

## Assessing the Impact of Screen Time on Physical and Mental Health in Medical Students in Pune - A Cross-Sectional Study

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### ARTICLE CYCLE

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### ABSTRACT

**Background:** There has been a substantial increase in the medical students' screen time, especially after COVID, due to digital education. Even though digital devices and apps are essential for various purposes, such as academic work and access to information, they can harm both physically and mentally. Despite the rising awareness Indian medical students still have limited acceptance of the potential danger. In addition to academic use, students frequently engage in entertainment activities such as social media use and binge-watching, thereby increasing their screen time and the associated negative health effects. **Aim & Objective:** To estimate the time MBBS students at Dr D Y Patil Medical College in Pune spend on screens and to examine its impact on their mental and physical health. **Settings and Design:** A cross-sectional study was conducted. **Methods and Material:** A total of 174 Participants were selected through convenience sampling, and a semi-structured Google Forms survey comprising 20 items was used. Data were collected using a self-designed questionnaire that was pilot-tested and revised. After expert validation it was used. **Statistical analysis used:** Categorical data was collected and presented in table format. Descriptive statistics was presented in number and percentages. Analysis was performed using Epi Info version 7.2.7. **Results:** 77% of participants (n = 134) reported using screens for four to six hours per day, while 19% (n = 33) reported screen use exceeding six hours daily. The most commonly reported physical complaints included eye strain (30.8%, n = 54), headaches (20.6%, n = 36), neck discomfort (19.8%, n = 34), and back pain (13%, n = 23). Most commonly reported mental complaint included anxiety, which was reported by 21.6%(n=38), followed by irritation, 19.4%(n=34). Interestingly, more than half of the participants reported increased screen use (51.7%; n=90), which led to reduced physical activity. **Conclusions:** Thus, the study shows a very strong association between prolonged screen time and several health problems among medical students. Thus, awareness and preventive measures are urgently needed, given the increasing dependence on digital platforms.

### KEYWORDS

Screen time, Anxiety, Mental health, Physical health, Depression, eye strain, Medical students.

### INTRODUCTION

Many studies have been conducted, showing that increased dependence on technology has led to more screen time, which is the total time spent on electronic devices such as smartphones, laptops, tablets, and gaming consoles for studying, socialising, and entertainment (1). The rapid growth and widespread use of technology have transformed the academic environment and students' daily routines, raising concerns about mental and physical health (2). This shift was especially amplified after the COVID-19 pandemic, when traditional classrooms were replaced by online learning platforms (3).

As a result, students reported difficulty in adapting to new learning methods, along with reduced physical activity and increased screen time (3). In addition to academic tasks, students increasingly rely on digital devices for recreational activities such as social media,

online gaming, and binge-watching, further increasing their screen time (4).

Excessive engagement with electronic devices has been associated with behavioural concerns, including increased dependence on digital media, reduced attention span and potential decline in academic performance among medical trainees(5). Furthermore, prolonged screen exposure has been linked to various physical health complaints, such as digital eye strain, headaches, sleep disturbances, and musculoskeletal discomfort, arising from sustained visual demands and poor ergonomic practices (6).

In addition to these physical consequences, growing evidence suggests that pandemic-related lifestyle changes have contributed to increased sedentary behaviour, reduced physical activity, and unhealthy daily routines among young individuals, alongside rising digital engagement (4). Such behavioural changes may further

increase the risk of long-term health issues if not addressed through early awareness and preventive strategies.

Despite increasing global recognition of these potential health implications, limited context-specific evidence exists regarding screen-time patterns and their associated physical and psychological health outcomes among undergraduate medical students in urban Indian settings. Therefore, the present study was undertaken to assess the duration of screen use and examine its relationship with physical and mental health among MBBS students in Pune.

**Aim & Objective(s)**

The aim of this study is to ascertain the amount of time undergraduate medical (MBBS) students at Dr.DY Patil Medical College in Pune spend on screens and to examine its impact on their mental and physical health. Objectives were-

- To collect the number of hours spent on screens by medical students
- To assess screen time and physical and mental problems faced among medical students

**MATERIAL & METHODS**

Analytical cross-sectional study design was conducted at Dr D. Y. Patil Medical College, Pimpri, Pune, among undergraduate MBBS students from the first to final year. Based on the reported prevalence of excessive screen time of 46.7% among medical students in the study by Rehman *et al.*<sup>3</sup>, which examined the impact of excessive screen use during online education on the physical and mental well-being of medical and dental students, the minimum sample size was calculated using the formula for estimation of a single proportion ( $n = 4pq/L^2$ ). Given an allowable error of 7.5%, the required sample size was estimated as 170 participants. Ethical approval for the study was obtained from the Institutional Ethics Sub-Committee of Dr D. Y. Patil Medical College, Pune (Ref. No.: I.E.S.C./37/2025; Research Protocol No.: IESC/FP/08/2025). Participation in the study was voluntary, and informed consent was obtained from all participants prior to data collection.

**Inclusion criteria:**

- MBBS students from the first year to the final year of Dr DY Patil Medical College and Hospital.
- Medical students who gave consent and willingly participated.

**Exclusion criteria:**

- Non-MBBS branches of the medical field were excluded (BDS, BAMS, BHMS, etc.)
- MBBS students currently in internship were excluded from the study
- Medical students who did not consent to the study.

A self-designed, semi-structured questionnaire comprising 20 items was used to assess screen-time patterns and their perceived physical and psychological effects among undergraduate medical students. Prior to the main study, pilot testing was conducted among 10%

of the estimated sample size ( $n = 17$ ) to evaluate the clarity, feasibility and comprehensiveness of the questionnaire. Necessary modifications were incorporated based on feedback from the pilot phase.

Content validity of the questionnaire was confirmed through expert review by faculty members from the Department of Community Medicine. The questionnaire, administered via Google Forms, was completed by 174 MBBS students; participation was completely voluntary. The data was entered into Microsoft Excel, cleaned, and analysed using EpiInfo software version 7.2.7.

**RESULTS**

A total of 174 undergraduate medical students participated in the study. The majority of participants were female (73%,  $n = 127$ ), while males constituted 27% ( $n = 47$ ). The mean age of the participants was 20.3 years.

**Screen Time Usage:** Daily screen exposure among participants showed that the majority of students reported using digital devices for four to six hours per day (77%,  $n = 134$ ). Screen use exceeding six hours per day was reported by 19% ( $n = 33$ ) of students, while 34.5% ( $n = 60$ ) reported two to four hours of screen exposure daily. Only a small proportion of participants reported screen use of less than one hour per day.

To better understand the distribution of screen exposure across academic years, responses were analysed as proportions within each year of study (Table 1). A higher proportion of second-year students reported screen use of four to six hours per day compared to other academic years. Similarly, the proportion of students reporting screen exposure exceeding six hours per day was highest among third-year (Part I) students.

**Physical Health Impacts of Screen Time:** Participants reported several physical complaints associated with prolonged screen time. Eye strain was the most common complaint, affecting 30.8% of those surveyed. Back discomfort (13%), neck pain (19.8%), and headaches (20.6%) were among the other problems. Almost 12.1% of people reported a burning sensation in their eyes, indicating eye strain. Other symptoms reported were less common.

**Mental Health Symptoms Related to Screen Exposure:** Many mental health-related complaints were also reported by the participants. Anxiety was reported as the most common, at almost 21.6% of those surveyed. Followed by 13.9% individuals reporting depression symptoms. Thus raising the understanding of the importance of screen hygiene.

**Impact on Physical Activity:** In this study, nearly 51.7% ( $n=90$ ) of participants reported that increased screen time had contributed to reduced physical or outdoor activity. Thus increasing the pattern of a sedentary lifestyle, ultimately affecting health. Moreover, the findings indicated that 77% ( $n=134$ ) of participants reported screen use for 4-6 hours per day, which may affect their health.

**Table 1- Daily screen time distribution across academic years ( column %)**

On a daily basis, how many hours do you spend on screens?	1st year MBBS	2nd Year	3rd year MBBS	3rd year MBBS (part 2)
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		MBBS	(part 1)	
<1 hr per day	2 (3.8%)	2 (2.8%)	0 (0%)	0 (0%)
2-4 hr per day	27 (51.9%)	21 (29.2%)	1 (5.6%)	11(34.4%)
4-6 hrs per day	18 (34.6%)	38 (52.8%)	8 (44.4%)	13 (40.6%)
>6 hr per day	5 (9.6%)	11 (15.3%)	9 (50%)	8 (25%)
<b>TOTAL</b>	<b>52 (100%)</b>	<b>72 (100%)</b>	<b>18 (100%)</b>	<b>32 (100%)</b>

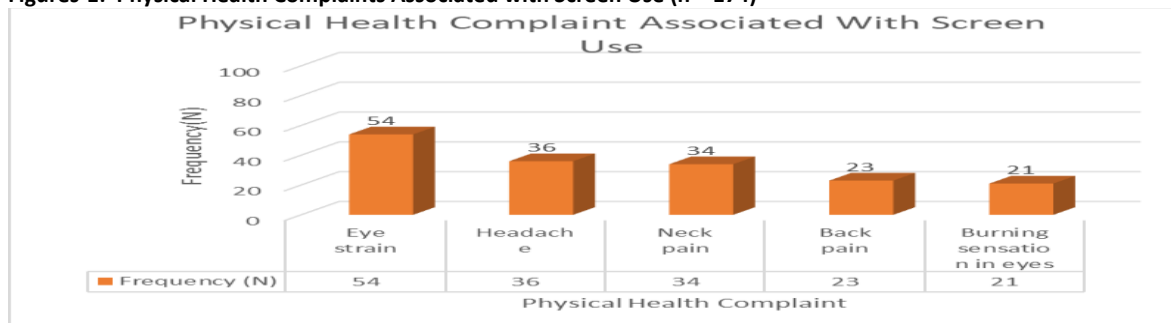
**Table 2: Physical Health Complaints Associated with Screen Use (n = 174)**

Physical Health Complaint	Frequency (N)	Percentage (%)
Eye strain	54	30.80%
Headache	36	20.60%
Neck pain	34	19.80%
Back pain	23	13%
Burning sensation in eyes	21	12.10%

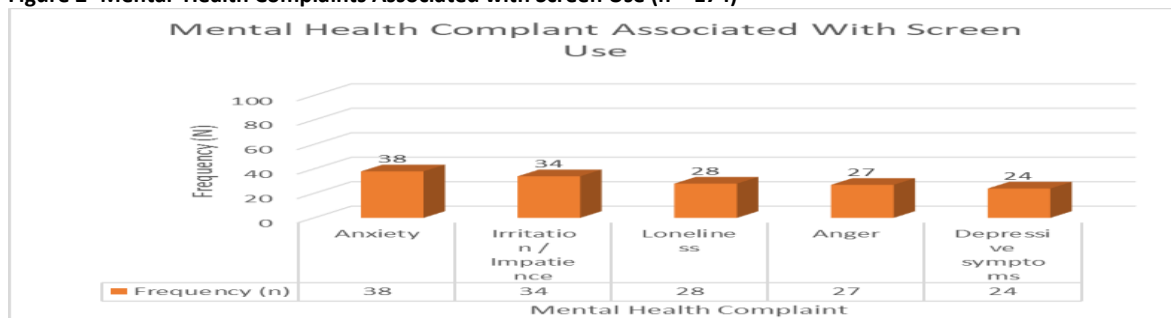
**Table 3: Proportion of Mental Health Symptoms associated with screen use (n=174)**

Mental Health Symptom	Frequency (n)	Percentage (%)
Anxiety	38	21.60%
Irritation / Impatience	34	19.40%
Loneliness	28	16.20%
Anger	27	15.40%
Depressive symptoms	24	13.90%

**Figures-1: Physical Health Complaints Associated with Screen Use (n = 174)**



**Figure 2- Mental Health Complaints Associated with Screen Use (n = 174)**



**DISCUSSION**

The current cross-sectional study was conducted among undergraduate medical students in Pune to examine the association between prolonged screen time and its effects on students' physical and mental health. A majority of participants reported prolonged daily screen exposure, with 77% (n = 134) using digital devices for four to six hours per day and 19% (n = 33) reporting screen use exceeding six hours daily. Similar findings have been reported by Rehman et al.(6), where 46.7% of medical and dental students spent more than two hours at a stretch on digital screens during online teaching. Likewise, a study conducted by Yeluri et al.(5) among 400 medical students reported an average daily screen exposure of 5.13 hours, indicating a comparable trend of extended device usage among medical trainees. In the present study, eye strain was the most frequently reported physical complaint, affecting 30.8% (n = 54) of participants, followed by headaches (20.6%, n = 36) and neck discomfort (19.8%, n = 34). Similar associations

between prolonged screen exposure and visual and sleep-related disturbances have been documented in previous research among undergraduate medical students by Baria et al.(7) conducted among undergraduate students of Gujrat, reported a significant correlation between increased screen time and poor sleep quality, suggesting that excessive digital engagement may contribute to physical discomfort and reduced well-being. Mental health-related concerns were also seen in the current study, such as anxiety, which was reported by 21.6% (n=38) of participants. Bhakat and Das(3) conducted a cross-sectional study among colleges and universities in India, observing considerable mental health challenges among college students during the COVID-19 pandemic, reinforcing the potential impact of prolonged digital engagement on emotional well-being. Furthermore, more than half of the participants in the present study (51.7%, n = 90) reported reduced physical activity associated with increased screen usage,

suggesting a shift towards sedentary behavioural patterns. Similar lifestyle changes have been reported in pandemic-related research, in which increased screen time was linked to decreased physical activity among adolescents and young adults. Marckhoff *et al.*(8) in a study conducted among adolescents in Germany also documented increased sedentary behaviour during COVID-19 restrictions, supporting the findings of the present study.

A systematic study conducted by Stiglic and Viner *et al.* (9) which analysed multiple studies involving children and adolescents across different countries, reported that prolonged screen time was consistently associated with unfavourable physical outcomes such as obesity, poor sleep, and reduced physical activity, as well as psychological problems, including emotional and behavioural difficulties.

Overall, the findings of this study align with existing literature indicating that prolonged screen exposure among medical students is associated with multiple physical and psychological health concerns. Given the increasing reliance on digital platforms in medical education, there is a need to promote awareness regarding screen hygiene practices, ergonomic measures and balanced lifestyle behaviours to safeguard student health.

#### CONCLUSION

The present study revealed that prolonged screen exposure was highly prevalent among undergraduate medical students, with 77% (n = 134) reporting daily screen use of four to six hours and 19% (n = 33) exceeding six hours. Increased screen usage was commonly associated with physical complaints such as eye strain (30.8%, n = 54), headaches (20.6%, n = 36) and neck discomfort (19.8%, n = 34). Psychological concerns, including anxiety (21.6%, n = 38), irritation (19.4%, n = 34) and loneliness (16.2%, n = 28), were also reported. Additionally, more than half of the participants (51.7%, n = 90) reported reduced physical activity associated with increased screen exposure. These findings highlight the growing need to promote awareness of balanced screen use, ergonomic practices, and the maintenance of healthy lifestyle behaviours among medical students.

#### RECOMMENDATION

1. Awareness programs on screen time should be conducted regularly.
2. The 20-20-20 rule should be implied.
3. Screen hygiene practices, optimal screen brightness, and proper posture should be encouraged.
4. Regular breaks should be given, especially in long classes.
5. Mandatory promotion of physical activity, especially at institutions.
6. Regular counselling for all the students.

#### LIMITATION OF THE STUDY

1. The study was conducted at a single medical college, limiting its national applicability.
2. Because convenience sampling was used, the generalizability of the findings to all medical students is affected.

#### RELEVANCE OF THE STUDY

This study provides evidence from the urban medical college of Pune, filling the gap in screen time usage among medical students by identifying specific physical and mental health-related complaints and enabling them to adopt healthy strategies at both institutional and individual levels.

#### AUTHORS CONTRIBUTION

All authors have contributed equally.

#### FINANCIAL SUPPORT AND SPONSORSHIP

Nil

#### CONFLICT OF INTEREST

There are no conflicts of interest.

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#### DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors haven't used any generative AI/AI assisted technologies in the writing process.

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