Original Research Article

A CROSS SECTIONAL STUDY TO ASSESS AWARENESS REGARDING EXCESSIVE SCREEN TIME AND ITS ADVERSE EFFECTS ON SOCIAL, MENTAL AND PHYSICAL HEALTH AMONG UNDERGRADUATE MEDICAL STUDENTS OF MGM MEDICAL COLLEGE IN INDORE DISTRICT

Sunita Vishwakarma[1], Salil Sakalle[2], Priyanka Mahawar[3], Amit Gharia[4], Mr. Shivam Dixit[5], Pooja Porwal[6]

[1]PG Resident, Department of Community Medicine, M.G.M. Medical College, Indore Madhya Pradesh, India.

[2]Professor and Head, Department of Community Medicine, M.G.M. Medical College, Indore, Madhya Pradesh, India.

[3]Associate Professor, Department of Community Medicine, M.G.M. Medical College, Indore, Madhya Pradesh, India.

[4]Demonstrator, Department of Community Medicine, M.G.M. Medical College, Indore, Madhya Pradesh, India.

[5]Assistant Professor (Statistics & Demography), Department of Community Medicine, M.G.M. Medical College, Indore, Madhya Pradesh, India

[6]PG Resident, Department of Community Medicine, M.G.M. Medical College, Indore, Madhya Pradesh, India.

A B S T R A C T

Background: The total amount of time a person spends in front of a screen like any electronic gadget is called screen time. Excessive screen time is associated with risk of health problems, such as obesity, poor school performance, decreased social interaction and lower physical activity. In today's digital age, it is essential to assess awareness of screen time, particularly in relation to exceeding recommended levels among medical students because they constitute a more susceptible group for harmful health behaviours due to academic, professional, and recreational activities.

Objectives: To assess the awareness level of undergraduate medical students regarding excessive screen time and to assess knowledge regarding excessive screen time and its adverse effects on health.

Materials and Methods: A cross sectional study of 6 months (April 2023-September 2023) was done among 300 randomly selected Undergraduate medical students aged group 18–24 years in MGMMC, Indore, using pre-designed semi-structured questionnaire. Data were entered in to Microsoft excel sheet and analysed using SPSS 25.0(Trial version).

Results: Of 300 Undergraduates medical students, majority were male. Among them 63% under 21 – 24 year old. Majority of participants (55%) belonged to second professional. 74% Students use screen more than three hours/day. The difference in screen time between genders was statistically significant (p-value - 0.041). Among 300 students only 14% students were aware about 20-20-20 rule but never followed the 20-20-20 rule.

Conclusion: In our study we found that a higher percentage of males spent excessive time on screens. Majority of the students were aware of the adverse effects of increasing screen time like increased risk of social isolation, poor academic performance, headache, eye problems, emphasizing the importance of taking frequent breaks.

Keywords: Excessive screen time, social isolation, physical activity, medical students.

INTRODUCTION

Excessive screen exposure has emerged as a significant health issue in recent years. The prevalence of electronic screen usage, including the internet, computers, video game consoles, mobile phones, smartphones, and other digital devices, has witnessed a notable surge globally over the past few decades.[1] Among various age groups, the young adults, including undergraduate medical students, is particularly immersed in prolonged screen exposure due to academic, professional, and recreational activities. While the benefits of technology are undeniable, concerns have been raised regarding the potential adverse effects of excessive screen time on social, mental and physical health.

The term "Screen time" is defined as the amount of time individuals spend using electronic devices, such as smartphones, tablets, computers, and televisions.[2] Digital devices, online spaces, and other screen-sharing platforms have become fundamental aspects of the existence of the current generation. Rapid advancements in technology make it possible for consumers in any part of the world, regardless of age, to experience a wider variety of fast-acting stimuli that are available with similar accessibility, practically anywhere via mobile devices, enticing them to indulge in the use of screens for longer than the suggested two-three hours per day .[3]

There are well-defined guidelines of screen time for children's, but it is not yet clear for adults. However, there is clear evidence that too much screen time can be detrimental to your health. For instance, previous study found that those spending six hours or more per day watching screens had a higher risk for depression, and that limiting social media use to 30 minutes per day lead to a "significant improvement in well-being".[4] The high prevalence of adolescents exposed to excessive screen time is a matter of concern because of its association with several health problems, such as overweight and obesity, alterations in blood glucose and cholesterol, poor school performance, decreased social interaction and lower levels of physical activity.[5,6] The use of e-readers in the evening has also been shown to affect sleep via suppression of melatonin secretion and alterations to the circadian rhythm. In addition, Excessive screen time have been associated with poor mental health including depression, which in turn may disturb the hypothalamic adrenal axis negatively impacting immune function and metabolism.[7]

Increased screen time is associated with adverse health behaviour, particularly delayed bedtime, shorter sleep duration, poorer sleep quality and increased risk of conditions such as obesity and depression. Excessive screen time is reported to be associated with a range of negative mental health outcomes such as psychological problems, low emotional stability and anxiety. [8]

In today's digital age, where technology is an integral part of our daily lives, it is essential to assess awareness of screen time, particularly in relation to exceeding recommended levels among medical students. This is because they constitute a more susceptible group for harmful health behaviours due to academic, professional, and recreational activities.

Objectives
1. To assess the awareness level of undergraduate medical students regarding excessive screen time.
2. To assess knowledge regarding excessive screen time and its adverse effects on social, mental and physical health.

MATERIAL AND METHODS

$$n_O = \frac{Z^2 pq}{e^2}$$

Where, Z= confidence limit at 95% (standard value 1.96)

p= Prevalence from review of literature (80%), [9]

q= 100-p

e= Margin of error (5%)

Sample size (n) = 246
Also 20% non-response rate was taken
Which made sample size of 294.91 ≈ 300

Inclusion Criteria
The study includes Undergraduate medical students of MGM Medical College, Indore, aged between 18 to 24 years, who have given consent to fill out the pre-designed semi-structured questionnaire.

Exclusion Criteria
Students aged above 24 years and not willing to offer consent.

Study Tool
A predesigned pretested semi-structured questionnaire was used for the assessment. A questionnaire containing twenty-five questions was created using Google Forms, with objective answers aligned with the study's objectives. Data were entered in to Microsoft excel sheet and analysed using SPSS 25.0(Trial version). Continuous data were expressed in terms of mean and SD. Categorical data were expressed in form of proportions and percentage. Appropriate test of significance like Chi-square test applied wherever necessary and p value <0.05 were considered as statistically significant.

Excessive screen time was assessed based on the measurement of mean daily time (hours/minutes) spent in front of television and mobile, laptop and/or using the computer, on weekdays and the weekend, during a typical or usual week. For the final result, the weighted mean was calculated from the following: summation of time spent in sedentary behaviours on weekdays (Monday- Saturday) multiplied by six, added to time spent on the weekend (Sunday) multiplied by one. This result was divided by seven to obtain the mean number of

hours a day that the medical students spent on screen activities. Excessive screen time was defined as spending more than 3 hour per day in these behaviour.(In previous study, Excessive screen time was defined as watching television and using the computer or playing video games for more than 2 h/day).[9]

RESULTS

A total of 300 undergraduate medical students, 73% were male and 27% were female. Among them 37% students under the age of 18-20 year old and 63% under 21 – 24 year old. Majority of participants (55%) belonged to second professional. [Table 1]
Among the 300 undergraduate medical students, in the age group of 18-20 years, 10.8% spend less than 3 hours per day on screen, while 89.2% spend more than 3 hours. Similarly, in the age group of 21-24 years, 34.9% spend less than 3 hours, and 65.1% spend excessive screen time (more than 3 hours) per day. The p-value, which assesses the statistical significance of the observed differences, is reported as 0.008.
20.5% male students spent less than 3 hours per day on screen, while 79.5% (174 individuals) spent more than 3 hours. Females with less than 3 hours of screen time represented 40.7% (33 individuals), and those with more than 3 hours were 59.3% (48 individuals). The difference in screen time between genders was statistically significant, with a p-value of 0.041. [Table 2]
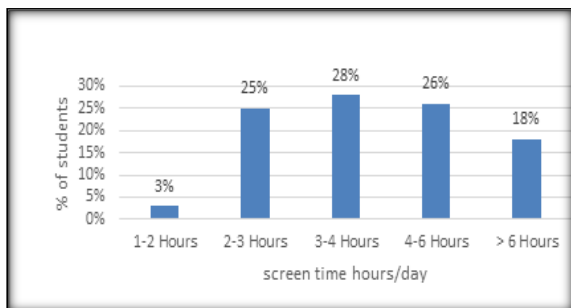

Figure 1: Distribution of hours spent in front of a screen per day

In the case of duration of screen time, the given options varied from one hour to more than 6 hours. Out of 300 responses, 9 responses (3%) corresponded to 1-2 hour, 75 responses (25%) corresponded to 2-3 hours, 84 responses (28%) corresponded to 3-4 hours, 78 responses (26%) corresponded to 4-6 hours and 54 responses (18%) corresponded to more than 6 hours. mean screen time per day by the students was found to be 4.25 hours.

Table no. 3 shows that 264 students agreed that excessive screen time increases the risk of social isolation, while 36 disagreed. Majority of the study participants (91 %) felt that it was important to taking frequent breaks from screens reduces hazards of excessive screen time. 210 (70%) undergraduates do not agreed with the fact that maintaining good posture negates screen time concerns. 147(49%) students agreed that long periods of sitting and maintaining the same posture while using electronic devices, such as computers or mobile phones, can contribute to discomfort and potential health issues related to the muscles and skeletal system while 51% students disagreed.
Students who are aware of spending less than 3 Hours on screens, 75 believe that excessive screen time affects academic performance, while 171 believe it does not. Only three student who are spending more than 3 Hours on screens, believes that excessive screen time affects academic performance, while 51 believe it does not.
The majority of students (86%) agreed with the fact that setting limits on screen time can help reduce the potential hazards of excessive screen time. [Table 3]
Of the 300 participants, only 42 participants (14%) were aware of the 20-20-20 rule regarding screen time. This included 33 males and 9 were female students (Figure 2).
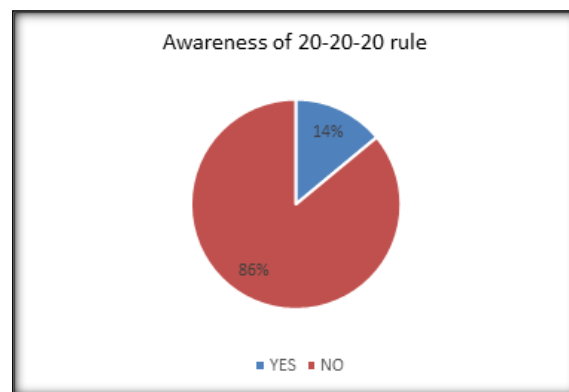

Figure 2: Awareness of 20-20-20 rule among study participants

Most of the participants were aware of the various physical, mental and social effects of excessive screen time. Most of the participants were aware of the adverse effects of increased screen time, with high percentages acknowledging concerns such as eye strain(93%), poor social interaction(88%), headaches72%),sleep-related problems(68%) and anxiety. Awareness levels vary slightly between male and female students. [Table 4]

Table 1: Sociodemographic profile

S.no	Socio-demographic variables	Frequency (N)	Percentage (%)
1	Gender Male	219	73%

		Female	81	27%
2		Age 18-20 years 21 -24 years	111 189	37% 63%
3		Education 1st Professional 2nd Professional 3rd Professional 4th Professional	36 165 72 27	12% 55% 24% 9%

Table 2: Screen time by age and gender

S.No.	Variable	Screen time N (%)		p- value (χ^2 test)
		less than 3 hours	more than 3 hours	
1.	Age group-18-20 year 21-24 year	12(10.8) 66(34.9)	99(89.2) 123(65.1)	.008
2.	Gender-Male Female	45(20.5) 33(40.7)	174(79.5) 48(59.2)	.041

Table 3: Assess awareness of students based on their perceptions and knowledge

Awareness	Screen time per day N(%)		Total	p-value(χ^2 test)
	< 3 Hours	>3 Hours		
Excessive screen time increases the risk of social isolation				
True- False- Total-	66(22%) 12(4%) 78(26%)	198(66%) 24(8%) 222(74%)	264(88%) 36(12%) 300(100%)	.537
Excessive screen time affected communication skills				
True- False- Total-	18(6%) 60(20%) 78(26%)	183(61%) 39(13%) 222(74%)	201(67%) 99(33%) 300(100%)	.000
Taking frequent breaks from screens reduces hazards of excessive screen time				
True- False- Total	63(21%) 15(5%) 78(26%)	210(70%) 12(4%) 222(74%)	273(91%) 27(9%) 300(100%)	.034
Good posture negates screen time concerns				
True- False- Total	27(9%) 51(17%) 78(26%)	63(21%) 159(53%) 222(74%)	90(30%) 210(70%) 300(100%)	.551
Prolonged screen time in a fixed position lead to musculoskeletal disorders				
True- False- Total-	21(7%) 57(19%) 78(26%)	126(42%) 96(32%) 222(74%)	147(49%) 153(51%) 300(100%)	0.009
Excessive screen time affect academic performance				
True- False- Total-	75(25%) 3(1%) 78(26%)	171(57%) 51(17%) 222(74%)	246(82%) 54(18%) 300(100%)	.029
Setting screen time limits reduce potential hazards of excessive screen time				
True- False- Total-	78(26%) 0(00%) 78(26%)	180(60%) 42(14%) 222(74%)	258(86%) 42(14%) 300(100%)	.017

Table 4: Awareness of adverse effects of increased screen time among students

Adverse effects	Male (n=219)	Female (n=81)	Total (n=300)
Increase risk of eye strain	204(68%)	75(25%)	279(93%)
Increase risk of metabolic syndrome	81(27%)	36(12%)	117(39%)
Increase risk of obesity	111(37%)	36(12%)	147(49%)
Sleep related problems	153(51%)	51(17%)	204(68%)
Anxiety	117(39%)	51(17%)	168(56%)
Poor social interaction	198(66%)	66(22%)	264(88%)
Headache	168(56%)	48(16%)	216(72%)

DISCUSSION

The purpose of the study to understand the level of awareness among undergraduate medical students regarding the potential negative effects of excessive screen time on physical health. The study reveals statistically significant differences in screen time and genders (p- value =0.041). Excessive screen time with age groups also statistically significant (p-value =0.008). Findings of our study indicate that 89.2% of medical students aged 18–20 years report excessive ST, and the rate is higher in males (58% versus 16% in females). We found that a higher percentage of males spent excessive time on screens compared to females. Similar comparative findings have been reported from study conducted during recent times in China with 9.4% of Chinese adolescents aged 14–20 years report excessive ST, and the rate is higher in males (15.3% versus 3.5% in females).[10]

In this study, though majority of the students (93%) were aware of the various vision related problem e.g. dry eyes, associated with excessive screen time. a case-control study by Doguizi S et al in 2019 showed that 37.7% of respondents in the case group (> 6 hours/day) experienced dry eyes, while in the control group (<1 hour/day) there were 10.2% of respondents experienced dry eyes.[11]

In our study, the majority of the participants (91%) were aware that taking frequent breaks from screens is important, as it significantly reduces the hazards of excessive screen time. This finding is also statistically significant (p- value =.034). Among 300 students only 14% students were aware about 20-20-20 rule but never followed the 20-20-20 rule (take a 20 second break every 20 min of close work and gaze at objects at least 20 feet away). In a study by Rui Li et al showed that Among 2363 invited students, 56% did not know the 20-20-20 and 6.5% knew but never followed the 20-20-20 rule.[12]

82% of the respondents feel that their efficiency at work has reduced due to the increase in screen time. Among the physical health effects from screen time, the majority of the respondents (72%) said that headache was a predominant effect from screen time. Increase risk of eye strain and anxiety was also cited as a physical health effect from screen time. In a similar study done by Subodh H Bharadwaj et al showed that 57 out of 102 respondents (55.3%) said that the increase in screen time has negatively affected their efficiency at work/academics, 47 of the respondents chose headache as a physical effect from screen time.[13]

CONCLUSION

Based on major findings of the study, significant proportion of students, particularly in the 21-24 age group, spending more than 3 hours per day on screens. In our study we found that a higher percentage of males spent excessive time on screens compared to females. It was concluded that majority of the students were aware of the adverse effects of increasing screen time like increased the risk of social isolation, poor academic performance, headache, eye problems, emphasizing the importance of taking frequent breaks. However, we found less awareness of the 20-20-20 rule highlighted a gap in knowledge regarding eye care practices during screen use.

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