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Original Research Article

The impact of sleep quality and screen time on academic performances of students at University of Hyderabad: a cross-sectional study

Neha Chaudhary[1]*, M. Surya Durga Prasad[1], Sonaxi Gokhru[2]

[1]Department of Public Health, University of Hyderabad, Hyderabad, Telangana state, India
[2]Department of Public Health, Jawaharlal Nehru University, New Delhi, India

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***Correspondence:**
Dr. Neha Chaudhary,
E-mail: drnehachaudharyyy@gmail.com

ABSTRACT

Background: Sleep deprivation or low-quality sleep might influence mental, physical and cognitive functioning. And everyone being dependent on digital devices highlights excessive screen exposure, which leads to increased sleep problems, lower academic performances, and low self-esteem. However, this area needs to be explored more among university students. Hence, this study aimed to evaluate and establish a correlation between increase screen time, varying sleep quality and academic performance, as well as to assess the average screen time usage by students at University of Hyderabad.
Methods: In this cross-sectional study, a selection was made of 120 students from the age group 19-29 years, from January to April 2025, using convenience sampling. Data was collected using Pittsburgh sleep quality index (PSQI) tool and a self-structured questionnaire comprising of demographic details, screen time usage, and academic performance variables.
Results: The global PSQI score was calculated with 75.8% of respondents having poor/ low sleep quality (PSQI score >5). An average of 5.1 hours per day of screen usage was seen, with screen usage just before bed accounting for an average of 1.90 hours per day. A significant association was found between sleep quality and screen time with academic performance (p value <0.05), however, there no association was found between sleep quality and screen time (p value >0.05).
Conclusions: Sleep quality and screen time showed an association with academic performance. However, there was no significant association established between sleep quality and screen time.

Keywords: Academic performance, PSQI, Screen hour, Screen time, Sleep quality, Students

INTRODUCTION

Sleep is an essential part of human life, which is inextricable. The ability to feel energetic and fit after sleeping is described as 'sleep quality'.[1] Many studies indicated that sleep quality influences numerous facets of quality of life, like health, physical, mental, cognitive functioning, and psychological impacts.[2,3] Lack of sleep and irregular sleeping patterns has shown impact on academic performance.[4]

With the advancement in technology, almost everyone is dependent on digital and electronic devices, which have evolved as an integral component of daily life, highlighting high digital consumption. 'Screen time' describes duration of time spent on television, internet, and videogames or computers and is rising, especially among young adults.[5] Excessive exposure to screens has shown association with poor academic performance, increased sleep problems, obesity, behaviour problems, increased aggression, lower self-esteem, and depression.[4]

According to WHO guidelines, children younger than 2 years should not use the screens and children older than 2 years but younger than 5 years, should limit their screen usage not more than an hour.[6] However, there are no screen-time cutoffs specifically recommended for older children or adolescents by either the WHO or any other government/country health guidelines.[7]

Together the concern arises towards poor quality of sleep and over use of screen time, might affect the academic performances of students. Hence, the study was focusing on providing a comprehensive understanding for establishing a correlation between varying sleep and increased screen time impacting academic performances of students, and potential factors affecting them and to ascertain the average screen time used by the University of Hyderabad students.

METHODS

A cross-sectional survey was conducted among the University of Hyderabad students in Telangana, India, between the age group of 19-29 years from January to April 2025. Convenience sampling was used to select 120 students, with a prevalence of 48.63%.[8] The institutional ethical committee of the University of Hyderabad reviewed and approved the research protocol (UH/IEC/2024/193). Once the informed consent was obtained from the participants, data collection was collected using a self-structured questionnaire containing demographic details, screen hours, purpose of screen usage, factors affecting quality of sleep and screen hours, academic grades, and the Pittsburgh sleep quality index (PSQI) tool.

Pittsburgh sleep quality index is a tool, which is used to evaluate sleep quality. It contains a number of questions that evaluates sleep habits over the last month. The result from each question was given a score from 0 to 3, where 3 indicated the greatest disturbance and 0 indicated the least disturbance. The scores are then calculated by summing the seven components to obtain a total global PSQI score. The range of global score is between 0 to 21, where >5 score indicates significant sleep difficulties or poor sleep quality.[9]

Total hours of screen usage per day was utilized to evaluate screen hours. Academic grades were utilized to evaluate the academic performances of the students.

Data analysis

Data collection was done using MS Excel spreadsheet and SPSS statistical software version 29 was used for analysis. Mean, standard deviation, and percentages were calculated. Spearman correlation was used to evaluate the association between the variables, and the Mann Whitney U test was done to identify the significant difference among sleep quality, increase screen time and academic performance at a level of significance as 5%.

RESULTS

The study included 120 respondents, between the age group 19-29 years. The mean age was 23.4 years, with standard deviation was 2.30. 55.8% were the female participants more than the 44.2% of male participants responded.

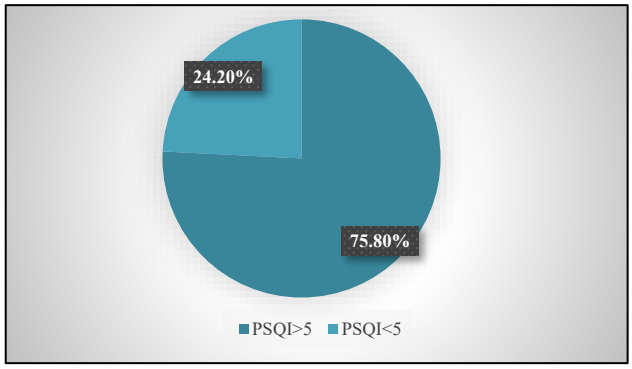

Figure 1: Global PSQI score indicating sleep quality.
*PSQI>5 = Poor sleep quality, PSQI<5 = good sleep quality.

The Global PSQI score was calculated using PSQI tool to analyse the sleep quality as depicted in Figure 1, it was found that 75.8% of the respondents reported global PSQI score >5 with an average mean of 7.38, showed poor sleep quality, whereas only 24.2 % of the respondents reported PQSI<5, had good sleep quality. Contradictorily, 22.5% of the respondents rated their own quality as very good, 54.2% as fairly good, only 18.3% as fairly bad, and 5% as very bad.

Table 1: Correlation between sleep quality, screen time and academic performance.

Variables compared	Spearman's ρ	P value
Global PSQI versus academic grades	0.184	0.045*
Screen time versus academic grades	-0.30	<0.001*
Global PSQI versus screen time	-0.116	0.208

*Statistically significant.

28.5% of respondents used screens for less than 2 or 2 hours per day, whereas 72.2% used the screen for more than 2 hours per day. The average screen time used by the respondents was 5.1 hours per day with an average of 1.9 hours per day noted on screens just before sleep. The types of screens used were smart phones (96.7%), laptops (49.2%), televisions (1.7%), and others. The primary purpose for screen usage was social media with 42.5%, entertainment (movies, songs) at 23.3%, and for work/study at 34.1%.

Participants rated their overall academic performance as good (55%), 28.3% rated it as fair, 11.7% reported excellent performance, and 5% as poor. When asked

about lack of sleep or excessive screen time affecting their academic performance, 30.8% responded Frequently, 12.5% responded Always, 27.5% responded Occasionally, while 29.2% responded Rarely/never.

Table 1 represents, positive correlation (ρ=0.184) was appreciated between sleep quality and academic performance (p=0.045), whereas negative correlation (ρ=-0.30) was found between screen time and academic performance (p=<0.001). However, a weak negative correlation (ρ=-0.116) was identified between sleep quality and screen time (p=0.208); there was no significance.

Screen hours and academic grades showed significant difference (U=930, p<0.001), indicating that academic performance and hours of screen usage were associated with each other. However, there was no statistically significant difference was present between academic performance and sleep hours per day (U=1301, p=0.628).

Participants reported a range of symptoms associated with prolonged screen time, among which eye strain was most commonly reported by 69.2% of participants, followed by headache (39.2%), 30.8% experienced sleep disturbances, and 35.8% noted reduced physical activity due to screen usage. Taking a note towards the underlying cause of prolonged screen usage, stress/anxiety was reported as most commonly affecting 41.7% respondents, followed by peer influence (12.5%), home environment (5%), and others.

Numerous potential factors were identified affecting sleep quality and screen time, categorized as psychological, lifestyle/behavioural, and environmental factors.

Psychological

Stress, anxiety, restlessness, mental health, depression, overthinking, personal/ family issues, sex drive.

Lifestyle/behavioural

Excessive screens, irregular sleep patterns, double dinner habits/ irregular eating patterns.

Environmental

Mosquitoes, noise/light, physical discomfort, back pain, leg cramps.

DISCUSSION

The study was conducted to evaluate the impact of sleep quality and screen time usage on the academic performances of students of the University of Hyderabad. The study revealed interesting findings and gave insights for sleep quality, sleeping quantity, screen time usage, types of screens used, grades, and overall academic performance.

Participants included in the study ranged between 19-29 years, with more females (55.8%) participating than males (44.2%). On the contrary, the results reported of a study conducted on the impact of sleep time on sleep quality, where the males (54.4%) participated were more as compared to the females (45.3%).[4]

Majority,75.8% of the participants shown poor sleep quality with a global PSQI score >5 the (mean of global PSQI score was 7.38, indicating poor sleep quality), whereas only 24.2% respondents shown good sleep quality (PQSI<5). In the same way, mean PSQI score was 8.09, revealed from study conducted on adolescents in United Arab Emirates indicating poor sleep quality.[10]

In this study, the average screen time reported was 5.1 hours per day, with an average of 1.9 hours per day noted for screen usage just before sleep, indicating significantly high consumption of screens, especially during the night time, which was significantly higher when compared to the study carried in Tamil Nadu among the medical students, where the average was of only 2 hours per day.[11] And similar findings were seen in a study conducted to perceive quality of sleep and quantity, revealed an average of 5.13 hours of screen usage per day.[12]

Among the devices used, the most commonly used screens were smartphones (96.7%), followed by laptops (49.2%), computer (7.5%) and televisions (1.7%) were rarely used. The findings differed somewhat from the outcomes obtained by study a conducted among medical students in north coastal Andhra Pradesh, showing mobile computation (98.2%) was the highest, followed by tablet (31.5%), televisions (22.3%) and laptops (13.5%).[13] Study conducted to perceive quality of sleep and quantity, revealed that smartphones were utilised by everyone (100%), laptops (78.7%) and tablets (42.3%).[12]

In this study, sleep quality and academic performance were positively correlated. Parallel results were seen in study at Singapore residential college, where the findings from multivariate analysis highlighted quadratic relation between academic performance and overall sleep quality.[14] Whereas inverse findings were seen among Palestinian students, the study revealed no correlation between academic performance and quality of sleep.[15]

Screen time and academic performance were negatively correlated. A study conducted in Tamil Nadu, established negative correlation between screen time usage and academic performance.[11] Similarly, in a meta-analysis conducted, academic performance and screen time showed a negative correlation.[17] However, sleep quality and screen time showed a positive correlation, but there was no statistical significance in the test (p value 0.064). On the contrary, a strong positive correlation between PSQI and screen time was reported among young adults.[18] Other studies conducted highlighted a negative correlation (r=-0.61).[4]

Excessive use of screens had shown adverse effects leading to respondents experiencing mostly eye strain (69.2%), followed by headache (39.2%), reduced physical activity (35.8%), and sleep disturbances (30.8%). In another study, (54.6%) drowsiness, (52.9%) headache, and (34.5%) low mood was noticed.[19]

The outcomes from this study highlighted that several factors contribute to trouble sleeping among the respondents, with psychological factors emerging as the most significant among which stress, anxiety, restlessness, depression were noted. Followed by lifestyle and behavioural factors excessive screen time, irregular sleeping habits, heavy food consumption, double dinner habits, and environmental factors, noise in the hostel/room, mosquitoes, light exposure and physical discomfort, back pain, leg cramps, tiredness, and body pain also posed a challenge for the respondents.

The results obtained from the study were in line with several studies, that highlighted the potential factors influencing sleep related behaviours. The factors accounted for were stress, self-control act, bedtime habits, neighbouring environment, excessive screen time before bed, personal sleep habits, alcohol, noise, lights, sound with noise from the neighbourhood, roommate disturbance, and physical environment such as silence, peace and darkness.[20-22] Additionally, it was noticed that physical discomfort such as pain, and lower back pain were responsible for sleep related disturbances.[23,24]

The study was conducted solely at one university; however, the study contributes to existing literature. Variables such as daytime naps, energy levels, and health related factors were not utilized.

CONCLUSION

The study aligns with the past research done with introducing new findings and insights about the increased poor sleep quality, screen time, and low academic performance. A notable impact of sleep quality and screen time was found on the academic performance of students; however, sleep quality and screen time did not reflect any significant association. There were several potential psychological, environmental, and lifestyle factors were identified that might mediate the relation between them.

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Ethical approval: The study was approved by the Institutional Ethics Committee (UH/IEC/2024/193)

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