiting screen-time for children aged 2–5years to 1 hour/day.[11]

It is considered by many people that screen time for adolescents should not exceed 2 hours per day. Since COVID-19 pandemic, screen time among adolescents has increased many folds for academic reason and this did not decline much even after the pandemic has been over. Apart from IT professionals, a sizeable proportions of office works are now based upon use of smart devices with screens. Educational establishments are also shifting towards smart classes.

Information from the developed nations may not be applicable to Indian population, which is passing through rapid economic and social transition. Limited number of studies have explored the use of various screen-based media and their effect upon the health of Indian population. Medical profession requires many years of study including multiple competitive examinations and to get prepared for them students get enrolled for various online study courses. All these things increase their screen time considerably apart from their recreational and other extracurricular activities.

Hence it was felt necessary to generate local data on high screen-time and factors associated with it. In this context present study was designed with the objectives to estimate the proportion of high screen-time among the MBBS students of a Government Medical College of Northeast India and to determine its association with their self-reported health problems and socio-demographic factors.

Method:

It was an institution based cross-sectional study conducted during August and September 2024 among MBBS students of a Government Medical College of Northeast India.

Minimum sample size requirement for this study was determined by using the formula for calculating sample size using proportion.[12] Considering the prevalence of high screen-time among young adults as 61.8%,[13] at 5% level of significance and using 10% allowable error sample size was calculated to be 238 students. Bearing in mind the chances of receiving incomplete responses as 10% it was further inflated to 262.

At first, class representatives of different MBBS professional batches were informed about the study. After that all the students of each professional batch were briefed about the study objectives and methodology in a class room session. Study subjects were chosen by stratified random sampling. MBBS students were stratified into 1st, 2nd, 3rd and final year batches. Attendance registers were used to construct sampling frames for different professionals. Lottery method of simple random sampling was used to choose the study subjects. It was decided to select 66 students from each professional year using attendance registers on the day of data collection as the sampling frames. But it was not possible to get equal number of students from each professional year as many of them had prior assignments. Finally, it was possible to include 254 students as 10 of them denied participating during final stage of sampling due to their prefixed assignments.

Written informed consent for participation in this study was sought from the selected students. Unselected students were requested to leave the classroom for the time being. MBBS students who remained absent during the process of sampling and Intern doctors were also excluded.

A self-administered and validated questionnaire containing socio-demographic particulars, information regarding usage of LED / LCD screen devices, self-reported existing health problems etc. was distributed among the consenting students and they were asked to fill it in the class room itself. Half an hour time was allotted for this purpose. Students were also briefed to fill in the questionnaire themselves without discussing with their fellow friends. Filled in questionnaires were scrutinized as far as possible for missing entries while receiving back. Screen-time was defined as the amount of time spent by a subject for viewing an active display on an LCD or LED screen. High screen-time was defined as spending more than 2 hours per day by an adolescent or adult for viewing an active LCD or LED screen. In this study self-reported screen-time was considered.

Data from the filled in questionnaires were entered and analyzed in computer using SPSS-29 for windows.[14] Result of this study has been prepared using descriptive statistics namely mean & SD for continuous data and discrete data are presented in terms of proportions. In univariate analysis, Chi-square test has been performed to test the significance of difference between two proportions. Student't' test has been used to test the significance of difference between two means. In multivariate analysis, Logistic regression model has been applied to predict the consequences of high screen-time using selected independent covariates.

Obtaining written informed consent from all the study subjects was ensured. Confidentiality was maintained at every step while dealing with data. Subjects found to have high screen-time were informed about their status and were advised to get counselled at the Yuba-Yubati Clinic of RKSK program operational in OPD complex of the institute. Protocol of this study was approved by the Institutional Ethics Committee vide order no: F.4(6-13)/AGMC/Medical Education/IEC Approval/2022/11476, dated 09. 08. 24.

Results:

Mean (SD) age of the study subjects was 21.20 (1.455) years and mean (SD) number of family members of the students was 4.37 (1.481). Proportion of high screen-time among the MBBS students was found to be 96.1%.

Among the study subjects 140 (55.1%) were male, 61 (24%) were studying in first professional year, 86 (33.9%) in second, 76 (29.9%) in third and 31 (12.2%) were studying in final year MBBS. Among the students 152 (59.8%) were residents of urban areas, 204 (80.3%) were from nuclear families, 133 (52.4%) were day scholars and 127 (50%) of the students were pursuing some online study courses. (Table 1)

Table 1: Socio-demographic Characteristics of the Study Subjects (N=254)

Variables	Subgroup	n(%)
Gender	Male	140 (55.1)
	Female	114 (44.9)
Study year	First	61 (24)
	Second	86 (33.9)
	Third	76 (29.9)
	Final	31 (12.2)
Residence	Urban	152 (59.8)
	Rural	102 (40.2)
Family type	Nuclear	204 (80.3)
	Joint	50 (19.7)
Type of student	Hosteller	121 (47.6)
	Day scholar	133 (52.4)
Online study course	Enrolled	127 (50)
	Not enrolled	127 (50)
Screen-time	Normal Screen-time	10 (3.9)
	High Screen-time	244 (96.1)

Out of all the respondents, majority, i.e. 96.4% of the male students had high screen-time. Similarly, 96.7% of the urban residents, 97.5% of the students from nuclear families, 98.3% of the students who were residing in hostels, 96.1% of the students irrespective of pursuing online courses had high screen-time and all the students studying in third year MBBS had high screen-time. Except the type of family, proportion of high screen-time did not differ significantly across different groups of respondents. (Table 2)

Based upon self-reported health problems, it was observed that 110 (43.3%) were having some eye problems like dryness, blurring of vision, redness etc, 69 (27.17%) had sleep disturbances, 15 (41.34%) had mood disturbance, and 66 (25.98%) were having neck pain. Among all, 118 (46.5%) opined life as unthinkable without a smartphone, 98 (38.6%) said it is not so and 38 (15%) had no idea about it. Higher proportion i.e. 60% of the students with normal screen-time reported to be suffering from eye problems as compared to those who had high screen-time. Higher proportion i.e. 80% of the

Table 2: Factors associated with the screen time among the study participants (N=254)

Variables	Sub group	Screen time		Chi Square (p-value)
		Normal, n (%)	High, n (%)	
Gender	Male	05 (3.6)	135 (96.4)	0.110 (0.740)
	Female	05 (4.4)	109 (95.6)	
Residence	Urban	05 (3.3)	147 (96.7)	0.420 (0.517)
	Rural	05 (4.9)	97 (95.1)	
Family type	Nuclear	05 (2.5)	199 (97.5)	6.051 (0.014)
	Joint	05 (10.0)	45 (90.0)	
Type of student	Hosteller	02 (1.7)	119 (98.3)	3.188 (0.074)
	Day scholar	08 (06)	125 (94.0)	
Online study	Undergoing	05 (3.9)	122 (96.1)	0.000 (1.000)
	Do not undergo	05 (3.9)	122 (96.1)	
Year of study	First	05 (8.2)	56 (91.8)	6.605 (0.086)
	Second	03 (3.5)	83 (96.5)	
	Third	00 (00)	76 (100)	
	Final	02 (6.5)	29 (93.5)	

Table 3: Health Problems of the Students by the Amount of Screen Time (N=254)

Health problems	Sub group	Screen time		Chi Square (p-value)
		Normal, n (%)	High, n (%)	
Eye problems	Present	06 (60.0)	04 (40.0)	0.580 (0.446)
	Absent	104 (42.6)	140 (57.4)	
Sleep disturbance	Present	02 (20.0)	08 (80.0)	0.025 (0.875)
	Absent	67 (27.5)	177 (72.5)	
Mood disturbance	Present	04 (40.0)	06 (60.0)	0.058 (0.810)
	Absent	101 (41.4)	143 (58.6)	
Neck pain	Present	03 (30.0)	07 (70.0)	0.005 (0.942)
	Absent	63 (25.8)	181 (74.2)	
Other health problems	Present	00 (00)	10 (100.0)	0.069 (0.793)
	Absent	18 (7.4)	226 (92.6)	

Table 4: Logistic Regression Analysis of the Determinants of Screen-time (N=254)

Variables		COR (95% C.I.)	AOR (95% C. I.)	p - value
Gender	Female	1		0.067
	Male	2.876 (0.733 – 4.113)	3.534 (0.643 – 4.283)	
Study year	1st, 2nd & final yr	1		0.038
	3rd year	1.756 (1.134 – 1.957)	1.216 (1.014 –1.671)	
Residence	Rural	1		0.078
	Urban	3.409 (0.145 – 6.563)	2.378 (0.235 –5.563)	
Family type	Joint	1		0.083
	Nuclear	1.183 (0.717 – 1.937)	2.023 (0.019 –3.231)	
Type of student	Day scholar	1		0.089
	Hosteller	1.029 (0.274 – 3.674)	1.339 (0.256 –4.437)	
Online study	Not pursuing	1		0.019
	Pursuing	2.160 (1.565 – 4.342)	1.984 (1.565 –2.342)	

AOR= Adjusted odds ratio; COR = Crude odds ratio.

subjects with high screen-time had sleep disturbances like delayed onset of sleep after going to bed and wakening in between sleep etc. Higher proportion i.e. 60% of the subjects with high screen-time had mood disturbances like getting irritated easily, being intolerant in minor issues, restlessness etc. Higher proportion i.e. 70% of the subjects with high screen-time suffered from neck pain. Similarly, all the students high screen-time complained of other minor health problems like dizziness, bloating of stomach, nausea etc. But none of these differences in proportions were found to be statistically significant. (Table 3)

Logistic regression model was used to determine the effects of some selected sociodemographic variables, study year, type of student, pursuing online study course etc. upon the respondent's screen-time. In this model high screen-time was the dependent variable ($\leq$2h/day = 0 and >2h/day = 1). Gender of the respondents (female =

1, male = 2), Study year (1st, 2nd and final year = 1, 3rd year = 2), Residence (Rural = 1, Urban = 2), Type of family (Joint = 1, Nuclear = 2), Type of student (Day scholar = 1, Hosteller = 2), Pursuing online study course (Pursuing = 1, Not pursuing = 2) etc. were the independent variables. In the adjusted analysis, all the independent variables were included in the model. Logistic regression analysis showed that a MBBS student pursuing online study course had 98.4% higher chance (AOR: 1.984, 95% CI: 1.565–2.342) of having high screen-time, similarly a student studying in 3rd year had 21.6% higher chance [AOR: 1.756, 95% CI: 1.014–1.671) of having high screen-time than the rest when the effect of other variables were controlled and these were found to be statistically significant (P<0.05). The effects of other independent variables in determining screen-time of a study subject did not attain the level of statistical significance. (Table 4)

Discussion:

Present study has detected the proportion of high screen-time to be 96.1% among the undergraduate medical students in Tripura state, whereas, a cross-sectional study conducted among undergraduate medical students in Indore city during 2023, has found the proportion of high screen-time to be 74%.[15] Probable reasons for detecting lesser prevalence in this study may be due to the fact that here high screen-time was defined as viewing screens for 3 hours or more. Similarly, study carried out among high school adolescents in Joao Pessoa city, Brazil during 2009, has also found the prevalence of high screen-time as 79.5%.[16] A study conducted in Bangladesh also detected prevalence of screen-time as 79%.[17]

In another study conducted in the year 2019 proportion of high screen-time was found to be 87.7% among high school students in an urban area of Kerala state of India.[18] This lesser proportion detected by the Kerala study may be due to the facts that the subjects were school students and younger in age than the present study mean (SD) age being 14 (0.81) vs 21.20 (1.455) which might have allowed lesser access to smartphones and insufficient availability of 5g network in India at that time. Prevalence of high screen-time among 9–11-year-old children has been reported to be 45% in Canada, 63% in Australia, 68% in Malaysia and 59% in United States.[19] A community based cross-sectional study conducted during 2018 among adolescents residing in a resettlement colony of New Delhi has found the proportion of high screen-time to be 98%.[20] Though the study was conducted seven years earlier than the present study, it's finding was at par with the finding of the present study. It may be due to the fact that the 37.8% of the participants of that study were aged either 15 years or more and they were residing in an urban area of the national capital of India, where accessibility to internet was better than other areas. An institution based cross-sectional study conducted in Ghaziabad during 2019–20 among children aged 2-5 years has found the proportion of high screen-time to be 60%.[21] Though this proportion of high screen-time was found to be lower than the present study, it was actually huge in amount for the study population, who were children aged 2-5 yr only.

In the present study, mean (SD) age of the study subjects was found to be 21.20 (1.455) years, similarly, it was found to be 21.4 (1.6) years by a study conducted in North India.[22] Whereas, a study conducted in Kerala has found mean (SD) age of the study subjects as 14 (0.81) years as the study was among high school students.[18]

This study has found 96.4% of the male students to have high screen-time, whereas, a study conducted among MBBS students in Indore has found it to be 79.5% only.[15] In a Brazilian study also, male adolescents were found to have higher screen-time i, e, 84.3%.[16] A study conducted in Zhejiang province of China also showed higher screen-time in boys than in girls (45.4% vs 39.1%).[23]

In the present study 80.3% of the study subjects were from nuclear families. A similar study conducted in Kerala also found that 80.9% respondents were from nuclear families.[18] But a study conducted in Delhi has

found it to be 65.8%, which was lower than the present study.[20] It was observed in this study that 96.7% of the urban residents were having high screen-time though it was not significant. Similarly, a study conducted in China also did not find significant urban rural difference in this regard.[23]

In the present study 27.17% of the study subjects were found to have sleep disturbances but it was not significant, similarly a cohort study conducted in Uttar Pradesh and Bihar also has found it to be only 18.4% and 33.24% in male and female adolescents respectively and it was also not significant.[24] It was observed that 41.34% of the subjects were having mood disturbances in the present study, similarly a study conducted in China also showed increased screen-time to be associated with higher depressive symptomatology.[25] A study conducted in UK during 2020 has also reported positive association between higher screen-time and poor mental health.[26] In this study 43.3% students reported some eye problem, whereas, in a study conducted among adolescents in Saudi Arabia during 2018-19, most 66.0% the study subjects reported to be having one or more ocular problems after smartphone use.[27] Present study has identified pursuing online study course and studying in 3rd professional year as the significant determinants of high screen-time among the medical students, which was at par with the findings of a study conducted in Indore.[15]

Limitation:

Self-reported screen-time and self-reported health problems were considered in this study and it may be a possible source of bias. As the study subjects were young adults, health effect of prolonged high screen-time might have not been revealed by this study. Examination of the effect of other variables in determining screen-time was not possible due to resource constraint.

Conclusion:

Though majority of the MBBS students have high screen-time (>2 hrs / day) but it was not affecting their health significantly. 'Studying online' and 'studying in higher classes' were found to be the significant determinants of high screen-time in the study population.

Declaration:

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Conflicts of interest: Nil

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